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**Conventions and Quantification –
Transdisciplinary Perspectives on
Statistics and Classifications**

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Charles Tilly (1929–2008)

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Rainer Diaz-Bone & Emmanuel Didier (Eds.)

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Transdisciplinary Perspectives on
Statistics and Classifications

Mixed Issue

Article

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Special Issue

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No. 156

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The Sociology of Quantification – Perspectives on an Emerging Field in the Social Sciences

Rainer Diaz-Bone & Emmanuel Didier*

Abstract: »Die Soziologie der Quantifizierung – Perspektiven auf ein entstehendes Feld in den Sozialwissenschaften«. The introductory article to this HSR Special Issue presents the emerging field of sociology of quantification, which can be regarded as a transdisciplinary approach to the analysis of processes of quantification. Processes of categorization and classification are included because they can result in processes of generating figures and numbers also. The contribution sketches the science-historical development of this field. It is argued that processes of quantification are related in many ways with other social and socio-economic processes. Therefore, one can speak of a comprehensive political economy of statistics, quantification and categorization. Especially the works of the French statistician and sociologist Alain Desrosières are an innovative and far-reaching groundwork for the analysis of statistics, quantification and categorization. Also, Desrosières has pointed to the fundamental role of conventions for processes of quantification (as for processes of categorization) and he has published important contributions to the French science movement of economics of convention (*économie des conventions*). At the end of the article, a set of positions for a sociology of quantification are presented.

Keywords: Sociology of quantification, Alain Desrosières, Pierre Bourdieu, Michel Foucault, economics of convention, history of statistics, measurement, categories, categorization, INSEE.

1. Introduction

To quantify is to invent a convention and then to measure.
(Desrosières 2008, 10)¹

Quantification has made modern states, sciences and economies possible. And – vice versa – states, science and economy are driving forces for quantification processes (Woolf 1961; Duncan 1984; Porter 1995; Desrosières 1998, 2003; Didier 2009). Social scientists claim that numbers in society enforce trust (Por-

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¹ Translation by the authors.

ter 1995) and that we are living in “worlds of numbers”² or in “worlds of indicators” (Rottenburg et al. 2015). All these wordings point to the development of the last century which came up not only in specialized worlds, but also in the experience of everyday life worlds of ordinary people (Gigerenzer et al. 1989). They point to a change of worlds in which quantitative information became more and more a dominant form of information relevant for coordination, for evaluation and for valuation. The establishment of the metric system in Europe in the 19th century, the upcoming of industrial production, the unification of currencies, the processes of nation building and of internationalization promoted the importance of quantitative information, which are endowed with a huge scope in space and time, which also facilitate comparisons between units and points in time (Porter 1995; Desrosières 1998, 2008, 2008a, 2014; Thévenot 1984; Espeland and Stevens 1998, 2008).³

With the Internet for two decades at least, a new form of political economy has evolved, which is based on quantitative information, on algorithms and new forms of the public, and of services and products. The amount of data which is analyzed – more and more on an automated basis and in real time – has given birth to the widely nowadays applied buzz word “big data” (Mayer-Schönberger and Cukier 2013; Burrows and Savage 2014).⁴ All in all, the economization and computerization of societies and the Internet will make quantification a more and more important research phenomenon.⁵

2. Sociology of Quantification – An Emerging Scientific Field?

The sociology of quantification analyzes processes of production and communication of numbers, also of graphs as visual representations of numeric data not only in relation to the political power that they unleash, not only in relation to “society” and not only in relation to classical sociological research questions (as social inequality, pluralities of valuation and coordination, conflict and critique, rationalization, labor division and its organization, social cognition etc.), but also as social processes “in itself and as such.”

² In German “*Zahlenwelten*,” see also Kalthoff (forthcoming).

³ For the establishment of the metric system see also Duncan (1984) and Alder (2002); for the establishment of time measurements see Zerubavel (1976, 1977, 1981).

⁴ The Internet is linking not only human beings but also texts, data files, objects and machines. More and more machines and objects are directly connected by the Internet, which is called the “Internet of things” (in short IoT, see Atzori et al. 2010). This trend accelerates the speed with which data are generated, traded, matched and analyzed.

⁵ And it is an open discussion whether the classical social research methods and research approaches are still appropriate for the analysis of these new data formats (Savage and Burrows 2007; Burrows and Savage 2014).

For one thing, we shall have to overcome our tendency to think of social measurement or quantification as something external to the social system in the sense, say, that the tailor's tape measure is external to the customer's waist. On the contrary, I argue, the quantification is implicit – sometimes explicit, for an observer not blinded by methodological preconceptions – in the social process itself before any social scientist intrudes (Duncan 1984, 36).

This latter perspective is strongly represented today by actor-network theory and convention theory. So the range of phenomena of sociology of quantification includes quantification processes *in* the sciences,⁶ quantification in society driven *by* the sciences,⁷ quantification processes driven by *other* social processes, including for example implementations of numeric technologies, standardization procedures,⁸ bureaucratic management, political decision-taking and newer trends as self-quantification – although in modern societies, which are penetrated by scientific concepts; these distinctions cannot be conceived as clear cut. Thereby, all stages of quantification processes are of interest as the construction and implementation of categories and indicators; the transformation of knowledge into quantitative information; the usages, representations and ways of communication of numbers; the very different ways to use the numbers once they are produced; and finally the (e)valuations and impacts based on these quantitative figures.

One has immediately to add that the *sociology* of quantification in fact is a transdisciplinary scientific movement – not restricted to the discipline of sociology. Without the contributions of statisticians, economists, historians, philosophers, information theorists, anthropologists and political scientists, this scientific strand would not exist, and especially historical analysis was groundwork for this field. Renowned scholars as Fernand Braudel or Charles Tilly not only used quantitative data and applied quantitative methods for historical analysis, they also practiced the old and noble “critique of the sources” which consisted in reflexive consideration about the methods of quantification.⁹ As this HSR Special Issue demonstrates, historians still offer important contributions to the

⁶ The sociology of statistics thus should be regarded as part of the sociology of quantification (see the works of Desrosières 2008, 2008a, 2014; and also contributions as Camic and Xie 1994; Anderson 1988; Raftery 2001; Godin 2005; Camargo 2009; Didier 2009; or the contributions in Alonso and Starr 1987). See also the classical literature on foundations, problems and reflections of measurement and quantification in the social sciences (Sydenham 1979; Woolf 1961; Lazarsfeld 1961; Duncan 1984; Roberts 1985). See also the contribution of Centemeri (2011).

⁷ This perspective is advanced by the so-called performativity approach, see below. See also the contributions from Fabian Muniesa (2016) and Corine Eyraud (2016) in this HSR Special Issue.

⁸ See for interrelations of standardization, conventions and quantification Lampland and Star (2009), Thévenot (2009), Timmermans and Epstein (2010) and Busch (2011).

⁹ Cliometrics is the sub-discipline in historical analysis using econometric methods in the historical analysis of quantitative historical data.

analysis of quantification and in the discipline of history.¹⁰ And since four decades now, the association QUANTUM has gathered researchers who apply computerized statistical methods in the analysis of historical data.¹¹

Also, the contributions in this HSR Special Issue demonstrate that research contributions in this area are more and more interrelated, i.e. authors relate to each other's work and are aware of each other's perspectives on quantification. This new quality can be grasped by the notion of "field."¹² There are influential precursors which can be regarded as classical studies. Several traditions can be identified. First, the French one, going back to Durkheim and Mauss (1903), and then Bourdieu (1984), who all considered, in a Kantian twist of mind, that social categorization and social enumeration were a social product of special importance, and thus that they were crucial objects of sociological inquiry. Second, an American tradition began much later, during World War II, with the rebellion of some sociologists against the wave of quantification that the discipline of sociology underwent then. Symbolic interactionists on the one hand with especially Herbert Blumer (1969) and later Howard Becker (1972), and ethnomethodologists on the other, with Garfinkel (1967) and Aaron Cicourel (1964), began to make quantification an object of sociology, in a clear critical tone, aiming at questioning the monopole of the quantitative criteria of proof. This rebellion happened to finally take shape only at the very end of the 1970s, in the denomination of "qualitative sociology." Another tradition of research comes from the historians of science. After Thomas Kuhn's *Structure of Scientific Revolutions*, published first in 1962 (see Kuhn 1996), Lorenz Krüger gathered a group of scholars at the University of Bielefeld to discuss whether the apparition of probability was in itself a scientific revolution or not. This led both to the publication of two collective volumes entitled *The Probabilistic Revolution* (1987, 1990) and to the shaping of a group of historians often identified as "the Bielefeld Group." Finally, another kind of research, sometimes referred to as "the internalists," took shape when users of quantification, that is professional statisticians, economists and sociologists, got themselves interested in the question of their own history. Very famous examples of this are Paul Lazarsfeld's "Notes on the history of quantification in sociology" (Lazarsfeld 1961)¹³ and Otis D. Duncan's "Notes on social measurement" (Duncan 1984).

¹⁰ See the contributions from Lars Behrlich (2016), Martin Lengwiler (2016) and Daniel Speich Chassé (2016) in this HSR Special Issue.

¹¹ The journal *Historical Social Research* is also the official journal of QUANTUM. See <<http://www.gesis.org/en/hsr/profile/quantum>>.

¹² The sociological notion of field was developed by Pierre Bourdieu. See for an application in the analysis of economy Bourdieu (2005); see also Martin (2003).

¹³ This article from Lazarsfeld is reprinted in Woolf (1961).

3. Alain Desrosières' Legacy

Now, there are important modern publications in the field of sociology of quantification as Theodore M. Porter's book *Trust in numbers* (1995), and articles written by Wendy Espeland and co-authors (Carruthers and Espeland 1991; Espeland and Sauders 2007; Espeland and Stevens 1998, 2008; Espeland and Vannebo 1998). But the most important and most influential works – at least in Europe – were published by the French statistician and sociologist Alain Desrosières who mixed all together these four traditions of social studies of quantification. And the contributions in this HSR Special Issue refer to are grounded in his seminal work. From its beginning, sociology of quantification in France has focused firstly on social categories, classifications and counts of categorizations. Here, French scholars could continue this tradition founded by Emile Durkheim, which was advanced by Pierre Bourdieu and the French scientific movement of the so-called *économie des conventions* (EC, see below).

The very specificity of Alain Desrosières in this field, made possible by the very specificity of the institution that hired him, was that he was not only a social student of statistics. He studied statistics reflexively because he was *also* a practitioner of statistics and was aiming at improving them. The INSEE (*Institut national de la statistique et des études économiques*) has this very great originality compared to other statistical institutes around the world that it belongs to its duty not only to produce data (such as the Census Bureau does magnificently), but also to produce studies based on these data – which is devoted mainly to academics in the US. In France, people like Alain Desrosières are paid to be *at the same time* bureau of the census professionals and university professors.

In the 1970s, Desrosières was given the task to refurbish the socio-professional categories in France which were getting old (they had been created in the 1940s). It led him, under the impulse of Bourdieu, to dig into their history and to produce new theories of quantification, and to a better understanding of the mechanisms of categorization. Only then, he himself (and others) transformed the most important social nomenclature in France! Social studies of statistics were put to use for statistics. This episode became one epitome contribution in the field (Desrosières and Thévenot 1979, 2002; Diaz-Bone 2015).¹⁴ Also French studies on quantification were mainly interested in the activities of state institutions and in public action (see the contributions in Besson 1992). But later, the analysis of indicators and accounting became also

¹⁴ See also the contributions of Thomas Amossé (2016) and Etienne Penissat et al. (2016) in this HSR Special Issue.

part of these studies in France (see for example Desrosières 1995, 2001, 2015; Chiapello and Desrosières 2006; Salais 2004, 2012; Thévenot 2009, 2011).¹⁵

In the US, as well as in the UK and in Germany, sociologists from the beginning on did research on metric measurements, on the analysis of book-keeping, accounting and on rankings. These were more important than the analysis of categorizations – although some work on categories and the differences between categorization and quantification do exist, as the conceptual distinction of “marking” which is using numbers to represent categorical relationships and “commensuration” which is using numbers to represent metric relationships (Espeland and Stevens 2008, 409).¹⁶ The German contributions to the sociology of quantification focused also on numeric calculation and representation (Stagl 1976; Aly and Roth 2004). Also German scholars early cooperated with British scholars in the field of accounting.¹⁷

But still sociology of quantification is no unified field, and it is not a fully established field. One reason for this is that scholars who work on quantification are also engaged in other – and sometimes much better institutionalized – fields of research. This can be regarded as impediment, but an advantageous consequence of this is to have contributions to sociology of quantification from different other scientific strands and fields as from the social studies of science and technology (Latour and Woolgar 1979; Latour 1987),¹⁸ the performativity approach in economic sociology and in the sociology of finance (Callon 1998; MacKenzie 2006) or critical accounting studies (Miller and Hopwood 1994; Power 1997). Another reason is that there is still no clear cut set of research problems, no coherent agenda and no elaborated theoretical and associated methodological approach for such a scientific field – maybe with the exception of Alain Desrosières’ work as we discuss below. Although this field emerges as an international one, it is fragmented by crossing national and cultural boundaries as well as by language frontiers. For some years now the number of international meetings, conferences and research groups is rising.¹⁹ Likewise more and more editorships are published – offering an international collection of

¹⁵ See also the contributions of Eve Chiapello and Christian Walter (2016), Corine Eyraud (2016), Robert Salais (2016) and Laurent Thévenot (2016) in this HSR Special Issue.

¹⁶ One of the important exceptions in US sociology is the research on classification in the tradition of symbolic interactionism of Bowker and Star (1999); further exceptions are for example the contributions of DiMaggio (1987), and for the relationship of categorization with quantification see the contributions of Zuckerman (1999), Zhao (2005, 2008) or Fourcade and Healy (2013).

¹⁷ See the contributions in Kalthoff et al. (2000) and in Mennicken and Vollmer (2007).

¹⁸ See also the forthcoming special issue of the *Journal Science & Technology Studies* (S&TS): “Numbering, numbers and after numbers: Doing & undoing calculative practices.” See also Godin (2005).

¹⁹ Two examples: At the *Wissenschaftskolleg zu Berlin* there has been a focus group on quantification in 2013/2014 (headed by Wendy Espeland). Laurent Thévenot organized a conference on the sociology of quantification at Paris Malakoff in November 2015.

contributions (see for example Adkins and Lury 2012; Rottenburg et al. 2015; Bruno et al. 2016, forthcoming). An “Alain Desrosières Prize” has even been set up by the *Société française de statistique* to reward annually the work of a young social student of quantification. These developments make scholars more and more aware of each other and of the sociology of quantification as an emerging field. Maybe the claim of an emerging field at this moment is more a hypothesis, but we think that the evidence for this claim is gathering.

The work of Alain Desrosières can be regarded as the best suited groundwork for sociology of quantification as a scientific field.²⁰ Alain Desrosières was an internationally and widely renowned scholar not only in the field of sociology of quantification but also as an expert in the history of statistics.²¹ Especially his book *The politics of large numbers* (Desrosières 1998) was received in many countries and many disciplines.²² Alain Desrosières was also a “*compagnon de route*” of the French movement of the so-called “*économie des conventions*” (in English “economics of convention,” in short EC) which postulated the conventional (and therefore social) nature of qualities and quantities (Desrosières 2011, 2008, 2008a, 2014; Diaz-Bone 2015).²³ So presenting and discussing his work needs to recognize Desrosières’ relation to the French tradition of epistemology (which is presented in the sociology of Pierre Bourdieu) and his contribution to the scientific movement of EC.

Conventions are at the heart of the processes of quantification and of economization. Alain Desrosières emphasized this point, arguing that statistics must be conceived as simultaneously conventional and real (Desrosières 2009, 2014). It is this concept of convention as basis for cognition and valuation which was made famous by EC. From early on Desrosières had close relations to this scientific movement and his publications (especially the later ones) can be regarded as contributions to EC (Diaz-Bone 2015).²⁴ EC was founded in the 1980s by a group of economists in the Region of Paris: François Eymard-Duvernay, Olivier Favereau, André Orléan, Robert Salais and Laurent Thévenot (see Salais and Thévenot 1986; Storper and Salais 1997; Favereau and Lazega 2002; Eymard-Duvernay 2006, 2006a; Diaz-Bone 2011, 2015). Since more than ten years, the internationalization of EC has been an ongoing process

²⁰ See also the contributions in the special issue of *Statistique et société* edited by Didier and Dreesbeke (2014) as well as the contributions in the special issue of *Partecipazione et conflitto* edited by Bruno, Didier and Vitale (2014).

²¹ He was born 18th of April 1940 in Lyon and died on 15th of February 2013 in Paris.

²² Originally published in France in 1993 as *La politique des grands nombres*.

²³ See the contributions of Rainer Diaz-Bone (2016) and Emmanuel Didier (2016) in this HSR Special Issue.

²⁴ Alain Desrosières regarded himself not to be part of the inner core of founders of EC, but published works contributing to this complex pragmatic institutionalism of EC (Diaz-Bone 2011, 2015). In fact, one of his last written articles reveals his close affiliation to this movement (see Desrosières 2011).

and the journal *Historical Social Research* has already published a series of special issues devoted to EC and its applications.²⁵ Nowadays, it is more than evident for the growing international network of conventionalists that the contributions of Alain Desrosières are not only seminal for the sociology of quantification but also for EC. Desrosières' writings integrated analysis of categorization and quantification from its beginnings with EC (Diaz-Bone 2015).

4. Governing by Numbers, Critique, Statactivism and Retroaction

But the work of Alain Desrosières expands well beyond the crucial question of the interrelationship of social categorizations, quantification and conventions. One of the threads that is woven all along his oeuvre is the question of the relationship between quantification and government. The titles of his books speak for themselves: *The politics of large numbers* (Desrosières 1998), *Governing through numbers* (Desrosières 2008a), *To prove and to govern* (Desrosières 2014).

This point raises the question of his relationship to the work of Michel Foucault. Foucault – especially in *Territory, Security, Population* (Foucault et al. 2004) – where, in short passages, Foucault proposes to study the link between statistical practices and governmentality. This link, which Foucault points out more than he really explores, has been dug deeper by Ewald, a close student of Foucault, in his work on the welfare state (1986) where he has a whole chapter on the governmentality of the average.

But at the INSEE, if Foucault was used for his work on nomenclatures (Foucault 1994), his work on governmentality was not familiar. The reason is that his works were taught during his classes of the *college de France*. Even though pronounced at the end of the 1970s, his works were published only in 2004. And it happened simply that the administrators of the INSEE did not go to the public lectures of Foucault.

On the contrary, Foucault had one very influential auditor in the person of Colin Gordon, a very interesting character in that he always remained outside of the university system. Gordon actually sat in person at Foucault-conferences and

²⁵ In 2011, the first HSR Special Issue "Conventions and institutions from a historical perspective" offered introductions, theoretical considerations and empirical applications of this French approach (Diaz-Bone and Salais 2011). In 2012, a follow-up issue was published offering discussions and further considerations (Diaz-Bone and Salais 2012). In 2015, the next HSR Special Issue "Law and conventions from a historical perspective" was published, presenting research of convention theory in the transdisciplinary field of sociology of law, history of law and economic sociology of law (Diaz-Bone, Didry and Salais 2015). The articles in these issues are available in the HSR Archive, available at: <<http://www.gesis.org/en/hsr/archive>>.

became enthusiastic (Jardim 2013). His enthusiasm gave rise to the book *The Foucault Effect* which was edited with Graham Burchell and Peter Miller (Foucault et al. 1991), who at the time were working in the sociology of accounting.

Desrosières, in a kind of paradox, was much more aware of the work of the team at the London School of Economics because they were working on a specific quantification technique, accounting (Rose 1991; Miller 2001). So what he knew about the Foucault of governmentality had made an English detour.

In other words, Desrosières was not influenced by the work of Foucault, at least until the very end of the 2000s, and the reverse actually is also true. The main differences between them ensue from the raw fact that Desrosières was first interested in quantification when Foucault was first focusing on government. Thus, Foucault did not see that there are actually different statistical techniques and that it makes a difference. He linked statistics, all statistics, mainly to neoliberal governmentality. On the contrary, for Desrosières, the baseline is that there are several different statistical methods, which have very different effects in the government of the population. For him, it soon became clear that different modes of quantification are associated with different modes of government. For example, he has shown how French seventeenth century Colbertism also had its specific statistics. This work of Desrosières would end up in his famous *Table of the five forms of State* (2003).²⁶ Foucault, and with him Ewald and Donzelot, had only an intuition of the object that Desrosières was pursuing.

After this work on the relationship between quantification and governmentality, Desrosières focused on a whole new set of questions related to the specific case of quantification used by a neoliberal government such as the one that he was witnessing since the middle of the 2000s (Desrosières 2015). He always was passionate in the political scene in which he was living. As shown in this very HSR Special Issue, this led him to tackle three questions. First, that of the benchmarking techniques and retroaction (Desrosières 2015; Bruno and Didier 2013), second the question of the randomized experiments applied to public policies (Bardet and Cusso 2012), and third the question of statistical activism (Bruno et al. 2014).

Thus, Desrosières opened up a whole series of topics that deserve to be approached through the study of their relationships to quantification and conventions. From the ways societies produce their own categories and nomenclature, to the ways numbers are used and thus participate to the government of the population passing by the specificities of control in our neoliberal world. His work might be illuminating in many different ways.

²⁶ See the contribution from Rainer Diaz-Bone (2016) in this HSR Special Issue (in particular, Table 3).

5. Positions for a Sociology of Quantification

We propose to consider a set of positions which could be suited to integrate a more coherent field of research on categorization and quantification.²⁷

- 1) Sociology of quantification has been very productive when it has considered the societal interrelations and the division of labor (of different actors) engaged and entangled in a kind of a widely understood “political economy of coding, categorization and quantification” overarching many stages of production, distribution, application and recognition of categories and quantifications. Laurent Thévenot (1983) and Alain Desrosières (2011a) have worked out this embracing perspective on social engagements in categories and quantifications wherein social representations, the exertion of power, social reproduction, the interrelation of state and other social institutions are involved in the definition, establishment and application of categories and quantifications in social space (Boltanski and Thévenot 1983). Laurent Thévenot (1983) and Alain Desrosières (2007) coined the notion of statistical chains, respectively long chains which integrate these stages. The invention (construction), implementation and application of categories and quantification are costly societal investments in the sense of the concept of investment in form developed by François Eymard-Duvernay and Laurent Thévenot (Eymard-Duvernay and Thévenot 1983, 1983a; Thévenot 1984; Diaz-Bone 2015). So we claim for the interest of analyzing also the core processes of categorization and quantification which focus only on single parts of these chains. So we claim for the need to analyze also the core processes of quantification and their socio-epistemological prerequisites – not only the societal uses of numbers and the impacts of quantification.
- 2) Since *The politics of large numbers* (Desrosières 1998), the perspective on quantification is often based on a pragmatist and conventionalist approach. Quantifications are possible after conventions (how to categorize respectively how to measure) have been invented (Desrosières 2008, 10). There are no naturally given categories or measures. Both are the result of constellations of objects, human beings, dispositives (“instruments”), conventions and practices. This position is a critical stance against too simple positivistic ideas of categorization and measurement in the social sciences.
- 3) The historical and pragmatist perspectives of conventionalists on categorizations and quantifications lead to the rejection of the dichotomy between externalist and instrumentalist explanations. Conventionalists do not choose between the two. Both categorizations and quantifications

²⁷ Of course, we propose them for discussion in the field and not as “rules.”

have to be interpreted and applied by actors in situations. This is an internalist perspective as starting point, reconstructing the meaning of categorizations and quantifications from an actor's situation which is extended to the analysis of the wide-ranging socio-historical scope of categorizations and quantifications in whole societies as result (Storper and Salais 1997; Boltanski and Thévenot 2006; Diaz-Bone 2015). This position is a critical stance against the assumption that categorizations or quantifications serve only certain social classes, only some institutions or special interests and have a given and complete meaning. It is not meant to regard the interpretation and application of categories and measure as free and arbitrary in situations. But the effects of quantification cannot be bound to one or several social entities. They spill all over any social setting, including on those who might have set up the quantitative tool (Didier 2013).

- 4) Categorization and quantification may have their uses and misuses but this depends on agencies and socio-political constellations and also on (e)valuating positions. There is no reason to condemn or avoid quantification (or quantitative methods) per se. This position is a critical stance against scholars who study quantifications and statistics as objects and reject quantitative methods and criticize quantification or categorization on which quantification can be based.²⁸ The abstinence from methodological expertise would bereave social sciences not only from their analytical power but also from their potential to engage for fairer forms of quantification and coordination.
- 5) Many of the contributions in this HSR Special Issue engage implicitly or explicitly for a kind of “public sociology” (Burawoy 2005) i.e. a scientific discipline bringing in its analyses (in this case of quantification and its social preconditions and its consequences) into public debates about the improvement of society – however, this will be defined by engaged citizens. The privatization of quantification processes and the monopolization of data as resources are not only an increasing problem for citizens – being analyzed and controlled by indicators without a legitimate conventional basis –, but this trend will also undermine social research infrastructures and social science research. Instead of private and hidden interest, publicly debated and justifiable scientific standards should be the ground for quantification, measures and categories. What is at stake here is a new understanding of science as a core element of modern states. Thereby, states can no longer be understood as officialdoms or pure for-

²⁸ Historical social research without quantitative data would be a “fallback” into the history of events, ideas or “great man” (see for an outline of historical social research the outline by Wilhelm Heinz Schröder (1994)).

mal bureaucracies but as ways how to bring in a common good into forms of valuating and coordinating public issues (Salais 2015).

6. Contributions in this HSR Special Issue

This HSR Special Issue “Conventions and quantification – transdisciplinary perspectives” presents a collection of contributions from scholars from different disciplines such as historical sciences, sociology, statistics, economics and others who all refer to the works of Alain Desrosières and who are more or less influenced by his work. (And the notion of “sociology of quantification” we used above should not be restricted to disciplinary boundaries – such as sociology only.) The way Desrosières crossed the disciplinary boundaries made him a true transdisciplinary scientist.

The first article of *Emmanuel Didier* (Los Angeles) situates the career and work of Alain Desrosières in his Parisian and transdisciplinary context. *Rainer Diaz-Bone* (Lucerne) links the work of Desrosières to EC and discusses the difference between categorization and (metric measurement). Didier and Diaz-Bone emphasize the importance of the “political economy of quantification and categorization,” which the writings of Alain Desrosières – as the writings of Laurent Thévenot – have introduced. The *Centre d’études de l’emploi* (CEE, the French center for the study of employment) was a leading research institution for EC. *Thomas Amossé* (Paris) portrays the research on quantification done in the course of this institution and he also relates this to the emerging EC. Two of the founders of EC, Laurent Thévenot and Robert Salais, are also contributing to this HSR Special Issue. *Laurent Thévenot* (Paris) presents the 30-year-old tradition of the “politics of statistics” and of the analysis of the “political economy of coding,” which was a birth element of EC and sociology of quantification in France. His contribution relates important concepts – nowadays regarded as part of the theoretical body of EC – also to the analysis of quantification. *Robert Salais* (Paris) claims for the awareness and the need of the close interrelationship of statistical conventions and social conventions. Referring to the tradition of EC and the work of the economist Amartya Sen, he argues that the ethical and normative basis of the informational basis of socio-economic coordination and evaluation offers an inherent integrative power for more social justice and social integration. The international group of authors of the next contribution continues the exploratory strategy, invented by Luc Boltanski and Laurent Thévenot which is to entangle actors in card games with socio-economic categories and classifications. *Etienne Penissat* (Lille), *Cécile Brousse* (Paris), *Jérôme Deauvieux* (Paris), *Julien Chevillard* (Lausanne), *Emmanuelle Barozet* (Santiago de Chile) and *Oscar Mac-Clure* (Santiago de Chile) analyze the initial study and its further replications and application in different countries. *Eve Chiapello* (Paris) and *Christian Walter* (Paris) study

the different forms of financialization of the economy. They identify different conventions which make different forms of financialization and professions in the economy possible. *Corine Eyraud* (Aix-en-Provence) analyzes the change in the public accounting in France. She works out the different political philosophies which are involved in these accounting systems of the state. *Fabian Muniesa* (Paris) focuses the training and the pedagogy in the Harvard Business School which implies a certain form of the valuation of enterprises. His article works out how the underlying convention of economic valuation came up. The Millennium Development Goals as defined by the United Nations in 2000 is the topic under study in the contribution of *Daniel Speich Chassé* (Lucerne). He analyzes the historical co-construction of institutions and statistics, whereby the Domestic Gross Production in the postcolonial age is of special interest to him. *Lars Behrlich* (Utrecht) examines the early history of statistics in the ancient regime in France. He traces the problems in the establishment of a nationwide agrarian statistics. Finally, *Wendy Espeland* (Chicago) proposes the idea of “reverse engineering” and she also relates quantifications to emotions.

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Alain Desrosières and the Parisian Flock. Social Studies of Quantification in France since the 1970s

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Abstract: »Alain Desrosières und die Pariser Gruppe. Die Social Studies der Quantifizierung in Frankreich seit den 1970ern«. Alain Desrosières has played a central role in the French intellectual scene from the 1980s to today for his theories of quantification. In this article, I trace his career and that of his contemporary Parisian scene in three steps: first, the period when he was associated to Pierre Bourdieu; second, the one when he became part of what we propose to call a flock of scholars all working on the qualification of reality; and finally, the one when Desrosières was associated with the *Centre Koyré d'histoire des sciences*. Finally, we use statistics to analyze the extent of the international reception of his work.

Keywords: Desrosières, Bourdieu, INSEE, quantification, statistics, reality, politics, qualification, conventionalists.

1. Introduction

Alain Desrosières died on 15 February 2013.¹ He was a central figure in the French intellectual generation following the likes of Bourdieu, Deleuze and Foucault, and whose importance has begun to be recognized throughout the world in the past decade. Recounting his career permits us to write the intellectual and social history of his generation – that is to say, presenting different types of groups of which this singular personage was a member. We will do it from his point of view, that of quantification, which is of capital importance, for no social science worthy of the name can develop without some conception of statistics.

Desrosières' originality was owing to the fact that he was far from being the simple "quantitativist" in this complex swirl of intellectual currents. Beside his impressive technical erudition, he developed what is becoming a veritable scholarly discipline in its own right – the social history of quantification – which takes measurement and quantification practices as the very object of

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¹ This paper is an adaptation of the introduction that I wrote for the last book of Alain Desrosières (2014) that was published after his death.

inquiry. Indeed, the world in which we live is pervaded by quantities that are produced in a specific fashion and have their own effects and uses. Desrosières showed how they could be envisaged as full-fledged social objects. And Alain Desrosières always conceived his scholarly activity as having political relevance. His intellectual contribution was ever marked by a great generosity and mindful caution with respect to his ideological presuppositions as well as their social effects. His qualities flourished in the soil of quantities.

And so Desrosières' contribution would seem to have been to demonstrate – throughout his life and in three different ways, with Bourdieu for one, with those disciples and successors who were also interested in the qualities of our reality, for another, and finally with his colleagues at the Koyré Center – the importance, the depth, and the amplitude of social inquiries into quantification.

2. The Bourdieu Period: Nomenclature and Social Representations

Alain Desrosières was born 18 April 1940 in Lyon. Admitted to both the *École Normale Supérieure* and the *École Polytechnique* in the same year, he eventually opted for the latter (class of 1960). Deeply concerned with matters political and those touching on citizenry, he then chose ENSAE, which led to his becoming the administrator of INSEE (1965) owing to the fact that here was instruction in the social sciences, in contrast to other applied-science schools at the *École Polytechnique*.² He was trained in sociology by Pierre Bourdieu himself, who taught here from 1963 to 1965 (Seibel 2004). In the 1950s, in Algeria, Bourdieu had made the acquaintance of statisticians from INSEE, who introduced him to the national statistical system. It was this encounter of a “literary” sociologist with functionaries who were trained engineers that strongly influenced Bourdieu’s work and perforce his teaching in two different ways (Desrosières 2003).

On the one hand, extending the methods used by Durkheim in his work *Suicide* (1897, 1951), Bourdieu used statistics as an instrument of empirical proof. Despite the war, he conducted several studies in Algeria with his administrative friends from INSEE (1963). Then during the 1960s he worked on social inequalities in mainland France, reclassified as a mechanism of domination (Daras 1966). And during the 1970s he was inspired by methods of “correspondence analysis,” invented by Jean-Paul Benzécri and Brigitte Cordier-Escoffier, so as to visually represent his field theory and that of social capital, in particular in *Distinction* (Bourdieu 1979, 1984, Blasius et al. 2008 for its English-speaking reception).

² The French INSEE is the equivalent to the American Census Bureau.

On the other hand, in following another strand of the Durkheimian tradition, which for its part arose from neo-Kantianism (Durkheim and Mauss 1903), Bourdieu exhorted the young statisticians grouped around him to take seriously the “requirement of reflexivity” critique by taking statistical categories themselves as objects of study. Scholarly production, he said, is also a social production, and as such it interests sociology. Bourdieu was thus fain to take up Wittgenstein’s metaphor of glasses that one must remove from one’s nose so as to observe them.

But when you remove your glasses your vision blurs. Desrosières later wrote, in 2003, that these two teachings – using statistics empirically while at the same time reflexively studying them – were difficult to reconcile. But he succeeded in achieving this tour de force in reworking the nomenclature of socio-professional categories (CSP then PCS in 1982). This had been initially developed in France after the Second World War by Jean Porte, administrator of INSEE. It became central in the national statistical apparatus, for it furnished the principal representation of French society in its entirety, still very strongly influenced by conceptions that were both classist and industrial after the war. But by the early 1970s, as society itself changed, it had grown dated. Desrosières worked with Laurent Thévenot, another administrator of INSEE, ten years younger, in the group that from 1978 to 1981 was officially charged with reworking the nomenclature. They were behind the principal changes. The two authors distanced themselves from the “optimist scientism” of the generation of administrators that had preceded them and they took up the dissent “that had agitated a highly politicized youth in the wake of the Algerian War (ending in 1962) and in May 1968” (Amossé 2014).

Rethinking the paradigmatic tool by which France represented herself to herself implied once more taking up the list of sub-categories here and reworking the internal organization of categories in terms of their varying hierarchical levels. Desrosières had the idea – not to be expected from an engineer – of carrying out these modifications by focusing on the *history* of nomenclature, which called into question the conventional reasoning as concerned the CSP. Drawing also on the thought of Mauss and Durkheim regarding classifications and pursued by Bourdieu, he showed that this nomenclature was the impure product of a conjunction between “natural classifications” and “logical classifications.” This is to say that it was an arrangement between, on the one hand, “typologies” of established *métiers* within the social reality of work, and on the other hand of certain principals of logical classifications claiming application to all of society and inherited from past struggles; neither did the typologies nor the principals take precedence but were placed on an equal footing. In particular, in the nineteenth century, there arose the difference between employers and employees; then, in the 1930s, the level of qualification, sanctioned by one’s level of diploma, which gradually remodeled the representations of work. Neither did the nomenclature of the CSP find its coherence through logical deduc-

tion nor by induction from the *métiers* actually observed; rather, it emerged from historical determinants springing from local struggles of classification, in the sense that they initially only applied to a small number of categories. And Desrosières and Thévenot concluded that “the taxonomist registers the state of these struggles with deformations that depend on the position he assumes” (Desrosières and Thévenot 1979, 52).

Based on this observation that the nomenclature does not arise from a sole logical principle, the next step consists of inferring that it can only be understood as multi-dimensional. Rejecting the utopia of a “spherical” society where all the individuals are equidistant according to their own particular dimension, Desrosières and Thévenot simplified and recovered Bourdieu and his theory of total social capital divided by two – economic capital and cultural capital. French society could be approximately represented as a distribution of its diverse social categories between these two dimensions.

It was from these theoretical findings on the nature of categorical representation that Desrosières and Thévenot drew lessons with respect to a reworking of the CSP’s nomenclature. For instance, categories such as artists, the clergy and teachers, which had previously been classed by the nomenclature in the grouping “others,” were thus analyzed as beneficiaries of high intellectual capital but with meager incomes and hence placed in the general grouping of managers, even if they were not always employees, owing to their proximity in terms of cultural capital. They proposed creating the category of “intermediate professions.”

Moreover, this bi-dimensional framing of the nomenclature had an impact on how to utilize it most profitably. In particular it was simplistic to use it as the sole scale of relations of prestige in society. Desrosières identified three main groups of users – the public statisticians with whom he worked, the university sociologists employing empirical data and private institutes – and he showed that the properties of this instrument had an impact through to the end of the statistical chain, including interpretation of the data, thus concluding that both the use of statistical instruments and their genesis deserved to be studied from a sociological perspective.

This critical work on statistical classifications might evoke the work of Aaron Cicourel and John Kitsuse (1963) which became extremely influential in the US during the 1970s and 1980s, especially in the sociology of the left, epitomized by ethnomethodology and interactionism. They argue that official statistics produce their own categories as the result of administrative behaviors, and impose them upon the social conducts that they pretend to measure. For them, official statistics are nothing else than a “measurement by fiat,” that does not account for the social process under scrutiny, but imposes its own definition. Desrosières and Thévenot discovered the work of Cicourel fairly early in the 1980s but, despite similarities, they did not buy into this argument. Their work in history and sociology of official statistics had clearly demonstrated

that, contrary to Cicourel's argument, categories were through and through penetrated by social conducts, former conflicts and interactions so much so that the State does not simply impose his own views; it "registers" the result of past social conflicts. It makes "investments in forms" as would later Thévenot call them, in making more logically consistent categories that clearly remain "natural." This important difference, generated by the fact that Desrosières was at *the same time* a producer of statistics and an analyst of them, which was possible because of the specificities of INSEE compared to the Census Bureau on the one hand, and the US academic system on the other, explains why the critiques of quantification expressed by the American "qualitative sociology" never really took root in France. In France, critique of quantification always remained informed by the internal practice of statistics, and oriented towards this practice, even though at a distance that could be more or less large.

From that time on, Desrosières' work showed an enthusiasm and freedom vis-à-vis those institutions in which the work was done and where this zeal and liberty were not only much greater than what one sees today but which themselves helped to *produce* an atmosphere which – at INSEE in the 1970s – was exceedingly favorable to the social sciences. Testifying to this, for example, was the 1976 Vaucresson symposium entitled "*Pour une Histoire de la Statistiques*," which resulted in the publication of two volumes that documented its proceedings (Affichard 1977, 1987) and in whose organization Desrosières played a central role. At the same time a series of works were carried out in collaboration with a group of other researchers likewise close to Bourdieu. Notable among these was Luc Boltanski, teaching at the *École des Hautes Études en Sciences Sociales* (EHESS), who was then writing his book *Les Cadres* (1982, 1987), a new and detailed study of the relation between social categories and political representation. Laurent Thévenot, for his part, was carrying out inquiries and tests on those "investments in form" which are endowed with the power of oversight in the economy and in politics (Thévenot 1983, 1984, Desrosières and Thévenot 1988). Michael Pollak, an Austrian researcher then installed in Paris, and to whose memory Desrosières dedicated *La politique des grands nombres* (Pollak died just a few months before the publication of the book), was investigating intellectuals and the relation between the socio-political conditions of their work and the nature of their productions. This research and the fellow feeling uniting members of this generation in the 1970s helped give birth to a new sociology interested in "*économies de la grandeur*" (Boltanski and Thévenot 1987, 1989), an intellectual current which in 1984 issued in a new laboratory at EHESS, namely the *Groupe de Sociologie Politique et Morale* (GSPM).

3. The Period of the *Groupe de Sociologie Politique et Morale* (GSPM): Qualifications

At the end of the 1980s a new way of thinking about and applying the social sciences made its appearance in France. It was within this certain intellectual complex that the social history of statistics played a central role, constituting a clear link between the various actors, in particular between members of GSPM, those of the *Centre de Sociologie de l'Innovation* (CSI) gathered around Bruno Latour and Michel Callon, and certain conventionalist economists. So as to understand the intellectual energy and fermentation of that period, I must first provide a picture of its intricacy, after which I will show Alain Desrosières' contribution.

The sociologists of GSPM sought to extend Bourdieu's research by questioning the critical role of sociology. Bourdieu viewed his discipline as an exercise in disclosure, beyond representations, of real social mechanisms like inequalities or domination. Nor did the new generation of researchers seek to practice a "critical" sociology – as Boltanski described the efforts of Bourdieu – but a sociology "of the critic," taking as its subject the activity of critiquing itself, such as practiced by the ensemble of social actors (Boltanski and Thévenot 1989; Boltanski 1990).

New socio-political conditions had made this reflexivity possible. Bourdieu had worked during the Algerian War and then under the right-wing governments of the Fifth Republic, thus always in the opposition, but the accession of François Mitterrand and the Left to power in 1981 aroused hopes that deprived his protest position of some of its urgency. The members of the GSPM, under no illusions as to the achievements of the left-wing government, took it upon themselves to carry out more theoretical research on social criticism, whether of academic provenance or not. They obviously did not desist from critical use of the social sciences, but they took the inherent risk in this type of inquiry by temporarily pushing to the background their direct exercise so as to produce a better theoretical understanding.

And so a link was rapidly established between that conception of sociology and the anthropological study of science which Bruno Latour and Michel Callon were importing from the Anglo-Saxon countries and developing at the *École des Mines de Paris* at the time. They had placed the analysis of scientific controversies at the heart of their method (Callon and Latour 1991). Instead of proceeding to a critique of sources so as to identify the "true" innovators or the "true" determining factors of the discoveries, as did the history of science and traditional epistemology, the analysis of controversies was for them a method known as "symmetrical," allowing for the study of the process by which both human and non-human actors express the qualities of the entities hereby engaged.

Finally the GSPM (principally via Laurent Thévenot and Alain Desrosières) and the CSI (via Michel Callon) were also linked to “conventionalist” economists grouped around Robert Salais, André Orléan, François Eymard-Duvernay, Olivier Favereau and Jean-Pierre Dupuy. These economists came also from the INSEE. They took part in the research on statistical categorization, and were applying the results to economical questions. For example, Eymard-Duvernay worked on the diversity of the firms within a branch, according to their goal and management logic. Another example: Robert Salais began a history of the concept and categorization of unemployment. They were looking for a re-articulation of standard micro-economic theory on this ground.

The work of the researchers of these three groups thus covered both ordinary persons and scholars; they observed how, together, in situations of uncertainty, they were able to establish “qualifying” events for those social entities constituting reality. Hence, and contrary to Bourdieu’s proposals, they were interested in explicit processes of the production of reality and so did not conceive them as practices disclosing a veiled reality.

Apart from a number of shared intellectual interests and their generational proximity (the majority of them were born between 1940 and 1950), these researchers had much else in common. At first, in the 1990s, they saw each other regularly, in the professional seminars or in the “private” salons that some of them held, thus resuscitating a kind of eighteenth-century sociability – this milieu benefiting substantially from that sociability which only Paris makes possible. Then they conceived of themselves as heterodox. They felt they constituted an alternative to mainstream sociology, which at the time, would have been for one part methodological individualism, epitomized by Raymond Boudon; the study of organizations exemplified by Michel Crozier and finally the Bourdieusians who were being officialized in the academic institution. To escape from these three pillars, they had little respect for disciplinary boundaries, aided in this by the fact, with just a few exceptions, that they were not hired by universities. Those who were not administrators of INSEE (like Desrosières) or researchers at EHESS (like Boltanski) taught at those typically French *grandes écoles* – Latour and Callon at the *École des Mines*, the conventionalists at the others. This allowed each of them to enrich his research by crossing sociology, political science, economics, law, and again anthropology, with very few constraints.

Among these disciplines, philosophy had been particularly mobilized by that intellectual complex – but in a radically different fashion from the ways in which it was habitually utilized at the time in the social sciences. At GSPM, instead of placing it in a superior position vis-à-vis sociology, which would have little more to offer than empiricism, the researchers recognized the shared origin of the two disciplines and placed them on an equal footing. Philosophy was paradigmatic in its construction of a framework that Boltanski and Thévenot called “the model of cities” (Boltanski and Thévenot 1987, 2006). Ac-

ording to them, philosophers produce systems of justice that are internally coherent, explicit within their own rules, and which aim at universality. The systems that become the most legitimate permit sociologists to make explicit the orders of justice socially observed, and this is why they constitute grammars to which the actors must conform, even implicitly, when they justify themselves. The project thus consisted of practicing a sociology not of philosophers but of philosophy itself – a sociology interested in the social effects of philosophical productions.

For his part, Bruno Latour also made great use of philosophy, but in another fashion. At that time he asked if those characteristics which appeared during the controversies had previously belonged to humans and non-humans who were involved in them, the controversy thus presenting an occasion by which to discover that which previously existed (realism); or, to the contrary, if these characteristics did *not* exist prior to a controversy that was occasion by which they were then produced by humans (constructivism). Latour insisted on the fact that these two philosophical options had their virtue, and he sought a philosophical theory permitting him to move beyond this alternative (Latour 1996). By mobilizing in particular the work of Gilles Deleuze, Isabelle Stengers, and the American pragmatists (notably William James), Latour gradually produced an ontology all his own which enjoys the success that it does today (Latour 1991, 1993). Latour did not therefore make philosophy the object of another discipline but practiced it as a discipline by which he constructed responses to questions posed by his empirical inquiries; he thus laid claim in part to the role of philosopher.

The social history of statistics constituted an essential link between the sociology of science, the economics of conventions and the sociology of criticism. These links were constituted, for instance, by the fact that Alain Desrosières, while remaining at INSEE (where in 1987 he was appointed to CREST, the institute's research laboratory), was also a full-fledged member of GSPM, and that in 1993 he published *La politique des grands nombres: Une histoire de la raison statistique* in the collection *Anthropologie des sciences et des techniques* supervised by Bruno Latour and Michel Callon at Editions La Découverte.

This book is his masterpiece of that decade. It covers the period from the seventeenth to the mid-twentieth century. The subjects treated here largely go beyond mere nomenclature. One finds chapters on survey techniques, econometrics, correlation analyses, or yet again various national administrative traditions in terms of collecting information and quantification. In each case Desrosières expands the arguments that he had built on focusing on nomenclatures. He shows that all the statistical instruments have a twofold nature, contradictory and irreconcilable, being simultaneously both “logical” and “natural,” at one and the same time constructed and real; all of the statistical data is artificial because it is produced by humans while yet being real because it describes the world as it is.

Then he made another detour via history in his long-term description of how the focusing of these tools has been accompanied by a dual task – the statistical tools being brought into line with other elements present in the society to which they lent themselves while at the same time discerning usages to which they could be put. The reader learns how the actors arrived at practicable solutions to the contradiction inherent in statistics and ultimately succeeded in “doing things that hold together” (Desrosières 1993, 17). Desrosières shows how this work, ensuring that very diverse elements should converge and congeal, amounts to expressing those characteristics of each element that are compatible with the others. And so he participated in investigatory work on how humans specify the qualities of their reality. But his own contribution was to show how certain of these *qualities* were *quantities*. He thus delivered the continent of quantification to this collective enterprise preoccupied with surveying the horizon of qualification.

He also mobilized philosophy (Daston 2000), but in way that was different from GSPM or CSI. He took up once more the alternative of realism versus constructivism formulated by Latour, but did not attempt to produce an alternative philosophy reconciling two antagonistic conceptions. This man who spent time every day with statisticians had observed that they defended arguments apropos of statistics that were sometimes realist, sometimes constructivist, and that they felt no crying need for personal coherence or consistency. Their practical epistemology *depended on the situation*. For the actors, he remarked, “the choice between the two postures, realist and conventionalist, is not an existential choice engaging the person in a committed fashion” (Desrosières 2008b, 138). There was no compelling reason why the actors should *not* have altered their stance. This is why Desrosières insisted that their epistemology itself be construed as an object of sociological inquiry, which on the one hand would cover situations where they adopt one or the other metaphysical system, and, on the other hand, covering those figures of compromise between the two:

The fact of taking seriously both realist and non-realist attitudes in relation to statistical techniques allows for the description of more varied situations, or, in any event, to recount more unexpected stories that do not take the form of a narrative privileging one or the other of these standpoints (Desrosières 1993, 10).

All of these works formed a constellation that was not unified. To try it today, moreover, would be to risk failure, as this perspective would repel many of them. The label of “pragmatic sociology” that is sometimes used today is deceptive because anachronistic (back then the term was not used) and implies inadequate political presuppositions. Desrosières never described himself in this way. What’s more, Latour wrote about the differences between the work of CSI and that of GSPM (Latour 2009) and Boltanski did a sociological analysis of the effects of the theory of the actor network of CSI, from which he thus implicitly distanced himself (Boltanski and Chiapello 1999, 2005). Perhaps the

constraints imposed on the collective lifestyle of the intellectuals at the end of the century rendered null and void the old model of the “school of thought.”

Yet there was indeed a collective, and to conclude this section we might attempt to specify its properties. With all due respect to my predecessors, I should like to compare them to those flocks of birds that have impassioned ecologists as of late – no mockery here, just a heuristic device to describe new forms of sociability. These flocks are associations of several different species (just as the individuals in question here were from different laboratories and disciplines), composed on average of some twenty persons who move about together in search of food and to protect themselves against predators. These fluid associations are based on complementary characters (differences among species) but also supplementary ones (similarities among species). They generally include a nucleus of “leaders” who were there at its inception and were influential in launching it on a certain course. The relations, hierarchized, between individuals in flocks are complex and range from the tolerated plundering of aliment to relations of affinity. These flocks break down at end of a period that can range from five minutes to one day, hardly a negligible period in the life of a sparrow, and can sometimes reform from day to day during a season. It seems to me that the points in common with the sociability of that certain intellectual complex are more than apparent (Sridhar et al. 2009).

The fact that his flock was Parisian did not severed Desrosières from foreign contacts, quite on the contrary. During the second half of the 1980s, he became close to the “Bielefeld group” composed mainly historians of science. They had been invited for the academic 1982 year by Lorenz Krüger in Bielefeld, to establish together whether or not the apparition of probability was a revolution in the sense defined by Thomas Kuhn (1996). The answer is in the landmark *History of the probabilistic revolution*. Desrosières did not know them at the time, but immediately caught up with the group and became friend with many of them (especially with Gerd Gigerenzer, Lorraine Daston, Ted Porter and later on Mary Morgan). Their historical perspective on science had a very important influence on the way he writes about statistics. As well, he adopted their constant requirement to be at the same time internalist and externalist, that is to describe the inner scientific operations of statistics as well as the outer influences exerted on them (Gigerenzer et al. 1989).³

³ Ted Porter, in a recent conversation, told me that the Bielefeld group, being composed of historians, was unaware of the work of the sociologist Cicourel.

4. The Koyré Period: Government and Indicators

At start of the third millennium the internal links of that Parisian flock of qualification specialists, in their situation of uncertainty, began to distend. The links that Desrosières maintained with them also relaxed without there having been any real difference of opinion. He remained an associate member of GSPM and continued to publish with his friends at the *Presses de l'École des Mines de Paris*, but he moved closer to the *Centre Koyré d'Histoire des Sciences* (EHESS) of which he became a member in 2001 – but of course without leaving INSEE. One mustn't perceive this as some kind of historicist assertion. To the contrary: the final period of Alain Desrosières' scholarly life related more directly to the question of the relation between statistics and government.

The vicissitudes of public life again impacted his work. After the year 2000 it became increasingly evident that new statistical tools were spreading and circulating throughout France and the world – namely productivity indicators, quantitative targets, and all the so-called benchmarking techniques. In 2001, with promulgation of the organic law relating to finance laws (LOLF), to be definitively applied starting with the finance laws of 2006, quantitative performance indicators were implemented in all administrations, including INSEE, and accompanied by instructions that each agent give quantitative account of his activity. At the same time, criticism leveled against these tools increased. The wide use of these techniques as well as the growing success of Desrosières' writings – it has to be said – have profoundly transformed public perception of the relation between statistics and politics. Now everyone immediately perceives their enmeshment. But the word “politics” has gained a very different sense from that which was developed in *La politique des grands nombres*. Desrosières was interested in that difference.

Indeed, his works always proceeded from a certain political vigilance that did not then translate into engagement for a certain party. He always remained on the left, but, according to an informal survey realized on his closest friends, never identified himself as a “*gauchiste*” (a radical). Already his turn to statistics upon his leaving the *École Polytechnique* in 1963 at twenty-three years of age, one year after the end of the Algerian War, was already informed by politics, in a way that he would explain with one of those formulas that he would laughingly utter: “Mathematics = Torture.” Not because the practice of mathematics made him suffer – he excelled at it – but this was the formula's abridged version. There was a more extended version which he had in his mind: “Mathematics = *École Polytechnique* = French State and Army = Algerian War = Torture.” It shows that he resented the political connotations of *la voie royale* in France at the time – mathematics as the science of the engineer and of power – and he abandoned it for the more social path that was on offer with first ENSAE and then INSEE.

During the “Bourdieu period,” impregnated by Marxism, he saw politics through the lens of social categories. Reflexivity with regard to statistics allowed him to apprehend their way of disclosing the social inequalities that existed among diverse groups and of measuring the mechanisms of domination and the effects of classification resulting from these inequalities. In the period that followed, politics took on a more fundamental and structural meaning for Desrosières. As a matter of fact, in his 1993 work *La Politique des grands nombres*, he blended extremely different approaches, like the history of the state, that of mathematical tools, and a historical sociology of the elements of global culture. Then he showed how their slow articulation and rearrangement establish themselves as constituent parts of the institutional reality in which we live today. He described this institutionalization as “politics.” In the case of surveys, for example, he explains that it is because mathematical tools have been associated with a standardized territory, with the social question, and with state action that they are entirely dependent on politics; it is inscribed in the links between these remote elements which, thus arranged, become the reality of societies themselves (Desrosières 1993, 104).

Politics with governmental connotations became the object of his analyses after the year 2000, when benchmarking tools became an inescapable development. Moreover, he entitled one of his two volumes of collected articles, appearing in 2008 with *Presses de l'École des Mines, Gouverner par les nombres* (while the title of the first volume, *Pour une sociologie historique de la quantification*, remains more in the spirit of the previous period). One finds here “five ways of articulating the state, the market, and statistics” (2008b, 9; see below, Chapter 1), thus presenting this theory with particular precision. Desrosières’ point of departure is that ongoing debate ever since the eighteenth century as to the form that state intervention should take with respect to the development of markets. He distinguishes five historic configurations that link these two elements, and he notes that in each of them the state is not content just intervening but erects a system by which the economy is observed. These systems express statistical tools having different technical properties specific to each. For example, during the liberal period of the nineteenth century, the state sought to produce pure and perfect markets; to that purpose it set up a measurement system for quantities exchanged on the markets which limited the asymmetries of information among actors. Later, during the Keynesian period of the 1950s, the state established national accounting practices by which the stimulus circuits could be better monitored. Each time the methods of specific statistical observation were established by the state for the purpose of informing its intervention in the economy.

The fifth and last configuration he treats in his inquiry is neo-liberalism. It is initially characterized by a large market, a polycentric state (i.e. numerous administrative centers dispersed over its territory) and a system of statistical knowledge based on technology incentives which serve as performance indica-

tors or benchmarking. Desrosières dwelled on the analysis of that configuration in much greater detail in later papers (Desrosières 2014). It would thus appear that neoliberalism cannot be summed up merely by citing technology incentives. Desrosières was also interested in the importance of randomized testing, a method developed in all areas of public intervention and in particular with respect to developmental aid (Bardet and Cusso 2012).

We thus discover that there is another way to analyze neoliberalism apart from the economic texts followed by Michel Foucault (2004, 2007). Desrosières got very interested in this approach at the time, and also in the work of the scholars of the Department of Accounting and Finance at the London School of Economics who remained the heroes of the concept of “governance” until now (Burchill et al. 1991; Power 1997). But the statistical approach as promoted by Alain Desrosières, in particular his attention to method, allows us to give a factual description of it that has far greater precision; in other words, a description that is much more sociological as concerns both its origins and its effects than what one can read in the work of his predecessor (Jeanpierre 2006). This path blurs the watchword “reflexivity” by simply proposing that we view all statistics, whether produced by the state or not, as constituting a production that is inseparably cognitive and political, while at the same time reconnecting with an interest in the critical uses of the sociology of statistics.

It was particularly during this final period of his life that Alain Desrosières sought out interaction with young researchers. He met with them within the framework of the *Pénombre* association, which has brought a sense of humor to its fight against the misuse of numbers in the public space since 1993 (Association *Pénombre* 1999) and frequently in efforts at education, an activity that he valued enormously. He prepared and often conceived his courses in tandem, together with university friends, economic historians. It was with Michel Armatte that he gave a course in the history of statistics at ENSAE between 1991 and 2008 that permitted him to meet student administrators destined to become his colleagues at INSEE as well as the sole (or more rarely two) “free” (non-civil servant) student(s) in each graduating class who then turned to research in social science and inevitably attended this course.⁴ At EHESS, together with Amy Dahan and Michel Armatte, he led a seminar on the history of statistics in the Master program in the History of Science at the *Centre Koyré*; and as of 2008, within the framework of GSPM, he led a seminar entitled “The Politics of Statistics.” He also gave regular talks in the seminar on the history of economic thought as organized by Annie Cot at the University Paris 1. And finally, between 1992 and 2011, even if not a university professor, he was invited to sit on twenty-one committees reviewing theses pertaining to the history of quantification.

⁴ This is how I met Alain. The professor-student relationship later turned into one of intellectual complicity and deep friendship.

Desrosières was an extremely attentive, generous and positive-minded teacher. He loved being face to face with students. Many of us have memories of our visits to office number 1001 in the INSEE tower where he worked and would receive us. He was always ready to comment on a text that had been submitted to him, not looking for faults but setting out the associations that the text inspired in him and passing on published references or a contact with a new interlocutor who he felt was pertinent. His taste for transmission gradually made of him a sort of guide for an entire generation of students interested in his work, either because they employed statistical tools or were transitioning to research on statistics, and in a variety of social science disciplines. Thus did he lay the intellectual and social foundations for a discipline – the social history of statistics – as now practiced by a large number of scholars.

However, he never really went to the trouble of institutionalizing it. INSEE let him do what he wanted mainly because he was protected by his status of “*polytechnicien*.” This allows him to take much freedom with the kind of work which is usually expected in this institution. But he paid this freedom with a relatively slow career (he did not reach the top hierarchical levels of command), and a low level (but not an absence) of interest expressed by INSEE towards his work. In the beginning of the 2000s, he proposed to Paul Champsaur, then Director, to open a small unit dedicated to the history of statistics. He was answered “One single Desrosières if well enough here. I will not open a unit where I would get a whole bunch of little Desrosières.” He did not insist, and those working with him were left scattered in many different institutions, without anywhere to unite. Here once more we have the image of the flock.

5. Reception

As Michel Armatte put it, Desrosières was *un mailleur* – “a mesher.” He had the passion and the art of creating original relations between persons, between ideas, and between persons and ideas. Moreover, he did not exclude himself from this activity, gladly preserving links that had been forged long before. To be mentioned here is the fact that he very quickly renewed ties, in his own fashion, namely in preserving a great independence, with those who had remained close to Bourdieu, in becoming a member of the editorial board of the review *Genèses* from 1995 to 2008. Likewise, he never ceased to have converse with friends from GSPM, from CSI and the conventionalists.

But what about the other way around? Who was interested in *his* work? In describing Desrosières’ readership, a population in its own right, the use of statistics is particularly welcome. This question gives us occasion to ourselves follow his dual lesson of recommending the *practice* of statistics – but a statistical practice that is also an exercise in writing and conducted in light of his socio-historical analysis. So it is in this spirit that we shall not here attempt to

“benchmark” him in a competition with other works or authors but to depict, through the use of numbers, the communities of which he was a member. We have focused on his book *La politique des grands nombres*. Published in 1993, reissued in pocket format in 2000 with a new afterword, translated into English in 1998, this book affords us the opportunity, some twenty years later, to track reception of his work. It is not enough to know that almost 6000 copies of this work have been sold to date – we also wanted to know who has used it and referenced it – and for that we employed Google Scholar. We compiled a data base for the total number of references made to *La politique des grands nombres* in both the French and English versions.⁵ It is evident that the English-language references are overrepresented and that a number of inescapable French-language references (and those of other languages) have been ignored (for instance Boltanski and Chiapello 1999, itself cited more than 3700 times in the database, does not appear in the cited references, though the book is in its bibliography). But we availed ourselves of this tool because it was the most exhaustive of those bibliometric databases that were easily accessible (Kosmopoulos and Pumain 2008, Jacobs 2009).

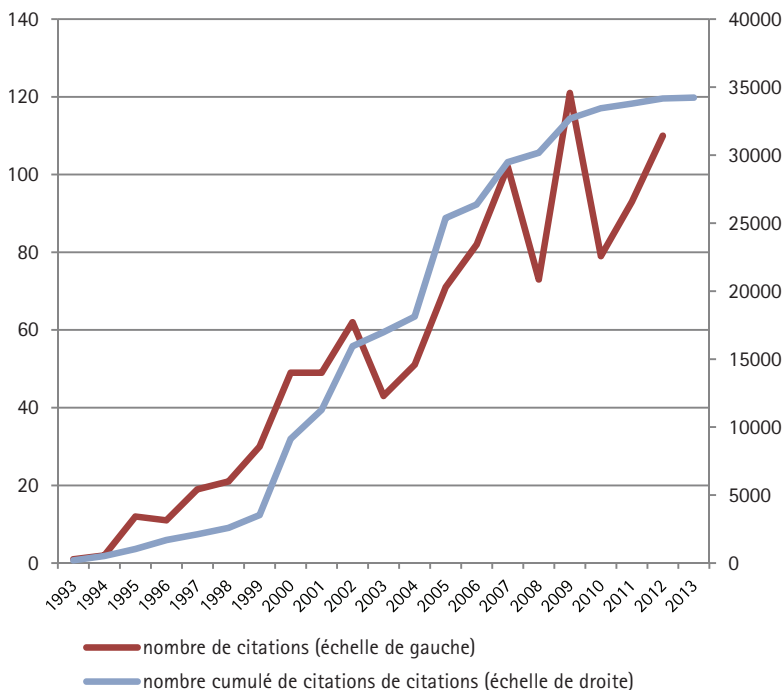
But despite these deficiencies, 1332 references, of which 1120 were usable, had cited *La politique des grands nombres*. These works constitute our corpus. With the exception of 2003, the number of citations has increased every year up until 2007, at which point it varies by some hundred citations per year. The book’s success is thus not on the order of a fashion or a passing trend, being read for a brief period and then forgotten. It has instead become a classic that continues to be read and cited each year.

The notoriety of the book in a larger sense can be assessed according to the number of times that the authors who cited *La politique des grands nombres* were themselves cited – cumulatively, at the end of the period under examination, one arrives at close to 35 000 references in which a text was cited that itself cited the work (see Figure 1). Translation of the book into English evidently had an important effect on the number of second order citations. An impressive increase of such then followed and as initiated by the work of Geoffrey C. Bowker and Susan Leigh Star *Sorting Things Out* (1999), which itself is cited almost 4000 times. Then in 2005 one sees a renewed surge that is in large part due to the book having been cited by Bruno Latour in his *Reassembling the Social* (2005), he himself being cited almost 6000 times. In our corpus these two books and that of Desrosières lead the pack in terms of the most frequently cited works. But who exactly composes the readership of *La politique des grands nombres*? First of all, it is international. In our database almost half the

⁵ Many thanks to Étienne Ollion, who kindly carried out this compilation in July 2013. Thanks also to Michel Armatte, Tanja Bogusz, Luc Boltanski, Antoine Desrosières, Gaël de Peretti, Theodore M. Porter and Laurent Thévenot, whose readings of previous versions of this text were invaluable.

references are in English; but one also finds them in German, Spanish, Portuguese, Italian, Polish, Dutch, Danish and other languages more difficult to identify. It should also be pointed out that apart from English the translation rights were sold for the Greek in 2002 and for the Spanish and German in 2003, thus showing the undeniable diffusion of this book abroad, particularly in the Anglo-Saxon world, as well as in France.

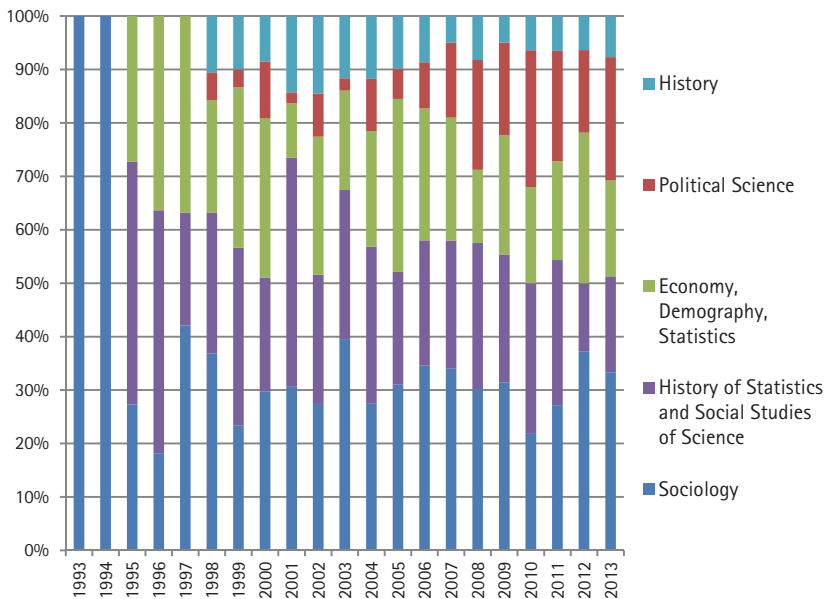
Figure 1: Number of Citations and the Number of Citations of Citations of *La Politique des Grands Nombres*



Furthermore, we wanted to know the disciplines of those who were citing the book. We ourselves construed a nomenclature of the disciplines of the citing authors in conformity with the theory of Desrosières – that is, by oscillating between overarching principles and those specific cases observed in the database. We finally arrived at a nomenclature of five items (as well as the five forms of state). The five disciplines citing Desrosières are general sociology, the history and sociology of statistics and science, the disciplines of applied statistics (economics, statistics, and demography), political science, and general history.

It is thus abundantly clear (see Figure 2) that Alain Desrosières' book was initially cited by representatives of three disciplines with equal frequency – those in the field of applied statistics, historians as well as sociologists of statistics, and the sociologists. A crucial point here must be underscored, namely that Desrosières was read as much by those who make quantification an object of study as by those who themselves produce and utilize the data. His book not only serves to “remove the glasses from our nose” but to remount and wear them with greater aplomb. It is in this respect that he was able to remain faithful to his wish to articulate these two postures with respect to statistics. And it is between these two groups of readers that the sociologists constitute an intermediate readership, what might be seen as toggling between the two options, a bit like the review *Genèses* where the statistics are used to produce knowledge about society while at the same time being studied as an instrument of government. This ternary readership is still going strong.

Figure 2: Disciplines of the References Citing *La Politique des Grands Nombres*



A secondary development is that starting in 1998 one can see the implantation of political scientists who will end up representing more than one-fifth of his readers beginning in 2008. The last definition of politics that he formulated clearly resonated with that discipline, which then as a consequence became increasingly interested in the book under study here. Finally, also appearing in 1998, was a marginal but manifest and abiding interest on the part of historians

in the broader sense. The general historian is now accepting statistical objects as legitimate terrain, something that others, particularly in foreign countries, have championed for quite some time now (Daston 1988, Porter 1995).

Hence the work of Alain Desrosières has been widely disseminated both in France and abroad and has come to interest a wide array of disciplines. Continued survival of the social history of statistics that he invented requires it to be situated at the center of gravity of this constellation of disciplines.

6. Prospects: Lasting Impact of the “Desrosières Effect”

Alain Desrosières’ work has inspired too many reprises and extensions for anyone to suggest that there should be a “conclusion” to it all. The prolongement of his memory can obviously not be the affair of one single hypothetical hero, but of the whole flock of his successors. An end point has been reached – but now the prospects loom large. It is with pleasure that I quote several lines that were collectively drafted in his honor when he died, thus conforming to his taste for seeing his friends gathered together.

Alain Desrosières was indifferent to official status, to age, and even to the disciplinary affiliation of those with whom he engaged in a working relationship – and which, in his case, was often indissociable from his friendships. He performed that irreplaceable role of a ferryman not only between the generations but between intellectual communities too often inclined to ignore one another when not engaging in compulsory competition. Embedded in different institutions, he was always concerned with not allowing himself to be reduced to these, of not taking up a position of power within them, and of ensuring a freedom of scope indispensable to creativity. His extraordinary erudition, covering an area of rare expanse, his joy in scholarly ingenuity, and his political vigilance went hand in hand with a humble charisma whose most striking expression was its generosity (Thévenot et al. 2013).

The “Desrosières effect” will make itself felt for many years to come.

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Convention Theory, Classification and Quantification

Rainer Diaz-Bone *

Abstract: »Konventionentheorie, Klassifikation und Quantifizierung«. The article presents the main contributions of the French approach of economics of convention (EC) to the analysis of classifications and quantifications. Here, Alain Desrosières has delivered many outstanding contributions. The article shortly presents the approach of EC. Conventions are socio-cognitive resources actors rely on to achieve shared interpretations, evaluations and valuations of situations and the value of objects, persons and actions. Also, the interpretation of institutions has to apply conventions. Conventions with semantic content and without semantic content are compared, and the different scopes of convention-based coordination (in time and space) are discussed. Also the conception of a political economy of classification and quantification is presented. At the end of the article, a typology of situations of classifications and quantifications is introduced.

Keywords: Economics of convention, institutions, classifications, quantifications, semantic content of conventions, neoliberalism.

1. Introduction

This contribution focuses on the outstanding contribution of Alain Desrosières to the analysis of classification and quantification (Desrosières 1998, 2008, 2008a, 2014).¹ Desrosières' work is closely linked to the scientific movement of the so-called "economics of convention" (in French *économie des conventions*) – in short EC –, which has been developed in the last three decades in the Paris region (Desrosières 2011; Salais 2012; Diaz-Bone 2015). Today, EC can be regarded as a core element of the new French social sciences (Dosse 1999; Nachi 2006; Corcuff 2011). Also, EC has been developed as a transdisciplinary and complex pragmatic institutionalism, focusing mainly on processes of economic coordination and collective assignment of worth to products, services but also to other objects and persons (Salais and Thévenot 1986; Favereau and Lazega 2002; Eymard-Duvernay 2006, 2006a; Diaz-Bone 2011, 2015, Bati-

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¹ See also the contributions in Emmanuel Didier and Jean-Jacques Drosbeke, eds. (2014) and Didier (2016, in this HSR Special Issue).

foulier et al. 2016).² From the viewpoint of EC, competent actors rely on conventions to achieve shared interpretations in situations as a precondition to realize a collective goal. From its beginnings, EC has analyzed the significance of conventions as foundations for social processes of classification and quantification. Also, EC has connected categories and quantifications (figures/numbers) to the far-reaching and convention-based social coordination in which institutions (organizations, rules) are embedded. This approach includes innovative perspectives on classification and quantification, but links these processes also to the foregoing and the following social phenomena. In this article some of the main contributions to the analysis of classification and quantification of EC will be presented and discussed. But also some open questions and perspectives will be discussed.

2. Convention Theory

At the core of a convention is the attention to economic coordination out of which economic institutions, values and entities (products) emerge. Instead of postulating pre-given needs, resources, evaluations and product qualities – as transaction cost economics does –, EC regards convention-based coordination as the real ground of all these ontologies. And EC assumes a plurality of possible ways to structure these coordinations. There is no single “most effective” or “optimal” convention for economic production, distribution and consumption. The two monographs “On Justification” (Boltanski and Thévenot 2006) and “Worlds of Production” (Storper and Salais 1997) introduced two sets of conventions which were introduced on the basis of more general principles.³ And all the introduced conventions share the character as logics of coordination which provide actors a shared frame of interpretation, evaluation and valuation for the worth of goods, objects and persons. In these books, these conventions are presented as “orders of justification” (Boltanski and Thévenot 2006) or “worlds of production” (Storper and Salais 1997). This way, the emphasis of the convention-based coordination is placed on the normativity of coordination or on the collective intentionality of production. For EC, competent actors are able to evaluate the appropriateness of conventions in situations and they are regarded as competent to switch or to reconcile conventions. Examples for such conventions are the domestic convention, the industrial convention and the market convention. The *domestic convention* can be related to craftsmanship.

² See also the special issue of *Revue économique* 40 (2) from 1989 which introduced the notion “*économie des conventions*.”

³ There are two other important monographs for EC which were later worked out. These are “The New Spirit of Capitalism” (Boltanski and Chiapello 2006) and “The Empire of Value” (Orléan 2014).

Here, in small and family-based companies actors bring in the traditional ways of production, manual labor and personal experience to generate unique specimens. The *industrial convention* structures the coordination of scientifically controlled and planned mass production. Quantification and a high degree of division of labor are important principles. While the first two conventions have a long-term orientation, the *market convention* provides a short-term orientation. Actors are oriented towards individual needs and (changing) prices. The *civic convention* engages in equal rights and values actors who engage in public affairs. Actors relying on the *green convention* are looking for the protection of nature's integrity and they value products and actions applying this criterion.

There are more identified conventions as the network convention or the inspired convention. All are influential ways of coordination in the economy which cannot be reduced to one convention alone (Storper and Salais 1997; Boltanski and Thévenot 2006).⁴

Every modern approach has to deal with the two mega paradigms in the social sciences: pragmatism and structuralism. The perspective on conventions as structuring resources for competent actors indicates that EC relates pragmatist and structuralist traditions to work out a new pragmatic institutionalism. Objects and cognitive formats are included in theorizing and empirical analysis, because from the standpoint of EC they have an impact on coordination in situations. A pragmatic theorem is the difference between institutions and conventions. The reason is that institutions' meaning (the meaning of rules, standards, law etc.) for coordinating actors is conceived as incomplete which explains why conventions achieve their character as pragmatic resources for the usages of institutions.⁵

In fact, EC is unique in another regard: although it was founded by five economists – namely François Eymard-Duvernay, Olivier Favereau, André Orléan, Robert Salais and Laurent Thévenot – EC has been from its beginning a transdisciplinary scientific movement. EC integrated concepts, methods and research perspectives from history, statistics, sociology, educational science, health science, political science and law.⁶ Today, there is a third and interdisciplinary generation of representatives in France and EC has become an international transdisciplinary approach including a growing amount of researchers outside of France (Diaz-Bone 2015).⁷

⁴ All these conventions empirically occur not in their pure and ideal versions. That is the reason why Michael Storper and Robert Salais use the notion of "*possible worlds of production*" (Storper and Salais 1997). Luc Boltanski and Laurent Thévenot have worked out the tensions, compromises and combinations of the identified conventions (Boltanski and Thévenot 2006).

⁵ For a discussion of this difference see Salais (1998) and Diaz-Bone (2012).

⁶ See actually the dictionary "Dictionnaire des conventions" (Batifoulier et al. 2016).

⁷ As is documented by the contributions in the following issues of *Historical Social Research*: Rainer Diaz-Bone and Robert Salais, eds., 2011, Conventions and Institutions from a Histori-

3. Classification and Metric Measurement

One of the birth moments of EC was the analysis of social and institutional practices of classifications.⁸ At the French national institute for statistics and economic analysis (INSEE), Alain Desrosières and Laurent Thévenot (1979) started a methodological analysis of principles of social classifications. At the end of the 1970s, INSEE was an exceptional institution for transdisciplinary research on (statistical) categories, (social) class, categorization and classification.⁹ INSEE can be regarded as a birth place of EC.¹⁰ The new department for labor (“*division emploi*”) – headed by Robert Salais – was in charge of developing new approaches for the analysis of labor, unemployment and labor institutions (Salais 2008; Diaz-Bone 2015). Salais and collaborators reconstructed the upcoming of the labor category of “unemployed” in the evolution of the industrial organization in France (Salais et al. 1986). They showed that the category co-evolved with the upcoming of new labor institutions and a new interpretation of long-lasting labor relations (industrial labor contract, insurances, etc.). At INSEE, Desrosières and Thévenot were charged to prepare the reform of the French socio-professional categories – which in France had been widely used since the 1950s and were cognitive references in the French mass media and in the French population since then (Desrosières and Thévenot 2002; Amossé 2013, 2016). Research at INSEE continued foregoing traditions, such as the work of Durkheim and Bourdieu on social classes and categories, but also the studies on industrial and professional categories (see Diaz-Bone 2015).¹¹ One result of these studies was the identification of the conventional

cal Perspective, Special Issue of *Historical Social Research* 36 (4); Rainer Diaz-Bone and Robert Salais, eds., 2012, *The Économie des Conventions – Transdisciplinary Discussions and Perspectives*, Focus of *Historical Social Research* 37 (4); and Rainer Diaz-Bone, Claude Didry, and Robert Salais, eds., 2015, *Law and Conventions from a Historical Perspective*, Special Issue of *Historical Social Research* 40 (1); all issues are available at <<http://www.gesis.org/en/hsr/archive>>.

⁸ Another starting point was the analysis of labor and labor institutions, see Salais and Thévenot (1986), also Salais et al. (1986).

⁹ The notions “categorization” and “classification” are often used assuming similar meanings. But categorization emphasizes the *process of assigning* an entity (individual, event, object etc.) to a category, while classifying also emphasizes the *process of valuing* an entity by relating it to a class. In the social sciences the meaning of the word “class” denotes also social groups while the word “category” does not have this strong semantic relationship to social entities. The notion of “classification” denotes the process of classifying but also the architecture of the system of categories or classes – the latter is not part of the semantic content of “categorization.”

¹⁰ INSEE stands for the “Institut national de la statistique et des études économiques” <<http://www.insee.fr>>.

¹¹ There was also established research at INSEE, see the contributions of Bernard Guibert, Jean Laganier and Michel Volle (1971) and also from Michel Volle (1982).

and historical character of categories and classifications.¹² No social classification can be built only on logical principles alone and no social classification can be built on empirical data alone. Desrosières (1998) has invented the concept of the “*equivalence principle*” as the implicit logic upon which categories and classifications (as their systematic arrangement) are based. Also, Desrosières brought in the concept of “*equivalence space*,” which is the political and geographical scope of categories and classifications (Desrosières 1998; Didier 2016). In the succession of Durkheim and Bourdieu, it was evident for Desrosières, Boltanski, Salais and Thévenot that categories of the official administration are related to the symbolic struggles of social groups who want to achieve their group being represented and established as a category in the official statistical classifications e.g. the official system of professional groups (Diaz-Bone 2015). And vice versa, the conventionalists identified how the existing categories of official statistical classification were enacted by different actors and through a chain of coordinations as in the case of official surveys as powerful representations in the social space (Thévenot 1983; Desrosières 2007).¹³ Since then, the social conventions, underlying categories and surveys have been a continuous research interest of EC (Thévenot 2011, 2016). Another strand of research scrutinized the pragmatics of classification by arranging so-called “experiments,” which were situations in which individuals had to classify (to categorize) persons having only incomplete information about them. This way, Boltanski and Thévenot brought classifying individuals in situations in which they had to explain and to justify their practices (Penissat et al. 2016). Soon, it turned out that these individuals referred to more general principles when they had to justify their ways of classification as ways of valuing classified persons – at this moment in the 1980s Boltanski and Thévenot became aware of the “orders of justification” (Boltanski and Thévenot 1983, 2006). Another important concept which was developed in the context of this research on statistical categories and classifications is the concept of “investment in form” (Eymard-Duvernay and Thévenot 1983, 1983a; Thévenot 1984). But actors also need a cognitive instrumentation to rely on when they coordinate and actors have to invest in forms i.e. to construct them as equipment for coordination. Forms enhance the scope in time (duration) and space (range) of convention-based coordinations. Statistical categories can be conceived as one sort of such forms.

French conventionalists first gained access to the sociology of quantification analyzing classifications and of categories which are regarded as the basis of counts of classified individuals. As Espeland and Stevens (2008) remarked, one can understand categorization and classification as basic forms of measurement on the measurement level of nominal scale (which they name “marking”). They

¹² Many results are documented in the two volumes edited by Joëlle Affichard (1977, 1987).

¹³ Laurent Thévenot compiled a set of research contributions (INSEE 1981).

refer to Hubert Blalock's presentation of the nominal scale. Blalock related this measurement level to classifications.

Classification is fundamental to any science. All other levels of measurement, no matter how precise, basically involve classification as a minimal operation. We therefore can consider classification to be the lowest level of measurement as the term is used in its broadest sense. For example, we place Presbyterians and Catholics in distinct categories, but we do not imply that one is greater than or better than the other. As long as the categories are exhaustive (include all cases) and non-overlapping or mutually exclusive (no case in more than one category), we have the minimal conditions necessary for the application of statistical procedures. The term nominal scale has been used to refer to this simplest level of measurement (Blalock 1972, 16).

In contrast to the statistics textbook, conventionalists' research was interested in the historical emergence and the pragmatic handlings of these categories. From EC's perspective, it is problematic to equalize classifications and the nominal scale. The reason is that EC studies empirical social classifications (instead of analytic variables defined by statisticians). Social classifications can have many different levels (organized in main categories and subcategories) and be based on a complex arrangement of many dimensions – while a scale must be unidimensional. As an institutionalist approach, EC recovers also the social foundations of classifications and categories. There are two main arguments: (1) Social categories are based on conventions as underlying social principles and (2) conventions – as equivalence principles – interrelate social categories and enable the socially recognized architecture of social classifications (as hierarchies of social categories).

Measurements at the nominal scale level and higher levels of measurements are in some aspects different.¹⁴ As Table 1 illustrates, metric scaling results in numerical representations while single categories – which can be coded with arbitrarily assigned numerical codes – do not have an inherent relation to numbers. The exception is categories being counted, but this is already a strategy of aggregation.

¹⁴ Located between the nominal scale and the (two) metric scales (interval and ratio scale), the ordinal scale is very common especially in survey data sets. In difference to the nominal scale it includes rankings of categories (see Blalock 1972 and Duncan 1984). Here, nominal scale and metric scale are discussed because they represent two statistical traditions which are related to two different philosophies of the social. George Udny Yule's perspective on statistics was its property to model the categorical reality of societies (and social classes), while Karl Pearson's perspective on statistics was its property to model the continuous reality of societies, which he believed to be the latent reality underlying categories (Agresti 2013, 623).

Table 1: Categories and Measurements

	Categories/Classes ("nominal scale")	Metrics ("metric scale")
Equivalence Principle	categorical identities and their relations	scaling procedure
Forms of Complex Arrangements	classification as system of categories/classes	index as one new quantitative representation
Quantification	only by aggregation (as counts) – numerical codes are arbitrarily assigned	case by case and by aggregation
(E)valuation	additional/foregoing processes are necessary to differentiate good and bad categories	hierarchical ranking "built in" by metric measurement
Dependency of Representational Context	high	low

Alain Desrosières had already discussed the differences between categorization and (metric) measurement early on (Desrosières 1995). Later he stated that quantification is to be composed out of two elements. First a convention must be introduced and, second, based on the convention, measurement can be proceeded (Desrosières 2008, 10). But the main difference between nominal scales ("categories") and metric scales is that metric figures, numbers, have a "built-in valuation" (already on the single case level) because the represented information enables an immediate evaluation in terms of "more" or "less." Even complex arrangements of metrical measurement as indices offer an immediate evaluation because an index is also a numerical representation. In contrast, classifications as complex architectures cannot be represented in a simple manner. Actors have to study them, otherwise they will not understand the information entailed in single categories and their positioning in the classification. The result is that the valid evaluation of representations of categories (even if numerically coded) is more dependent on contexts than the evaluation of representation of metric measurements.

4. Semantic Content and Scope

However, convention theorists use different notions of convention. And they are aware of this different meaning of the notion "convention." So far, the article presented the two important notions of convention which were introduced as orders of justification (Boltanski and Thévenot 2006) or as worlds of productions (Storper and Salais 1997). It is important to add now that these two versions of conventions in EC are based on underlying principles which help to

identify acceptable conventions and to delimit orders of justification resp. worlds of productions from other principles or devices of coordination.¹⁵ EC here has introduced structuring and underlying, more general criteria to systematize the conventions in the two important sets of convention, Boltanski, Thévenot, Storper and Salais worked out.¹⁶ These conventions offer *semantic content*. They contain – because of the deeper foundation on more general principles – a structured meaning which can be adapted to many situations in form of explanatory stories. This way, the structural influence on EC articulates itself.¹⁷ Ordinary actors understand the adequacy of these kinds of conventions in situations as socio-culturally established structures. In this sense, actors must be practical metaphysicians (Boltanski and Thévenot 2006, 145).

But in EC one can identify other usages of the term “convention.” Other kinds of conventions are more or less introduced as socially established standards. What makes these usages of the term interesting but also a problem is their *missing semantic content*. This idea of convention without semantic content can be illustrated by the highly influential definition provided by David Lewis.

A regularity R in the behavior of members of a population P when they are agents in a recurrent situation S is a convention if and only if, in any instance of S among members of P,

(1) everyone conforms to R;

(2) everyone expects everyone else to conform to R;

(3) everyone prefers to conform to R on condition that the others do, since S is a coordination problem and uniform conformity to R is a proper coordination equilibrium in S (Lewis 1969, 42).

It is striking to see that Lewis does not include semantics (meaningful content, semantic structure or discourse) in the definition of the convention R itself, alt-

¹⁵ Storper and Salais introduced two oppositions to identify four worlds of productions: (1) do they produce specialized products or standardized products and (2) do they produce generic products or dedicated products? (Storper and Salais 1997, 32 et seq.). Luc Boltanski and Laurent Thévenot presented “axioms” for a grammar of orders of justification (Boltanski and Thévenot 2006, 74 et seq.). These axioms for acceptable orders of justification demand for example that all possible members of a “polity” can be identified – which are all human beings who could share an agreement in this world. Other axioms require that all members of a polity have principle access to different states of worth and all states of worth can be ordered. And it must be mentioned here that both models of conventions postulate convention-based convention to address a common good.

¹⁶ This is the main difference of EC to other institutionalist approaches who do not offer any criteria and whose set of “logics” of coordination can be regarded as arbitrary and unsound ad hoc-collections of “logics.” This seems to be the case with the approach of “institutional logics” (Thornton et al. 2012). For comparisons see Charlotte Cloutier and Ann Langley (2013) and Rainer Diaz-Bone (2014).

¹⁷ The structuralist influence on EC is well-remarked in the introduction to the collection “Conventions and structures in economic organization” (Favereau and Lazega 2002), see Emmanuel Lazega and Olivier Favereau (2002).

though he tried to bring in a foundation for a theory of language! This kind of “emptiness” of his notion of convention opens the door for the problem of arbitrariness. Olivier Favereau (2008) has started to work out a critique of Lewis’ definition, arguing that conventions cannot be reduced to objective and observable behavior (as a way of conforming) and that conventions need to be regarded as regularities in intersubjective actions and beliefs (where the latter are not observable). Also, Olivier Favereau points to the problem of the importance of language use; because conventions have their existence in (collective) language use, they have to be represented in language and conventions have to be interpreted (2008, 124).¹⁸ Important for Favereau’s critique is the distinction he makes between “two types of convention, embodying, in the first case, a mental model of a common world, and in the second case, a behavioral model of interindividual interaction” (Favereau 2008, 125).¹⁹ The identification of different kinds of conventions is an important contribution of Favereau’s work.

But one has to add another element in the critique of Lewis’ concept of convention. Lewis did not consider and analyze the *semantic content and the semantic organization of the convention itself* – finally conventions without semantic content could become also a “mental model of a common world.”²⁰

For Lewis, the established practice of driving cars on the right side of the street in the US is an example of such a convention (Lewis 1969, 41). There will be historical reasons why cars are driven on the right side in the US. But this convention is arbitrary in the sense that driving on the right side solves the problem of car traffic (which is avoiding accidents) in the same way as driving on the left side – as it is the convention in the UK. There is no substantial reason why the US convention should be more legitimate or preferred than the UK convention. This rule is a standard which works perfectly well but *without semantic content* that could explain why the right side of the street in the US is normative “the right side” and why this convention should be considered as superior to another one. The only requirement for this car-driving convention is that everybody in the same country sticks to it. But one could easily imagine that one convention could be replaced by another one (for whatever reason). This would be a costly policy because the convention has prolonged in traffic law and the technical design of cars (where the steering wheel is on the opposite side, depending on the convention). So the driving convention could appear as justified by its anchoring in law and in technical features. But it would be a mistake to believe that the convention itself has enforced its connection to law

¹⁸ Independently, François Eymard-Duverney (2009) has also discussed the foundational importance of language use for EC.

¹⁹ See also the proposal of John Latsis (2005) similar to the one of Olivier Favereau (2008). For the concept of mental models see Douglass C. North and Arthur Denzau (1994).

²⁰ André Orléan has proposed to relate the notion of paradigm to EC’s concept of conventions (Orléan 1986, 1989, 1999). This is more close to the notion of conventions with semantic content. But Orléan does not reflect on the distinction of different kinds of conventions.

and technical features. There is no inner relationship between driving on the left side in the UK and UK traffic law or UK car-engineering. The car driving convention is not able to enforce its extension to other realms. For the UK, one could argue that also trains use the right side. But in Switzerland cars are driven on the right side of the street while trains use the left track.²¹ There is no necessity to have the same convention for car driving and trains; different conventions can be combined and all of them are arbitrary – as their combination is.

In contrast to conventions without semantic content, conventions with semantic content have an inner potential to enforce a more coherent fitting with their social “environment.” Of course, conventions do not enforce themselves, but their enacting in a process of coordination also enacts their semantic content as resource for shared ways of interpretation, evaluation and valuation that will work for coordination. These practices can be “shared” and will “work” because of their coherence with objects and cognitive formats. This coherence is possible when the process of coordination translates the semantic content of the convention into this collective practice and into a corresponding result, thereby adequately supported by equipment (of objects and cognitive forms) which respects and fits to the semantic convention of the convention.

Conventions with semantic content (which are well combined with object and cognitive formats) bring in more power to extend their area of application, thereby overarching single situations of coordination and integrating series of coordinations.²²

An example to illustrate this “powerful effect” is the study about French Camembert production offered by Pierre Boisard and Marie-Thérèse Letablier (1987, 1989; Boisard 1991, 2003; Eymard-Duvernay 2004). They compared the two coexisting but completely opposite conventions resp. worlds of Camembert production, Camembert distribution and Camembert consumption.

The traditional way to produce, distribute and consume Camembert expects the pre-product milk to be a natural product from traditional Normand cows, which entails its seasonal, climate and regional taste. The cheese is produced in family-based cheese dairies in a manner which is characterized by craftsmanship and traditional knowledge. Milk is regarded as a natural and living substance. These producers have their distinct milk production, their Norman cows and their Norman meadows nearby. Manual labor, personal expertise and regional identity are quality markers for the cheese and its taste. The taste of the

²¹ In fact, the reason why in Switzerland trains use the left track is that English engineers were involved in the establishment of the Swiss railway system.

²² Here, the notion of convention of EC has some parallels to the concept of “episteme” as presented by Michel Foucault (1994). As conventions with semantic content, the concept of episteme is a deeper structure and endows knowledge (discourses) and practices with a high degree of coherence. And an episteme is conceived to integrate many different discourses and to structure them in a coherent way – thereby realizing itself as an overarching and deeper structure. See also Diaz-Bone (2013).

produced traditional Camembert is varying. It varies not only with season and climate but depends also on the tradition of the cheese dairy. The cheese is certified by regional labels (“certificate of origin”) and distributed to special cheese retailers and it is consumed by “connoisseurs” of the French cheese tradition. The traditional Camembert cannot be stored for a long time and it is to be eaten soon.

The modern production, distribution and consumption of Camembert as mass production are made possible because the milk is supplied from farms all over France and the milk is pasteurized and homogenized and transformed into a standardized product. The Camembert is produced in cheese factories which are equipped with modern food-industry technology and scientific experts, controlling the production at every stage. The produced cheese has a standardized taste and it is produced for long duration. Consumers buy it in the supermarkets, appreciate its predictable taste, store it in the refrigerator and eat it cold. Here the domestic convention and the industrial convention are opposed to each other. They define two completely different ontologies and qualities of “Camembert.” In this case, the two quality conventions are able to integrate and to govern two different chains of production, distribution and consumption. But quality conventions are not always able to “enforce themselves” as a governance principle through a whole chain, as the analysis of quality chain has demonstrated. Wide-ranging quality chains – like the ones for different sorts of coffee – integrate different quality conventions on different segments of the chain (Daviron and Ponte 2005; Ponte and Daviron 2005). And it becomes a new research topic to analyze how to explain the quality governance of the whole chain (Ponte and Sturgeon 2014).

The scope of conventions can be related to the scope of quantifications which are based on conventions. To argue that conventions with semantic content have more intrinsic power to extend their scope does not mean to say that conventions without semantic content will not realize an extended scope. Instead, these conventions gain their potential from their embeddedness in networks of objects, practices and cognitive forms as an “extrinsic property.”

Conventions with semantic content and conventions without semantic content will be different in regard to their legitimacy and also to the legitimacy of quantifications built upon them. The explanation for this is again their content, now as order of justification which backup discursive strategies of explanation and legitimation. And quality conventions as the industrial convention or the market convention which have a close affinity to numbers as cognitive forms can be expected to be the most powerful in this regard. To be clear: The argument developed here is about the convention-based procedures how quantification is implemented, i.e. how numerical representations are derived from conventions. It would not be sufficient just to count ex post any kind of convention-based phenomena. Conventions without semantic content – and quantifications built up on them – will have difficulties to be protected against

critique if their arbitrary character is recognized and then reflected as an inadequate foundation. Table 2 compares the two kinds of conventions discussed here, summarizing some of the relevant different properties they have for EC.

Table 2: Conventions with Semantic Content and without

	With Semantic Content	Without Semantic Content
Articulation	Conventions as logics of coordination (orders of justification or worlds of productions)	conventions as (pure) "standards"
"Grammar"	yes	no
Arbitrary	no	yes
Intrinsic Power to Establish its Scope (in time/space)	high	low
Intrinsic Property to be Publicly Recognized as Legitimate	high	low

In contrast to other institutionalist approaches, EC has a more skeptical position towards theoretical models combining different ontological levels. EC's methodological position is located beyond methodological individualism and methodological holism. As Storper and Salais (1997) argued, EC tries to place interpretation from the standpoint of actors in situations of coordination. Therefore, one could label EC's methodological position a complex pragmatic situationalism (Diaz-Bone 2011, 2015). If EC avoids basing its explanatory power on a duality of macro-entities (as "society as a whole") and micro-entities (individuals and their preferences),²³ then the concept of "scope" becomes important to EC: "our framework [...] challenges the classical macro-micro distinction since judgements of worth are precisely ways of enlarging the scope of an evaluation from a local context and of crafting generalized statements" (Thévenot 2001, 418). To extend the range of coordinations in the dimensions of time and space, actors rely not only on established and well-known conventions but also on *intermediaries*. Intermediaries (as persons, objects) contribute to the scope of conventions from situation to situation (Eymard-Duvernay and Marchal 1997; Bessy and Chauvin 2013; Diaz-Bone 2015).

Theodore Porter (1995) has argued that quantification is a *technology of communication and of distance*, arguing that quantification effectuates trust (as

²³ To use such multi-level models (as micro-macro-models or micro-meso-macro-models) inevitably brings in the problem of different ontologies located at different levels. But there are conditions for the use of such models. (1) These holistic ontologies (macro level) and individualistic ontologies (micro level) need to be theorized in a complete and adequate manner. (2) These models need to include mechanisms which link the different levels, thereby respecting the different involved ontologies. In fact, the pragmatist foundation of EC contradicts the usage of multi-level models, because pragmatism rejects dualisms.

impersonal and objective information) and that numerical information spans distance in time and space more easily.

Standardization is a social strategy and social practice which also is applied for the purpose of the extension of scope of coordination (Brunsson and Jacobsson 2000; Timmermans and Epstein 2010; Busch 2011; Thévenot 2009, 2015). Standardization (as normalization) has been studied as a technology of power, governance and regulation (Brunsson and Jacobsson 2000; Thévenot 2009; Busch 2011; Ponte et al. 2011), and the work of Michel Foucault is most prominent for this perspective (Foucault 1995). Those conventions, which show an affinity for standardization via quantification – as the industrial convention and the market convention – can rely on this strategy. Conventions that do rely on certification – as the green convention and the civic convention – also do extend their scope by the implementation of certificates via standardization (and the support of law).²⁴ Standardization is a complex process, comprising a series of steps and including the definition, implementation and exertion of standards (Timmermans and Epstein 2010). From the standpoint of EC, these steps always need to be embedded in a convention-based practice, because standards are regarded as incomplete in terms of their meaning (as any other kind of institution is). And the idea of a convention as a “pure standard” refers to conventions without semantic content – as the example from Lewis of car-driving conventions mentioned above. (And consequently a convention with semantic content will be needed to exert the convention as standard.)

Alain Desrosières (1998, 2001) identified two related phenomena, based on this kind of quantification as standardization: “metrology” and “adunation.” Metrology is the historical process of implementing the metrical measurement system (not only in the sciences but also in everyday life – for trade, time measurement, geography etc.).²⁵ Adunation is the process of forming the (French) Nation by establishing nationwide standards (not all of them quantitative ones).

Standardization is not essentially bound to quantification. Standardization is possible as the definition of a routine or a procedure which can be exerted without numerical representations.

But the process of standardization as the transformation of a convention into a numerical represented rule contradicts – at least to some degree – inherently some of the conventions identified by EC in the sense that these conventions resist this kind of transformation (as the domestic conventions or the convention of inspiration). Their cognitive formats are different to numbers as representations. In-

²⁴ Laurent Thévenot has argued that standardization must be complemented by the personal regimes of engagement, so that standardization can be transmitted into individual routines and practices (Thévenot 2015).

²⁵ See for the history of metrology also the works of Eviatar Zerubavel (1981), William Cronon (1991), Eric Brian (1994), Ken Alder (2002) and Benoit Godin (2005).

stead, stories (about personalized examples and visual (iconic) representations are relevant for coordinations based on these conventions.

5. Perspectives for a Political Economy of Classification and Quantification

The influential works of Alain Desrosières on the history of statistics were path-breaking for a comparative understanding of official statistics (Desrosières 2008, 2008a, 2014). His work cannot be restricted to the history of statistical thinking in the sense of a history of the modern science of statistics. His notion of statistics correlates to a much wider idea of statistics as the science of (mainly numerical) state knowledge, of its institutions and of its representation. He integrated the analysis of statistical forms and societal organizations – as historical forms of state, of the economy and of their interrelations.

Table 3 summarizes different forms of the interrelation of state, markets and statistics in the course of the last centuries as they were identified by Desrosières (2011a). The five identified epochs articulated different forms of the political economy of classification(s) and quantification(s). It is important to understand the role of statistics in this table. These are dispositives requested by state administrations to fulfill their tasks – which vary depending on the different philosophies of the state and its role in the economy.

So far, EC has mainly focused its analysis on processes of classification and quantification implemented and entertained by state institutions. Maybe this is a bias induced by the French social sciences, where the state was identified as an important generator of societal representations (Desrosières and Thévenot 1979, 2002) and social groups (Bourdieu 1984; Salais et al. 1986; Boltanski 1987). Alain Desrosières' important typology can be characterized as *state-centered and developed from the perspective of official statistics*. He studies the role of state-driven official statistics and its statistical forms for the economy. For this purpose his work will have an enduring relevance and impact.

But nowadays, more and more scholars discuss developments and upcoming agencies for classifications and quantifications which are not controlled or entertained by state administrations. One catchword is “big data” (Mayer-Schönberger and Cuiken 2013; Japac et al. 2015), denoting the automated search and economic exploitation of structures in huge amounts of data sets. This phenomenon becomes more virulent because of the ubiquity of the Internet and the computerization of everyday social activities.

Table 3: The State, the Market and Statistics

	Conceptualization of Society and of the Economy	Mode of Action	Forms of Statistics
<i>Engineer State</i> Production and People (since the 17th century)	hierarchically structured institution, rationally organized	optimization under constraint; reduction of costs; planning; technocracy;	demography; production in physical quantity; input-output-table; material balance
<i>Liberal State</i> Trade and Prices (since the 18th century)	physiocracy; an extensive market; free competition	fight against corporatism; free-trade philosophy; anti-trust law	statistics promoting market transparency
<i>Welfare State</i> Waged Work and its Protection (since the end of 19th century)	the labor market has to be protected	laws on working hours, accidents, unemployment; compulsory social insurance systems	labor statistics; surveys of working households budgets; consumer price indexes
<i>Keynesian State</i> Global Demand and its Components (since the 1940s)	markets cannot function on its own and must be regulated at a global level	managing the occasional gap between global supply and demand through state policies	national accounting; economic budgets
<i>Neoliberal State</i> Polycentrism, Incentives, Benchmarking (since the 1990s)	an extensive market; free and undistorted competition	moving from rights to incentive; turning administrations into agencies	construction and use of indicators to evaluate and classify performance; benchmarking

Source: Desrosières (2011a, 45)²⁶

What is different to the world of official statistics in the era of neoliberalism is the *increasing privatization* of data collection and data analysis. The underlying conventions for classification and quantification in the private sphere of the (Internet-)economy are *invisible* and therefore, no more accessible to public observation and deliberation.²⁷ For example, private enterprises implement their own scoring systems to evaluate customers and clients, which are not visible for them and in many cases customers and clients don't even know that there are evaluated this way (Fourcade and Healy 2013; Mayer-Schönberger and Cukier 2013).

Desrosières already noticed processes in the “statistical chain,” which make the initially underlying conventions of statistics (as invented by official statisticians) invisible and transform the interpretation of statistical figures from a

²⁶ The table was slightly modified and shortened by the author.

²⁷ For a discussion of the contradictions and limits of neoliberalism from the standpoint of convention theory see William Davies (2014) and the review essay by Diaz-Bone (2016).

conventionalist representation to a “realistic” representations of social entities – the statistics from then are not being recognized any longer as based on conventions (Desrosières 2009, 308).²⁸

Once quantification procedures are encoded and become routine, their products are objectified. They tend to become ‘reality’ in an apparently irreversible way. The initial conventions are forgotten, the quantified object is naturalized and the use of the verb ‘to measure’ comes to mind or is written with no further thought (Desrosières 2015, 334).

And there is a social demand for such a realist representation of social entities by statistical figures, which are legitimated by an unchallenged institution (Desrosières 2009, 313). One can argue that the constellation of neoliberalism and computerization in time of the Internet will extend and accelerate the processes which naturalize the products of quantification procedures.

As Desrosières indicated in the characterization of the neoliberal state (see last row in Table 3), data production has become polycentric, placing the state in a new situation with private organizations (big enterprises and non-government organizations, NGOs), who became data producers themselves, thereby questioning the legitimacy of the state monopoly for societal representations based on numerical data. The state has lost its position as the principle guarantor for symbolic power and has also lost its status as the “monopoly of legitimate symbolic violence” (Bourdieu 2015, 4).²⁹

Table 4 provides a first sketch of a more general frame, presenting in the columns four ideal types of situations in which classification and quantification can be executed.

The perspective to understand these situations is the perspective of coordinating actors, not the one of official statistics in relation to the state and to the economy – as in Table 3. The four situations represent four possible and own standing “centers” or situations for classifying and quantifying processes which emerge out of actor’s coordination. Here, the claim is not that the table lists all possible situations. But the presented situations are characterized by a maximum of differences in regard to aspects discussed so far – and they should be understood as ideal types which do not occur in pure form in reality.

²⁸ For the concept of statistical chain see: Laurent Thévenot (1983), Alain Desrosières (2007) and Diaz-Bone (2016).

²⁹ The causes for this loss of the state’s position are also located on the supra-national level as Robert Salais (2013) has analyzed in his history of the origination of the European Union.

Table 4: Four Situations of Classification and Quantification

	Centralistic State Situation	Deliberative, Pluralistic Public Situation	Free Market Situation	Private Monopolistic Situation
Example	officialdom, state administration	social movements, NGOs	stock exchange	Internet monopoly
Classification or quantification legitimated by monopoly of symbolic power	yes	no	no	no
Power monopoly for implementation of classification or quantification	yes	no	no	yes
Classification or quantification orientation towards a common good	yes	yes	yes	no
Visible convention(s) of classification or quantification	yes	yes	yes	no
Debatable/discussable conventions	no	yes	no	no
Acceptance for a pluralistic constellation of classification or quantification	no	yes	no	yes
National constraint of classification or quantification	yes	no	no	no
State convention	external state	situated state	absent state	absent state

Alain Desrosières (2015) has coined the notion of “retroaction,” which denotes the public questioning of official statistics by social groups which are concerned by quantification in a devaluing (discriminating) way.³⁰ Statistics not only has become an *object of critique*, but has become a *dispositive of social critique* as well (Desrosières 2014a).³¹ All in all, neoliberalism cannot be reduced to one convention or assigned as denominator to a whole socio-economic epoch. All four situations (and maybe some more) have occurred in modern societies over a few hundred years, but in different constellations, and

³⁰ Wendy Espeland and Michael Sauder (2007) have applied the concept of “reactivity” in their analysis of actor’s reaction to rankings. Annick Bourguignon and Eve Chiapello (2005) worked on the role of criticism in the processes of implementing quantitative measurements as performance evaluation systems. Antoine Lyon-Caen and Joëlle Affichard (2005) analyzed the implementation of the Open Method of Coordination and processes of upcoming resistance to it.

³¹ See also the French approach of “Statactivisme” (Didier and Tasset 2013; Bruno et al. 2014; Bruno et al. 2014a).

they have varying impact in different social spheres. Seen from the standpoint of coordinating actors, different conventions of the state – as they were introduced by Michal Storper and Robert Salais (Storper and Salais 1997; Salais 2015) – can be adequate frames in the definition of the situation, the collective intentionality and the common good. The notion “convention of the state” is different from the state-centered perspective which takes the state (its administrations and its legitimacy) as granted. The “external state” is actor’s expectations to have state administration to intervene and to solve the problem of coordination. The “absent state” is actor’s expectation that the state will do nothing concerning the coordination and its outcome. The “situated state” is a frame for actors who know that they can pursue the common good and only in case of failure they expect the state to intervene (not knowing in which manner). These different interpretations of “the state” will result in different ways, how to proceed quantifications.

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The *Centre d'Études de l'Emploi* (1970–2015): Statistics – On the Cusp of Social Sciences and the State

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Abstract: »Das *Centre d'Études de l'Emploi* (1970–2015): *Statistik – an der Spitze der Sozialwissenschaften und des Staates*«. The *Centre d'études de l'emploi* (CEE) is a Paris-based public research institute. This article will attempt to draw up a social history of quantification viewed through the lens of the Center's story. Positioned on the cusp of science and State, its own history relates the tension, hesitations, and upheavals that have marked relations between labor and employment administration and social science organisms over the last 45 years. More specifically, it provides insight into the role played by statistics in the effort to combine action and knowledge – and by this we understand both a field of actors with its rules, practices and a myriad of instruments, methods and results.

Keywords: Research center, institutional portray, Paris region, quantitative methods, social sciences, economics of convention.

1. Introduction

Created in 1970, The *Centre d'études de l'emploi* (henceforth in short as CEE or “the Center”) is a medium-sized establishment. Employing between 50 and 100 employees as staff, it is typical of the many thematic research institutes that sprung up at that time (Pollak 1976).

Having co-hosted early productions in the line of heterodox economics called the “economics of convention” (*économie des conventions*), the CEE illustrates the unique relationship between the social science community and statistics in France – and elsewhere – during the 1980s and 1990s. Studied as a subject of research even before the “critical turning point” (*tournant critique*),¹ statistics were then withdrawn from research practices. This indeed amounted to a temporary rejection of a specific type of quantification: the large-scale public statistical surveys, symbolizing the State and the knowledge of society it builds.

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¹ As proclaimed in 1988 by the *Journal Annales* (Desrosières 2011, 67).

The history of the CEE in terms of both its status and its research activity reflects a shift from one era to another – the quantifying positivism espoused by the *Commissariat Général du Plan*² to a new expert power of numbers that went hand-in-hand with the emergence of a neo-liberal State (Desrosières 2014). Between these two periods, a plurality of different ways of relying on reality were examined and theorized at the CEE. And this chapter of the story may not be entirely closed.

Our institutional narrative will be in chronological order and based on administrative documents (legal texts, audit reports), the full range of publication collections at the Center and interviews carried out with present and past members.³ My own experience, gleaned over the last nine years in my role as researcher at the CEE will form part of the input.

2. State Science up to Science of Margins (1970-1983)

The CEE was set up by the decree of 25 November 1970, but its origins date back to 1962 when a research department specializing in “poorly adapted” population categories was created in the *Institut national d’études démographiques* (INED). It very quickly sparked the interest of the working population. The department head, Claude Vimont, had previously acted as advisor to the cabinet of Bernard Chenot, Minister for Public Health and the Population. A graduate of the *Institut d’études politiques de Paris* and doctor in economics, he acted as *rapporteur general* for the *Commission de la main d’œuvre* of the IIIth, IVth and Vth Plans, and also worked with Jean Fourastié, head economist for the productivity policy implemented within the Marshall Plan. It was more of a political decision than a scientific one that led to the setting up of this department and its substantial financial aid (Girard 1986), making it possible to carry out several statistical surveys and studies, in keeping with the specifications of the Plan, particularly concerning changes to the working population, employment, and human resource requirements.

At the end of a decade marked by the emergence of employment problems (Pénissat 2009), Joseph Fontanet, Minister for Labor, Employment and the Population at the time, decided to consolidate his administration’s research and sta-

² This is the body in charge of economic planning in France between 1946 and 2006 (see Fourquet 1980 for an historical overview), hereafter named the Plan.

³ Thanks to (in alphabetic order): Jean-Claude Barbier, Christian Bessy, Jean-Louis Dayan, Jean-Pierre Faguer, Michel Gollac, Bernard Gomel, Guillemette de Larquier, Marie-Thérèse Letablier, Laurent Thévenot, Marie-Madeleine Vennat and Serge Volkoff. My sincere thanks also to Jean-Louis Dayan and Christine Daniel, who kindly granted me access to the CEE archives. I take full responsibility for the analysis and any possible errors in all the documents and data used. In no way whatsoever shall this engage the responsibility of the institute, any of its directors, or successive members.

tistical resources in an effort to gain clout vis-à-vis the Ministry of Economy. While remaining part of the INED, this department then became the CEE. Its mission was to study labor market functioning and to carry out research in the field of the sociology of employment.⁴ Claude Vimont remained at the helm of this new organization and in this capacity acted as scientific advisor to the General Director for Labor and Employment Administration of the Ministry. In addition, he was vice-president of the Employment Commission of the VIth Plan.

Due to its dual origin, both administrative and scientific – which has been symbolized by its first director – the positioning of the CEE was ambiguous from the outset. Somewhere between a research organization and an administrative department, the CEE is one of these “French-style” hybrid institutions, caught between science and the State, much like the INED as described by Alain Desrosières (1997). However, the similarity ended there. Whereas the INED – mid-way between “*science sauvage*” (wild science) and “*science d’Etat*” (State science), had succeeded in securing its position as a key seat of French-style demographic studies which it had embodied since the immediate postwar period, the CEE’s main focus was administrative – for the first decade of its existence in any case. The internal structure and organization were clearly hierarchical with the director at the top – acting as main interface with the Ministry – above the research fellows (senior, when formerly in the INED, and their less experienced counterparts) and at the bottom, short-term contract employees (mostly in charge of data entry and coding). Departmental meetings had a strong administrative atmosphere and had little in common with the ambience of a research unit. Writing a PhD was forbidden, as was attending scientific colloquia.

That said, the CEE’s vocation was not purely administrative.⁵ The creation of the *Cahiers du CEE* collection in 1973, where researchers could publish their work, was proof of the Center’s wish to confirm its unique positioning and set itself apart from the existing scientific journals and administrative publications at the time. Although it has not had a major impact on the economic science field, the collection is known and has its place among French economic reviews (Koen 1986). This is more largely true of the academic recognition of the Center’s research into labor economics (Mériaux 1978). Yet, it had few ties with the field of sociology of work, despite the fact that the *Institut des sciences sociales du travail* (operating under the auspices of the Ministry of Employment since its creation 20 years previously) had just closed down (Tanguy 2011).

The creation of the CEE sealed the plan, born of political aspiration and scientific ambition, to give substance to an issue that was yet to be clearly defined

⁴ Decree no. 70-1087 of 25 November 1970.

⁵ At the end of the 1970s, a regional head of employment stated “I don’t wish to be unpleasant but the research they do is almost scientific,” the adjective “almost” meaning “too” (thanks to Michel Gollac for the anecdote).

– employment. The intention was to produce information likely to drive public policy and thereby contribute to the creation of social science for employment, via *employment studies* (much like the INED *population studies*). Research methods were thus mainly statistic-based – either derived from existing data but exploited in an original manner; or from “in-house” representative studies designed according to the INED model (using a large cohort of students for example); or from reduced-scale surveys of companies where quantitative data are often enhanced by interviews in workplaces, not dissimilar to the “survey research” developed in sociology of work (Tanguy 2011). In-depth interview-based inquiries of a sociological nature were rarer. They were mostly covered by the *Division jeunesse* (Youth Division), which became part of the CEE structure at the time of its inception.⁶ Its director, Jean Rousselet (doctor in paediatrics), upheld the multi-disciplinary approach, which left substantial scope for analyzing attitudes and mentalities.

Micheline Galabert (economist and graduate of the *École nationale d'administration*, who took over as director from Claude Vimont in 1973) seemed slightly defensive as she pointed out that the place given to statistical research was not to the exclusion of other methods. It is true that in the 1970s, quantitative analyses were predominant at the CEE, and these were conducted along the lines of the methods developed at the same time as the *population studies* already mentioned. Having no in-house IT resources, the Center's research relied on analyses conducted in the Institute until the beginning of the 1980s. At a time when the framework of the Plan and the INED methods were the main references, the use of statistics was a given. Thus, statistics were key in the *Cahiers du CEE* volumes that most aptly reflect the period. Covering the area of employment in the manufacturing sector, these publications adopted, for instance, a taxonomist approach to determine the exact skill structure of employment and the geographic and sectorial distribution of employees. Even research conducted by the Youth Division involved making large-scale statistical surveys. One such example is a study carried out on several thousands of pupils born in 1955.

That said, the fact that statistics were used was not necessarily tantamount to their endorsement. For example, Jean Rousselet criticized the use of statistics in his preface to the 15th issue of the *Cahiers du CEE*. Unhappy with the still vague nature of social sciences for employment, he expressed the regret that a global approach had not taken shape and addressed harsh criticism more directly at “approaches that were almost exclusively statistical [...requiring] arbitrary systematizations and groupings.” He pointed out that “all too often specifics have been boiled down to generalization just for the sake of producing simple and easy-to-read spread sheets” and that “the reality of individual experience

⁶ The *Division jeunesse* had its origins in the *Centre d'étude et de recherche sur les conditions d'emploi et de travail des jeunes* (Cercetj), which was created in 1955.

has become increasingly foreign to the formal structures of institutions and organizations.” He added that “even words themselves gradually take on a different meaning and end up changing the apparently objective nature of purely quantitative analyses” (Rousselet 1977, 13-4).

This written the statement reflects the personal position of its author and more particularly his attachment to the human dimension. But it also reveals that certain issues were being revisited at the time: a reflexive withdrawal from the methods and categories of economic and social analysis therefore developed – this was also the case in the *Institut national de la statistique et des études économiques* (INSEE, the French National Institute of Statistics and Economic Research; see Desrosières 2011). A number of research projects started to explore the categories of perception and practices of “social codification” (Thévenot 1983) in a movement later described by Nicolas Dodier as a “totalization crisis” (1996).⁷ At CEE, structural approaches gradually started losing ground as the economy shifted from growth mode and the employment crisis took a hold. Analyses relying on administrative variables, such as geographical entities (*département, région*), as well as economic ones (occupation, industry), in the form of maps or forecast tables, were featured less systematically in the productions of the Center.

Throughout the years, research tended to focus on employment in the tertiary sector and employment of women – and no longer on the manufacturing industry, the kernel of economic statistics for the *Trente Glorieuses*. Researchers started exploring marginal employment zones such as temporary work, subcontracting, homeworking or teleworking, the unemployed, etc. It was no longer the Youth Division alone that focused on these aspects even if some of its researchers, also associate fellows at Pierre Bourdieu’s unit, worked specifically on the subject of “*marginalisme*.” The head of this Division was besides one of the first authors to theorize the subject of allergy to work (Rousselet 1974), thereby symbolizing a breakaway from the initial missions of the Center.

The type of recruitment carried out in the 1970s highlights the increasing discordance of the Center in relation to more legitimate areas of economic administration and research: *Polytechniciens*⁸ were particularly numerous among economists and demographers belonging to the INSEE and the INED (Pollak 1976; Desrosières 1997) and *Normaliens*⁹ among sociologists working in the *École pratique des hautes études* and the *Centre national de la recherche scientifique* (CNRS, the French National Center for Research). On the contrary, the CEE employed individuals with diverse academic backgrounds and experi-

⁷ See also the contribution of Laurent Thévenot in this HSR Special Issue.

⁸ The *École polytechnique* is a top French engineering school whose students become, for a part, high-rank civil servants and researchers.

⁹ The *École normale supérieure* is an elite higher education institution mainly leading to teaching and academics careers.

ence, with specializations ranging from economics to philosophy, and also including demographics, geography, or psychology. Its members had previously worked as engineers, doctors, nurses, social workers, trade union members, etc. With the exception of some engineers and IT specialists, there were few employees with qualifications in statistics, and practically no one had a PhD. The research tended to follow a “learning by doing” mode in an environment that could be described as artisanal. Here, with the exception of some statistic treatments made by the few professional statisticians at the INED, most of the analyses were done the old-fashioned way, using paper, pencils and a calculator.

The 1970s saw a move towards outsourcing scientific production, with a multiplication (advocated by the Plan) of administrative and research bodies (similar to the CEE) supposed to compete with the CNRS and universities (Pollack 1976). The Center also symbolized the clash of generations associated with the events of May 1968 and the subsequent departure of the positivism of social sciences of the previous decade. To give an example of the political atmosphere prevailing within the walls of the Center itself, any programming work done by short-term contract employees was checked for signs of sabotage at the end of the working day. The distance increased vis-a-vis statistics and analytical approaches that prevailed in the INED. At the end of the 1970s, a new profile of statistician appeared on the scene – one willing to work on developing new methods for analyzing these “*enquêtes intermédiaires*” (non-representative small scale surveys conducted on companies or workplaces). Around the same time, the sociology model based on measuring and quantifying was mainly rejected (Tanguy 2011).

The CEE’s initial scientific ambition started to lose momentum. The innovative methods and theoretical developments announced in the early *Cahiers du CEE* hardly went beyond the exploratory stage. It is true that research into how local employment markets operated had partially been linked to the segmentation theory.¹⁰ Additionally, research into how technical progress impacted job content provided opportunities for attempts at modelization. That said, the Center’s contributions were, for the most part, of an empirical nature, as Henri Chaffiotte, another *énarque* and economist, pointed out in the first foreword for the *Cahiers du CEE* he penned following his appointment as director in 1979.

There was a further shift when the Left came into power in 1981. A State Ministry for Research and Technology was created, tangible proof of the government’s commitment to jointly developing its research and industrial policies. Having suffered cutbacks in the latter half of the 70s, social sciences were once again granted funding. It was expected that they would assist the democratization process of research through their links with social actors and the long-awaited reconciliation between fundamental and applied sciences. In terms of

¹⁰ Michael Piore took a sabbatical at the CEE at that time, during which he followed several sectorial field surveys.

labor and employment, economics and sociology were supposed to boost the competitiveness of the economy, notably by bridging the gap between the different industrial players (the State, employers and unions) and by supporting the model of “*démocratie sociale*” (social democracy) upheld by the Auroux laws.

The CEE’s activity coincided with these new trends. Even if the quality of its research came under harsh criticism,¹¹ following a two-year administrative struggle,¹² its position was eventually consolidated with increased resources and a change in status some years later.

3. Theoretical Development and Withdrawal from French Public Statistics (1984–1993)

In 1984, the Ministry for Research created the *Programme interdisciplinaire de recherche technologie, travail, emploi et mode de vie* (PIRTTEM, interdisciplinary research program for technology, work, employment, and lifestyle), inspired by the American industrial research laboratories of the first half of the 20th century where a cross-disciplinary approach combining scientific methods and a broad range of skills was adopted to solve specific problems (Pestre 2002, quoted in Tanguy 2011, 167). Back in France, the early 1980s saw a leaning towards possible restructuring of academic disciplines. With regard to social labor science, the first audits conducted at the PIRTTEM underlined the inadequacy of the existing and outdated analytical frameworks (which still tended to be based on the economy of the *Trente Glorieuses*) and also emphasized the need for increased focus on company-level analyses. For the most part, the CEE was already following this trend, with its empirical *savoir-faire*, notably the surveys carried out in companies, and the plurality of academic directions followed by its members. The Center would be supported throughout the 1980s by the Minister for Research¹³ and proved itself to be the ideal environment for hosting an emerging line of thinking positioned midway between economics and sociology – the economics of convention.

In 1984, François Eymard-Duvernay was appointed director of the CEE. He was then joined by Laurent Thévenot, who worked alongside him to make the Center the ideal site for a convergence of different research programs initiated in the early 1980s – at the INSEE in particular. Research into three distinct

¹¹ As stated in the summary note written by Bernard Mériaux in December 1981 following his assessment report of the CEE submitted to the Ministry for Labor (CEE archives).

¹² Several notes and administrative reports were produced between 1981 and 1983 on the subject of the CEE, with recommendations fluctuating between closing down the Center and supporting it (CEE archives). The latter option would finally be chosen.

¹³ Several notes written by Yves Lichtenberger between 1983 and 1989 attest to this (CEE archives).

areas thus irrigated the Center's program: firstly, an economic study of the plurality of work organization models implying different "*investissements de forme*" (investments in form, see Eymard-Duvernay and Thévenot 1983a, 1983b, 1984; see also Thévenot 2016 in this HSR Special Issue) used for manpower management; secondly, a sociological investigation into the plurality of approaches to constructing a moral judgement; finally, an historical reflexive analysis of statistical tools and categories viewed as a plurality of means of representing social and economic reality. It is the notion of "convention" that bridges the gap between these three areas: it enables individuals to coordinate action in different work organizations, to formulate a judgement in different arenas of society and to develop different representations of the world.¹⁴

With its new director and a change of status, the CEE was well on its way to becoming a fully-fledged research center: the mission statement clearly mentioned that it had to "carry out research,"¹⁵ and it now had a board of directors and a scientific advisory group, thereby guaranteeing an equal balance between academics and administration directors; the collections published by the Center were redefined with the creation of *Dossiers du CEE* in addition to the *Cahiers du CEE*, the latter being used only for more in-depth productions from then on; a research seminar for non-CEE members was organized and collaboration with other scientific organizations was developed.

At first, this new research-oriented direction followed by the CEE focused on the economics of convention. Indeed, the importance given to this program is reflected both by the composition of the scientific council¹⁶ and the volumes of the *Cahiers du CEE* published in the second half of the 1980s. The first issue in the series, entitled *Les conventions économiques*, gave an overview of the analytical framework being developed by the Center at the time, illustrated by very diverse case studies.¹⁷ The following issue, entitled *Entreprises et produits*, was dedicated to publishing the work of in-house researchers, many of whom had been working at the Center since its inception. This research would often take the form of "situated" case studies (two examples being the footwear industry in the Cholet region and Camembert production in Normandy). All this provided additional input for the ongoing thoughts on "*modèles d'entreprise*" (company models). Three "types of coordination" were thus identified: "via the market, via investments that stabilize exchanges in a broader space, via investment into sustainable personal relationships" (Eymard-Duvernay 1987, xx). These three approaches corresponded to the market, the industrial, and the do-

¹⁴ For a more detailed presentation, see Diaz-Bone and Salais (2012).

¹⁵ Decree no. 86-399 of 12 March 1986.

¹⁶ Among those present were, notably, Robert Salais and Olivier Favereau, two of the founding fathers of the economics of convention, as pointed by Alain Desrosières (2011).

¹⁷ Two such examples are mine safety in the Decazeville-Aubin coal basin in the 19th century and the "production function of dairy cow milk" in the Ternois region in the north of France in the early 1980s (Thévenot 1986).

mestic types of economy respectively. The three subsequent editions of *Cahiers du CEE* (entitled *Les économies de la grandeur*, *Innovations et ressources locales* and *Justesse et justice dans le travail*) disclosed some empirical applications and theoretical developments inspired by this three-pronged program covering the economics of convention and the French schools of pragmatic sociology and the sociology of science. Thanks to the efforts of its directors and part of its research team – not forgetting its publications, the CEE earned its reputation as one of the pivotal institutions for this assemblage of research.

The new direction taken by the CEE brought a vast array of empirical materials into play: observations and interviews, corpuses of archival materials and scholarly texts, professional and legal documents, written traces and statistical counts. This did not amount to a rejection of quantitative methods per se but was more a voluntary withdrawal from the major national statistical surveys. At the time, both theoretical development and research practices focused on the notions of particularity and locality (as opposed to totality and nation level), illustrating the polarization between monographic and statistical approaches described by Alain Desrosières in *Justesse et justice dans le travail* (1989). A brief overview of these two forms of research (including the mutual criticisms they received) provided us with more details of the type of generalization they lead to: the unity and both the global and exemplary nature of the monograph were compared with the totality, the exhaustive nature and the “*conventions d'équivalence*” (conventions of equivalence) of statistics.¹⁸ Whereas at the time statistical research was still then relying on a division of work between researchers and statisticians, quantitative analyses were no longer carried out at the CEE as a key activity, notably owing to insufficient human and technological resources. Because of the fine granularity of data requested for analysis, contextualized observations and textual materials were often preferred to numerical data.¹⁹

In addition, statistical tools were used as subjects for research from then on. Whether they were the national accounts, the large-scale surveys, or the macro-economic modeling of company situations, it was the consistent manner adopted by public statisticians when organizing and depicting reality that was questioned by Alain Desrosières, François Eymard-Duvernay, Laurent Thévenot, and Francis Kramarz. Underpinned by the objective of disclosing different conventions underlying the construction of facts and coordination of actions, these authors stepped back from the professional universe they were familiar with, to which they belonged, and from which they aspired to break away.

¹⁸ See Desrosières (2011, 72) for a presentation of the notion.

¹⁹ In *Les Économies de la grandeur* (Boltanski and Thévenot 1987), words replace numbers as subjects for analysis. Another sign of the limited attention given to results of statistical methods was the PROSPERO software program, developed by Francis Chateauraynaud when he was at the CEE, the main and first focus being put on the categorization of texts: although it could have allowed to carrying out factor analyses methods, it was not used for this purpose.

The growing distance vis-à-vis statistics could appear to be a paradox coming from professional statisticians (Desrosières 2011). It was part of a movement of reflexivity addressed to knowledge production operations which went beyond the CEE but which was (the movement of reflexivity) facilitated by personal experiences and institutional trajectories. It is certainly no coincidence that it was the INSEE civil servants, who had stepped off their “classic” administrative career path when they committed themselves to research, who produced this work. And neither is it any more surprising that it was developed in the CEE, this center situated on the cusp of administration and research, where the number and variety of methods were the norm. Here we can perhaps draw a parallel with the career path of Luc Boltanski, following his ideological split with Pierre Bourdieu. Imposing a new multi-faceted mode of perception of reality implies going beyond a single approach conveyed – in certain areas of discussion at least – by previous visions of the world, and therefore being able to break away from these: industrial governance symbolized by the INSEE national accounts; a purely market-driven economy which also tended to be defended from within; the large scale surveys and variables used in the first period of the “*sociologie critique*” (the critical sociology of Pierre Bourdieu), up to the 1970s at least to highlight the structure of social inequality (be it “*reproduction scolaire*,” matrimonial alliances or the judgement of taste).²⁰

Research carried out at the CEE time showed a *contrario* specific focus on domestic and local issues, which had often and for a long time been previously considered as economic archaisms. In the same way, monographs and micro-objects became central to the practice of research. This opposition is not to be read so much vis-à-vis statistical counting and quantitative methods themselves, but more with regard to large-scale statistical surveys, symbolizing administrative variables that compact the thickness of real practices and prevent consideration of other categorizations when attempting to understand reality.

Not everyone working at the Center shared this approach however. Following the arrival of François Eymard-Duvernay, the practical and theoretical options chosen by CEE gave rise to some tension, both internally and externally. The direction followed was met with much reticence on the part of some researchers working at the Center. Some went as far as to refuse the distancing from the French Public Statistics and the Ministry of Labor and continued to conduct studies at its request. Other researchers, sometimes the same ones, estimated that the economics of convention was not “critical” enough because the subject chosen was precisely the “weapon” used for sociological disclosure

²⁰ The 1980s saw Pierre Bourdieu's sociology also drawing away from statistics and his criticism of State domination was increasingly explicit (if we consider for example his lecture on the State given at the Collège de France in 1990; Bourdieu 2011, 24–5).

or social protest.²¹ Outside of the Center, the exotic nature of certain micro-objects, such as the ladled camembert or the *coquille Saint Jacques* (scallops)²² were misunderstood, especially in the public administration, which was mainly concerned with seeking specialists in order to tackle the issue of fast-growing unemployment. Although it was not completely disconnected from the issues facing the Ministry for Labor, the way the CEE analyzed the economy and society clearly showed its withdrawal from public statistics and, more broadly, from State action.

The appointment of two INSEE civil servants as director and deputy of the Center took place at the same time in the middle of the 1980s, with a reinforcement of the role of statistics in the public administration of labor and employment. This was in line with the ambition announced as of 1981 by the social reformers at the Ministry to strengthen its scope of expertise. However, the wish to pursue an original theoretical research direction and not to foster the best practices of the statistics Institute led to a deterioration of relations between the Center and its original governing body. The new ministerial team appointed in 1988 restated its intention to have arms available to defend an alternative policy to that recommended by the macro-economic models estimated by the INSEE and the *Direction de la prévision* (along with the INSEE, one of the main French public administrations of the Ministry of Economy). Following two audit reports²³ and several years' hesitation on the part of the government, plans to shut down the Center started to take shape in 1992 – at a time when the creation of an extended public administration for studies and statistics (that was to include the CEE) within the Ministry for Labor was on the horizon. This would be to replace the former *Service des études et statistiques* (SES). However, the project of a merger never materialized, mostly because of the resistance shown by both management and the members of the Center.

²¹ *Les Economies de la Grandeur* (Boltanski and Thévenot 1987) was, for instance, met with a particularly stormy reception. Many researchers denounced the relativization of critical resources drawn from labor law and union action advocated in this piece of research. In the context of a breaking away from Pierre Bourdieu's sociology, Luc Boltanski's and Laurent Thévenot's analysis of the plurality of forms of criticism and their respect for the principle of symmetry in the sociological analysis were not seen as an attempt to allow the "small fry" to defend themselves. On the contrary, it had been considered as a sociology providing support to capitalism, without any real critical power. Luc Boltanski has since responded to such views in his book *On Critique* (2011).

²² See the *Cahiers du CEE* 30 and 32, for instance.

²³ The economist Jean Vincens and the senior official Gabriel Mignot were requested to do this in 1988 and 1992 respectively. In his report submitted to the Ministry, the former acknowledged the high quality of the research carried out at the CEE, stating for example that (the Center) "has developed an extremely ambitious theoretical and methodological approach aimed at gradually overseeing field work, in an attempt to standardize it and increase its scope. This framework was very well received by a significant number of researchers outside the CEE, leading to the development of a set of concepts forming a paradigm, which would inevitably compete against the dominant paradigm" (CEE archives, 64).

The *Direction de l'animation de la recherche, des études et des statistiques* (DARES, Labor and Employment Ministerial Studies and Statistical Department) was officially created in January 1993 but did not bring about any institutional changes for the Center, apart from the appointment of Annie Fouquet, INSEE civil servant and sociologist (who was at the time heading up the SES) as head of the CEE while Claude Seibel took command of the DARES. The proximity of these two senior civil servants provided a new blueprint for the Center's development and allowed it to strengthen its ties with the Minister for Labor, and more generally speaking, with the expectations of the public statistical system.

4. A Return to Work and Employment: Constructivism versus Realism, Public Policy Evaluation (1994–2003)

The creation of the DARES marked the commitment of social reformers to have a real influence on government policy (Fouquet 2007), whereas the growing trend (in the INSEE in particular) was to use labor micro-economy as a basis for making economic decisions (Champsaur 1996). In this context, resorting to statistics was a given, as recorded in an exchange in July 1992 between Gabriel Mignot, one of the civil servants involved in setting up the project, and an SES staff representative clearly concerned that a monographic-type approach still had a place in studies conducted in the future DARES: "I am not a believer in purely qualitative research, everything should end up being quantified; I make no distinction between statistics and studies."²⁴ This stance reflected the administration's mindset whereas at the time statisticians were increasingly hired and micro-computing was expanding, making collection and analysis of statistical large sample surveys much easier.

At the CEE, the appointment of Annie Fouquet confirmed the new direction taken by its former management during its final term of office. The economics of convention was still a significant source of inspiration for research conducted at the Center under the leadership of François Eymard-Duvernay, henceforth focusing on the analysis of how the labor market operated. However, there were other formally defined scopes of investigation: evaluation of public labor policy was directed by Bernard Simonin, and Michel Gollac oversaw an analysis of organizations and working conditions. The importance placed on quantitative data and methods varied from one focus area to another: although present in the program derived from the economics of convention, they played a secondary role, unlike the research into working conditions where their role was more central. As for the evaluation of labor policy, on the whole this mostly

²⁴ Exchange found in the DARES archives (1993–2000) and recorded by Etienne Pénissat (2009, 143).

steered clear of quantification tools. In the 1990s, attitudes toward quantitative methods varied greatly within the Center. This was at odds with the Ministry for Labor's expectations but was in keeping with the history of the CEE.

Statistical methods and tools may have played a minor role in the economics of convention program. That said they are far from being totally absent. Upon his arrival at the CEE in the mid-1980s, Christian Bessy set up, for instance, databases for dismissal and redundancy authorization requests (with the agreement of the Ministry for Labor) and produced a sector typology. He would later enrich it with a cross-analysis of wage-setting variables derived from the INSEE surveys *Coût de la main d'œuvre/structure des salaires* (on labor cost/wage structure). It comes as no surprise that typologies and classification methods were key to these research programs: However unlike previous studies carried out at the Center (typologies were already used in the 1970s), the aim was not then only to classify the different cases observed; the intention was also to offer a theoretical scope to the categories obtained from these analyses, which were then compared to industry or company "models."²⁵

If typologies appear to be adapted to the "conventionalist" program, existing statistical surveys could not offer the same level of granularity as observations conducted directly at the workplace. Due to the relative paucity of variables belonging to these data, they could not take into account those areas where reality resulted from a negotiation or was only partially visible (manpower management in companies, recruitment processes in the labor market for instance). It even did not always seem relevant to try to measure phenomena, like recruitment practices, where the target population was not known.²⁶ In addition, the publication of a figure that could be immediately taken and used in the public debate (one such example being the number of job vacancies) might be more of a hindrance than a help when attempting to provide shared knowledge on economy and society. Thus, these were the key notions of the representative survey and the quantifiable indicator had become less relevant. In order to understand and classify the vast array of different labor market intermediation or company models, François Eymard-Duvernay defended the need to open the "black boxes," namely, public statistical surveys. He went on to denounce what he qualified as the artificial "totalization" of companies, which provided an aggregate, illusory, yet at the same time, a key to economic statistics.

During a workshop organized in January 1994 by the DARES on the theme of "using statistical methods for research on labor," François Eymard-Duvernay mentioned the model of an "*enquête négociée*" ("negotiated survey") where the person interviewed is no longer just an instrument used for extracting infor-

²⁵ Other theoretical analytical frameworks were used at the Center in a typological perspective such as in the work of Bruno Courault on productive specialization in the 1980s and 1990s.

²⁶ Should only successful recruitments be considered? In terms of job advertisements, what should be the reference population?

mation. Instead, his or her own knowledge is restored and taken into consideration in the survey. He expressed the wish that “these deviant procedures contrasting with the canons of ‘scientific’ statistics should not be restrictive, they are an essential part of the survey protocol.”²⁷ During the discussions, Serge Volkoff, who would join the CEE some years later and who worked on linking statistics and ergonomics in order to study the relation between health and work, finally supported this position. For health and safety, as well as for manpower management in companies, the issue of defining how reality was anticipated and dealt with *prior* to any statistical survey was particularly important.

In practical terms, carrying out conventionalist research at the CEE entails giving clear proof to the Ministry by the use of figures. But it still was the image of an artisan who enjoys working with “unclean” data that was valued there. As it was a hybrid environment, the Center was deemed a suitable place to work on these specific types of survey and better understand the contrast between the specific and the general considered as notions. Furthermore, this opposition between different forms of surveys can be seen as a metaphor depicting the situation of the Center in relation to the INSEE and State statistics. As François Eymard-Duvernay stated during the workshop, this was not a symmetrical situation: “large scale surveys hold a dominant position [...] and we have to firmly adopt a critical point of view with respect to them” (Furjot 1995, 273).

Such criticisms are also partly shared by Michel Gollac in the unit he manages at the CEE. However, although the use of quantitative methods is not systematic, critical view is less perceived as an obstacle to the analysis of statistics survey. It has even been theorized that it should be part of the statistic reasoning process. An associate fellow at Pierre Bourdieu’s laboratory and, having developed a reflexive approach to statistical data, he arrived from the Ministry of Labor to develop quantitative projects and to organize the work of researchers who remained distanced from the conventionalist program. Because micro-computers, memory size, and statistical software were being developed in the 1990s, many researchers were involved in the analysis of the Conditions de travail, which was considered to be a legitimate instrument by the DARES. Issues such as work intensification were covered, followed by information, technology, and organizational changes in companies with the arrival of Nathalie Greenan, illustrating the strengthening of ties with the public statistical system.

The decade following the creation of the DARES was a particularly innovative period in terms of statistical surveys on labor and employment (Gollac and Volkoff 2010). The CEE was a resource for their analysis and thus contributed to the dissemination and understanding of their main results. The originality of the research done in the Center, particularly by Michel Gollac with regard to this data, was due to the specific care taken when interpreting the statistics. He

²⁷ As re-transcribed by Daniel Furjot in his summary of debates (Furjot 1995, 272).

believed that neither criticism of the statistical data nor their analysis should stop. In addition, the data themselves would be used in the process of *déconstruction* of the figures, the intention being to authorize and not prohibit their use. Such a stance was adopted in the interpretation of the surprising results of the 1991 survey on working conditions: the “data” were analyzed by linking changes in statistics with changes in reality, revealing a double objectivation process – of working conditions themselves and of figures produced to sum them up (Gollac 1997).

This position tended to reconcile the expectations of the Ministry for Labor and the main – critical – view existing in the CEE concerning the use of quantitative methods. The divergence of these standpoints was clear when the question “What is a good figure?” was posed during the workshop in 1994. In her opening speech, Mireille Elbaum, deputy at the DARES, described what was expected of statisticians and their responsibility in the social debate. For the administration, a good figure was one that had been carefully calculated, was not questionable and as such constituted proof likely to trigger action: it should be an “*objet réalisé*” (consistent with a “realist” position). Conversely, François Eymard-Duvernay and Nicolas Dodier spoke out against the use of black boxes (which is what surveys amounted to when they were considered as technical objects and not social processes) and did not agree that a good number – “the real number” – was the one that sealed the discussion. Having explored the dissemination of scientific statements based on statistics, they considered that a good figure was above all an “*objet négocié*” (consistent with a “constructivist” position), the product of a social compromise.

This debate on the use of quantitative methods brought up two opposing views relating to the expected roles of State and science. This tension was also present in the research on public policy evaluation conducted at the Center in the 1990s, which focused not on the measurable effect but on the usage of employment policies by different actors, whether it was the beneficiaries or the agents responsible for implementing them. Use of quantitative data was very limited, as such pieces of research mainly relied on field surveys comprising interviews and observations. Even if the early 1990s saw an increasing demand for quantitative expertise within the scope of the Ministry for Labor, the Center chose to take the opposite direction.

The Center broke away from the metrological approach of evaluation²⁸ which consisted of measuring and analyzing the gap between the objectives and the outcome of each separate public policy, an approach which was then defended by the *Conseil scientifique de l'évaluation* (Council for Scientific Evaluation of Public Policy) and used by the Ministry for Employment in its annual report on employment policies. In the introduction to the first issue of the *Cahiers du*

²⁸ This approach was imposed in France with the creation of the *Revenu Minimum d'Insertion* (minimum income benefit) and the Viveret report that followed in 1988.

CEE published after Annie Fouquet's arrival, entitled *Les politiques publiques d'emploi et leurs acteurs*, Bernard Simonin argued that separate evaluations of different policies were certainly necessary but insufficient, because they did not foster comprehension of the global nature of their effects. For this purpose one would have to observe actual practices and meet the field actors to understand the plurality of approaches that they follow (Simonin 1995).

The evaluation framework for employment public policies thus defined was closely linked to the economics of convention program. The various actors involved were not only considered to be like the docile cogs of an administrative machine where the subjects (individuals and companies alike) were obliged to comply with "top down" imposed State legislation. They were seen as beings with access at ground level to a plurality of resources and principles of action. Without being hostile to quantitative methods, the evaluation carried out at the CEE in the 1990s went hand in hand with a critical reflection on the role of the State, which is compared to other forms of public action, more specifically on a local level.

In the closing article of *Les politiques publiques d'emploi et leurs acteurs*, Jean-Baptiste de Foucauld (Commissioner-General of the Plan at the time) and Laurent Thévenot portrayed the State as only one of many actors in a position to define and assess public policy: In a context characterized by an unremitting crisis in terms of employment, social ties and public action, it was considered to be in less of a position to claim the only one. In the language of the "Economics of worth" (Boltanski and Thévenot 1987, 2006), the two authors condemned the predominance of quantitative methods in evaluation, which were related to the "industrial" and to the "fame" orders.²⁹ Instead they plead in favor of an evaluation approach which could, partially at least, be implemented by the local players themselves in a spirit of grassroots democracy far removed from overbearing expert or technocratic visions.

Another direction taken in the Center concerning the evaluation of employment policy highlights the growing distance vis-à-vis the State, not because of increased focus on the local level, but on the contrary by an opening to an international dimension.³⁰ The evaluation contract of the European Structural

²⁹ For instance in 1992, the "900,000 long-term unemployed" operation and the subsequent evaluation relied on a survey of 10,000 unemployed. Here, the fact that statistics were used reflects both the symbolic strength of the quantified target (which would lead the Ministry to organize systematic interviews with unemployed people, resulting in numerous unemployed people being struck off the register) and the argument of authority that a large scale evaluation statistical survey entails.

³⁰ This opening did not only concern employment policy, given that it had already been carried out on family policy (Hantrais and Letablier 1996), without a specific evaluation intention, triggering a shift to the international scene, a trend which continued to gather momentum at the CEE after the year 2000 with both participation in or coordination of several European projects.

Funds, with 10 or so employees working at the CEE under the direction of Jean-Claude Barbier at the end of the 1990s, was symptomatic of this shift in focus. An alliance between some researchers from the Center and the European Commission services was then formed, the objective being to have an independent evaluation of State action. Gradually, evaluation experts took more power, with an increasing autonomy from national administrations, be they budgetary or operational. In parallel, there was a move towards institutionalization of this area, with the creation of the *Société française d'évaluation* (the French Evaluation Society). Jean-Claude Barbier was its first secretary and for some years the society benefited from resources provided by the Center.

In the course of the decade, two very different directions were thus taken by the CEE in the evaluation of public policy. The first was at a local level, the other at European level and the common denominator was the marking of distance from the State and from the quantitative methods it implemented or wished to implement (through its administration). This resulted in increased pressure from the Ministry and, at the end of the decade the recruitment by the Center of some micro-econometricians whose analyses could not be refused by the Ministry. However these “standard” evaluation methods were still then accompanied by a critical viewpoint of micro-econometric methods by other researchers of the Center. More particularly, the poorly controlled importation of models developed by the “hard sciences” was denounced.

This being the case, throughout the 1990s, despite the diverging viewpoints of the Center and its main supervisory ministry, especially concerning the use of statistical methods, DARES’ commitment to establishing a productive link between research and statistical expertise, together with Annie Fouquet’s pacifying influence “in-house” and her negotiating ability outside the Center were accompanied by increased funding, allowing the Center to continue working on a wide range of research projects. External support waned somewhat when Annie Fouquet left to replace Claude Seibel as director of the DARES. Jean-François Germe³¹ was then appointed director of the CEE.³²

5. Transformation of the State and Normalization Process of a Hybrid Area (2004-2015)

The last chapter in this institutional history is marked by the far reaching transformation to the public administration after the 2001 vote in favor of the *Loi organique des lois de finance* (LOLF, the administrative accounting law). This

³¹ Sociologist, professor at the *Conservatoire national des arts et métiers* (CNAM).

³² The Center’s budget was allocated to the *Budget de la recherche et des conventions de développement* for then.

law modified the budgetary procedure in force in France since 1959 by introducing a performance-based dimension and supervision of public administration. For the CEE, this meant that as of mid-2000, they were included in a budget that was part of a program supervised by the Ministry for Labor only. This confirmed a tightening of its control of the CEE's activity. At the same time, Antoine Magnier, who embodied the economics-based direction taken by the administration, was appointed director of the DARES. Several micro-econometric statisticians and/or mainstream economists arrived in his wake. An excellence-focused and performance-driven climate prevailed, with an alliance between neo-liberal trends of both State and science (Pénissat 2009).

A second change was introduced and its effects were felt at the same time as those of the LOLF – namely, the granting of CNRS tenure to CEE employees. This decision, planned more than 10 years previously, did not become effective until 1999. And the tangible consequences were not made effective until mid-2000, when the regular individual assessment of CEE employees by the different *sections* of CNRS was set up. The full integration into a world of research where question of assessment plays an increasingly important role came about when several audits of the Center's situation were performed within the framework of the LOLF.³³ The timing of these different assessment exercises put even more pressure on the Center, with potentially contradictory injunctions: the integration in the CNRS tended to reinforce (individually at least, for members of the CEE) ties with research whereas the budget-driven reform obligatorily entailed intensified steering and control of the activity by the Minister of Labor. It is worth pointing out here that both measures were marked by the increasing use of quantitative indicators, not as a research method nor as a subject for analyses but as a means of assessing research pieces, fellows and centers.

In 2004, Pierre Ralle (INSEE civil servant and macro-economist) was appointed director of the CEE. His “social reformer” profile was not very far removed from that of Annie Fouquet. However, the context was different, as was his style of management. While the 1990s saw a wish to appease the atmosphere reigning within the Center, in the 2000s it was more a question of breaking away from a legacy considered to be cumbersome. In fact, an internal reorganization of the Center was undertaken, with the departure of a significant number of research fellows (employees that had been there the longest – many of them for over 20 years). Conversely, new staff was recruited for fixed term public-sector contracts (University researchers, INSEE civil servants, etc.) and contractors from the private sector were taken on. A new employment model was introduced and employee mobility and short-term projects partially replaced the stability and long-term projects of previous decades. A metaphor was used in

³³ They are the result, in 2005, of lying Ministries inspection services with a view to drawing up a *Contrat de projet et de performance* (project and performance contract, mandatory for public organisms within the LOLF) and of the *Cour des comptes* (Court of Auditors).

the Center comparing research to cycling – if you do not move forward, there is a risk of falling. Funding stabilized before being reduced at the end of the decade, a far cry from the significant increase of funding and resources experienced up to 2003. The director tended to align the Center with public sector reforms and this was not always well received by CEE researchers.³⁴ There was clearly a tightening of control – however the steering by the DARES was not really organized around the Center’s focus areas.³⁵

In terms of scientific directions this period brought about some changes, with the intention of developing different types of public policy evaluation (including macroeconomic simulations, micro-econometric exercises and random controlled experiments), as well as a wider opening towards social welfare themes (labor force participation, pension, caring occupations). The key focus areas that underpinned the activities of the Center did nonetheless remain aligned with those of previous years.

A major change was due to the new dominant position of quantitative methods. If the CEE was still a place where case studies relying on field surveys were carried out, the use of micro-statistics was now widespread. Even more so than in the previous decade, the growth of IT and the increasing accessibility to a great number of large-scale surveys conducted by the public statistical system made it possible for researchers to produce quantitative analyses autonomously. Reflections of a methodological nature continue to exist at the Center – one such example being the possibility of linking research either by combining different methods or designing original quantification measures. However, hardly a trace remains of the most critical positions taken with regard to statistics.

Researchers whose activity was in line with the economics of convention program, such as Géraldine Rieucou or Guillemette de Larquier, adopted for instance a micro-statistical approach to their work at the Center, using data obtained from large surveys, such as the *Labour Force Survey* for the analysis of the different recruitment channels. In addition, such research led to the setting up of new surveys by the public statistical system, such as the *Offer* survey, which focused on recruitment practices. This renewed proximity to public statistics since the 1990s reflected methodological innovations which made it possible to develop surveys with substance, allowing more in-depth analyses. In addition, the assessment of researchers, especially in empirical economics, reinforced the injunction to use statistical methods. The analysis of micro-statistical surveys was thus both an opportunity and a constraint. However

³⁴ The report drawn up by the Ministries inspection services states for instance that the reforms initiated by the new director were going in the right direction, his managerial methods had to a certain extent contributed to destabilizing the organization (page 1 of the summary; CEE archives).

³⁵ See for instance a new report of the lying Ministries inspection services in March 2013 (CEE archives).

these practices were always accompanied by other empirical methods in the socio-economic field derived from the economics of convention, with field case studies carried out to offer possible pointers for interpretation.

In other units of the Center, research and discussions started in the 1990s on the statistical analysis of work organization and working conditions continued. These relied on the wide set of existing surveys on work, with a focus on the job quality issue, and even suggested developments at European level. One such resource is the *Meadow*, a project coordinated by the CEE between 2007 and 2010. The deliverable was a manual presenting guidelines to conduct a linked employer employee survey in order to understand the dynamics of organizational change.³⁶ The inclusion in the Center of a team comprising ergonomists and statisticians to analyze work activity demonstrates the wish to continue reflection on the relation between the quantitative and the qualitative, with, in particular, thoughts of an epistemological nature concerning the construction and use of statistical surveys for health at work (Volkoff 2005). In addition, these analyses were used for practical purposes. The ensuing drawing up of surveys directly involving field actors (doctors, health and safety specialists in companies, employees) as seen from the perspective outlined back in the 1990s: the *Evrest*, which consisted (and still consists in 2015) of a longitudinal database of regular visits by occupational health care professionals, was one of the more original examples.³⁷

Public policy evaluation projects also saw a gradual yet significant arrival of statistic-based work at the Center. The original positioning of the CEE gradually disappeared. Evaluation was conducted using a wide range of approaches and subjects thanks to the arrival of several economists. In the context of the LOLF, there was clearly renewed interest for evaluation in all parts of the administration with, more specifically, reflection on the role of experimentation. So-called American-style experimentation was back to stay (Monnier 1987). In this context, it would be fitting to consider creating public policy that should systematically be experimented *ex ante*, ideally using a random statistical measure and matching methods borrowed from the medical field. The personage of the expert statistician marked the end of the 2000s, together with the notion of average effect and the growth of micro-econometrics.

The CEE followed this trend by launching experiments on discrimination concerning for instance access to employment and the *Revenu de solidarité active* (to replace the RMI). Nevertheless, it continued to offer a wide range of disciplinary approaches and methods that very few research centers could provide: A publication on the RSA (Gomel and Eydoux 2014) comprised for instance critical reflections on the method of random controlled trials at a time

³⁶ <<http://meadow-project.eu>>.

³⁷ <<http://evrest.alamarge.org>>.

when enthusiasm for experimental methods and the belief in a new methodological “one best way” was waning in France.

The end of the last decade at the CEE was marked by the realization of the need to use statistical data but nevertheless supported by a vast array of disciplines and methods. This proliferation of approaches was not without problems because of their possible disqualifications in the academic field where there was permanent assessment of researchers and stronger competition among research units. The scientific normalization underway left only little scope for areas without their own clearly-identified research infrastructures or methodological approaches. The unique position of the Center, which was finally recognized after the writing of the mid-term scientific document in 2014, still did not necessarily imply its external legitimacy.

Thus, there was paradoxically a withdrawal of support for the activity of the CEE at a time when the Center finally seemed to correspond – in terms of the research it produced – to the expectations of a Ministry for Labor wishing to obtain broad-based and in-depth knowledge of its areas of responsibilities and the policies it implemented. In 2010, the unit directors of CEE expressed their opposition to Pierre Ralle’s appointment for a third term of office and this triggered a period of unstable governance, with three different directors since 2010,³⁸ followed by budgetary cuts. Further audits were therefore requested from the supervisory Ministries and a restructuring process was launched for the Center, the outcome of which is uncertain today in 2016 in terms of both the budgetary allocation (Ministry of Labor and/or Ministry of Research) and its scope of action and mission statement.

6. Conclusion

The four chapters in the CEE story trace the changes of its institutional positioning and scientific focus over the years. While statistical tools and methods have not always played a key role in the activities of the Center, it is nonetheless true that they have been used in one form or other in the 45 years spanning the Center’s existence – either for the practice of research or as an actual subject of research.

At the beginning, both the activity and vocation of the Center were in line with the requirements of the Plan and a mathematical statistics approach. However, the Center was faced with a crisis concerning its purpose, employment, and methods. It gradually shifted its focus from research on structures to studies on margins. In the wake of vast interdisciplinary research programs, the CEE’s fortunes changed in the 1980s. It then became a place where theoretical

³⁸ Alberto Lopez (2010-2012), Jean-Louis Dayan (2012-2014), and Christine Daniel (2015).

development – a departure from both its administrative origin and the main trends in economics and sociology. It repositioned official statistics tools within a broader set of worldviews and moved away from the large-scale statistical surveys considered as providing a simplistic and overbearing State vision of society. The following decade would see a consolidation of the diversity of positions at the Center. These ranged from taking a stand against the “evaluating/quantifying” State to seeking statistical approaches combining the reflexivity of the social sciences and the positivist expectations of the Ministries. More recently, far-reaching transformations of public administration and research organisms have been making themselves felt with increased mobility for researchers, cutbacks and the carrying out of research projects mainly based on micro-statistical data. A normalization process, from both the administrative and scientific points of view, of the hybrid environment of the CEE is on its way.

The position taken and the work carried out at the Center show how difficult it is to reconcile two visions of statistics: the *realist* vision required by the administration in order to take action on one hand; the more *constructivist* vision on the other, providing a subject of reflection for the social sciences. The weight of the State’s role in France might explain the original nature of the economics of convention and socio-history of quantification, including critical one. These trends have, without a doubt, benefitted from favorable conditions allowing them to be developed at the CEE, an environment interfacing administration and research and helping to reveal and analyze a plurality of ways of perceiving the world. Prolific as it has been, the institutional position of the Center is no less fragile when faced with normalization processes launched at a time when the left hand of the State joined the right.³⁹

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³⁹ To use Pierre Bourdieu’s expression.

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From Social Coding to Economics of Convention: A Thirty-Year Perspective on the Analysis of Qualification and Quantification Investments

*Laurent Thévenot**

Abstract: »*Von der sozialen Kodierung zur economics of convention: Eine drei-Bigjährige Perspektive auf die Analyse der Investitionen in Qualifizierung und Quantifizierung.* Among the contributions to the presently growing sociology of quantification, a long-standing French tradition has built on an approach to the "politics of statistics" based on the formatting practices of the transformative chain that leads to data. It resulted from statistician-economists who, in the critical spirit of the 1960s, were reflexive and largely open to the social sciences, and cooperated with historians and sociologists. The article offers a 30 years' perspective on the avenue of research that began with the article "*L'économie du codage social*" which goes from labour designation and qualification to ways of making occupation worthy. It leads to the broader notion of "investments in forms" which produce equivalence and economics of coordination. While making available in English large extracts of the original paper, the author adds comments from today perspective on the development of this trend which has fuelled both *On Justification* (co-authored with Luc Boltanski) and convention theory more generally.

Keywords: Conventions, quantification studies, symbolic forms, worth, economics of convention, economic sociology, pragmatic sociology, social categorization, science and technology studies, history of social sciences, sociology of work.

1. Introduction

In *Historical Social Research's* Special Issue on "Conventions and Institutions from a Historical Perspective" edited by Rainer Diaz-Bone and Robert Salais (2011), Alain Desrosières noted that, among the six founders of the line of heterodox economic thinking known as the "economics of convention" (Dupuy et al. 1989), four had a strong background in statistics and had worked together at the *Institut national de la statistique et des études économiques* (the French National Institute of Statistics and Economic Studies, hereafter referred to as

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INSEE) (Desrosières 2011, 64).¹ Another strong link between them was their critical inclination, which was shaped by the political protest that erupted in the aftermath of the Algerian War (which ended in 1962) for the oldest among them and in May 1968 for the youngest. At the time, Marxism was a strong influence, and INSEE civil servants actively followed the various left-wing and radical-left political trends of the time. In addition to this critical stance and the Marxist insistence on practice, Pierre Bourdieu's critical sociology influenced their reflection on the practice of statistics, "planting some of the first seeds for the development of the economics of convention" (Desrosières 2011, 66). A key advance in the history of this development came from the analysis of "forms of equivalence," a preliminary stage in convention theory that was first published in "*L'économie du codage social*" (Thévenot 1983) and to which Desrosières referred in his article (Desrosières 2011, 68).² The translation of large extracts of my 1983 publication makes up the core of this article. The introductory first section is a comment on my 1983 paper, as the beginning of section 3, section 5.2 and the three first paragraphs of section 5.3.

Equivalence means "of equal value" and is therefore the basis of any (e)valuation, a domain meeting with increasing interest today. Thus, this article introduces a plurality of ways of assembling occupations that also makes them valuable. The equivalence form is a preliminary step before evaluation. It brings things or people together "on an equal footing" with each other, this phrase pointing to the practical and even bodily root of the operation of making equivalent. The approach I took to equivalence related the making of these forms to their practical implications. I conceived their costly elaboration as an investment to be taken into account among other fixed assets and considered their benefits for the practical and uncertain coordination of actions as a return on such an investment. This analysis was based on a combination of formerly disconnected disciplinary domains. Research in the economics and sociology of organization and labour combined with research in the sociology of social categorization, equivalence and quantification, thus contributing to the foundation of both "economics of convention" and "pragmatic sociology." Examining this movement more than thirty years later makes it possible to shed further light on it. In this article, I add commentaries on this history to my initial article on social coding – which is translated and abridged here but not rewritten (only the titles have been added) – in order to preserve its status as an archival document.³

¹ Apart from Jean-Pierre Dupuy (who rapidly departed from this line of research) and Olivier Favereau (who has had an enduring influence on it), François Eymard-Duvernay, André Or-léan, Robert Salais and Laurent Thévenot met and worked together between the mid-1970s and the 1980s at INSEE on what eventually became this new orientation in research (Salais and Thévenot 1986).

² For an earlier formulation of the stakes behind classifications, see Thévenot (1979).

³ In a recent article, Thomas Amossé revisited the history of socio-professional classification in France, carefully identifying the "traces of Bourdieusian sociology" as well as the way in

The first commentary concerns the continuity and shifts with regard to the treatment of symbolic forms in Pierre Bourdieu's sociology and by Émile Durkheim before him.⁴ During a conference for an American audience, Bourdieu qualified his analysis of the power of symbolic forms as an extension of two syntheses (Bourdieu 1977). The first associated the "the neo-Kantian tradition" (Humboldt-Cassirer or, the American variant, Sapir-Whorf on language) with "the sociology of symbolic forms," for which Durkheim laid the foundations by treating them as "social forms" (Bourdieu 1977, 405-7). The second synthesis benefitted from the Marxist tradition, which related symbolic productions to the interests of the ruling class and thus to vested interests. It highlighted "the political role as an instrument of imposition or legitimation of domination" constituting "symbolic systems" (Bourdieu 1977, 408). It led Bourdieu to oppose both "the error of interactionism" and "the neo-phenomenological tradition" (Alfred Schütz and Peter Berger) as well as "certain forms of ethnomethodology" that only see forms of communication or a world as self-evident without distinguishing this political role from the "arbitrary (although not known as such) instruments of knowledge and expression (taxonomies) of social reality" (Bourdieu 1977, 409). The movement, of which the source is retraced here, effects a detour in relation to the shorter circuit or short circuit of the Bourdieusian model of the imposition of arbitrary forms. This detour inscribes these forms within the organization and, more specifically, "the regularization of established relationships" at its centre (cf. inf. Conclusion). By characterizing the forms that are "invested" according to their "length and domain of validity," one can explain the "economic articulation" between forms of a similar nature (cf. Conclusion), which subsequently leads to distinguishing between "modes of coordination." This analysis of forms of equivalence in action – or, more specifically, in the uncertain coordination of multiple actions – is the origin of the "pragmatic" epithet applied to this type of sociology and not without some confusion with American pragmatism, which did not initially inspire it. The shift away from Bourdieu's model of the simple imposition of a symbolic form does not, however, imply an abandonment of his critical perspective concerning the powers of domination. On the contrary, differentiating between the forms and the coordinations that these forms equip leads to broadening the analysis of the sources of domination and oppression, without remaining confined to the inequalities of the capitals held, be they diverse kinds (Thévenot 2011b, 2015b, 2015c).

which it served as "a laboratory for pragmatic sociology" (Amossé 2013). See also his article in this HSR Special Issue.

⁴ Indeed, this movement did not begin in relationship to George Simmel, the preminent sociologist of forms. On its confrontation with Simmel's formatting of the human, see Thévenot (2016).

2. From the "Discourse on the Method" to a Framework for Analysing the Conventions and Operations of Qualitative and Quantitative "Formatting"

Statistical "data," as the name – from the Latin *datum*, "something given" – indicates, is currently used as something that is a *given*, something accepted that is able to serve as the basis for reasoning. Recurring debates on the proper classificatory code sometimes have the merit of drawing attention to the prior conditions in which it was produced. Nonetheless, an examination that remains confined to the question of the accuracy of the code risks leading to a denunciation of a specific manipulation without shedding light on the characteristics of the coded object. Whether or not something is made a datum is the result of scientific or political struggles. Yet I would instead like to examine in this article what makes some data *ready for use* in both the arguments formulated by men and women in the sciences or of the state and more anonymous types of treatment, such as computing and the law. The medium for this reflection will be a study of the process of statistical codification of professional identity, begun during the preparatory work for creating the classification of professions and socio-professional categories in 1984 (Desrosières, Goy and Thévenot 1983).

Beyond making the task of data codification and the relationship between practices and rules more explicit, this study shall lead to an overall reflection on both the process of producing the classificatory code and its roles. Indeed, the coded form is not specific to statistics, being encountered in law, of course, as well as in regulatory texts in general, measures, instructions, objectives and so on. Instead of taking them for so many symbolic forms, I would like to consider them from an utterly materialist point of view in order to introduce them into an economic analysis. What purpose do these forms serve? How are they produced? The study presented here is the first step in a more general examination of *standard formatting* operations and their roles.⁵ The description of the modes and roles of the coding of professional identity thus introduces a broader study of the *investment [immobilization, in French, which means capital asset formation] of forms* (laws, rules, instructions and so on) that are not generally taken into account in economic analysis. I adopt the position here of presenting this reflection on social coding by retracing the history of how the object of this study was constituted. The formatting procedures for objects, concepts and the categories that prepare the establishment of relationships between them are at the heart of the questions tackled in this article.

⁵ The initial elements of this research, which was first conducted along with François Eymard-Duvernay, are presented in Eymard-Duvernay and Thévenot (1982, 1983).

The reform of the nomenclature of professions and socio-professional categories that INSEE began in 1978 was defined within the institution as an engineer's task, consisting of developing a new statistical tool to be used in the process of producing data on employment and social situations. In accordance with the engineer's working methods, there was an initial phase consisting of preliminary work on the conception of the new product. Since the early 1970s, an extensive amount of literature on occupational classification and destined to clarify the principles that were supposed to guide the establishment of the proper system of classification had been produced. In the light of a study on the analysis of occupational qualifications and classifications (*L'analyse des qualifications et les classifications d'emploi*) published in 1973 and based on the contributions of experts from a diverse range of French institutions involved in the classifying of occupations (INSEE, the *Ministère du Travail*, the *Centre d'Étude et de Recherche sur les Qualifications* and the *Centre d'Études de l'Emploi*), a definition of the taxonomist's task emerged that can be defined as follows: the taxonomist must *choose pertinent criteria* allowing *occupations* to be assembled into *homogenous* and *exclusive* categories. Even more than determining the proper criterion, it seems to me that the overall definition of the taxonomist's task posed a problem as it emerged in this *compendium* of rules on the taxonomical method. While the definition did indeed conform to the canonical presentation of classifications when taking into account the nature of the objects to be classified, each of the terms of this definition raised questions that had not been treated much in the quoted texts.

- Was the classifier in a position to choose the *definition* of the categories?
- Could these categories be *homogenous* and *exclusive* and be based on divisions according to *criteria* that the classifier deemed *pertinent*?
- What are the *objects classified* by the taxonomist and what is the *universe* that he or she intends to relate?

3. Making the Conventions of Qualification and Quantification Visible Using the History of Tools and the Sociology of Practices

Beyond the initial mention of the reflexive and critical effects of a historical approach, this section shows the connections that the research programme presented here established between three types of questions:

- 1) *Political and critical*: Animated by a critical inclination stemming from the political context of the time and the Marxist tradition, the researcher's survey shifted to the practices – disregarded or disqualified by engineers – of the lowest-placed personnel with regard to the division of labour and the (statistical) hierarchy of the production line. It uncovered skills and talents

that were previously unknown and which were distinct from the instructions and orders given by the equivalent of the bureau of methods.

- 2) *Methodological and epistemological*: By its objects and (ethnographically inspired) approach, the survey figured among the current types of opposition between the qualitative and the quantitative, or between statistics and monograph. Yet these oppositions systematically disqualified the second pole asymmetrically presented as “smaller” than the first. Strengthened by our contact with sociologists, we (notably Alain Desrosières, François Eymard-Duvernay, Robert Salais and myself) intended to raise this second pole to the same level as the first, drawing on knowledge in distinct disciplines.
- 3) *Analytical*: Beyond this methodological and disciplinary openness, I progressively sought to distinguish forms – or formats – of knowledge that led to different appreciations and which referred to diverse relationships to the world and others. Such a difference is sketched out in this section, using the vis-à-vis between an industrial model of statistical production and a familiar and customary model of knowledge and usage shared in the workshops. This type of difference is also present in the following section, “From formatting to appreciating: Three ways of increasing occupation.” In the founding model for a pragmatic sociology of critique that I elaborated with Luc Boltanski (Boltanski and Thévenot 1987, 1991, 2006, 2007), these differences were related to economies of industrial and domestic “worth.” The analysis of these valued relationships to the world was clarified and refined in the next stage of a sociology of engagement (Thévenot 2006). Undertaking surveys of firms, Eymard-Duvernay has brought to light the plurality of “quality conventions” (Eymard-Duvernay 1989). After a survey of the categorization of the unemployed, placed in perspective historically and comparatively (Salais, Baveze and Reynaud 1986), Robert Salais and Michael Storper developed a pluralistic approach to distinct “worlds of production” (Salais and Storper 1992; Storper and Salais 1997).

The first studies to respond to the questions expressed at the end of the previous section were undertaken in the spirit of preliminary reflections on the reform of the classification of activities and products published by Bernard Guibert, Jean Laganier and Michel Volle (1971).⁶ Sketching out a chronology of industrial classifications since the eighteenth century was a method for questioning the idea of a classifier choosing the proper definitions for relating the social world. This historical perspective was utterly foreign to the statistician’s state of mind, which was quicker to “invent” rather than archive, and it was interesting because it denaturalized classifications. Initial work on the classification of socio-professional categories was conducted from this point of view

⁶ Michel Volle has since pursued the work on classification that began with this article (Volle 1982).

(Desrosières 1977). Brought to light were the connection between the “invention” of statistical categories of “*cadres*”⁷ and “skilled workers” as well as the first collective agreements and labour regulations that began codifying the various categories of classification between 1936 and 1939 and which were extended and solidly established by the Parodi decrees in 1945. By showing that statistical classifications were historically marked representations of the social space, these historical studies suggested that such classifications could not be constructed from scratch. They called into question the earlier representation of the taxonomist choosing the pertinent criteria for the definition of occupations, a representation that constituted a theoretical definition of the taxonomist’s task. The question of the forms reused in the task of classifying became central, and it seemed to me that the theoretical discourse had to be confronted with the practical conditions of the implementation of these classifications.

The fact that the reform of the classifications of professions and socio-professional categories was done at INSEE in a unit dedicated to both production *and* data analysis – and not in a unit that was autonomised at the time in order to specialize in classifications in general – undoubtedly influenced the choices surrounding this method. It would not have been possible to maintain the connection between the statistical study of professions – that of the persons surveyed and that of their classification – or to construct a theoretical framework integrating all of these questions, if the division of statistical work had been even more advanced in the central services of the directorate-general of INSEE. But the principal division that is effective separates this directorate-general from the regional establishments or the near-entirety of the work to produce data is realized in what, within INSEE, are called “workshops” for data-entry and coding. The strongest concentration of identical work stations are found there, and the work is organized so that it follows the rules of industrial production. Data collection is carried out by investigators who interview surveyed individuals, and the questionnaires carefully filled out by them are “coded” by “coders” and then keyboarded. These workshops are headed by supervisors who are themselves overseen by a production manager. At the directorate-general, a survey manager supervises the entire operation. The scale of professional statuses closely mirrors this flowchart.

The indigenous terms (these activities being referred to as *aller au charbon* – literally: “to go down the pit” –, according to the in-house jargon) show that the reference model during the phase when the classification is used is the industrial production process and not the principles of the taxonomic method as

⁷ Cadre is difficult to translate into English, since, in addition to “manager” or “executive,” it can also refer to a company’s professional staff. For further discussion of the term, see Arthur Goldhammer’s translation of Luc Boltanski’s “Les cadres. La formation d’un groupe social” (Boltanski 1982) into English “The making of a class: cadres in French society” (Boltanski 1987). Goldhammer chooses not to provide a direct translation of cadre.

I have just explained. Nonetheless, both models of the activity of classifying are aligned on more than one point, the *definition* of these rubrics by distinctive criteria being perfectly adequate for the *formulation* of instructions ready to be executed. More generally, the technical definition of the different tasks implied in the process are observed to be tightly grouped, just like the habitus of the agents engaged in them (Bourdieu 1979). Thus, the formal rigour of the taxonomist, who is a formalizer by training, is closely articulated with the requirements of rigorous formulation adopted by administrative forms following the model of the law as well as with that of the computer programmer's formatting and the coder's formalism. The result of this adequacy, which (as is often forgotten) is a condition for the success of the division of labour, is that a very weak share of difficulties in applying the instructions are actually made explicit and, climbing back up the hierarchical levels, are liable to end up modifying this rule. Systematic measurements of the differences in coding, however, show that one in five cases cannot be coded with certainty by strictly applying the instructions.

The statistician who makes the effort to go out in the field, such as the production engineer, observes the failure of instructions and the resistance of the subject being treated. He or she knows that the production process does not quite conform to the coherent set of rules. In the workshops where the studies are coded, he or she can observe the use of handwritten lists circulated among the coders, a *customary* of sorts established at the workshop-level and destined to treat cases that are not foreseen in the instructions in a similar way, in addition to constituting a kind of flexible and local extension of the instructions. Even more informal but no less habitual are the verbal exchanges regarding difficult cases between the coders in the same workshop. Furthermore, these habits can only take shape due to the many years the coders have been in the same workshop, their familiarity with how the classifications are used and their close acquaintance with one another.

It is part of the statistician's task to evaluate the reliability of the data he or she produces and to elaborate verification procedures. Thus, by having a selection of questionnaires coded once more, this time independently, he or she can calculate the rate of error. The "errors in measurement" related to the collection or coding of data are therefore classically distinguished in the statistical manuals from the "random errors" resulting from the survey itself. Unlike the latter errors, errors in measurement are nonetheless not interpreted within a theoretical framework similar to the statistical theory of surveys.

On the other hand, information on the limits of the instructions circulate in the form of anecdotes relaying particularly amusing or difficult cases involving coding. It seemed to me that elements for advancing another model could be found using the unsuccessful examples of the model for the task. Research intended for a new system of classification has made it possible to develop a more systematic analysis than the transmission of anecdotes or the production of the average ratio of measurement errors. It explored two types of objects that

seemed to me regrettably neglected or reduced in the theories on classification: the *raw material* on which the coders worked – in other words, the declarations made by those surveyed about their professional situation – and the *actual practices* whereby the coders had the habit of treating problematic cases when the instructions were insufficient.

4. New Perspectives on Social Identification Based on the Declared Occupation: A Job under what Title?⁸

It was thus difficult to fabricate an operational system of classification without familiarizing oneself with how this tool was actually used. Such a test of reality forced one to acknowledge that the raw material for classifying was made up of responses to the questionnaires (responses not only to closed questions, but also to open questions when it came to declaring job titles) and not “real” occupations. Unfortunately, when this condition of the classification work was not repressed in favour of a more noble definition of the “occupation” or the “occupational situation,” it usually led to criticism involving the distortion of reality that resulted from mediation by the professional designations that were mentioned (d’Iribarne 1973; Vincent 1973). In the 1970s, debates surrounding the concept of qualification resulted in the emergence of this position with regard to ways of registering the professional situation, which were considered as so many perverted forms preventing access to the reality of occupations. In contrast, I made it a priority to carry out research on these designations and, more generally, on the recording or registration of the professional situation in the “statistical chain.” This last notion indicates a view on data formation that sees its process as a production line, or assembly line (in the spirit of workplace studies) while specifically focusing on the changes and transformations of the format of information that this chain is made of.⁹

During the first stage of registration in the questionnaires, the most apparent causes of uncertainty were those that led to difficulties in the following stage (the “coding,” meaning classifying in the coded rubric). Vague or apparently contradictory responses constituted a source of difficulty. The frequency of unsatisfactory responses, which can be reduced by the investigator’s presence, is often only related to the formulation of the question, its logical coherency or

⁸ In the 1983 text on social coding that serves as the basis for this article, this section as well as the two that follow are taken from internal publications at INSEE dating back to 1981 (Thévenot 1981b, 1981c).

⁹ The term statistical “registration” is here preferred to that of the “observation,” “gathering” or “collection” of data because, borrowed from law, it brings out the characteristics of this operation – meaning the cost of this registration and its effects, or the report within an authoritative state.

the goodwill of the person surveyed. Due to the large number of these difficulties, a study has been conducted concerning the question about “familial assistants” (Huet 1981). The question involving the 1975 census returns, which was destined to construct the category of *familial assistant*, was the following: “Do you work, without being a salaried worker, by helping another person in his or her profession (for example, a member of your family)?” The activity of female farmers is an extreme case of non-“professionalized” work, which was particularly difficult for the statistician – who was supposed to track the limits of a given category in a hazy and shifting zone – to enter in the database, since the logical disconnections it imposes (“familial assistant” should be opposed to both “farmer” and “salaried farm workers”) did not conform to the practice of the women surveyed. A return visit to these women showed that their responses depended not so much on the duration of the work on the farm (a variable that, in theory, constituted the best divisional criteria for the statistician) as on the type of farm and the configuration of the household. In the field of market gardening, women can perform the same tasks as their husband, and the statement “We share all the tasks” is frequently made. Women readily refer to themselves as “*farmers*” like their husbands. On small-scale polyculture farms, however, women execute both specific tasks (caring for animals and milking) and “stopgap” activities whereby they “lend a helping hand” but which are less valued than those performed by their husbands. They feel less than others that they are practicing a *profession* that, furthermore, their husbands only rarely acknowledge, even when they are very active on the farm and have had professional training (Huet 1981). The increase in the number of *farmers* and the reduction of *familial assistants* thus expresses less an increase in the amount of time devoted to agricultural work than it conveys the transformation of the wife’s status on the farm. In an elderly couple of market gardeners, the husband – who filled out the whole family’s census return – did not indicate a profession for his wife, who, when questioned about this, protested by declaring that she worked more than her husband (Huet 1981). Based on this example, one clearly sees the repercussions on the response of the identity of the person being questioned and especially his or her position in relation to the categories implemented, in which he or she is most often interested within his or her family or workplace. An ambiguous response can indicate how these systems of identification hesitate or contradict each other during a period of great change. In this case, the response was the result of the progressive substitution of a familial structure (two spouses working on the farm and both professing themselves farmers) by another (a head of the farm and family along with his wife, simultaneously “mother of the family” and “familial assistant”).

The absence of responses or the form of the general responses conveys the survey’s attitude towards questioning (Tabard 1975). It is well known that the INSEE questionnaires are often perceived as requests for information emanating from the administration. They are therefore attributed a legal value that

they do not actually have, and the responses are modelled on those given to other administrations, which borrow from statutory categories.¹⁰ The responses are also the result of the general attitude towards the questionnaire, which varies considerably according to the social background of those being surveyed. In the absence of a systematic study on this topic, my observations call into question the superficial opposition among those being surveyed between the careless ones and the conscientious ones and brings out the influence of a household's social configuration on the way of responding. Thus, in a household in which the husband was employed (at a supervisory level) by the Ministère de la Marine (Ministry of the Navy) and whose diploma of general education was – like his wife's – only a *certificat d'études primaires* (certificate of primary education), the woman (who was raising five children) expressed much goodwill by responding to the questions of the investigator who came to question her further. However, she was unable to specify the professional situation of her husband, who only mentioned the vague title “administrative agent” for the question about profession. She simply indicated that he took care of selling Breguet planes the year before. In a household composed of *cadres*, the woman, an assistant director at a classical music radio station, filled out all the questionnaires for the household in great detail and provided an excessive amount of information for a number of responses. She complacently explained that she had a great deal of trouble classifying herself in the survey grids, which “never fit her particular situation.” Thus, holding a “*brevet de technicien des métiers de la musique*” (technician's certificate in musical careers) exactly corresponding to a *baccalauréat de technicien* (technician's *baccalauréat*) or a *brevet de technicien* (technician's certificate) for the question about diplomas, she deemed it necessary to add the complete title to the question *other diplomas* because this diploma seemed to her “something slightly separate.” As for the man with whom she was living, whose occupation as a sound technician was of a lower status than hers, he elaborated a radically different point of view. He said that the questionnaires are made so that everyone can find their place in them and that one must adapt oneself to the proposed grids without modifying them – in other words, no one is unclassifiable. One can distinguish the completely diverging consequences to which these different attitudes to the questionnaire can lead in the coding phase that follows. In the first case (the administrative agent), the uncertainty will be great, the choice of the coder or the automatic rectifications operated will have a huge influence on the result. In the second case (the female assistant director), there is a wealth of information, but it somehow falls outside the questionnaire; only a qualified coder and manual procedures can make it possible to mobilize this information. In the third case (the sound technician), the person surveyed operated his own rectifications

¹⁰ This mode of questioning has an even more noticeable effect when it is completely administrative. On the effects of the administrative questioning of individuals, see Merllié (1982).

and provided the statistician with raw material that conforms to expectations, without it being possible to assert whether it is of good quality (the statistical categories could have been misunderstood).

These few observations show that, when the declarations concerning a person's professional situation leave the statistician unsatisfied because they are lacunary or contradictory, they are not simply the result of how the question was formulated or the psychology of the person being surveyed. In order to interpret them, it is necessary to examine the relationship between the statistical categories and the legal categories or practices by which the individual is identified.

5. From Formatting to Appreciating: Three Ways of Making Occupation Worthy

Within the framework of the reform of the classifications, it seemed useful to systematically study the declarations of profession, their instability from one source to the next (the “fuzziness of declaration”) for a given individual and the specific effect of the coders' interpretation (the “fuzziness of coding”), all using a large number of samples. The rubrics for which the designations are the least unstable (rate inferior or equal to 10%, when the average is 34%) are the following: artist (painter/sculptor) (0%), craftsman (0%), notary (0%), notary's clerk (7%), midwife (0%), physiotherapist (10%), social worker (10%), fisherman (0%) and commercial sailor (10%). Behind the composite appearance of this enumeration, it is possible to grasp what makes the name of a trade solid. One will seek to link this more or less great solidification to the differences in the relationship maintained by the person who practices it in this name, differences that clearly appear when one sketches the semantic field of the terms in use to designate the occupation (see Figure 1).

The first two activities are practiced like *arts* and the next two like *offices* or a *charge*.¹¹ These are two extreme cases of the fixity of the job title and its absolute fixing to the person who holds this title by way of *talent*, *purchase* or by *appointment*, terms designating an operation that seems to have led to this practically unchanging attachment (see the upper part of Figure 1). It is well known that the term “art” does not only designate the artist's activity, but also that of the doctor or the lawyer when one wants to indicate a “natural” ability that – if it can be highlighted thanks to an occupation – pertains to a “talent” or “gift” (that one “maintains” and does not “acquire” like an office or “learns” like a trade). The name of the trade merges with the proper name of the man or woman of art, who has managed to “make a name for himself or herself” (his or her signature, in the case of an artist). Office and ministry characterize situa-

¹¹ According to Old Regime traditions, notarial offices are sold and purchased.

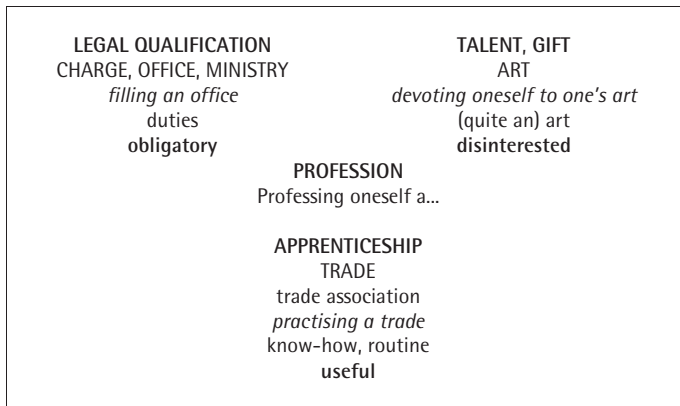
tions in which the adherence of the person holding the title to his or her occupation is sanctioned by a legal act of acquiring the office or being appointed in a ministry. This adherence is as strong as in the precedent case, although it is not the art that merges with the man or woman of art in his or her signature but the officer who merges with his or her office – as manifested by the annexation of the name of the occupation to the name of the person who holds the title (Lieutenant T or Doctor Z). This legal state is quite favourable for reliable statistical registration and, by consolidating the name of the occupation it implies, explains the low variation in the titles declared.¹²

An intermediary place in this figure can be assigned to the *profession*. If one considers the medical professions, which are often made into models of their kind, one simultaneously observes a reference to the *state*, the *art* and the *trade*. The reference to the *state* is made by the rather strict regulation of access to the profession and the qualifying properties (academic title), of which the procedures for monitoring this are delegated to the educational system. The reference to *art* occurs through frequent allusions to talent and personal intuition in the clinical sense of the practitioner and which cannot be reduced to a university science. Finally, the reference to a *trade* is made because professional experience is readily emphasized along with study under those who have mastered the discipline. As for the specificity of the *profession*, it should undoubtedly be sought in the “autolegitimation” by peers and in the mechanisms associated with it, hence within the range of classifying systems that doctors have at their disposal for situating themselves (diploma, academic degree, hierarchical role and specialty) and from which originate the variable but precise responses. The last two activities mentioned because their designations are particularly stable – fisherman and commercial sailor – obviously do not pertain to the two types sketched out beforehand (*office* and *art*). They are *trades*, and the reference to this term indicates a whole series of oppositions to the precedent activities (cf. Figure 1). A *trade* is the result neither of a supposed talent nor a legally recognized quality – or state – but of an apprenticeship. This manual and imitative apprenticeship under people of the same trade is traditionally what makes a trade legitimate (neither legal nor remarkable) and lends stability to the name. The fisherman’s trade, which is most frequently accessed through learning on the job, therefore has a stable name. More generally, the oldest trades of manual workers or craftsmen, which are practiced in tradi-

¹² In civil law, the state is constituted by all of the inherent human properties to which the law attaches legal effects (properties that, in legal terms, qualify it). In the same way, the qualification of manual workers, as it was defined in the collective agreements and remunerated with a salary, characterizes the only properties of a worker that are acknowledged as useful in the production process, even if other capacities can in fact be implemented. It is understandable that these qualified properties are the best suited for statistical data entry because they are at once monitored, homogenous (by way of the law) and known by the people being surveyed (because associated with economic sanctions).

tional sectors with production processes that have remained unchanged, have kept the same names: hairdressing (rate of instability: 16%), leatherworking (12-23%), food supply and building work (14-26%). Among the manual workers in food supply, there is a particularly marked contrast between the traditional qualified trades with strict designations (a less than 25% variation) – bakers-pastry chefs, butchers, cooks and kitchen assistants – and more recent industrial professions, the titles of which fluctuate much more, such as specialized dairy workers (42%) and manual workers in breweries and canneries (47%).

Figure 1: State, Art and Trade: Three Ways of Making One's Occupation Worthy



More generally, the occupations of which the denominations fluctuate the most (rate of instability higher than 60%) are the occupations of manual workers in sectors transforming raw materials (the steel industry and the transformation of raw metals, wood, glass and plastics), in which the production processes have profoundly changed. This has resulted in a drop in the individual and manual intervention of the worker and the definition of a trade being challenged due to the transference of a large part of the intervention to automated equipment. Continuous production processes in particular hinder any clear delineation of the attributions and the formation of a trade name but are more often defined by the phase of the process during which the worker intervenes (“supervisor of machines blending chemical products,” “employee for blending chemical products”).¹³ The head of personnel in an establishment transforming plastics in the region of Nantes explained to me that, in his view, there is no longer any reason to refer to occupational designations in the classifications. Only two notions were important to him in the management of his workforce: the hierar-

¹³ For concordant observations on the absence of a trade name among the specialized workers in large-scale industry in the region of Amiens, see Desrosières and Gollac (1982).

chical coefficient and the “injection” or “extrusion” workshop, where the employed individual was working.

5.1 The Management of Trade Names in Companies

The original article included a section on the challenge presented by professional designations and classifications in workforce management in companies. It is not translated here because it was partly included and therefore already published in English in an article that appeared the following year on “Investment in forms” (Thévenot 1984). In it, a director of human resources declassified a grid of occupations that conformed to that of the collective agreement in order to establish a new one that he had created himself. He abolished the link between the coefficients of salaries and a type of professional identity represented by trade names, of which the definition largely escaped him since it went beyond the scope of his company. He instituted a new mode of identification in terms of occupations entirely determined by his company, his workshops and his machines. By acting in this way, he contributed to reinforcing his position in relation to that of his competitors within the same field of activity – particularly in relation to the oldest artisanal pole, which he deemed archaic.

5.2 Political, Administrative and Legal Representations of Occupations

This section covers another aspect of the politics of forms and their investments. It deals with the direct intervention of professionals in socio-professional classification, showing the challenges that this classification constitutes. The comments and analysis are the result of my observations within the discussion group for the classification project with healthcare professionals, of which I was a member. Longer elaborations on this have subsequently been published in a chapter I wrote for the book on this classification (Desrosières and Thévenot 1988).

In Thomas Amossé’s article (“Revisiting the History of Socio-Professional Classification in France”), which I have already mentioned, he continued to follow the changes in this classification in relation to employers’ actions (Amossé 2013). They involve a group of employers who, during the second half of the 1990s, sought to overturn the Parodi categories and therefore the social boundaries that had existed since the end of the World War II. This is perfectly illustrated by the conclusions reached at a meeting held at INSEE on 24 February 2, 1999, with two representatives of the *Union des industries et des métiers de la métallurgie* (Union of Metalworking Industries and Trades, hereafter referred to as “UIMM”) who suggested that the concept of cadres was “less and less adapted to the reality of the sectors of activity covered by the UIMM,” recalling that “many have no managerial role,” “the boundary with

technicians [being] therefore not clear” (Amossé 2013, translation in the online English version of the *Annales*).

The section introduces a type of analysis subsequently developed in a “politics of statistics” that is understood not only as the direct intervention of actors according to their social and political affiliations, but through an analysis going back to the constitutive forms of social and political representation (Thévenot 1990). In history and in the sociology of sciences and techniques, a number of explanatory elements are called social, including social factors, social context, social conditions, social interest, social dispositions and so on. Using them as an outside fulcrum for revealing something poses a problem when the object being studied participates in the very construction of what is designated as social and political. In order to avoid this kind of circularity, it is necessary to elaborate a framework of analysis for such constructions, which are used to measure and questions politics (Thévenot 2011c).

In the preparatory work for the new classification, I had the chance to meet other types of people making professional identities, whose activity interfered with statistical registration. I was able to study in vivo the diverse interventions of professional groups seeking to modify the registration of their profession in the statistical classification.¹⁴ The “classification struggles” (Bourdieu and Boltanski 1975) appeared with explicit clarity within dialogue groups formed for the occasion, in which conflicting definitions between professional groups were played out through the intermediary of their representatives. These interventions were not exerted through influence or manipulation, but by resorting to the most objectivized resources in the definition of professions and by the argument on the shifting of the frontiers between them. The regulatory texts, academic titles, instituted training, representative bodies, ethical codes and the names constituted in other classifications were so many established forms capable of being articulated along with the registration in the classification, the choice of criterion and the formulation of a definition of a rubric or its title. The representatives of the professions in turn expected a consolidation of these forms. The faint “fuzziness of coding” of the healthcare professions, which I have already mentioned, attests to the relatively strict articulation between statistical coding and social coding to which professional representatives apply themselves. However, as the statistical categories do not have the strictness of the law, there remains some room for manoeuvre in the precedent articulation that characterizes the places where the “social structure works” (Thévenot 1975), meaning where professional groups work to modify their identity when the evolution of their occupations lends itself to it. Because statistical classification cannot affect distinctions below a certain quantitative threshold, it assumes aggregations that can authorise this room for manoeuvre. Thus, the

¹⁴ For some examples of these interventions, see Desrosieres, Goy and Thévenot (1983).

proposition to group together the paramedical professions of rehabilitation and therefore bring together physiotherapists (regulated profession) with psychomotility specialists (*psychorééducateurs*: unregulated profession) has met with the resistance of the former profession's representatives. The sole fact of being classified among the healthcare professions is a factor that can make it possible to gradually accede to more "instituted" forms. While, in an initial classification project, ambulance drivers had been classified along with other drivers of light vehicles because their activity was not very medical and furthermore frequently mixed (taxi-ambulance), the representative of the *Centre national de formation des personnels sanitaires des transports* (National Training Centre for Healthcare Transportation Personnel) advanced the fact that half the companies were "approved" and practiced "only one profession" and, on the other hand, this profession "was part of a *chain of care*." According to him, the existence of a healthcare diploma for ambulance drivers justified classifying them with auxiliary nurses. This proposition was fought by other professional representatives who in turn advanced the *duration* of the *training*, which only lasted three months for the drivers and 10.5 months for the auxiliary nurses.

I have favoured the term "registration" in order to stress that the collection of data – regardless of the justifications advanced – had by its very form been linked to the administrative and the legal, meaning with accountable, regulatory and legal forms. Work on the history of writing shows that these forms were originally indissociable from the first written texts of the third millennium BCE, having been accounts used for registering the Mesopotamian state's transactions (Goody 1979). These administrative lists were at once the first texts, the first classifications and the first statistics. In 1911, the first acts of sorting according to the variable profession were envisaged for registering legal acts – such as civil status, licences, bankruptcy, convictions and so on – according to the profession (Desrosières 1983). The need to extend and homogenize the professional grids established in large companies and bureaucratic organizations created by the extension of collective agreements in the 1930s laid the groundwork for post-war statistical classifications. Within this particular context, the category of "*cadre*" was invented (Boltanski 1982). Unlike the professional representatives who only had to take into account the limited space of a competing field of professions, the classifiers have to represent a national space in their classifications in a formally homogenous manner. Their work is therefore closely related to the modalities of political, administrative and legal representation of the social world. The 1947 "*Nomenclature des activités individuelles*" (Classification of Individual Activities) and its reworked editions up until the 1975 "*Code des Métiers*" (Classificatory Code of Trades) were strongly marked by corporatist representation by professional groups. Along with the creation of a *Commissariat au Plan* (Planning Commission) after the Liberation, other modes and instruments for representing and managing social relationships were put in place. In the early 1960s, the discourse on the shortage of manpower, elab-

orated during the period of post-war reconstruction, began to be put into the forms of state planning action, meaning the relationships between the objectives of public organisms and those of the social partners that were represented. The success of the concept of qualification was largely due to the fact that it was a good form for serving as an operator in these relationships between the need for qualified manpower advanced by the representatives of employers, the demands of the unions for salaried workers calling for standardized recognition of salaried workers' aptitudes in the conventional grids and the objectives to develop and promote training under national education. Professional groups were not represented in these places, and qualification – rather than trade – was a category on which the members of the commissions agreed, conflicts regarding its measurement being circumvented. Classifications that were more adapted than the “*Code des Métiers*” for evaluating qualification were thus put in place, among them the “*Nomenclature des emplois*” (Classification of Occupations), which was intended for surveys on companies. The “economy's recruitment needs” therefore justified a new classification by level of training. All of the classifications, including that of socio-professional categories, were replaced by a single *nomenclature des professions et catégories socioprofessionnelles* (or “PCS,” classification of professions and socio-professional categories – see Desrosières and Thévenot 1979; Desrosières, Goy and Thévenot 1983).

6. Conclusion: Towards an Analysis of Investments in Form

While the task of the person making the classification, as presented by experts in the matter, appeared rigorously determined by some logical principles – and limited in the pertinent choice of classifying criteria – and the user's task hardly showed through the shadow of the instrument, the study of their actual activities has strongly challenged the formal definition of these tasks. By studying this production process, I observed the oft-noted gap between the instructions of the bureau of methods and the diverse operations that were really performed to do the work (Linhart 1978). This “room for manoeuvre” between the two allows salaried workers to develop habits that do not conform to the instructions. Nonetheless, it seems that by opposing rules and practices, instead of being interested in the economy of their transformation, one tends to reduce the degree of formalization and therefore the standardization of these practices to nothing. The forms of the practices that do not conform to the rules are themselves more or less strongly established, as it has been noted in the case of the written customary or the “personal instructions book” (Pinsky, Kandaroun and Lantin 1979). In the case of individual interpretations of ambiguous cases, it has been shown that the typical images of the rubrics used for assimilations were themselves formed in a relatively uniform manner by the representation work of social groups (Boltanski 1982; Desrosières, Goy and Thévenot 1983).

The precedent observations suggest another approach of the opposition between the abstraction of models of economic theory and the diversity of observations that sociology collects on individuals, or between the strictness of the prescription of tasks and the variety of the conditions in which they are exercised. The study of the production of social coding has indeed brought to light a multitude of intermediary forms between the regulated and the unformed; it has brought out the work that is necessary for establishing a code and indicated the benefits that could result from it. This study therefore encourages the consideration of these forms on the same level as so many possible accounts that can be characterized by the *cost of establishing them* and their *rigidness* or *inflexibility*, meaning their capacity to economically reproduce a situation and to have effects without human intervention. Within the context of a company, I have sought to confront the modalities whereby these different forms were constituted, the relationships they authorize and their usefulness: routine contact with a clientele, trademark, manufacturing norms, occupational classification, company agreement regarding timetables, orders regarding the duration of labour and so on (Eymard-Duvernay and Thévenot 1986 [1982]). Some of these *immobilizations of forms* are acquired not by a costly and instantaneous operation of establishment, but by the repetition over time, as in the case of a clientele. So they do not have the more constituted form allowing for equivalence on a market. This outline therefore makes it possible to re-examine neo-classical concepts of “specific capital” and “barrier to entry” (Eymard-Duvernay 1983). I have thus advanced a conceptualization of investment that, within the same model, takes into account the roles of the tool and the rules as well as their articulation (Eymard-Duvernay and Thévenot 1983).¹⁵

Investing is establishing, by way of a particular expenditure at a given moment or the cumulated effect over time of habit, the determined validity of a form over the duration and a domain of validity. All these detours in production ultimately make possible the economies that result, on the one hand, from part of the regulation of established relations and, on the other, thanks to the production of equivalence making the produced forms compatible with those of other relations.

¹⁵ Unlike the text that was primarily written by Eymard-Duvernay (1983) and which I have already mentioned, this one was written by Thévenot and published the next year in an English version (Thévenot 1984), followed by a longer version in French (Thévenot 1986b).

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Quantification and Objectivity. From Statistical Conventions to Social Conventions

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Abstract: »Quantifizierung und Objektivität. Von statistischen Konventionen zu sozialen Konventionen«. Standard quantification processes and most often their analysis are derived from statistics' technique and approach. Social conventions are at the core of daily life, practical knowledge and coordination between people; statistical conventions are at the heart of cognitive activities developed by statisticians. What does quantification mean when addressed from the wider point of view of social conventions? This article analyzes the differences between social and statistical conventions. It enlarges the concept of objectivity in having recourse to the lenses of the plurality of worlds as defined by the economics of convention (EC), and to the concept of the informational basis of judgement in justice introduced by Amartya Sen. A wider conception of quantification processes in the social world can thus be elaborated, which opens fresh views on what become, in these processes, the concepts of facts and democracy.

Keywords: Quantification, conventions, statistics, worlds, plurality, informational basis, judgment in justice, facts, democracy.

1. Introduction

In his article in *Historical Social Research* 37 (1), Alain Desrosières (2011) has shown how deeply the economics of convention (in short EC) is historically rooted in research on the history of statistical conventions and categories. Are statistical conventions of measurement nonetheless of the same nature as the social conventions people have recourse to coordinate in daily situations of life and work? Or do they delineate two separate universes that intersect only fortuitously? Such questions are all the more important as standard quantification processes, and most often their analysis, are both derived from statistics' technique and approach. Social conventions are at the core of daily life, practical knowledge and coordination between people; statistical conventions are at the heart of cognitive activities developed by statisticians. Hence, what does quantification mean when addressed from the wider point of view of social conventions?

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In this article, I try to develop that wider view on quantification processes in taking inspiration from the EC. In Section 2, I review the status of objectivity in a few of the canonical works of sociology of quantification. In Section 3, I more in-depth analyze the differences between social and statistical conventions. Then, in Section 4, I enlarge the concept of objectivity in having recourse to the lenses of the plurality of worlds as defined by the EC, and to the concept of the informational basis of judgement in justice introduced by Amartya Sen. In Section 5, I list the main characteristics of quantification processes on which to look from such a combined point of view, mixing the economics of convention and Sen's developments.

So let me begin by briefly presenting the two universes of social versus statistical conventions. I will come back to them in Section 3. Social conventions allow us to coordinate with others, to form mutual expectations, to understand each other without even having to think about it beforehand, and explain to others the purport of what we are going to do, without *ex ante* negotiating a contract, without external rules embedded into institutions and dictating our behavior. Systems of conventions shared by people create worlds in which people mutually consider they live and act together. These worlds are not "real" in the positivist sense. They are real in the sense that coordinating people give the elements of these worlds compatible meanings and verify the likelihood of these meanings by the fact they successfully achieve their undertakings and projects. There is a plurality of such worlds of variable scope based on different principles. As social beings in our daily life, we are moving from one world to another, depending of the activity, the people, the situation at stake. They are not at all immutable worlds forever. They arise and re-arise again in situations by being generated via mutual expectations and coordination between people. They are for people more or less implicit or reflexively explicit depending of events and hazards. Though they are not – properly speaking – substantial, these worlds left interpretable traces, either material, cognitive, or symbolic in the situations. To what extent can all these very diverse common worlds we just spoke about be relevantly subject to standard quantification processes, applying statistical techniques?

To have a preliminary view of what statistical conventions are, open any publication by a statistician. You will always find, at the beginning or in a by-side insert, a series of methodological precautions. These tell the reader the detailed procedures and categories that have been employed, what they allow to say and not to say when interpreting them. The fact that the right procedures are followed serves as proof that data is correct. Publishing the methodology is supposed to guarantee the reproducibility: anybody who would try to reproduce the methodology would arrive at the same outcome. Doing so, statisticians are applying the procedural objectivity as employed in scientific research. Is this type of objectivity valuable for quantifying processes of social life? Do "ordinary" people have recourse on this type of objectivity when deploying social

conventions? Or do they put into action other objectivities? These are the issues I will first consider.

2. Scientific Objectivity and Social Conventions

Approaches of quantification processes have begun in the Anglo-Saxon world in the more general field of sociology of sciences. The Anglo-Saxon world, its social actors, and researchers, are characterized by its focusing on a specific conception of objectivity, that of scientific objectivity as first developed in Britain by the very influential scientist Francis Bacon.

I have immersed myself in a series of articles on objectivity that I had collected, promising myself to read them one day. These articles come from special issues from *Annals of Scholarship* published in 1992 that included work by noted researchers in the field of sociology of quantification, such as Lorraine Daston, Theodore Porter, and Peter Miller.¹ I find that the predominant notions and practices in the Anglo-Saxon world can be summarized by their strong historical reliance on a specific concept of “facts.” Any knowledge is not “fact.” To become fact, knowledge should be detached both from the context of observation in which facts were generated and from contemporary theoretical controversies (that are relegated to the rank of ideologies). If so, such facts could be said as objective, which means that such facts become entirely self-sufficient as incontrovertible truths. They owe nothing to the turbulence of ideological debates or the specificities of the field of observation. So they must prevail in the discussion.

2.1 From Baconian Objectivity to Modern “Evidence”

The above posture, very influential over time, is that adopted by Francis Bacon in the 17th century, in opposition to Aristotle and the scholastics. Lorraine Daston has followed the posterity of this position through the debates it raised over time within the scientific community (Daston 1992). It is worth briefly recalling in what system of beliefs Bacon has embedded his conception of objectivity.

Frank and Fritzie Manuel (1976) remind us that, among many writings, Bacon was the author of a utopia, *The New Atlantis* (Bacon 1951). The major institution of Atlantis was a college of 36 scientists-priests called the Elders. Their mission – an action program obeying to a very centralized organization – was to monitor in Atlantis the development of science toward innovation and the accumulation of scientific knowledge. This so-called Solomon’s House was independent both from the state and from the people. Elders decided what inventions and experiments should be made public and which should not, and

¹ See Allan Megill, ed. (1992, 1994).

also when to impart secret inventions to the state. “The end of our foundation is the knowledge of the causes, and secret motion of things; and the enlarging of the human Empire, to the effecting of all possible things” (Bacon 1951, 288). The methodology was based on the repetition of the same experiments under different conditions (what are called today experimental designs). Outcomes were discussed by the college and new experiments decided. Some Elders, called the “Interpreters,” were in charge to “distill from all the experiments general observations and axioms” (Manuel and Manuel 1979, 258). One recognizes the experimental, science-based objectivity of the concept of “facts” as above defined.

The other dimension of the objectivity of “facts,” independence from ideology, has been today amputated from its Baconian religious connotation. Bacon was concerned not to sully science by human emotions and, above all, that scientists “do not presume by the contemplation of nature to attain to the mysteries of God” (Bacon 1951, 6). Indeed, the scientist had a religious duty to inquire into God’s creation and to force nature to yield up in works all the potentialities inherent in creation (in other terms all that had ever been there, waiting for its discovery). But the objective of science for Bacon was accumulation of knowledge through the contemplation of nature, not accumulation of capital through the exploitation of nature. This (fragile) preservation of nature proceeds for Bacon from its God creation.

In the long run, this concept of “fact” has been refurbished without losing its key foundations. Today, minus religion-based ethics, plus quantitative efficiency (the search of what works),² the same ideal of objectivity is called “evidence.” Evidence remains something on which everybody should agree without discussion whatever his political, social, or theoretical position, and that can be extracted without cognitive damage from the singularities of the empirical observation. Evidence is not pre-given; it should be built through procedures that possess the property of objectivity.

In matters of scientific knowledge, the possibility of relying on this type of objectivity is dependent on the experimental protocol that must be as rigorous, verifiable, and reproducible by a third party as is possible. As emphasized by Allan Megill in his introduction, the underlying objectivity is procedural (Megill 1992). As long as the procedure is followed, the result obtained belongs to a sphere that is neither that which is true or just, but the unfalsifiable. It will remain valid until another researcher posits another theory and shows, using a methodology of the same nature, that in fact there should have been a different understanding of the same reality, that there are other properties and forces at work. And even then, the figures will be established along similar types of procedures.

² Search of what works is now the matter of a myriad of books in the Anglo-Saxon literature, both scientific and popular.

In such a methodological posture, quantification is sought, not merely for the additional information it provides, but mostly to bring the incontrovertible procedural proof that one is right. Could what is valid in scientific matters be transferred as such to social life (not to speak of the controversies on such issue in hard sciences also)? If so, “facts,” even those related to human and social affairs, should thus be abstracted from the social conventions of their time and population. This pretention is highly contestable, as we will see below.

2.2 The Use of Evidence in Quantification in Bureaucratic and Managerial Circles

Observing Anglo-Saxon bureaucratic and managerial circles, Theodore Porter (1992) and Peter Miller (1992) conclude that, in these circles, the force of quantification lies in its reliance on the objectivity of figures and the intangibility of the bureaucratic and managerial rules that underlie their constitution. The objectivity of figures is based on arithmetic, and therefore cannot be contested: 4 is larger than 3; a drop from 100 to 80 is a 20% reduction. The intangibility of the rules is due to the fact that they are rationally grounded and have been rigorously established to achieve a certain sort of optimum balance, both social and economic.³

Procedural objectivity has another property, “politically” interesting to transport into the social domain. It is impartial. The subject of this type of quantification cannot complain of partiality, and conversely can argue that s/he has not profited from any special treatment. Neither injustice nor favoritism, this type of quantification instruments a particular conception of justice, the justice based on objective equality of treatment. These two authors suggest the ways in which – in this social context of objectivity – figures can be appropriately manipulated and have the power to transform practices, behavior, and thinking. As Miller puts it, the proponents of corporate accounting (in this case analytical accounting) are driven by the utopian desire to “form” a new man, in the strongest sense, of giving shape and – almost – life. Such a new man would think and act according to the dictates of performance prescribed by accounting. He could not imagine any other way of being. For he has been convinced that the world created for him is efficient (privileging performance) and just (treating individuals equally). This world espouses values that this individual recognizes: talent, merit, and responsibility.

Procedural objectivity of that type is based on standardization, on the belief that, whatever the complexity, diversity, and singularities of circumstances, it is always possible to put somebody in a given case of a statistical table at the crossing of some general nomenclatures without losing any relevant piece of information.

³ This conception of “rule” can be found in John Rawls (1955).

2.3 The Impossible Transposition in Social Life

However, things are not so simple, for the transposition in social life of procedural objectivity is precisely a utopia. It does not work for every case or all circumstances. When is it relevant and when is it not are questions that cannot be eliminated without the risk of social or cognitive damage. To take this example, the film “Welfare” by Frederick Wiseman, devoted to a welfare office in the United States, illustrates the conflict, very painful for both parties, that arises when a request for aid that would be justified in terms of social justice based on the welfare of persons does not fit into the framework defined by the system of rules. The employee is caught between the desire to do the right thing, and the impossibility of satisfying the demand. And the applicant cannot achieve a just resolution of his case.

Does such a situation, apparently unsolvable, mean the impossibility to overcome the conflict or does it simply signal that there could exist other ways to define the problem, other worlds of quantification, and types of objectivity than those based on standardized impartiality? In such a situation, debating and convincing other participants that one is right is inconceivable for individuals because their claims are facing a complex, standardized, and powerful machinery, a multilevel system of rules which produce the data and the final yes or no judgment. Are there nevertheless worlds, in the sense recalled in the introduction, in which social justice could be achieved in being founded on other principles?

The way to overcome the blockade and to understand what is at work is to decode the entire chain that has produced the data. Only professionals of statistics have the capability to do so, if not the will. If it is done – and Alain Desrosières and Laurent Thévenot were pioneers of such an undertaking (Desrosières 2008; Thévenot 1984) –, it would publicly appear a series of rules of classification and measurement that, taken one by one, are in no way scientific axioms. They are socially determined in the sense that other choices would have been possible that would have led to another frame and judgment. In the illustrations from Wiseman, it could have appeared for instance that both the applicant and the employee had another principle of justice in mind, hence other ways of classifying and quantifying that would have achieved an agreement. One of the reasons could be that they know by their experience of life that, in this instance, using a minimum income threshold to decide whether to help or not was not relevant. For the specific case, the right issue was to provide the claimant with a decent housing that he cannot obtain on the market. The market was functioning on the basis of conventions, i.e. mutual expectations, like exhibiting individual responsibility, having a secure job, inspiring trust, etc. But, as these conventions are not taken on board by the rules of the welfare system, no adequate solution could be found.

3. When and Where Could Statistical and Social Conventions Meet?

We will pass here in review the specificities of statistical versus social conventions, and then consider how they could meet. The main difference between statistical and social conventions is basically that the former are rules, not conventions; only the latter can be labelled as conventions.

3.1 Statistical Conventions

Statistical conventions are not conventions in the sense of expectations mutually agreed among people, but rules. These rules have been pondered at length in keeping with forms borrowed from science, and aim for objectivity and inconvertibility. They create standard categories (which then allow general statements detached from elementary observation) by treating as equivalent all people, or answers to questionnaires that possess the same general property. As they are built for the long run, they have also their own temporalities that do not correspond to social temporalities.

Statistical conventions are built with reference to a founding scene: the configuration as defined by Norbert Elias (1973) in which the person is subject to questioning and is called upon to answer. These conventions are meant to construct and equip this scene adequately to reach the expected ends. We can speak of injunction because the person who is questioned faces (just like in a company) a vast institutional system embedded in the mechanisms, rules, and components of the scene, and hence enters a power relationship. This is clear in administrative statistics, for example the production of data that goes along with the daily operation of the welfare office, but is also more subtly present for the person being questioned for a population census or a survey.

Likewise, the general categories that underlie equivalence, according to Alain Desrosières (Desrosières 1998) (or commensurability, in the words of Wendy Espeland; see Espeland and Stevens 1998), and the observation methods deployed to implement them are elaborated, criticized, and revised in the professional spheres of statistics, accounting, or law. In these spheres, the discussion about which rules to choose and the choices to be made cannot totally escape from some observation on what is going on in society and the conventions at work. But the aim is that – once established – these rules can go their own way. So, the dynamic relationship between statistical and social conventions in a given society is complex and even unpredictable. Both systems borrow to each other, but at the same time they differ and sometimes even can take distance from each other.

3.2 Social Conventions

Social conventions also partake of cognition. That cognition, however, is the one of ordinary people, focusing on common situations, not of professionals of cognition. It arises not in a statistical scene centered on responding, but in daily life where action must be coordinated with others. At the difference of scientific or rational cognition which aims at producing explicit formal knowledge, the finalities of “daily” cognition are practical, even better, pragmatic. It is consequently centered on acting, precisely on the relevant acting that will produce the expected outcomes for people.

For EC, it follows from these characteristics that ordinary action always has three interrelated moments: a cognitive moment, a normative moment and a pragmatic one.

These moments, most of the time, are never considered as such either in statistics or in quantification processes. These moments are, however, essential to understand. In practice, they emerge in the instant and locus of the action (in other terms in the situation) and are indexed to these instant and locus. They are also dynamically articulated. The cognitive moment brings forth what “suffices” to know in the pragmatic moment (whose aim is the successful completion of the coordination). What to pragmatically know in the situation is linked to the normative moment. Conventions are also practical norms other people expect you will refer to in your action. So, they are not purely pragmatic in the usual sense, but they convey a notion of justice. It follows, for the EC, that the normative moment mobilizes individual conceptions about the fair treatment people expect from others during the coordination. Expectations on fair treatment allow people to select in their environment the relevant information, to interpret the behaviors and intentions of other people, and to guide his own action. The coupling of the three moments leads to success or to failure of the engaged coordination.

3.3 When and Where Could Statistical and Social Conventions Converge?

We have already noticed that the establishment of statistical conventions needs to be somewhat connected to social reality. If not, if they are too far away from daily understandings of that reality by people; the data processed from people’s answers would produce an information, mostly irrelevant for political purposes. In case of unemployment for instance, at least in France at the turn of the 20th century, women at work in homework (5 or 6 million), or peasants having at the same time an industrial job did not understand a situation of no work as unemployment in the modern sense (Salais, Baverez and Reynaud 1999). This situation was understood as part of normal life. Homework, for instance, had its off seasons with no orders. So, when questioned in a census, homeworkers did not produce answers leading to be classified as unemployed.

But it also can work in the other way. The diffusion in public policies of general categories may in the long run induce a shifting of “indigenous” understandings of social situation and lead not to identity, but to convergence towards statistical conceptions. It depends of other economic, social, or political transformations. In France, again for unemployment, from the 1970s onwards, women looking for a job began to register at public employment offices. In so doing, they adhered in practice to the official statistical definition of unemployment and were included in official statistics. It led to an increase of the number of unemployed people that was somewhat artificial because it was not linked to any fall of the level of employment.

Such reciprocal moves are unpredictable. It could or could not occur. As Bénédicte Zimmermann (2001, 2006) demonstrates, the move toward a general and generally admitted category of unemployment proved impossible in Germany. The plurality of social worlds (see the next section) was so resilient that still today several regimes of employment, hence several understanding of what means to be unemployed cohabit in Germany.

4. Worlds and their Informational Bases of Judgment in Justice

The problems with the articles on quantification mentioned above are, firstly, their tendency to limit the person to the rational individual, and secondly, the failure to take plurality into due consideration. They rightly described the conceptions of quantification in Anglo-American administrations and enterprises, but cannot ground any relevant critics. These limitations must be surpassed in order for research to fully grasp social processes of quantification. That is what EC can take on board by focusing on social conventions.

As individuals are social beings embedded into networks of affiliations and activities, they are able to differentiate different worlds in the meaning we provided in the introduction and to which we will come below. They are able to think and act within them by practicing the system of conventions relevant in the world in which – in the situation under progress – they consider to be. Hence, they have the capability to take distance from and to be critical against quantification processes they believe inadequate to their conception of the evaluated domain of activity or to their values. Any scientific approach of quantification processes should fully integrate these facts. It is no more possible to view the diversity of practices by the unique lens of objectivity as evidence, impartial objective justice and standardization of data. One should be open to other elaborations that obey to the above principles.

To succeed requires working at the crossing of two fields of research, that of the plurality of worlds already labored by EC and that of the informational bases of judgement on justice (IBJJ) as developed by Amartya Sen in his capa-

bility approach. We first remind the plurality of worlds as conceived by EC, and then, make the bridge with the Sen's IBJJ.⁴

4.1 The Plurality of Worlds and their Conception of Objectivity and Justice

The “plurality of worlds” hypothesis and its empirical description are running all along EC's research process, especially in Eymard-Duvernay (1989), Boltanski and Thévenot (1991), and Salais and Storper (1993, 1997).⁵ Through various elaborations, all these works converge towards the same basic axioms and outcomes.

As stated in the introduction, systems of conventions give access to a plurality of worlds. In Salais and Storper (1997) we distinguished four of these worlds: the industrial world, the interpersonal world, the market world, and the intellectual world – plus combinations between them. Let us here only focus of their conception of objectivity and justice.⁶

The *industrial world* is congruent with objectivity as evidence, for its organization and functioning are based on systematic standardization of products, of industrial processes, of work and individual identification, of measurement, of performance reduced to quantitative variables. The industrial world takes the evidence exhibited by numbers as a general principle to direct evaluation. No aspect of the reality at stake can escape to such processes of rising into generality. No singularity is capable of resisting such generalization and equivalence or to serve to support for criticism. In the industrial world, the particular is expressed only as an example, an application of the general model. It does not signal the presence of another world in the situation, though this might appear beneath the surface during the coding of elementary operations (Thévenot 1983). This is the price to pay in order to establish the impersonal impartiality of a quantitative observation of the situation, which is the sole conception of justice making social and economic coordination possible in that world. But there are other worlds, such as the interpersonal world and the market world. In the *interpersonal world*, coordination is based upon durable personal relationships. People have an in-depth knowledge of the others coming from familiarity acquired through proximities. To coordinate in a given situation does not have to rely on quantification. It mostly requires spontaneous forms of understanding of the situation based on familiarity and experience. In the *market world*, quantification is of interest only because it reveals the degree of competition between individuals and, more generally, between participants in the market. It helps to make ratings and scorings along price and cost comparisons,

⁴ See also Salais (2015).

⁵ See, for an in-depth presentation in German, Diaz-Bone (2015).

⁶ For a detailed presentation see Salais and Storper (1993), Storper and Salais (1997).

to discover the best offer or the best demand, to build anticipations on the futures. Basically, the ideal-type of quantification for all markets in the market world is made of the series of indicators that enable stock markets to make conjectures about the shares of all sorts that are bought and sold.

More generally, in the compromises that prevail between these worlds and the industrial world, quantification can be useful at certain levels of aggregation, but not at more “local” levels. And the question of what *not to quantify* becomes a key issue for achieving such compromises. There is no need to quantify everything; as Sen said, “description is choice” (Sen 1980). In other terms: quantifying is at the same time submitting people to evaluation, hence to control, and trying to guide their actions. Not to quantify implies to decide, whatever the way to do so, what type and scope of freedom, and into what domain have to be left to people, especially as markers of trust.

4.2 Sen and the Informational Basis for Judgment in Justice

So, we must look beyond the sociology of science-based quantification to elaborate the theoretical foundations of the plurality of modes of *quantification*, based on the plurality of worlds, and thereby the plurality of social forms of knowledge. Amartya Sen’s works on *capability* and the *informational basis of judgement in justice* (IBJJ) are offering the basis for a wider and more relevant theoretical framework on which to build. Sen – in an entirely different intellectual domain: the theories of justice – broaches the dimension of justice in its double dimension of “correctness” and of “fairness.” The originality of Sen, compared to Arrow or Rawls, is his insistence on the informational basis of judgement in justice, which, in a democracy, defines the content and mechanisms of collective choice. In his theoretical treatment of collective choices, Sen maintains the need for objective evaluation of the individuals and their social positions, as opposed to the dominant procedural current of ordinal ranking. The knowledge of social reality, of its *substance*, should be the object of a collective building of knowledge, not only the *ranking* between situations or individuals.

Such introduction of fairness issues radically transforms theoretical and practical approaches to quantification in the social world. Firstly, it renders explicit the normative dimension of any quantification process, which legitimates the need of public discussion and democratic deliberation on choices initially considered as purely technical and to be left to technicians and experts. Secondly, it enriches the concept of “facts,” making factuality and knowledge a collective elaboration where all stakeholders interested in the domain under review have to participate. Suddenly, John Dewey and his concerns about inquiry, the constitutions of publics, and people’s participation become parts of the fields of research and of collective action. Far from to be isolated against social conventions and

against the singularity of situations, facts, to be rightly and correctly elaborated, require taking into account social conventions and singularities.

Sen introduces, in effect, a fascinating concept for research on and practices of quantification, that of *factual territory*. Let us first quote Sen:

The informational basis of a judgment identifies the information on which the judgment is directly dependent and – no less important – asserts that the truth or falsehood of any other type of information cannot *directly* influence the correctness of the judgment. The informational basis of judgments of justice thus determines the *factual territory* over which considerations of justice would *directly* apply (Sen 1990, 111).⁷

A factual territory for a given issue at whatever level is composed of all the information which is, no more no less, necessary and sufficient to achieve the two criteria of correctness and fairness for the decision to build and the choice to make. For the *same situation*, depending of the world to which people consider belonging (or of the compromises between), several factual territories can be built for the same issue and a choice so offered to the democratic debate. The last – but not least – advantage to the concept of IBJJ is that the relevant information is not limited to quantities. This helps to have a wider look at quantification processes, notably at the selection of facts to be quantified and how, of those which are not. It helps to be aware of the normativity embedded into technical choices and to reveal it.

Without harking back to the canons of Arrow or Rawls, let us say that in theories of justice, the problem of democratic choice is to achieve an optimal outcome, according to two criteria to fulfil:

- 1) All individuals feel that they occupy the right place and have their claims taken into account, because they find the necessary resources and, according to Sen, the capabilities to conduct the life that they value.
- 2) This optimal outcome is attained through democratic deliberation between individuals in which each and all have been able to participate, express their claims and have them heard by others. Collective agreement is possibly only under these twin conditions. So, it is a matter of collectively reaching a state of common knowledge that is just, i.e. both correct and fair.

5. Implications for Research on Quantification Processes

Of course, few effective processes of quantification obey the whole guidelines leading to an IBJJ. But starting from this theoretical framework helps to discover, for a given process, which it takes on board and which is missing. So doing, one can found both: a relevant critique and a search for alternatives. To

⁷ The two emphases on the word “directly” are from Sen, the one on “factual territory” is made by us.

conclude, we will focus on three issues that make the difference for the analysis of quantification between the standard evidence approach and the approach of EC: facts, objectivity, and democracy.

5.1 Which Facts?

Coming back to our discussion in Section 2, one should emphasize that the facts so engendered – their “factuality,” if one could say – are not at all the evidence, so praised in Anglo-Saxon methodologies. The difference concerns several points:

- there are collective judgments on the situation at stake, its issues, and participants, not positivist or what-works statements reflecting some pre-existing reality, purged from its conventional elements;
- these judgments constitute cognitive representations in which normative concerns are embedded into the choice of cognitive categories and inquiry methods;
- there is a plurality of possible relevant judgments for the same situation and issue, depending on the agreement between participants on the relevant world (or compromise between worlds).

5.2 Which Objectivity?

The status of objectivity is not, and cannot be, the same for statistical and social conventions. The difference comes from the treatment of social justice. At best, as we have seen, statistical objectivity can support an instrumental conception of justice, equal treatment of quantifying between people, and impersonality. But it has not been explicitly searched for.

Expectations of fair treatment by people in their daily life and work are far from being restrained to equal treatment of quantifying. For instance, in a world built around personal and durable relations (one can find in neighborhood, in family, in small firms, or personal networks), people expect more than only impersonal treatment. As they know that others have a true knowledge of them, they expect (mutually) to be treated at their value. Not a standard number, but a value whose expression is, for the essential, qualitative, unique, and even singular as it is closely linked to the situation and to the persons present in it. In the market world, people expect as fair treatment to buy and exchange goods that satisfy their individual utility, hence the key role they attribute to the signals sent by the participants to the market and to their correctness. Only in the industrial world built on systematic standardization in all domains could people be ready to accept their instrumental reduction to numbers (though not so easily because there are here and there always traces of other worlds in any coordination built along industrial world’s principles, for instance in wage determination, or in tacit expectations from managers that workers compensate by their initiatives the failures and hazards that occur in any rational organization).

So if one endorses the theoretical approach of EC, objectivity should be understood as “conventional,” that is an objectivity which is not only correct in terms of scientific procedures, but is by the same way based on common expectations between the participants with regard to the right principle of justice (or the compromise) to refer to. The plurality of objectivities has to be acknowledged, each of one being viewed as socially valid, and of equal theoretical and practical value. Objectivity should be considered, above all, as a social construct at the crossing of correctness (in its usual scientific acceptance) and fairness (applying a principle of justice recognized as legitimate in the community at stake).

5.3 Which Democracy?

In an EC approach, enriched with Sen’s IBBJ, the theoretical and empirical grid to analyze quantification processes should start from the following assumptions:

- As a social construct, any objective judgment evaluating situations or people should be produced, neither from outside, nor from rules chosen by some authority or power considering it has some natural a priori legitimacy to do so.
- Choice has to be “democratic,” with the participation of the evaluated.
- Even so, these assumptions can be transcribed in several ways, depending of the way the leading authority conceives its action and coordination with the evaluated and find an agreement with them.

Following these guidelines to build observations helps to have access to segments of reality that are most the time inaccessible to standard approaches. One will only develop the last point about the diverse conceptions of authority, for it largely remains terra incognita. We had our attention attracted to this issue thanks to our approach to the state, developed with Michael Storper (Salais and Storper 1993, 326-46). Looking at the diversity of states’ conceptions in Europe and in process of the invention of the European Union, it is easy to discover traces of different historically-rooted conceptions of central authority and its relationship with democratic practices (Salais 2015). There are parallels and homologies to establish at a higher level with the worlds we presented in this contribution, especially the industrial world, the interpersonal world and the market world.

Remember that a world in our sense is not real in the standard meaning, but is a pragmatic world that holds on by the belief, shared by the participants, that they belong to that world. So doing, people develop mutual expectations that allow them to successfully coordinate. The same could be said of the relationship between a central authority and the people under it. Such a relation holds and leads to expected outcomes, only and only if both sides share the belief they belong to the same world. If not, quantification processes are characterized by a lack of consistency, which leads to rational manipulation, cheats, and other similar manifestations from both sides. Using a grid based on types of

authority and of legitimacy so conceived again helps to shed lights on such phenomena and to decrypt discourses and attitudes.

What are the key issues for defining such types of authority and legitimacy? is a largely open question. In Salais (2015), with regards to the state, I oppose two global conceptions of the relationship expected by both sides.

- 1) In the first conception, each side agrees to devolve to the central authority the whole task of building the quantification process (modalities, what and how to measure). Evaluated people, through their representatives, are asked to indicate if they agree the choices made by the central authority. The applied procedure is similar to the one which is used in standard representative democracy. The question that remains and to be observed is to what extent – as they have no true say in it (and are satisfied by such a position) – the evaluated people are committed to take the evaluation procedure as their practical benchmark.
- 2) In the second conception, the authority and the future evaluated people, by common agreement, decide to build part or all of the modalities of the procedure, including what and how to measure issues. In practice, it requires that both sides commit themselves into deliberative procedures which try to achieve deliberate decisions. At the difference from strategic decisions, deliberate decisions are decisions that both sides have the effective intention to apply. One will not go further, except to note the proximities with the concepts of subsidiarity and of deliberative democracy. One cannot expect that the central authority or the people spontaneously enter in such a demanding cooperative process. In his works, John Dewey (1927) has in-depth explored the political conditions making such frames of coordination possible. Dewey understands democracy as a collective practice led by collective movements that struggle for creating what Dewey calls publics, that is people gathering together able to defend a cause (common goods for instance) and to build the relevant knowledge for implementing this cause. When built along Dewey's lines, democratic quantification processes would bond the authority to implement principles of social justice as well as criteria and procedures that would have been collectively agreed and tested. Here we have the right format both to implement and to make relevant research on quantification.

6. Conclusion

Quantification is plural. One can build several processes of quantification for a given social activity. These processes will differ depending of the agreed principle of justice among the participants. Such a plurality means that any quantification process has to be situated, for the choices of what and how to quantify depend of the situation, the activity, the people, and their principles of justice, in other terms, the world (or the compromise between different possible

worlds) they agree they are living together. So, any quantification is at the same time an evaluation based on explicit or implicit values. Another consequence is that to be not only democratic, but basically correct in terms of representation of the reality and fair in terms of justice values, quantification processes cannot be built from above and from the external. They should involve, from the beginning to the outcome, the people whose activity is the object of quantification. Last but not least, one of the key questions often neglected on quantification issues is what is worth to quantify and what is worth not to quantify. For the sake of efficiency, for instance, it could be better for all to let spaces of freedom for people in which what is going on is neither observed, nor evaluated.

What precedes has to be taken both as a grid about what to observe and how, and as general guidelines to build what should be in our view a satisfying process of quantification; even if, until now processes of quantification in the social world have not yet, except rare examples, followed such guidelines.

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From Statistical Categorizations to Ordinary Categorizations of Social Space: History and Legacy of an Original Study Based on a Card Game

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Abstract: »Von der statistischen Kategorisierung zur alltäglichen Kategorisierung des sozialen Raums: Geschichte und Vermächtnis einer originären und auf einem Spiel mit Karten basierender Studie«. This article puts the sociology of quantification invented and promoted by Alain Desrosières into perspective regarding a fruitful but rarely addressed approach in this research stream: the relationships that are built between official (or scholar) classifications and ordinary categorizations of the social space. In order to achieve this, the article first sheds light on the history of an innovative study designed by Luc Boltanski and Laurent Thévenot, a study which aimed to put ordinary people in the position to produce their own classification of the social space on the basis of a "card game." In a second step, we aim to compare and analyze the later uses of this study in France and abroad (Germany, Chile and Switzerland). Beyond differences due to each study's design and theoretical background, every study's collected ranking clearly depicts hierarchical social structures, even though those rankings show some variations which rely on the kind of information indicated on each card games, national contexts and respondents' dispositions.

Keywords: Quantification, official classification, ordinary categorizations, social space, comparison, State, card game, conventions.

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1. Introduction

The “sociology of statistics”¹ – renamed, in the early 2000s, as the “sociology of quantification” – emerged in France in the 1970s following the meetings between statisticians and sociologists at INSEE (National Institute for Statistics and Economic Studies) – including Pierre Bourdieu, most notably, who then taught sociology at ENSAE (National School of Statistics and Economic Administration)² in the 1960s and urged future government statisticians to realize the need for reflexivity in the usage (development, handling, interpretation) of statistical categories (Desrosières 1998). At the crossroads of public statistics and sociology, Alain Desrosières is one of the main instigators of this new French sociological research project (Didier 2014),³ one of whose main features is to turn statistics into an object of sociological study in its own right, not just as a source or mere data used by sociologists to prove their points. Alain Desrosières and colleagues intended to “denaturalize” statistics by showing that creating nomenclatures, categorizing, and counting objects or people make up a whole social activity which must be made intelligible (Desrosières 1998). Far from being “neutral” and “cold,” statistical information is based on conventions and categories that suggest a specific outlook on society. The point is then to observe statistical activity to highlight its survey and coding practices, but also power relations and bargaining between interviewers and respondents, between sponsors and data producers, as well as between statisticians and statistical clerks, etc. In this way, it becomes possible to show how statistic is not only a way to “reflect” reality but rather to actually “institute” it (Desrosières 1997).

This research program leads to a proliferation of studies scrutinizing various items. However, a particular object will, from the start, make up a kind of “model” of the sociology of statistics, namely, occupational classifications. The French nomenclature of the so called Socio-Professional Categories⁴ (*Catégories socio-professionnelles*, henceforth CSP) indeed enjoys a special status in French society: This tool – developed in the early 1950s in a small INSEE department by an original statistician, Jean Porte – has emerged as the interpre-

¹ The authors thank Muriel Surdez for assistance with translating articles from German into French and Franz Schultheis who granted us an interview on the study based on a card game he completed with his students in the late eighties, although they may not agree with all of the interpretations/conclusions of this article.

² ENSAE is an institution of higher learning in the fields of statistics, economics, finance, and actuarial science which trains statisticians for INSEE.

³ See also the contribution of Emmanuel Didier in this HSR Special Issue.

⁴ CSP (turned PCS in 1982) is a classification that groups together occupations by combining several criteria (qualification, employed or not, hierarchical position, etc.). Since 1982, it has three aggregation levels, the most aggregated consisting of eight socio-occupational groups (farmers, craftsmen, shopkeepers and entrepreneurs, managers and higher intellectual professions, middle management, employees, workers, pensioners, others with no profession).

tative framework of social groups and social inequalities in France. Pollsters, public officers, political scientists, sociologists, statisticians, journalists, and experts refer to it daily (Desrosières and Thévenot 2002; Amossé 2013). The predominance of this “vision of social divisions” imposed itself on social actors (Bourdieu 1981), led by Alain Desrosières’ group of statisticians and sociologists to retrace the social history of this object, to show it as the product of a specific historical and political construction. This intellectual enterprise was all the more dynamic when INSEE, in the late 1970s, began a process of “renewing” CSP, which has elicited a series of studies on statistical work, and more broadly on the issue of categorizations. Alain Desrosières delved into the archives of public statistics to reconstruct the history of socio-occupational categories in France since the late nineteenth century (Desrosières 1977). Laurent Thévenot observed INSEE investigators’ and encoders’ practices in the field and in coding workshops to bring out the logic governing the growing statistical generality but also INSEE agents’ knowledge and expertise (Thévenot 1983). These works then matched Luc Boltanski’s concerns, who had for several years been reflecting on scholars’ taxonomies, and who was then completing his study of the construction of the social group called “*cadres*” (i.e. managers and professionals) in France (Boltanski 1979).

In the context of this intellectual ferment, Luc Boltanski and Laurent Thévenot then imagined an innovative study: placing “ordinary” respondents in the position of statisticians having to design statistical nomenclatures or having to find out the profession of a person based on only partial information about this person. This study is original in that it is not based on the usual social sciences methods – archives, statistical questionnaires, interviews, or direct observations – but on an experimental protocol where respondents are put in an extra-ordinary situation, namely that of producing and thinking out a classification of social space. The “fun aspect” of the experiment should not mask the major relevance of this device, which will be used to build up a reading grid of categorization and social cognition processes. Though Alain Desrosières was not directly involved in the investigation, this research fits completely in the sociology of statistics syllabus he had initiated in the 1970s. He, for that matter, used these study results extensively, as reflected in his famous book on socio-occupational categories, published with Laurent Thévenot in the late 1980s. This original study asked two sets of questions that turned particularly fruitful for the sociology of quantification and beyond, for any sociology that pays attention to the production of symbolic goods. First, this original shift – from the statistician to the layman – raises questions about what it means to classify and code, i.e. the different logics that form the structure of categorization practices, whether by experts or laity. Then, these investigation devices lead to the analysis of the relationships between official classifications (or by academic scholars) and common knowledge about the social world. Basically, they make it possible to carry out

the sociology of the way expert classifications are received and of the remoteness or similarities between expert and ordinary categorization practices.

By following the principles of Alain Desrosières' research program, this article aims to report on the ways experimental studies via card games are constructed and made use of in several national spaces. Indeed, this novel approach has recently been taken up again in France but also in Germany, Switzerland and Chile. We intend, at first, to show how the pioneering 1981 study is part of the quantification sociology syllabus by re-examining the context of its development and its main results. Secondly, we study the different uses of this "card game" abroad – focusing both on similarities with Alain Desrosières' sociology and shifts regarding the way this research design has been imported into different national contexts – and review the respective contributions of these investigations.

2. Towards the Sociology of Statistical and Common Categorizations: Going Back on the Lessons Learned from an Experimental Investigation

Alain Desrosières' historical work on CSP has revealed the historicity of categories used to describe the social world, but also the fact that statistical and legal categories participate in institutionalizing and anchoring a vision of social hierarchies in French society. Defining categories and delimitating groups belong to a political representation work that is not socially and politically neutral. Somehow, the CSP nomenclature participates in "building up" social groups and giving them visibility, hence a "reality" in society. The study, conducted from a series of games, is an extension of this work. Indeed, the approach focusing on the study of common categorization makes it possible, firstly, to denaturalize statistical categories by showing the degree of arbitrariness of these rankings and the plurality of possible classifications. Secondly, it becomes also possible to observe the way laypersons receive and internalize statistical classifications. Boltanski's and Thévenot's description of the experimental study allow tracing the game's features, its main objectives, and salient results.

The study was conducted with several groups of individuals presenting differentiated social profiles (marketing department executives, sales representatives of a multinational agrobusiness, school teachers who belong to a retirement club, etc.). Respondents were divided into groups of 12 or 14 persons – an even number that permits the formation of pairs. The study includes three games: the typical cases game, the card game, and the portrait (or poker) game.

In the "typical case" game, respondents must give examples of "cadres" (i.e. managers and professionals) and "workers" by specifying some elements relat-

ed to their characteristics (sex, age, and qualifications), their employment (the position held, company size, etc.) conditions, and living (home, car) standards. As for the card game, the point is to group pairs of players together, real people, represented by cards, who belong to the same “social environment,” using the information written on the cards: first name, age, educational level, occupation, status (self-employed or employee), qualification, the institution’s activity, and address. Secondly, respondents must provide a name and designate a representative card (“a case in point”) for each group. All the interviewees finally negotiate a common classification. The latest game, the so-called portraits or poker game, makes respondents compete with each other to find out a “mystery profession” from a series of clues they can (fictitiously) buy at a higher or lower price: the more information clues give on lifestyles, the higher their price. The winner is the person who finds the “mystery profession” by spending as little money as possible.

Note that this study system was then used as part of INSEE’s encoder-training (INSEE 1982). At the end of their training, all the practices and results implemented in these “games” were faced with the reviewed 1982 CSP and generally compared with the description of the social space as developed by Pierre Bourdieu in *Distinction* (Bourdieu 1984). The material collected during interviews and games, but also during these training courses, then formed the empirical foundation of the article entitled “Finding one’s way in social space” (Boltanski and Thévenot 1983), taken up again by Desrosières and Thévenot in the book they published in 1988 (Desrosières and Thévenot 1988).

The contours of this investigational device therefore take the opposite of the domination relationship usually applied: “laity” and not “experts” are, during the time of the study, in a position to delineate the social world. This is no trivial process as it supports a sociological project. First, it shows that statistical institutions’ classification and quantification work is not neutral, but involves imposing a particular vision of the divisions found in the social world. On the other hand, the point is to showcase laity’s expertise and knowledge of the social world (and INSEE encoders’ familiarity with it) to account for the plural tracking and identification logics in the social world.

2.1 Dissemination and Reception of Statistical Categories in Society

Starting from ordinary representations of society allows ultimately re-examining official categories in terms of their dissemination and reception in society. The question asked by the sociology of quantification is the following: To what extent do statistical categories – or “rankings by the State,” as Pierre Bourdieu puts it – impose themselves in the individuals’ reference and representation universe? This is one of the important results of the 1981 study taken up by Desrosières and Thévenot in 1988: For the most part, respondents describe the social world in a way that complies with expert categories, as dis-

seminated by official statistics and, more widely, by government institutions. Indeed, to name the groups they create, players mostly use the names found in the categories set up by INSEE's CSP classification, though these actually constituted groups are heterogeneous and not necessarily in agreement with the official definition of the nomenclature.

In other words, the lack of agreement among players on all occupations that belong to the "executive" group does not prevent most respondents from creating a group entitled as such to describe the top of the social space. Luc Boltanski and Laurent Thévenot concluded:

The homogenization of the system of professional titles, names of occupations and, more generally, of social classifications, and above all the creation of official spaces for the representation of occupational groups (whether real ones, like the corporate bodies [conseils], or symbolic ones, like nomenclatures), belong to the series of unifying processes (linguistic, educational, legal, etc.) linked to the formation of the State. Just as the law is 'presumed to be known by all,' so nowadays, in France, everyone is sufficiently acquainted with the official system of occupational-group representation to be able to use it, whether to reconstruct it from memory, to perform classifications, to argue with other people about its validity, or, when the occasion arises, to situate themselves within it (Boltanski and Thévenot 1983, 672-3).

The study therefore allows for the conclusion that CSP have indeed been disseminated in, and have penetrated, the common representations of the French social space; and the same is true as well – by means of CSP – of the institutional categories that underpin them (Desrosières and Thévenot 2002, 54).

2.2 From the Political Representation Work to the Social Categorization Logics

The importance of the political work done on social groups' representation in common categorizations is confirmed by the designation of cases in point, or "good examples." Occupations considered the most representative of the groups constituted by respondents are those that were the subject of the most noticeable political representation work. For example, the skilled metallurgy worker is almost always considered representative of groups made up of cards representing the popular classes. It is as if the typical figure of the worker put forward in the post-war period by the CGT (General Confederation of Labor) and the PCF (French Communist Party) was "necessarily" assessed as representative of groups formed by respondents, again regardless of the cards put in the same pile in these groups. As observed by Alain Desrosières and Laurent Thévenot,

this political representation work thus determines the creation of good examples and it may explain, in contrast, why the following cases were rarely chosen, though they were all eligible to rank at the top of the pile of unskilled manual workers categories: housekeeper, car-dealership storekeeper, storekeeper assistant, and night watchman (Desrosières and Thévenot 2002, 56).

Thus, the “good example” is not necessarily the most statistically representative of the social group it stands for. Therefore, the “executive” considered as representative by respondents is very different from the executive deemed representative in a statistical sense. The study “clearly shows that cognitive categorization processes cannot, when it comes to social categorization, be separated from political representation procedures and principles” (Desrosières and Thévenot 2002, 59).

However, Luc Boltanski and Laurent Thévenot point out that this internalization of the state and political description categories of the social world does not prevent variations according to the respondents’ characteristic features and social trajectories. “In these debates, the participants sometimes speak as if they were the representatives or spokespersons of a social group, appointed to advocate its specificity, identity and interests in political or union bargaining” (Boltanski and Thévenot 1983, 656). Discussions between players having to agree on a common classification thus lead to the creation of a “system of antagonistic positions in which participants speak as a function of the dispositions and properties of habitus (see Bourdieu 1984) which they derive from their class origin and class position” (Boltanski and Thévenot 1983, 656). Thus, as did Coxon (1974) before them or, later, Dominique Joye and Lorenzi-Cioldi (1988), they use many examples to show that the forms of social cognition and spotting cannot be analyzed independently of players’ positions and social features.

2.3 The Plurality of Categorization Forms

Identifying these variations between individuals leads to another important conclusion: when respondents refer to the expert categories, this does not necessarily mean they have internalized statisticians’ technical logic. Therefore, to sort out the cards or find the mystery individual, they mobilize their personal experiences, often familiar clues and cases – not standardized criteria. As Desrosières and Thévenot put it,

we managed to measure the distribution of the official representation of CSP, while highlighting the cognitive mechanisms that guide practical ranking activity substantially depart from the logic of technical criteria. These mechanisms on one hand build on the formation of typical images of categories, which owe much to the political work of representing social groups. On the other hand, they rely on an interpretation capability that is anchored on a personalized construction of the social environment, treated as a familiar domestic world (Desrosières and Thévenot 2002, 61).

Card combinations, and even the mystery profession game, support the latter finding. Those who find it most easy are those that mobilize their intimate experience of the social world by relying not on general and institutionalized criteria (socio-demographic variables) but on clues related to the lifestyle associated to the mystery profession. This approach, based on experience and on the familiar knowledge of a number of social space fractions, precludes a “cri-

terion-referenced” approach. The authors conclude from it that there is a distinction between two forms of relationship to the world: one based on reference to the official representations of social position, the other on the knowledge and recognition of indirect signs (tastes, ways of living, etc.) related to these social positions. Building on these results, Alain Desrosières later suggested that

the opposition also explains what distinguishes, among social sciences survey methods, monographs on one hand – covering cases deemed typical, and whose generalization is based on the idea of exemplarity –, and on the other the surveys based on representative samples for which generalization is based on probabilistic schemata (Desrosières 1989, 236).

State rankings therefore impose themselves neither perfectly nor unequivocally. In the “cases in point” game, though players rely on institutional and political categories to select examples of “cadres,” they are also able to distance themselves from the dominant representation. They select examples they know are far different from these standards but they wish, that way, to select a “case in point example” not in the sense of a “paradigmatic” one but one “worthy to be exemplary.” It is on this point, by emphasizing players’ reflexivity and critical distance face to the categories they handle, that Luc Boltanski and Laurent Thévenot (and Alain Desrosières, too), operated a turn toward what was later called pragmatic sociology.⁵ These works mark the “shift from an interpretation in terms of institution language and classification struggles, to a plurality of logical identity production” (Amossé 2013, 1057).

Hence, this study can be said to be the bedrock of pragmatic sociology (Boltanski and Thévenot 2006) and of an approach paying attention to the close relationship that develops between classification and assessment operations, where the classification of occupations is based necessarily on forms of judgments on profiles shown on the cards. Thus, Alain Desrosières claims this seemingly statistically neutral operation cannot be separated from and analyzed without reference to the types of judgment and perspective it brings into play on society (Desrosières 1989).

3. Classification and Ordinary Knowledge of the Social World in Switzerland, Germany and Chile

The “card game study” device initiated by these pioneers (Boltanski, Thévenot, and Desrosières) has long remained childless. However, it was re-discovered in the mid-1990s by several research teams and in different national contexts: in Germany (Schultheis et al. 1996, 1998), Switzerland (Neuhaus 2008a, 2008b,

⁵ In the wake of this change, the *Groupe de Sociologie Politique et Morale* (GSPM) was created in 1984.

2011; Chevillard, 2009), Chile (Barozet et al. 2014; Mac-Clure et al. 2015a, 2015c), France (Deauvieu et al. 2014) and in a more general way in several European countries (Deauvieu et al. 2011; Filhon et al., 2013). The adaptation and re-use of Boltanski and Thévenot's card game occurred in special historical and national contexts as well as within affiliations differentiated from the sociology Desrosières and his two colleagues had initiated.

3.1 Between Bourdieu's Sociology and Pragmatist Sociology

In general, these investigations are part of contexts marked by debates on social classes and/or boundaries between social groups. This is particularly the case in the Chilean investigation that extends a large statistical survey on social inequalities in the context of the growing power of social movements initiated in 2011 by the middle classes (students in particular) challenging excessive social inequalities. Forty years of the neoliberal model have transformed not only the social structure, but also professional and class identities. Similarly, in the case of Switzerland, Lukas Neuhaus examines first the socio-economic changes that, he said, necessarily affect the representations of the Swiss social space. Since the population's general education level has increased sharply and jobs are being moved from manual labor to white-collar work, he hypothesized that perceived social cleavages are no longer at the same level as before and that distinctions among middle and upper professions have become greater.

This type of questioning is also pregnant in the case of Germany, in Schultheis' work, since it emerged in the wake of Ulrich Beck's work on the end of social class and the imposition of individualism, or then again in French team's case, in the context of the debate in France on the re-composition of class divisions (skilled/unskilled and private/public). However, in the latter two cases, the card game study is also used to test official classifications. Proximity to the pioneers' objective is then more conspicuous. Schultheis' comparison with the French case is seen as a means to evaluate the role of the State and of German public statistics in the dissemination of the way social divisions are represented. As for the French study, it developed within an intense debate consisting, on one hand, in questioning the relevance of PCS nomenclature to grasp today's French social space; and on the other hand, hinging around the relevance of making a European classification based on Goldthorpe's class schemata often seen as unsuited to French society (Brousse 2009; Rowell and Penissat 2012). Questioning the relevance of official categories is even more explicit in Chevillard's research, as it aims to test whether or not Swiss respondents and especially French respondents residing in France and working in Switzerland (i.e. frontier workers) reproduce identical classification schemata (or very close), thus raising the matter of the appropriateness of using the PCS nomenclature in the case of employees working on the Swiss labor market.

These distinctions are reflected in the growing importance (or not) of the issue of the relationship between lay and official categorizations (statistics), at the core of 1980s research works. This question is central to Schultheis, Deauvieu et al., or again Chevillard, who relate the classifications obtained by them and by statistical institutions. Conversely, this comparison is virtually absent from Neuhaus' and the Chilean team's works. These differences (we will see they also alter investigation protocols) are not only related to the contexts of use of the original investigation; they also have to do with the sociological trends these researchers are part of. A rather "Bourdieu-like" trend, visible as has been said above in Desrosières' early work, which focuses on "classification struggles" and the dissemination of "state rankings" in the case of Schultheis and of the French team, as well as a more pragmatic affiliation among Chilean researchers who focus more on the plurality of ways the social world is perceived and of the judgments that accompany them.⁶

Interest in the issue of the role played by the State in the production and dissemination of social classifications also heavily influenced Chevillard's decision to import the card game. This affiliation is coupled with reference to a very prominent tradition in Switzerland of works on multidimensional classifications of social space (Lorenzi-Cioldi, Joye 1988), as opposed to one-dimensional approaches disseminated via prestige scales.

Neuhaus' borrowing from Desrosières', Boltanski's, and Thévenot's sociology is not so obvious. He especially emphasized that the latter were content to take into account individuals' trajectories and their social positions but paid not enough attention to their professional socialization. Actually, Neuhaus assumes social groups' perceptions are closely linked to mental structures learned and internalized in the workplace. He therefore aims to make a contribution to the theory of social classes highlighting the anchoring of ways of seeing and perceiving related to professional socialization.

3.2 "Sorting Out" or "Naming"? Similarities and Differences in Investigative Protocols

Such imports and re-appropriations of the original study led research teams to adapt the initial study system of the card game in different ways.⁷ The first distinction falls within the favorite polling mode: whether individual or collective. The Chilean and German teams, who were mostly interested in naming and classifying processes have, as in the original investigation, interviewed

⁶ Note also that the Chilean team includes sociologists (Emmanuelle Barozet and María Luisa Méndez), a socio-historian who has long worked in the Chilean statistical system (Oscar Mac-Clure) and a psycho-sociologist (Virginia Guzmán). Funding: FONDECYT projects N°1130276 and N°1150808. We also thank COES CONICYT/FONDAP/15130009 and Cristóbal Moya, research assistant.

⁷ The Chilean team also again took up the portraits game (Mac-Clure et al. 2015b).

respondents collectively to observe interactions between players and the justification registers they mobilized. By contrast, the French team and Julien Chevillard, who wished to identify respondents' categorization logics, have opted for one-on-one interviews. Lukas Neuhaus has adopted the same interview method but with a different perspective: he articulated the game with biographical interviews to analyze the effects of socialization on social representations.

These differences are also reflected in the ways information is dealt with. The French team and Julien Chevillard sought to quantify their results⁸ and have so far mainly focused on the rankings produced as revealing visions principles of social divisions. In contrast, the German and Chilean teams,⁹ like Boltanski and Thévenot's, have mostly used their observations qualitatively, the former focusing specifically on the names given to groups, while the latter looked at classifications and titles. Unlike the pioneers, no team has really tackled the issue of the representative cards of the groups formed by respondents. This blind spot has to do with the fact that none of the teams has a priority interest in the issue of the political work of group representation.

These differences are also found as regards interrogation methods and material processing is not necessarily reflected in the choice of respondents and of the information written on the cards. In general, although only the French team could, so far, present a representative sample, the teams sought to vary respondents' social characteristics to assess the changes in ranking based on respondents' characteristic features. Lukas Neuhaus is the only one focusing on specific audiences (teachers, engineers, lawyers and health professionals) in connection with his approach geared toward the impacts of professional socialization. As for Julien Chevillard, he wanted to assess whether the PCS classification was relevant and useful in the context of the Swiss labor market, and has therefore deliberately selected a sample of Swiss workers, French workers and frontier workers.

The information on the cards has also been adapted firstly to national contexts, and secondly on researchers' other specific questions. The transposition of the card game has been first to "give a national flavor" to the games, for card profiles to be "understandable" because they were hence "representative" of the studied contexts. That is why, in the German case, the legally codified and institutionalized terms – *Angestellte* (employees) and *Beamte* (officials) had to be inserted in the card game. Now, the Chilean case has led to the most extensive reformulation since it was unthinkable, in this specific country's context, to ignore ethnic differences, including representing the Mapuche Indians – who

⁸ The French study was conducted in partnership with INSEE and Eurostat, since lack of results quantification was unthinkable for the institution.

⁹ Secondly, following an exchange with the French team, the Chilean team has also analyzed quantitative results. The quantitative analysis reinforces the qualitative one and prepares the ground for a large-scale survey in 2016.

are a numerically significant minority – or overlook gender differences, due to the significant presence of housewives.

Even in the French case, the card game was not the same as in the 1981 study. Some professions widely found in the original card-game, such as skilled workers in the secondary sector, had much less weight in 2008 than they had in the late 1970s. These workers' profiles have almost disappeared from the card-game, while tertiary-sector employees and workers are significantly more represented. These forms of “translating” the game to take into account national contexts or different socio-economic circumstances reflect the difficulties and interrogations raised by making comparisons in time and space, especially where social and professional structures are concerned. Here we are faced with the sociological problem Alain Desrosières recommended to take into account regarding the reconstruction and comparison of “long series” of statistics such as: inquiring about equivalence conventions, to harden the observation categories of social reality, and enable them to be transposed from one context to the next (Desrosières 1992).

Beyond these context effects, game translations are also very tightly suited to each team's specific research question. In the case of Chile, the objective was to question the perception of inequalities and hierarchical logics. So, the information written on the cards had to be very broad (income, education, occupation, place of residence, gender, age, ethnicity, and religion) and include cards representing inactive women (housewives) as well as pictures of the characters represented. In contrast, Julien Chevillard confined the social universe represented by the cards to the sole professions, as he was interested in questioning the representations of occupational differentiations. The German and French teams remained closer to the original game (name, age, occupation, degree, employer, status, activity of the institution, and the number of employees). However, the French team has also updated this kind of information: first, by introducing the type of work contracts (fixed term or open-ended ones), a criteria that has become very cleaving on the French labor market; and also the matter of supervision, a criteria discussed in the context of the debate on constructing a European socio-occupational nomenclature. Again, Neuhaus's approach is relatively unusual among the other teams since, besides the profession, he insists almost exclusively on information pertaining to education and vocational training.

3.3 The Dissemination of Official Classifications: A French Peculiarity

A first set of these study results puts into perspective what early 1980s pioneers had brought forward regarding the role of PCS nomenclature as a language for the description of social world. Indeed, Schultheis and his colleagues insisted, in comparison with the French case, on the much greater diversity of names used by

the German players. While French respondents mainly mobilized PCS taxonomic vocabulary and collective agreements, German respondents expressed moral and behavioral judgments and denominations, or frequently referred to the school-level or the occupation of profiles shown on the cards. They conclude that, in Germany, the State, official statistics, and sociologists have not imposed nor disseminated a socio-professional nomenclature of the CSP type, so that individuals' capacity to name social differences with a unified vocabulary is much lower than in France. While that issue is not central to the Chilean team's concerns, it indirectly breaks at the surface of results. Here, too, the rankings and names given to groups do describe clear social differences which are perceived as such in society. However, the vocabulary mobilized to describe them is not unified and does not refer to concepts or categories disseminated by the State or intellectuals. They are often based on a moral lexicon and judgments about people's positions in the social hierarchy. For instance, poverty is explained away by poor willingness on individuals' part, while success and social mobility are also said to result from individual characteristics and effort.

Conversely, Chevillard's experiment emphasizes the penetration of logics underlying the official rankings of occupations in the French context. First, he shows that the "French" and the "Swiss" have significantly different classifying and naming ways. They boil down to each country's specificities regarding how the issue of social classes has been approached and the tools that have been developed in each country. In French respondents' results, groups like "*dirigeants*" (managers), "*cadres*," "*professions intellectuelles supérieures et libérales*" (upper and intellectual jobs and the professions), "*indépendants et artisans*" (self-employed and craftsmen) have been found and they refer as well to the world of "*ouvriers et employés peu qualifiés*" (low-skilled workers and employees), all proving quite close to the PCS nomenclature logic. If Swiss respondents' representations prove to be closer to a social stratification scale combining, in a one-dimensional way, the level of income and education¹⁰ (as for example the International Socio-Economic Index of Occupational Status), it is because the Swiss context has been impacted by the absence of a multidimensional model accepted by all, such as the French PCS. He then stressed that, for their part, frontier workers adopt classification and naming logics that are close to the other French respondents, i.e. close to the PCS perspective. Therefore, when respondents hold a job outside the national primary and secondary socialization context, it does not fundamentally alter their representa-

¹⁰ It should be noted, in connection with this finding, that there are no groups referring to socio-historical constructions backed by any form of institution whatsoever (PCS nomenclature, collective agreements or others). The groups made up by Swiss respondents do not bear the mark of identifiable criteria such as the notion of self-employed, director, executive, upper intellectual professions, or the professions.

tions of social positions. Hence, this finding underlines that official classification schemata of professions have been internalized by French citizens.

The French study complements that table with qualifications. It shows that respondents' general ranking structure is actually relatively close to the one found in PCS, especially as regards the gap between the self-employed and wage-earners and the distinction of social groups according to the logic of professional qualification (managers and higher intellectual profession, intermediate occupations, skilled and unskilled operating staff). In other words, while Boltanski and Thévenot insisted groups' names were closer to PCS far more so than their rankings, the results of the 2008 study indicate that rankings themselves are not unrelated, in France, to the official classification. However, they also show that studies have mobilized other ranking logics, namely occupation, employment contract, or academic qualifications.

Comparing these surveys is particularly interesting in the perspective of the sociology of statistics as Desrosières understands it. Indeed, it highlights the time or space variations in the links between the categories produced and disseminated by official institutions – public statistics particularly, or by legal authorities and/or intellectual (including sociologists) – and the perception categories lay people resort to about the social world.

Therefore, we can reveal the conditions under which statistical categories can emerge as formatting tools of the social world. The widespread use of PCS in the French context plays the role of a powerful inculcation and unification vector to impose a reading grid of social divisions, but to a lesser extent in other national contexts. The variable capacity of different countries' States to centralize data, to unify the production of statistical categories, and monopolize their dissemination gives more or less strength and "reality" to expert classifications in their ability to organize ordinary representations. It then becomes obvious that the political and institutional representation greatly impacts the very construction of social groups. The issue of the State and statistical categories was a pivotal one in Desrosières' early work (but also in Boltanski's and Thévenot's work); it is also deeply entrenched in his later work, especially when he tried to model the possible relation combinations between government forms and ways of using and processing statistics (Desrosières 1998).

3.4 Studies and Countries: Do they Bring about Differentiated Representations of Social Spaces?

Even if card games are not fully comparable across countries – and the comparison of results should therefore be conducted with caution – the various research teams' work reveal the plurality of forms of representation of the social world according to different national contexts or among individuals in the same country. This question was also pregnant in the work of Desrosières, who insisted that, besides official rankings, other worldviews are being deployed: "lay" peo-

ple's and unionists' (Desrosières and Thévenot 2002), or more generally, the outlooks constructed by social movements (the unemployed, precarious employees, artists and casual staff, etc.) who are challenging the representation forms of social issues as imposed by official categories. Focusing the study on these "other" forms of world representation, including through controversies and polemics (Desrosières 1998) then allows, firstly, highlighting the arbitrariness of "expert" categories, and secondly emphasizing the role of institutions – in Durkheim's sense of the word – which shore up social representations.

The Chilean study shows that, in a context where State intervention is limited – which erases the traditional European divide between state-owned and private establishments – and where economic disparities are very striking, the social world is essentially perceived one-dimensionally, because income and educational levels are particularly linked.¹¹ While Chevillard's work indicates that Swiss respondents are less prone than French ones to mobilizing a plurality of dimensions (and that the rankings they perform are closer, statistically, to a one-dimensional model corresponding for example to a social stratification scale), it is no less true that the classifications they operate are not strictly one-dimensional and hierarchical, as Dominique Joye and Fabio Lorenzi-Cioldi's work (1988) had already shown.

Finally, the French study shows how ordinary representations of the social space are based on multiple dimensions, sometimes mutually orthogonal. Thus the distinction between the top and bottom of the social space is articulated with other range of opposites: the divide between public and private employers or differentiations depending on the nature of the work to be done – for example the distinction between white collar clerical workers and blue-collar technical ones. Now, the investigation goes further: from a hierarchical clustering, it typifies respondents' logical categorization. This technique makes it possible to distinguish four main ones: according to the degrees written on the cards (10% of respondents), to the employment contract (10%), to the nature of the activity (40%), to qualifications and between the self-employed and employees (40%). The statistical results can account all at once for the high heterogeneity of classifying ways – very few respondents produce exactly the same rankings – but at the same time for similar logics that result in some areas of the social space being identified in a clearer and more consensual way (civil servants, employers and the self-employed, the low-skilled) while others are more blurred (intermediate occupations). Thus, compared to the findings in pioneering investigations, they insist that the diversity of rankings does not prevent shared ranking logics of the social space from being internalized.

¹¹ We must also consider this team was the only one that had included income in the information provided on the cards.

3.5 Respondents' Ordinary Representations and Social Characteristic Features

These representations of social space thus differ depending on the content of studies, on national contexts in connection with the socio-historical construction of social groups and work institutions – but also in terms of respondents' social characteristic features. For example, the pioneers would emphasize that social differences among respondents weighed heavily on their ways of naming groups: those most endowed with cultural capital most readily endorse official categories.

In the Chilean context, class position also seems to weigh on the rankings and names given to groups. Players belonging to the most affluent classes carry out the task of classifying cards in a multidimensional way, and manage to establish a multidimensional representation of society while the lower classes do it one-dimensionally, by mobilizing education levels – a highly valued resource in terms of mobility in Chilean society. On the contrary, these distinctions are less noticeable in the French study. Rather, they suggest that changes in classification logics are not very sensitive to differences in class position, even though they do point out the young and the working classes are less likely than managers or professionals and the more educated to adopt rankings based on the hierarchy of qualifications or degrees: the former are more prone to conduct their rankings according to the nature of the activities performed. The rudimentary nature of the tested social determinants (gender, age, educational level, and PCS) probably helps explain the difficulty to highlight these differences, which should be assessed in connection with social backgrounds and career paths.

In his own investigation, Lukas Neuhaus goes more deeply into that latter dimension: he crosses categorization logics with professional socialization or more specifically what he dubs “professional dilemmas” in which individuals are caught up, especially regarding women teachers and architect-engineers. This focus on specific jobs that are highly structured around specific professional practices and ways of thinking brings out the logics found in each of these distinct categorizations.

Women teachers implement two structuring logics: they make a distinction between concrete-bodily work and diffuse-intellectual work, as well as between “narrow” thought and “broad” thought, which in fact corresponds to an opposition between those with a highly specialized profession (medical practitioners, for example) and those with a low-skilled job (manual workers, among others). The logics they use to construct their rankings remind us of the main problem they have to deal with: the vocational orientation of students and their selection. The surveyed teachers set great store by manual trades, distributed into distinct groups, because they seek to enhance these jobs relatively to intellectual and more skilled trades, because their students cannot necessarily aim for the

latter. They also classify teachers not among diffuse-intellectual professions but in a group they entitled “social professions.”

Rankings by engineers and architects pertain to three clearly antagonistic perceptions: productive vs. unproductive occupations, creative professions vs. routine occupations and trades that rely on practical operations as opposed to those based on theory or abstraction. Again, these oppositions arise based on these engineers and architects’ “professional dilemmas”: some aspects of the categorizations they implement do not depend on their environments or their career paths but clearly on the way their professional practice is organized. They reflect a functionalist and organic vision of society.

This approach seeks to understand how forms of representation of the social space in relation with social origins and class position or to career paths and professional socialization are a reminder of what Desrosières and colleagues had – at the beginning of their careers – mischievously pointed out about statisticians: the eye-glasses that are used to see and interpret the social world are not independent from the forms of affiliation and socialization specific to individuals who wear them.

4. Conclusion

Framing the uses of an experimental study about ordinary categorizations of the social space in historical and comparative perspectives brings out the importance of this type of device for issues pertaining to categorization practices. While the sociology of quantification has shown great interest in the conditions data and statistical categories are produced, this device permits the analysis of the penetration of official categories in the ordinary representations of societies, an issue originally raised by Alain Desrosières in his work on CSP. This anchoring, we then realize, is different depending on the weight of State intervention in the centralization and dissemination of these categories. The singularity of the French case, marked by a public statistical system that has managed to monopolize the production and dissemination of the social world description-categories, stands out from what is happening in countries such as Switzerland, Germany, and Chile, where these categories are less unified under the aegis of the State. However, the State’s symbolic power does not impact all levels of categorization practices in the same way. In the early 1980s in France, it has mostly colonized the vocabulary and expressions mobilized to describe social hierarchies but it seems less able to account for respondents’ classification practices. Does it play no part on these, for all that? The 2008 French study and Julien Chevillard’s investigations indicate that some classification schemata in connection with PCS have been internalized by French respondents, whether they work in France or Switzerland.

The particular weight of public statistics in the inculcation of these representations should probably not be overestimated, though. Indeed, PCS has a particular feature in that it is partly rooted in the working-world legal and labor institutions. French workers are actually socialized to these categories in their social and professional environment, which is less the case in countries where statistical classifications do not lean, or less directly so, on labor institutions that are so pervasively present and unified at the national level. In all cases, what is at stake is institutions' capability of shaping the representations of the social space.

The use of these devices raises questions, more broadly, about the cognitive mechanisms at play when categorizing social space. Transversely, the rankings that have been made, though they were produced from substantially different card games in various countries, describe societies represented with hierarchical structures. But they also point to significant variations depending on what information is available on cards, on national configurations and respondents' dispositions. In other words, social rankings and their designations are determined by the relationship that develops between individuals' socialization and a study protocol, conventions or understandable and recognizable institutions in a particular political and social space of reference. Putting surveys back in their context of production, carrying out the sociology and history of the categories designed to understand and describe social world, and being attentive to changes in various individuals' viewpoints on reality: these are precisely a few of the key sociological principles bestowed to us in Alain Desrosières' legacy.

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The Three Ages of Financial Quantification: A Conventionalist Approach to the Financiers' Metrology

*Eve Chiapello & Christian Walter**

Abstract: *»Die drei Perioden der finanztechnischen Quantifizierung: ein konventionentheoretischer Ansatz zur Analyse der finanztechnischen Metrologie«.* This article presents a conventionalist interpretation of the financialization of the economy. We define three periods, each one associated with conventional calculation systems that may shape investment decisions. Each of these periods begins with the adoption by financial practitioners of a new "convention" to make investment decisions: the actuarial convention at the end of the 19th century, the mean-variance convention during the 1970s, and the market-consistent convention since the 1990s. These conventions are rooted in finance theory developments and are associated with different financing circuits for economic activity. When a new convention arises, it does not mean the disappearance of the old one, which can still be used by some practitioners for certain given matters, but it can also redefine some financial professions by fragmenting them according to the convention followed, and it can finally also give rise to new professions.

Keywords: Financialization, finance theory, quantification, quantification conventions.

1. Introduction

There are many different ways to describe the process of the financialization of the economy that has now been spreading for some thirty years: the financial markets' growing influence in economic and financial regulation of investments, the dematerialization of markets that has made global interoperability possible, the gradual decompartmentalization of banking and insurance activities, banking disintermediation, the unfettered inventiveness of financial engineering, the growing importance of financial activities in developed nations?

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GDP, etc. This financialization process, which is redefining whole sectors of the economy and transforming business operation logics as well as public policies, carries with it conceptions of the world, methods of problem analysis, calculation techniques, and decision-making principles which were originally forged for a limited number of special cases, but are now tending to spread to all questions and human activities. Structures for reasoning, representation and calculation drawn from finance can apparently be applied to and redefine all spheres of existence (Chiapello 2015).

This last aspect is the focus of this article, which proposes to define the interplay between the quantification conventions that underpin the development of finance. There has been extensive research in economic sociology to advance understanding of the forms of calculation used in the financial sector, particularly as they are considered determinant in market construction since they facilitate construction of agreement on prices. Financial theory is now seen, according to the title of Donald MacKenzie's book, as "an engine, not a camera" (2006). This stream of research considers financiers' work from the angle of the models they use, and often combines a subtle intellectual history of financial theory with the story of how a given model came to be adopted by financial actors.

Given that it is impossible to propose equally fine-grained historical research in a short article, our approach will be different, and can be summed up as "conventionalist." We consider that quantification systems have a history, and that it is possible to sketch out that history by identifying some major turning points in the conception of the phenomena we seek to model and understand. We propose to explain the history of financial modelling by introducing three main conventions which appeared successively in the financial field. After presenting our approach, we describe the three conventions, and then we outline some features of the periods they delimit.

2. Approach and Definitions

2.1 Associating Periods of History and Forms of Calculation

Following the approach taken in several works of research, this article rests on the idea that a connection can be established between changes in quantification systems and more general changes in the economic sphere.

Desrosières analyzes the relationships between conceptualizations of the State's role in economic affairs and certain statistical tools. He presents five "typical historical configurations" (the engineering state that is also a state administered by engineers, the liberal state, the welfare state, the Keynesian state, and the neo-liberal state) that are "not meant to describe successive stages in a histori-

cal progression, nor are they historically or logically exclusive. In concrete historical situations, they are often mixed together” (Desrosières 2003, 554).

Each one of these typical configurations is associated with a group of statistical practices. For example, since the very idea of the welfare state is based on the notion of insurance, it requires “statistical calculations of probabilities of the various events described by new labour statistics” (Desrosières 2003, 560), and the Keynesian state needs “national accounting tables and statistical series describing the relations among various components of supply and demand” (Desrosières 2003, 560).

Our perspective is also similar in some respects to the viewpoint discussed by Bryer (2000), who argues that it is possible to refer to accounting practices to differentiate between feudal, capitalistic, and capitalist mentalities. The types of calculation performed by entrepreneurs in different historical settings function as an “accounting signature” for the stage of the economy. Berland and Chiapello (2009) also proposed referring to accounting practices as a way to date the various stages of capitalism in different institutional and historical settings. In the same vein, we propose to show the relationship between types of financial calculus and the stages in financialization of the economy.

2.2 The Three Stages of Financialization

The idea of financialization is understood here in a fairly broad sense, designating the use of financial criteria by economic actors to make their investment decisions. Such decisions – to invest in a business sector or purchase an asset – can be based on calculation of a return on investment, which is a financial criterion, or on other considerations (herd behavior, habit, empathy with the seller, etc.). From the history of financial techniques, we identify three major ways of seeing investment in financial terms, associated with the three major groups of calculative techniques. These three calculative architectures share a common view: The return on investment (ROI) is what matters most.

The oldest configuration was linked to the calculation of discounted cash flows (DCF). This calculation method consists of forecasting the future economic flows that will be generated by the investment, and applying a discount to those flows to bring them to present value.

Financial reasoning then underwent a substantial transformation with the introduction of the mean-variance criterion in the 1950s. Under this criterion, the first two moments of the laws of probability (mathematical expectation and variance), which were previously simply measured statistically to describe financial variables, were used directly as parameters of theoretical models. Mathematical expectation and variance did not make their first appearance in the 1950s; they changed status, reproducing for finance the “probabilistic revolution” of 1930s’ econometrics (Krüger et al. 1987a, 1987b; Desrosières 1998). Starting from the 1950s, these two quantities concerned not only typical values

of the financial variables observed, but also the theoretical law of unobservable variables. The mean-variance criterion would lead to models of portfolio selection and reasoning combining measures of risk (volatility) with measures of return (mathematical expectation of return).¹

The discount rate, which, in the first configuration, essentially related to what could be earned on money if it was deposited with a bank instead of being invested, was modified and now incorporated a risk premium related to the specific investment. Analysis of the behavior of stock market prices led to statistical estimates for probabilistic modelling (initially designed for a single period), assuming that successive returns are independent and stationary and thus that past statistics will give a good sample for modelling the future.

Finally, in the most recent period, investments are always considered in the light of indications given by the markets, because the markets are constantly producing information on the relative values of a certain number of standard investments, i.e. on the price other investors would be willing to pay. The key point for valuing investments has thus become the active design of efficient markets – in accordance with neo-liberal ambitions – so that they can produce the required figures (in other words, market prices). The aim is no longer to discount expected future cash flows to obtain a present value, but quite the reverse: to take the present values observed on the markets, and to deduce from them all the expected returns on possible investments. As all values for all assets must be consistent with existing market prices, financial models are now used to value investments that have no market price in the same way as investments that do have a market price. These valuations are said to be “market-consistent.” They are actually “model-based valuations,” whose basic tool is risk-neutral mathematics (see below).

We thus argue that three major conventions of financial quantification have arisen in a superimposed succession, progressively overlapping: the “discounting convention” (whose base form is traditional actuarial discounting, the key object of which is the actuarial rate), the “mean-variance convention” (based on the probabilistic revolution, initially in the form of the mean-variance criterion, the key object of which is the optimization technique), and finally the “market-consistent convention” (whose mathematical expression evolved from the first efficient market hypothesis (EMH) in Fama’s definition of the 1960s to the no-arbitrage assumption in the 1980s). The arrival of a new “quantification convention” heralds the start of a new period, a new stage of financialization, although the old convention is not totally replaced: the new convention adds to the previ-

¹ This mean-variance criterion, coupled with the second law of errors (Laplace-Gauss) and Sharpe’s common cause of market fluctuations were the drivers behind the rebirth of Quetelet’s average man in the asset management industry (Walter 1996, 2002). The benchmark issues (see below) are closely related to Quetelet’s view of the average man, here replaced by the average portfolio (Walter 2005a).

ous forms and merges with them to form hybrids. The story of quantification in finance can thus be told as a gradual complexification of models, as new conventions spring up to enhance and displace previous quantification systems.

This simplification of history offers two advantages. Like any ideal-type construction, it proposes analytical tools to understand specific situations (the history of a profession, a market, a firm, etc.) by reference to the three conventions identified. It also proposes an overall interpretation of the general development through identification of phases.

This means that these three major conventions, being constructed to help us outline a history, are informed mainly by finance's mainstream or dominant ideas. By dominant, we mean ideas that have been adopted by so many actors that they have completely changed financial practices, professions, and regulations. We do not claim that the three conventions take into account all the debates on financial theory or all actual practices in the financial sector, but they do concern the most popular ideas and practices. In each period of time, the conventions were challenged and discussed. But when conventionalist researchers talk about "conventions," they often mean conventions that provide a good understanding of the collective operation of a particular sector (or sub-sector) of activity (Eymard-Duvernay 1989; Storper and Salais 1997). We now look more closely at what we mean by financial quantification conventions.

2.3 Financial Quantification Conventions

The financial valuation of an "object" (an investment such as equity, a debt such as a bond, or other objects) involves a large number of operations and several choices. Using the DCF method, for instance, requires selection of a time horizon, sequencing periods and the year of terminal value (which often accounts for 70% of the present value), definition of the number of periods to take into consideration and projections of the economic and financial variables associated with each period, and with each economic scenario to produce an estimate of future cash flows, selection of a discount rate, by maturity or otherwise, estimation of the price of the risk associated with the object (for example market risk, credit risk, default risk, etc.). An extremely large number of choices must be made. These choices are not what we refer to here in the concept of the "quantification convention." A quantification convention is more like a meta-convention: its name covers a configuration or a coherent set of operations both cognitive and normative, including selection of the items to take into account, relevant judgement criteria, choices of mathematical schemas, etc. Every quantification convention has an epistemic, a pragmatic and a political dimension (Chiapello and Gilbert forthcoming).

Every financial quantification convention is first built on a set of *assumptions regarding what makes the value of an investment*, an asset or a good. These assumptions are used to assess the benefit and determine the decision of

whether or not to invest (buy or sell the asset), or simply to manage the financial risk prudently by setting aside a provision to cover its value. Since things are always seen in terms of return on investment, financial valuation seeks to grasp a future which, by definition, is uncertain because it has not yet happened. It therefore requires *assumptions concerning what “shape” of uncertainty the future will take*, which is in practice an assumption regarding the distribution of financial and economic variables. Also required is a *selection of relevant predictive factors* drawn from today’s world that can be used to construct a decision, i.e. selection of what is true. Finally, it is associated with *specific forms, calculations and mathematical models* which somewhat operationalize these choices into a calculable form that, according to Walter (2005b), could be called the “formal cause” of value, by reference to Aristotle’s causality model,² as opposed to economic and financial information that are taken to represent the “raw material” of value, its “material cause.” All these factors relate to the *epistemic dimension* of the quantification convention, as it produces knowledge about things by looking at them from a financial investor’s standpoint, and seeks to state certain truths about them.

Every quantification convention also contains a *pragmatic dimension*: it makes certain actions possible, especially trade and arbitrage, as demonstrated by many studies on the economics of convention (Eymard-Duvernay 2006a, 2006b) and the sociology of market devices (Callon et al. 2007). Each convention enables actors – not necessarily the same actors for each convention, additionally conferring a *political dimension*. Through coordinated or uncoordinated action by these professionals, value can emerge. In this respect, the pragmatic dimension of the convention can be analyzed as the “efficient cause” of value. The arrival of a new convention enables the growth of certain practices, reconfigurations of some professions, and splits in others. As a result each conventional period is associated with its own breakaway changes in the form of new practices, changes in professions, and shifts in the power struggles between actors, or what MacKenzie and Spears (2014) would name an “evaluation culture.”

The concept of the convention also suggests that several conventions are possible. To begin with, the financial conventions studied here only equip a specific way of valuing things from a financial investor’s point of view. The financial investor sees everything as a capital good or asset, in other words something that will bring him a return. The value of the thing is thus bound up with its expected returns. Of course, this is a very specific way of assigning

² Aristotle identifies four types of cause: the material cause (the material that forms a thing: where does a thing come from and what is it made of?), the formal cause (the essence of the thing: what is its form or the model it is imitating?), the efficient cause or cause of change (whatever produces, destroys or modifies the thing), and the final cause (whatever the thing is “for”). Conceptually, the formal cause is expressed in the logos (definition) and in this sense, the mathematical form of the quantification refers to the idea of valuation, termed the “financial logos” (Walter 2011).

value to things, and it can conflict with other values: affective values, artistic values, etc. We suggest furthermore that there are several ways of looking at things as an investor, several forms of financial valuation itself. This means there are potential debates over values not only between financial valuation and non-financial valuation, but also involving different financial valuations, mostly promoted by different actors. Divergences on the question of financial value thus also reflect ethical divergences, because the instruments used for valuation are not axiologically neutral.

2.4 Financial Quantification Conventions and Capitalism

The financial investors' view is a capitalistic view in the narrowest sense of the term. If we consider like Marx (1867) that capitalism follows an M-C-M (Money-Commodity-Money) cycle and money is only invested in business in order to make more money, then financial quantification conventions underlie the capitalistic judgement that things are there to increase their owner's wealth. But these conventions also tell us about the way we decide, at different points of capitalism, to contribute funds to an activity, in other words to finance it. One of our hypotheses, then, is that every conventional era is associated with specific forms of financing for economic activity. These points will be developed further, after a more thorough presentation of the three conventions.

3. The Three Ages of Financial Quantification

It is possible to consider three periods in turn, showing how the expected return on investment and the related uncertainties are perceived. In particular, we first suggest that the discount rate invented by the first convention was transformed by the arrival of the following conventions. We now look more closely at this point.

3.1 The Transformations of Discounting

With the first financial quantification convention, the "actuarial discounting convention," present value is determined through a simple calculation: known cash flows were discounted to present value using a constant interest rate. Both the numerators (cash flows) and the discount factor (the inverse of the discount rate) are *deterministic*, in other words it is considered that there is no uncertainty affecting future cash flows or the discount rate. The discount rate used introduces into financial valuation a powerful simplification that is not obvious in itself: the same rate is used for all maturities of cash flows, such that the remuneration on money is considered identical for every maturity, whether one day

or one year. In other words, the yield curve is flat.³ This indicates that we have to be very careful when using this deterministic model. And finally, while a certain idea of risk is empirically taken into account by the choice of a higher or lower discount rate, that risk is not based on statistical calculation. These factors and others illustrate the numerous difficulties attached to this very simple deterministic model of valuation.

These are points that change with the second convention of financial quantification. In the “mean-variance convention,” the risk is defined by the variance (or its square root, the standard deviation).⁴ As a result of this convention, the level of risk premium is determined using the Capital Asset Pricing Model (CAPM) devised by Sharpe (1964). This model gives the risk premium level (using the linear relationship of the beta coefficient). In this quantification convention, the discount factor becomes *variable*, as it depends on the beta coefficient, but is not random.⁵ This second convention introduces a new and extremely important idea: the relevant discount rate for calculating a present value is related to the rate of return on a specific portfolio known as the “MV-optimal tangent” portfolio; this portfolio has been considered equivalent to the “market” since the seminal paper by Sharpe, and this “market” needs a proxy representation in order to apply this theoretical research to make practical real-life decisions. Serving as proxies is precisely the function of market indexes (such as the Dow Jones Industrial Average indexes). Apart from the technicity of this change, the new development is that financial valuation is now associated with market equilibrium. In the second quantification convention, valuation of any item requires a mean-variance (MV)-optimal tangent portfolio, which in practice means actors must keep up with an index. And conversely, any MV-optimal tangent portfolio (or market index) becomes a possible instrument for asset valuation.

The third financial quantification convention, the “market-consistent convention,” extends this idea. The discount factor, which in the second convention only varied with the investments studied (i.e. the risk specific to each one, measured by the beta), has now become random. “Stochastic discounting” replaces traditional discounting, whether the rate used is given (with the first convention) or results from an equilibrium model such as the CAPM (in the second convention). The stochastic discount factor is termed the “deflator,” just as a traditional operation deflates nominal values to real values.

³ The yield curve shows the relationship between the interest rate and the time to maturity.

⁴ We do not address the debates on the morphology of uncertainty here, but it should be remembered that the two views in competition are continuity (Brownian representation) and discontinuity (other representations). In the case of continuity, the risk is reduced to the variance. In other cases, it is necessary to complement variance with the other moments of the distributions if they exist, which is not always the case.

⁵ A random variable is a variable whose values depend on “events” or “possible states of the world,” for example the face on which a die lands depends on the event “face that lands after the throw.”

Table 1: The Three Ages of the Discount Factor

Convention	Characteristic of the Discount Factor
1	constant
2	variable but non-random
3	stochastic

The third financial quantification convention completely reshapes financial theory, with its cornerstone concept of “absence of arbitrage opportunity” (see below) in an arbitrage-free market. With this extremely strong concept, valuations of investments become “market-consistent” and pave the way for extended use of “fair market value” (FMV) as defined by international accounting standards.

3.2 The Third Convention

The intellectual cornerstone of the dominant contemporary financial approaches which we term the third quantification convention is the “absence of arbitrage opportunity” (AOA) principle in a complete market. Based on the pioneering mathematical results of Harrison and Kreps (1979) and Harrison and Pliska (1981) under the AOA assumption,⁶ mathematical finance has come to consider it possible to extract expected returns on investments from market prices. In these conditions, market prices are considered the perfect measure of discounted expected cash flows and can be used to “reveal” an underlying risk-neutral probability measure, unique all tradable securities, uncertainty being governed by what Mandelbrot termed “mild” randomness (i.e. fully describable by price volatility alone).⁷

To go from market prices to expected returns, assumptions must be made about the rate of return. In this approach, the risk-free rate of return is used as the expected rate of return for investors. Changing the discount rate is equivalent to changing the numeraire of the asset (a little like an exchange rate can be used to express a value in a different currency). But this change also means that real-world probabilities are replaced by a new probability termed the “risk-neutral probability.”⁸ For calculative purposes the “new finance” has imagined

⁶ Followed by Delbaen and Schachermayer’s fundamental theorem of asset pricing (1994).

⁷ This is typically the case of the Brownian representation embedded in the main financial models of mainstream mathematical finance, reflecting the persistent central role of Brownian motion in finance across the 20th century. Mild randomness is required to obtain a unique risk-neutral measure under the no-arbitrage condition. In the presence of jumps (discontinuous or “wild” randomness) a single risk-neutral measure is difficult to derive because the market becomes incomplete, and the further we move from the Brownian-based representation of risk, the weaker the AOA framework becomes. Ultimately, in a purely discontinuous non-Brownian uncertainty framework, the AOA framework fails.

⁸ As MacKenzie and Spears (2014, 400) explain: “Those probabilities are simultaneously less real and more real than actual probabilities: less real, in that they do not correspond to the

a new world, the risk-neutral world, in which all invested assets are assumed to provide the same expected rate of return, namely the risk-free rate, regardless of the risk of each specific asset. This purely mathematical transformation certainly has major financial virtues. Notably, it neutralizes a form of variability in the discount rate, which now becomes the same for all assets, risky or otherwise, a situation that was impossible under the first and second conventions.

This no-arbitrage theory has played a central role in finance. It is amazing how much can be deduced from this one simple financial assumption. Practitioners in various sectors of finance have subscribed to this assumption to be able to use this new “risk-neutral” technology, which has paved the way for the total financialization of the global economy. The powerful elegance of the “no arbitrage-mild randomness” representation for market-consistent valuation is a major development which has profoundly transformed financial practices over the last thirty years.

One of the counterintuitive consequences of this new framework is the disappearance of risk for management purposes. The mathematicians of finance, basing their work on assumptions of an idealized market with a mild randomness representation of uncertainty, have shown that for any fixed amount at a given maturity (payment of an insurance claim, a guaranteed amount, etc.), it is possible to entirely tame risk, whatever the degree to which the risk on the relevant phenomenon (financial market, real economy, demographics, climate change, etc.) materializes, because of the type of randomness chosen. Practical application of these ideas to build financial models – which will then be used to value assets and make decisions – requires construction of what is termed a “replicating portfolio.”

The replicating portfolio is a portfolio which shares the same properties as the asset it replicates (e.g. series of cash flows or terminal value). The replication technique can be used to hedge or value any type of asset, especially derivatives.⁹ This breakthrough in mathematical financial techniques paved the way for an invasion of the “real” economy by derivatives. The pillar of this technique needs “market-consistent” valuation, whose visible mathematical trace is the risk-neutral probability.

actual probabilities of events; more real in the sense that (at least in finance) those actual probabilities cannot be determined, while martingale or risk-neutral probabilities can be calculated from empirical data, today's market prices.”

⁹ The replicating portfolio technique was already fundamental to the Black-Scholes-Merton model, which facilitated the rise of the options market (MacKenzie and Millo 1973), and as noted by several authors, the risk-neutral approach was in fact implicit in the Black-Scholes model (1973), but not yet expressed specifically as a new probability. As MacKenzie and Spears (2014, 401) put it: “It is the strategy of Black-Scholes modelling writ large: find a perfect hedge, a continuously-adjusted portfolio of more basic securities that will have the same payoff as the derivative, whatever happens to the price of the underlying asset or assets; use that portfolio to hedge the derivative; and use the cost of the hedge as a guide to the price of the derivative.”

Let us summarize our point. While the key operational concept of the 1960s was the mean-variance (MV) optimal portfolio, leading to implementation of risk-return analysis in the asset management industry, the key operational concept of the 1980s was this new idea of replication with no-arbitrage, leading to implementation of risk-neutral analysis in the derivatives industry. Given the importance of the risk-neutral property of arbitrated prices, for instance to calculate the present value of any asset with a market-consistent framework, this feature can be considered as both the cornerstone and the mark of the third quantification convention.

The change in quantification convention is, as just seen, always supported by developments in financial theory, particularly the invention of new mathematical models which make all sorts of values calculable because they are founded on very restrictive assumptions. The first convention is rooted in calculation of DCF, which proposes a mathematical form that can make very different investments commensurable: all are treated as sums paid out with a view to receiving monetarily quantified returns in the future. The second is based on a reduction of the universe of investments under the two criteria of mean (the return) and variance (volatility as a measure of risk) which makes portfolio management models possible. Finally, the third convention is built on a new mathematical expression that has facilitated the rise of derivatives.

These mathematical models have been introduced into management instruments that govern financial decisions and help to shape professional practices. In each period, it is the models with the most easily-handled mathematical forms that are incorporated into calculation systems and accompany the transformation in the professions of finance. The most reassuring branches of finance, because they are the most readily translatable into calculation machines, are the ones that have spread to the point of becoming the dominant forms.

New professions have arisen while others have been changed. Practices previously considered highly risky because they involved a kind of gambling have seen particularly impressive expansion since the new calculation methods appeared to make them calculable and optimizable, and therefore controllable and manageable. Advances in modelling, combined with the increasingly massive collection of data and rising calculation capacities, mean that in finance, as elsewhere, people are able to undertake actions every day that used to be considered risky or impossible. It is very similar to what has happened in the transport sector, for instance: the speed and number of vehicles on the move has been increased on the grounds that vehicles of all types are safer than ever and their trajectories are easier to calculate and control. Of course, the limits of such a comparison are that the test of real-life application that validates financial models is not of the same nature, and the economic models generally show

low robustness.¹⁰ We will now see how each convention can be associated with practices, professions and points of time in capitalism.

4. Of Conventions and Men

4.1 The Actuarial Convention and Direct Circuits for Financing Investments

Doganova (2014) describes the adoption of the actuarial convention by forest managers in the late 19th century. This type of mathematical calculation, although it has long been expressed mathematically, was only used in the economic world for specific, well-defined objects: the estimation of financial annuities that could be paid out and calculations by certain life insurers (even though many were still operating on speculative models) (Bühlmann and Lengwiler forthcoming). Actuarial calculation was not used for other types of investments, in which an amount was also paid out, but to plant trees or acquire shares in a company rather than to buy an annuity. Its extension to other investment objects through the use of analogy was a key moment, and can be analyzed as a point in the financialization of capitalism that was also a moment of rationalization of the investment decision through more sophisticated calculation: not content with simply ensuring that the investor would regain his initial outlay with a surplus, calculation of DCF began to take into consideration the fact that the money could be invested elsewhere and generate different amounts at different maturities. Doganova (2014) explains that the actuarial view of the forest was constantly comparing the money that could be made from cutting down the trees today and then deposited in in an interest-bearing account, with the money remaining “invested” in the forest for conversion into cash at a later date. DCF calculations facilitate a comparison that appears rational because it can calculate different investments and thus opens up the way to arbitrage.

As far as professional practices are concerned, DCF allows comparison between pairs of investment opportunities and this makes it useful to investors who choose their investments one at a time. The decision to provide finance is made by looking at an opportunity’s potential. Today, according to the finance textbooks and in professional practice, ad hoc analysis of investments still involves estimating the monetary flows (cash inflows and outflows) associated with an investment, and then subjecting them to actuarial calculation to assess how attractive a prospect they are. The fund managers in private equity funds (in-

¹⁰ Financial calculation software does not appear to be subject to the same requirements as other technical innovations before they are put on the market. For example, the assumptions of continuity used in the Brownian representation of risk were not tested, even though they were dangerous (Mandelbrot 1963).

vestment funds, venture capital funds,¹¹ real estate management companies, etc.) follow this reasoning: they establish scenarios and construct business plans when studying potential acquisitions. The managers of start-up companies do the same, trying to raise funds by presenting the same type of calculative argument to investors. Bankers making traditional loans also look at the same factors: Will the investment to be funded be profitable enough to repay the loan? Finally, in large organizations, firms, and States, Net Present Value calculations have also become a required step in all investment projects. The gradual spread of these practices to business managers (Pezet 1997) and top civil servants in charge of major public investments (Miller 1991) can be dated back to the 1960s.

What all these investment practices have in common is a strong connection between the financial circuit and what is sometimes called the real economy: the investor is aware that he is investing money in an activity and a business, and that the money invested soon loses its form as “money” even though the actuarial calculation tends to disregard this and focus solely on monetary flows. The actuarial convention of financial quantification in fact translates investment requirements into financial language and oils the economy’s financing channels. These channels involve direct investment by individuals, firms, and States putting their savings or their surplus funds into projects directly or via banking intermediation (the banker collects deposits and makes loans for concrete projects). The provider of funds is aware that the investment he is making has low liquidity and will be difficult to withdraw from. As he bears the risk, he needs to conduct *ad hoc* analyses for every investment made.

During the first period, which we associate with the first convention, the financial markets (which represent a different financing channel from the self-financing and credit-financing channels) were of course in existence, and were even very large in certain countries at certain times (Obstfeld and Taylor 2002). But the patterns of reasoning used by their practitioners, who traded on stock exchanges and managed securities portfolios, were embedded in the first convention. Their professional approach can be found for example in the famous textbook “The Theory of Investment Value” (Williams 1938), that was used to train generations of financial analysts. This relates to the first convention, as the idea is to evaluate the discounted cash flows of a given security, and forecast the movements in an individual stock price, or predict overall stock market movements. This is still the basis of “fundamental analysis” which consists in forming a projection of future cash flows and “fundamental prediction” which consists in forming scenarios of future events.

These stock exchange professionals were the central actors of the second period, as the second convention not only produced a revolution in their standard

¹¹ France has venture capital funds called “FCPR” (*Fonds commun de placement à risques*), which are investment vehicles designed for investments in private equity.

practices, but was also instrumental in the rise of their professions, as we shall now see.

4.2 The Mean-Variance Convention and Disintermediated Financing

The new convention proposed a portfolio-based reasoning. In fact, Markowitz (1952, 1959) rigorously justified the concept of diversification, and demonstrated that any investor should consider not only the individual assets, searching for any theoretical under-evaluation, but the portfolio as a whole, with its total risk and total return, i.e. the overall trade-off between risk and return. The second convention gave birth to what is called the “quantitative approach to investment management” which is based upon statistical-probabilistic principles, and uses rational analysis to construct portfolios.

This convention accompanied the rise of institutional investors (particularly pension funds) in corporate financing. This rise is usually associated with the financialization process that began in the 1970s and went hand-in-hand with banking disintermediation. Funds came to be raised less through bank debt and more by issuance of securities (shares and bonds) on the financial markets. This financing channel, which had then gained importance, is generally marked by the existence of financial intermediaries who do not invest directly in projects, but buy liquid securities on a stock market. Except at the time of issuance, the money invested does not actually go to the firms being financed. Most monetary exchanges take place between professional financial actors, and the financial markets are mainly resale markets, secondary markets, not to say speculative markets.¹²

With this second period, trade in securities directly involving individuals which were still important in the first period became a very small part of the market: individuals were now putting their savings into funds that took charge of investing them for profit on their behalf. As for the companies that used the markets for financing, they had to monitor the secondary market for their securities if they wanted to raise further funds or avoid changing owner. Ultimately, the transformation of financing modes over this period was accompanied by a drastic change in governance in the name of shareholder value, as has been so

¹² In fact, Kaldor's definition is fully aligned with these practices: “Speculation [...], may be defined as the purchase (or sale) of goods with a view to re-sale (re-purchase) at a later date, where the motive behind such action is the expectation of a change in the relevant prices relatively to the ruling price and not a gain accruing through their use, or any kind of transformation effected in them or their transfer between different markets. Thus, while merchants and other dealers do make purchases and sales which might be termed 'speculative,' their ordinary transactions do not fall within this category” (Kaldor 1939, 1).

extensively described in the literature (Aglietta and Rébérioux 2005; Fligstein 1990, 2001).

Portfolio management models paved the way for a new professional figure and new professional practices, although their integration into the world of portfolio managers had its difficulties. After several years of confinement inside the academic world, portfolio theory began to enter the professional field at the beginning of the seventies, thanks to the simplification of the necessary calculations implemented by Sharpe in 1963. The mathematical complexity of the calculations was reduced so that it became possible to implement the simple linear formula of Sharpe's CAPM model. But even then, as noted by many professional investment managers, among them Andrew Rudd, "unfortunately, the computational requirements were too burdensome for the approach to be implemented on a large scale until the mid-70s" (Rudd 1989, 20).

Nevertheless, even after all these operational problems had been overcome, some asset managers decided to stick to practices we associate with the first convention, emphasizing active management, stock picking, and buy-and-hold practices, as opposed to passive or index-linked management, the watchword being: "don't tell me about indexation" (Walter 1996, 2002). The radically new and relatively provocative intellectual construction of the new quantitative way of managing funds ran counter to the traditional practices of professional asset managers, financial experts and technical analysts, who considered it possible to outperform or "beat the market" through detection of underpriced securities by traditional first-convention-based methods.

Table 2 shows how the asset management industry has evolved. Chronologically, the history of this industry began with stock selection practices that did not involve any probabilistic risk modelling: this is the "traditional" or "qualitative" conception of management, as opposed to use of probabilistic models. It was a "bottom-up" approach, where what counts is close examination of each target investment rather than an overall by-sector or by-geographical area approach, which is called "top-down." Then, from the 1960s, under the influence of Markowitz and Sharpe, the "quantitative" approach of asset management emerged. As previously remarked, a small minority of actors in the portfolio management industry refused to adopt these quantitative practices using index-linked funds and maintained a "counter-culture" of asset management called "alternative asset management," but this minority still lived in a world produced by the second convention (through the calculation software and financial bases they used, or through the applicable professional standards).

This professional revolution supported by the second convention was inseparable from the speedy growth in volumes traded on the markets. In countries that opted for a funded pension system, the apparent security of new, financial theory-based professional models led public policies to encourage the emergence of new financial actors. In the US, for instance, the 1974 Employee Retirement Income Security Act (ERISA) law triggered a general transfer of

pension fund management from their traditional managers (corporate management and unions) to finance professionals (Montagne 2006, 2012).

Table 2: The Asset Management Industry and Financial Quantification Conventions

Financial Quantification Convention	"Bottom-Up" Investment Process	"Top-Down" Investment Process
<i>First convention: actuarial, with no risk modelling "Qualitative" approach to portfolio management</i>	<i>Dominant approach in the first period</i> Traditional management, seeking out underpriced securities using DCF and criteria such as "fundamental analysis" with no consideration of risk parameters	
<i>Second convention: probabilistic risk modelling. "Quantitative" approach to portfolio management</i>	<i>Minority approach ("alternative" management methods)</i> Active management by selection of securities, prioritizing separate investment decisions for each security to the detriment of "macro" decisions. Supporters of these practices are nonetheless part of a social world produced by the second convention	<i>Dominant approach in the second period ("orthodox" management methods)</i> Index-linked management, passive or semi-active management, prioritizing major "macro" level decisions (by sector or country). "Performance numbers" CAPM-based and "benchmark" paradigm Still the dominant situation today

What we call the mean-variance convention thus accompanied the exponential growth in the securities market financing channels, and this went hand-in-hand with the rise of financial actors who were now much more disconnected from the real economy than in the first convention. The new decision-makers preferred highly liquid listed securities, and no longer needed to know what real investments were being made by firms. They were mainly interested in movements in stock prices, in other words the prices other professionals are willing to pay to buy the securities they hold, and the trends on this secondary market. They were judged and controlled mainly by reference to the various market indexes that operationalize the "market." They lived in a world of purely financial returns. Since the investments they made were highly liquid, capital turnover was very fast and took on the form of "money" several times a day. Money seemed to produce returns without transiting through investments in real projects. This is the illusion of liquidity produced by the financial markets that Keynes had already denounced: while the securities are liquid and could be traded, the investments made by the firm using the money collected are not.

The second convention thus accompanied what is usually called financial disintermediation, which is the decline in bank borrowing-based financing of

the economy. The intermediation that began to disappear was balance sheet intermediation, in the sense that a financial actor carries in its balance sheet the risk of the financial transformation between the funds collected in the form of deposits, and the loans it has made. The new intermediaries operated differently, only investing money belonging to others: the bearers of the risks associated with the investments selected by them were now investors who put their savings into funds which these intermediaries merely managed. The banking world itself changed: banks found it beneficial not to carry the risks in their balance sheet¹³ and to receive returns not on the differences between the cost of resources and the interest rates of the loans made, but on the sale of services to issuers and the management fees charged for managing portfolios for third parties.

4.3 The Market-Consistent Convention and the Derivatives Explosion

Finally, the third convention is closely connected to the rise of derivatives, which themselves have facilitated all kinds of financial innovations by combination into what are known as structured products. These products account for a substantial portion of financial trade today and have largely contributed to a redefinition of financial actors' boundaries, blurring the lines between the traditional bank handing out loans and the asset management industry, and also the lines between these banking and financial activities, and insurance activities.

Financialization of the economy is often associated with the "3D" evolution (decompartmentalization, deregulation, and disintermediation). With the third convention, it is possible to take the decompartmentalization process to unprecedented levels, which is not unproblematic for the regulators. From the outset financial regulation has followed the silo approach: banking organizations are governed by different standards from insurance organizations, which are in turn governed by different standards from those applicable to investment funds and pension funds (Scialom and Tadjeddine 2015).

One very interesting case is the expansion of credit derivatives. The name credit derivative covers various instruments and techniques designed to separate and then transfer the "*credit risk*" (the risk of an event of default by a borrower), transferring it to an entity other than the debtholder. Most credit derivatives are credit default swaps (CDS). CDSs developed very quickly in conjunction with collateralized debt obligations (CDOs), which are bonds

¹³ Securitization of debts (bonds rather than bank debts) was recognized in the 1980s as the way to reduce banking risks in a context of expensive credit (Bastidon Gilles et al. 2010). This is its oldest form. The type of securitization involved in the subprime crisis was different (because subprime securities were no longer issued by the final borrower, for instance a household taking on a mortgage, but by special entities created to pool credits) but related to the same aim to free the banks of the weight of the risks, which naturally tends to make close examination of the projects submitted less important for the banks.

issued against a mixed pool of credits. In this technique, credits are pooled into a financial vehicle (called a Special Purpose Entity, or a Securitization vehicle) used to securitize the loans by issuing obligations. The major role played by CDSs and CDOs in the financial crisis of 2008 is well known and these practices could only develop because of the integration of the third convention modelling into new software by investment banks and credit rating agencies (MacKenzie 2011).¹⁴ The combination of CDSs and CDOs made a new strategy possible: building portfolios of debt securities, then packaging and selling off tranches based on default probabilities. Huault and Rainelli-Le Montagner (2009) studied the rise of this brand new concept of credit derivatives. They explain that with the success of the Chicago Board Options Exchange (CBOE) enhanced by the Black and Scholes Formula (MacKenzie and Millo 2003), financial engineers

began to explore the potential of the new technology. Identifying the price variation of primary financial assets with ‘risk,’ they proposed to create a different kind of ‘derivatives’ [...]. Credit derivatives result from an extension of this logic, in which the underlying asset is replaced by the amount of the credit risk borne by a debt. (MacKenzie and Millo 2003, 549-50).

This was a complete innovation, as it meant there was no straightforward link to an underlying asset, whereas in the options valuation formula proposed by Black and Scholes the fact that the underlying stocks are traded on the market is crucial.

First CDSs, then CDOs were created in the mid-1990s by J. P. Morgan. The ISDA (International Swaps and Derivatives Association) has been fighting ever since to legitimize and obtain recognition of these practices, achieving the notable success of the decision that CDSs were not insurance contracts but financial products (Huault and Rainelli-Le Montagner, 2009, 560; Morgan, 2008). These credit derivatives are the symbol of hybridized financial practices: they are clearly providing insurance, which is traditionally the business of insurers. This insurance concerns the credit risk, which is a risk professionally managed traditionally by banks as it represents their core competence. But these products are sold neither by traditional banks nor insurers: new actors on the financial markets have arrived to compete with the more longstanding actors – who have responded by adopting the new practices themselves. As a result the banks actively participate in the securitization processes of the credits they give, and insurers too are starting to securitize the risks they insure, to fight competition from new market entrants (Bühlmann and Lengwiler forthcoming). And when the national laws allow it, the same big financial groups carry out various operations with their subsidiaries.

¹⁴ MacKenzie and Spears (2014) mention for example the introduction of *CreditMetrics* by J. P. Morgan in 1997, to evaluate credit risk, then the adoption of CDO Evaluator by Standard & Poor in November 2001.

Thanks to the techniques of derivatives, each component of the risk can now be covered by the creation of *ad hoc* instruments that can be traded on a market; this proliferation of financial instruments and derivatives markets triggered extensive change in the international capital markets, which have become a gigantic “risks fair.” In parallel, the banks and insurance companies, whose job used to be to bear long-term risks in their balance sheets, have learned to pass those risks on by securitizing them. By the grace of the models of the third financial quantification convention, all assets (credits) and all liabilities (insurance commitments) can now be securitized. This is precisely the property of market-consistent valuation models to be able to price such brand new assets.

The political clout of the third convention is so extensive today that its models are promoted by banking and insurance regulators (with the Basel III framework for banks and the Solvency II framework for insurance). Ultimately it looks as though the regulators, being unable to stem the tide, took on the idea initially advocated by the ISDA that good risk management could be carried out by well-informed financial actors practicing daily valuation of their risk exposure based on market prices. This is what the third convention’s mathematical instruments propose.

And so these instruments have also overseen a general disqualification of traditional risk assessment methods, which used to be based on *ad hoc* analyses. Since bankers can rapidly pass on the risks they acquire through lending, they no longer need to know their clients. All they need is a statistical approach to the default risk by category of borrowers (Baud and Chiapello 2015). Insurers, meanwhile, are gradually abandoning the traditional risk estimation methods that until now constituted their expertise.¹⁵

5. Conclusion

In this paper we have proposed a conventionalist interpretation of the financialization of the economy. To do so we have identified three periods, each one associated with conventional calculation systems that inform an investment decision. Each of these periods begins with the adoption of a new convention in the field of financial decision-making.

The significant factor in the actuarial period, which started with the 20th century, was the spread of DCF calculations. This marked a moment of rationalization of investment decisions, with the possibility of choosing between different projects on a solely financial basis. This convention constructed a commensurability between essentially disparate investments, all translated into

¹⁵ These methods largely relate to the first quantification convention (ad-hoc estimation of the probabilities of damage and the cost of that damage, adjusted to present value by actuarial techniques).

cash flow terms. This period, with the breakdown of the 1929 crisis and the ensuing substantial reduction in financial market activity until the end of the 1960s, saw broad dissemination of the associated convention beyond the restricted world of finance. DCF became the rational method of investment selection in a Fordist period that gave priority to industrial investment and employment over ROI. This period is not usually considered as a period of financialization because the financial markets had only a minor role, yet it should be considered essential in the spread of financial calculation: it actually resulted in the technique of discounting being taken for granted as the accepted method for intertemporal calculations. The key word of this first period is “discounting”: the key intellectual schema is that of pulling the future closer to the present. As seen earlier, the second and third conventions did not challenge the principle of discounting, but they did change the definition of the rate used, and then the mathematical structure of the calculation.

The second period was based on the portfolio model and the efficient market hypothesis, which were developed in the 1950s and 1960s. It was associated with asset managers’ adoption in the 1970s of “quantitative” or “modern” methods from modern portfolio theory; these methods revolutionized the business sector in the 1980s, but also brought it legitimacy. Without that revolution, the lawmakers would probably have been less favorable to the banking disintermediation that was set in motion in the 1970s. The key word for this second period is “diversification”; the key intellectual schema (added to the first) is the portfolio concept.

These two periods bring out two professional histories that are initially mathematically heterogeneous: the history of financial valuation and the history of fund management. These two histories first drew closer in the second period through the use of a discount rate derived from portfolio models in an efficient market in equilibrium, and then became mathematically homogeneous in the third period through the use of the replicated portfolio concept in an arbitrated market, whose rate of return became the norm for financial valuation.

The third (and recent) period, which began in the 1980s, is associated with a total overhaul of the efficient market hypothesis thanks to the invention of mathematical models able to produce values needed to market derivatives, using portfolios whose cash flows replicate the cash flow values of derivatives (hence the term “replicated portfolio”). In particular, these models have made it possible to construct derivatives from underlying assets that are not themselves traded on the markets, creating “synthetic assets” that have underpinned risk securitization. These innovations have taken our economies into a new stage of financialization that started end of the 1990s. During the second period, bank and insurance firm balance sheets were modified to incorporate much larger securities portfolios, making these two types of organization major actors in the financial markets; the third period is characterized by large-scale redefinition of the traditional businesses of banks (credit) and insurance companies. The key

word for this third period is “arbitrage.” The key intellectual schema (added to the first two) is the replication concept.

In the first period, any “object” could be discounted to extract a present value. In the second period, this discounting was applied to a portfolio of securities. In the third period, that portfolio has become a possible replication of any item, even non-financial.

The arrival of a new convention does not necessarily quash the previous convention, which can continue to be used by certain practitioners for certain matters (private equity funds, for example, are still working with the first convention), but it can also redefine some professions by fragmenting them according to the convention followed, as we noted for the asset management industry. It can finally also give rise to brand new organized professions like the swaps and derivatives industry (ISDA).

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Quantification Devices and Political or Social Philosophy. Thoughts Inspired by the French State Accounting Reform

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Abstract: »Instrumente der Quantifizierung und die politische oder soziale Philosophie. Gedanken, die durch die Reform des französischen staatlichen Rechnungswesens inspiriert wurden«. Our various studies in the sociology of quantification have convinced us that it is possible to look at social or political philosophies and seemingly technical tools at the same time, considering them as a totality. The works of Alain Desrosières have also demonstrated this. But our recent work on the French State accounting reform has shown that the new accounting system can be used in many different ways, for very different, and even divergent purposes. There seems to be no unequivocal link between a kind of quantification device and a specific social philosophy. This article aims to reconsider the nature and conditions of this link, on the basis of our recent work on state accounting reform.

Keywords: Sociology of quantification, sociology of accounting, French State accounting reform, new public management, neoliberalism.

1. Introduction

Over the last fifteen years, we have aimed to enter into the analysis of broader phenomena and processes by decoding the genesis and uses of quantification devices: the accounting reform of Chinese state enterprises makes it possible to grasp the essence of the Chinese economic reforms of the 1990s (Eyraud 1999, 2003), and the construction and implementation of a system of performance-based management in French universities informs us about the profound transformations they have undergone in the last two decades (Eyraud et al. 2011). These various studies have convinced us that, as the works of Alain Desrosières have shown, “it is possible to look at the same time at social or political philosophies and seemingly technical tools, considering them as a totality” (Desrosières 2000, 84); it is indeed not only possible, but productive and even necessary.

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This is first because, if one starts out by integrating tools and devices into the analysis, once the technical difficulty is overcome, the reading of the processes at work is easier and less open to discussion: the processes are largely objectified in the changes of devices and become relatively self-evident. Secondly, these tools and devices are not inert objects; they act in the sense that social actors partly orient their action in relation to them.¹ It is therefore no longer possible nowadays, in view of their growing importance, to understand the functioning of a field or an organization and the logics of the actors involved without integrating them into the analysis. That is why, in recent years, many researchers have adopted this approach, either for quantification devices, or more broadly for management devices (Boussard and Maugeri 2003; Chiappello and Gilbert 2013) or for instruments of public action (Lascoumes and Le Galès 2004). These authors use various terms: *outil* (tool), *outillage* (toolset), *dispositif*, *instrument* – is it possible to choose one, and for what reasons? If we start from Foucault's definition, the term *dispositif* seems to us the one most capable of holding together "social or political philosophy" and "seemingly technical tools." Indeed, Foucault defines the *dispositif* as

a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid [...] The *dispositif* itself is the system of relations that can be established between these elements (1994, 299).

The term thus emphasizes the complex and varied nature and the systemic dimension of these "ensembles"; we have chosen to render it here by "device."²

This being said, our recent research on the transformation of French State accounting (Eyraud 2011, 2013)³ has shown that the accounting system could be enrolled in different and even divergent logics and objectives: to show that the state is heavily indebted or not so much, to improve public management or encourage the outsourcing of public activities. The link between a type of quantification device and a social or political philosophy does not seem to be univocal; they are perhaps not "a totality." This article aims to question the nature and conditions of this linkage through an analysis of the French State accounting reform.

¹ Desrosières analyzes these "retroaction" phenomena especially in his last writings, brought together in a work published posthumously (Desrosières 2014).

² The English rendering of Foucault's *dispositif* has given rise to extensive discussions. Some of the published translations retain the term in French, others opt for various *ad hoc* solutions such as "apparatus," "device," "arrangement," "socio-technical system," "mechanism," etc.

³ The materials on which it was based are firstly interviews, in particular with actors involved in the process of constructing the new state accounting standards, secondly archives (documents and official reports), and thirdly a corpus of French newspapers and magazines from the time of the drawing up of the first new-style balance sheet to the time of the first certification of the accounts.

In order to do so, in the first part, one needs to understand the state accounting model before and after this reform, the actors in the process of construction of the new norms, and the major choices that they made. The second part explores the objectives and uses of this new accounting system and shows precisely their plurality. The third part puts forward a grid for the analysis of quantification devices which seems capable of casting light on the nature of the link between device and philosophy. The final part tests this grid by comparing the new French accounting system with public accounting in the UK and New Zealand.

2. The Construction of the New Accounting Device

2.1 The Old and the New

Since the 1990s, a growing number of countries, with some English-speaking countries in the lead (New Zealand, Australia, then the UK and the United States), have undertaken a major transformation of their public accounting systems, moving from a specific public accounting to business accounting. Many analysts regard the adoption of business accounting for the public sector as one of the elements of New Public Management (cf. for example Suleiman 2003, 184-93). The change of accounting system came into effect in France on January 1st, 2006.

The essential function of the old type of accounting was to enable Parliament to ensure that the taxes were collected and spending made in accordance with the budget that had been passed, and to prevent fraud and misappropriation. Based on the idea of public funds, it was a *cash basis accounting* that retraced the inward and outward movements on an annual basis, which reasoned in terms of cash flow and recorded operations at the moment of receipt or payment. All collections are regarded as revenue, whether they result from taxes or borrowing – whereas business accounting would register the former as an accrued asset and the latter as a debt (or liability). Likewise, all outgoings, whether public salaries, real property purchases, or product purchases, are treated as expenditures. By contrast, business accounting distinguishes the former, as costs, from the latter two, which are recorded as assets (fixed assets for real estate and current assets for stocks) that can generate future gains. The “result” of the accounting period corresponds to the cash variation. Fixed and current assets exist as lists and inventories, and are non-quantified, whereas stocks exist in the form of physical quantification (so many hectolitres of fuel, etc.).

The new accounting regime is an *accrual basis accounting* which records and values all assets (fixed assets, stocks, receivables, and liquidities) and all liabilities (debts and provisions), and on that basis draws up a *balance sheet* which retraces the accrual situation of the entity in question. It is there an ac-

counting of flows and stocks. It also set up a correspondence between the costs and revenues of a reference period (the annual accounting period). Receipts and expenditures are recorded at the moment when the credit or debt is generated, and not at the moment of receipt or payment. This principle makes it possible to calculate a revenue, in other words a profit or loss over the period of activity, and is the basis of the drawing up of the *statement of income*. Marx, Sombart and Weber noted that monetary calculation and the accounting that allow a balance sheet to be drawn up and the profitability of an operation or a period to be calculated were foundations of the capitalist enterprise and conditions of possibility of the development of modern capitalism. But what is the place of these foundations and conditions of capitalism at the heart of contemporary states?

2.2 The Actors of the Process

In international terms, it is the *International Public Sector Accounting Standards* (IPSAS) that have become the reference standards for this new state accounting. They are produced by the *International Public Sector Accounting Standards Board* (IPSASB), a committee of the *International Federation of Accountants* (IFAC), a multinational group formed by the professional associations of accountants. These standards are largely inspired by the new international norms for the private sector, the *International Financial Reporting Standards* (IFRS), produced by the *International Accounting Standards Board* (IASB), which itself also arose from the accounting professions and is close to the IFAC.

Researchers in economics and accounting (cf. for example Aglietta and Réberieux 2004, 151-85; Colasse 2007, 50-6; Richard and Colette 2008, 9-29; Walton 2008), adopting Albert's (1993) distinction between Anglo-American capitalism and "Rhine model" capitalism, distinguish two major accounting devices or systems: the Anglo-American and more especially British model, and the Franco-German or continental European model. Each of these corresponds to a choice regarding the assets to be valued in the balance sheet, the degree of freedom allowed to enterprises regarding accounting information, the connection or disconnection between accounting and taxation, the scope for interpretation allowed to accounting professionals, and the actors and processes of accounting standardization. Underlying these choices one finds a conception of the enterprise and its objectives and an opinion as to which stakeholders matter and for whom the accounts are drawn up. The British and American accounting model is thus the bearer of a contractualist and shareholder-based model of an enterprise that essentially presents accounts to its capital providers, whereas the continental European accounting model is the bearer of an institutionalist, partnership-based enterprise model, that of an enterprise that has to present its accounts not only to its owners but also to its creditors, its employees and the state. There is thus a correspondence between an accounting device and a form of capitalism.

The IASB was created by British accountants; from the outset it was closely linked to the major international audit firms, themselves of Anglo-American origin. The same is true of the IFAC. The standards they produced were thus strongly marked by the Anglo-American and more specifically British tradition. The complete set of IFRS, produced in the early years of the century, also emphasizes a new principle for the valuation of assets, “fair value”⁴ or “market value,” which had been progressively introduced into the American standards from the late 1990s, and to which we shall return. The IPSAS extend the recourse to “fair value” compared to the IFRS.

In France, the new accounting device was drawn up by the *Comité des normes de comptabilité publique*.⁵ This committee, under the minister in charge of the Budget, has – unlike the IPSASB – a large public-sector majority, with a strong representation of the Ministry of Finance, although there are also some representatives of the private accounting world and the world of business. The committee worked from mid-2002 to the end of 2003 to produce the new standards, which were adopted at the start of 2004. It based its deliberations on the IFRS, the IPSAS (which had then been produced in part), the *Plan comptable général* (PCG, the French accounting standards, which were entirely typical of the continental European model) and what it took to be the specificities of the French State. It is clear that the principles on which these various references are based could not easily be reconciled, and that the committee had to make choices.

2.3 Two Major Choices

We shall simply examine here two controversies that arose within the French committee and the ensuing choices.⁶

The first concerns the method used for the valuation of fixed assets. To value a fixed asset, a machine-tool for example, several choices are possible; in particular it can be valued at its acquisition price or historic cost, or at its current market price (fair value). Historic cost was used throughout the twentieth century, accompanied by the calculation of an amortization which takes account of the depreciation of the asset: the enterprise sets aside a provision for amortizations with a view to replacing it when necessary. In this way “the capitalists obliged themselves to respect their capital” (Richard 2010, 62); accounting analysts consider that this mode of valuation, which is that of the French PCG, is thus part of an industrial-type capitalism. The IFRS and IPSAS standards prefer “fair value,” updated on each closing date, which creates great volatility in accounts from one period to another; it “brings the volatility of the markets into company reports, [...] favours the penetration of enterprises by

⁴ The normative dimension of this term will be noted.

⁵ A large proportion of our interviews were carried out with members of this committee.

⁶ For an exhaustive analysis of the controversies and choices, see Eyraud (2013, 117-72).

financial logic [...] and] is rooted in a justificatory vision of the market as guarantor of justice and the common good” (Aglietta and Rebérioux 2004, 159 et seq.). Analysts regard it as belonging to another form of capitalism: finance capitalism (cf. for example Capron 2005).

How then should the fixed assets of the State be valued? After considerable controversy within the French committee, fair value finally won out for the valuation of non-specific land and buildings (except for historic buildings, cemeteries, etc., which were assigned a symbolic value of one euro). Contrary to what might have been expected, this what was not the choice of the members of the committee drawn from the private sector⁷ nor from liberals who might come both from the public and the private sector, advocating a move towards the IFRS and a minimum state which, in order to shrink, could, at least, sell off its assets. On the contrary, market valuation was advocated and vigorously supported by the committee members from the public sector, who wanted maximum recognition of the specificities of the State, and who seemed very attached to a strong State and public services. As one of them explained: “We want a value that can be used in management, and to be able to say to the ministries: ‘This market value can help you in your decisions: stay in your buildings, or sell them, or rent them out, and go and rent or buy where it’s cheaper.’” This choice is thus not grounded in a justificatory vision of the market but rather in a conception of “good management,” even if this “good management” can include the sale of assets when this appears economically more rational.

A second controversy concerned intangible assets: should the level of education, state of health, research capacities, etc. be regarded as national wealth and therefore as intangible assets, or only the related expenditure (salaries of the civil servants providing these, overheads, etc.) as costs within the profit and loss account? A committee member wondered:

If we want the net situation to be made meaningful, even if it is negative, we need to be sure that we take account of all public investments; and the real investments are education, research, health. [...] For a state, an investment is an expenditure that will have positive effects in the future; even in purely financial terms, it means being able to levy taxes in the future, so these are all expenses that favour growth.

But the committee chose not to count them as investments, to the great annoyance of some members. We encounter here two fundamentals of the capitalist enterprise and its translation into accounting, fundamentals that our work on Chinese State enterprises enabled us to bring to light (Eyraud 2003). First, the

⁷ These people, who were very attached to the French *Plan comptable général* and its form of monetary calculation, historic cost, were strongly opposed to market value; it has to be said that they had not spent their working lives in the big international auditing firms. In a general way, in the accounting field, there is struggle and conflict between these two forms of monetary calculation (historic cost and market value) favoured by different groups and social groups and actors; market value now has the upper hand and becoming more widespread.

capitalist enterprise has a purely economic function: welfare and ecology are externalized; they are not among its objectives but part of what economists precisely call “externalities,” potentially covered by taxation. Secondly, labor is regarded as an expense and not as an asset; it is (finance) capital that produces wealth, labor consumes it. We have here the vision of the role of capital and labor in wealth production that was at the foundation of capitalism, and which state accounting adopts for its own use.

These two examples show clearly that accounting categories are social constructions. These are generally historical constructions built up over long periods (Richard 2010), here they are constructions resulting from controversies and compromises among actors in the short span of the working out of the reform. An accounting device thus integrates strong political or philosophical choices which are precisely the object of these struggles among actors.

3. A New Accounting System for What Purpose?

A major accounting change generally corresponds with a change in the objectives and intended readership of the accounts, and, conversely, a change in objectives and readership requires a major change in accounting – its categories, modes of valuation and or its financials documents. So, business accounting for the French State – for what purpose? To measure the wealth and solvency of the state? To aid public management? It is important to distinguish discourses and practices in this area. We can analyse the discourses through the interviews we carried out in the *Comité des normes*, the statements of senior civil servants or ministers, official reports and press articles. We shall analyse the practices in the next part of the article.

3.1 Measuring the Wealth and Solvency of the State?

As we have seen, the new accounting provides an economic and financial vision of the state. But does it aim to measure the wealth, and changes in the wealth, of the state, or indeed its solvency? The *Comité des normes* officially replies “No” to this question: “Given the specificities of the state, the net position that is presented is more in the nature of a balance without obvious meaning than measure of the growth of wealth” (Comité des normes de comptabilité publique 2003, 18). A member of the Committee explained this position: “The IFRS are made for listed companies, companies that are for sale, even if only in small pieces [...] The state is not for sale. Fundamentally, imagining that accounting will tell you the value of the state is an absurdity.”

For the press, the answer is clearly “Yes.” Some journalists explicitly compare the accounts of the state to those of a company: *Le Figaro* (22/11/06) or *Les Échos* (31/05/07) refer to the accounts of “the enterprise France,” while *Le*

Monde publishes an article entitled “The state: a very, very big enterprise” (30/05/07). *Les Échos* (31/05/07) goes further, using, admittedly in quotation marks, the vocabulary of financial analysis: “improving its balance sheet,” “turnover,” “operating costs,” “net result,” “accounting loss.” But the uses and analyses of these accounts diverge. Some newspapers and some economists highlight the indebtedness and/or impoverishment of the state; others, by contrast, use the new accounting to relativize public indebtedness by comparing it with the assets, showing that there are not only debts but also public wealth.

The financial markets and ratings agencies, in other words the external providers of capital and their “advisers,” do not seem to use the new accounting as a basis for a financial analysis of states: all the criteria they put forward can be calculated from information from the national accounting: GDP per capita, growth rate, public deficit/GDP or public debt/GDP ratio.

3.2 An Aid to Management?

A member of the Committee developed this point of view:

Applying business accounting to public bodies has a real but limited interest. It won't tell you the value of the public service, but have we counted all the buildings, can we say roughly what this or that cost? Before this accounting was applied, the answer was ‘No’; you have to apply business accounting methods to work out the costs. Business accounting can improve management for perhaps 10 to 20% of assets and liabilities.

The possibility of calculating costs, preferably full costs, is, to a large extent, the primary objective assigned to this new accounting. But for what purpose should costs be calculated? On that point, opinions diverge.

3.2.1 Managing “Better” and Making Internal Trade-Offs

We recall the words of the committee member who wanted “fair value” valuation of buildings so as to enable ministries to decide between remaining where they were, renting, and selling. This was also the view of another member, who is now in the accounting department of the CNRS, the French science research council:

Accrual accounting should not be given inflated importance, but it shouldn't be underestimated either. It enables to manage public funds better. For example, CNRS travel costs are 17% up on the previous year. With a good accounting system you can decide between videoconferencing and travelling.

3.2.2 Comparing Public/Public or Public/Private

Knowing the costs of an activity also makes it possible to compare several entities that perform the same type of activity. The procedure is not the same when one compares one public entity with another, or the costs of an activity

conducted by a public organization with those of the “same” performed by a private company.

In the first case, the objective is generally to set up competition between public entities to push them to reduce their costs. This is the explicit aim of pricing the activities of French hospitals: “The principle is to reduce the cost differentials between hospitals for the same service. The underlying hypothesis is this cost variation is due to different levels of efficiency” (Centre d’analyse strategique 2010, 6).

In the second case, competitive processes are introduced in order to allow decisions to be made – and many works and statements by senior civil servants mention this – between “doing things” and “paying to get things done.” Activities may be outsourced to private companies – the activity in question is then privatized – but also to associations. Finally, the calculation of the full costs of an activity with a view to comparing the private offer and the public cost is also a basic component of the “preliminary economic evaluation” preceding the drawing-up of a call for tenders for a public-private partnership (PPP); this new accounting therefore seems necessary for the development of PPPs, which took off in France from the middle of the first decade of the century.

This comparison of costs, between public and public or public and private, raises two fundamental problems. The first is well summarized by Riveline’s remark: “the cost of a good does not exist” (Riveline 2005, 12): it is based on choices, conventions, there is no single objective cost. The second lies in the fact that the comparison is generally made on the basis “all things being equal,” without considering the conditions of production of the activity, such as the differences in the sociodemographic composition of the users or clients, or not always relating them to the quality of the services produced.

3.3 The Same Tool for Different Purposes

From the measurement of wealth to aid to management, we find ultimately two major possible orientations for the uses of this new accounting device: serving an “effective state” with the aid of “good” public management and strengthening economic rationality in political decisions, or serving the development of neo-liberalism through a shrinkage of the state, a reduction of public spending and, above all, the development of public-private competition and the opening up of new markets on public resources for the private sector. One should therefore not conflate the development of the managerial spirit within the state and the development of neoliberalism: these are two different forms of rationalization, in the sense that their objectives differ.

It is certainly the case that the tool opens up different possibilities for action, which has meant that it has met with a fairly broad consensus among the senior civil servants concerned. The words of one of them are particularly enlightening:

An accounting directive, M49, required local authorities to show the production cost of water. Many local politicians are strongly opposed, on the grounds that “Your instruction raises the price of water.” That is absurd: the instruction required the cost to be shown; the political debate is then about whether this cost should be paid through water bills or taxation. And I don’t see how there can be a real debate without a tool that tells me this cost. People want to break the thermometer on the grounds that it raises the temperature. It’s the same for state accounting. It seems to me useful to show the costs; this is what it costs, now we can have a real debate about it: “Shall we do it, or not? Shall we finance it, or not? How do we finance it? What are our priorities? and so on.”

In other words, business accounting for States could be used in the service of an informed democratic debate. How does one then explain that one and the same tool can be used within such different logics, and thus impact the course of events very differently? Do social or political philosophies and technical devices really form a totality? What ultimately is the nature of the linkage between a device and a philosophy?

4. On the Nature of the Link between a Device and a Philosophy

The research presented here shows that there is indeed a social and political philosophy, or rather, there are social and political philosophies, within a quantification device. To go further, we can, it seems to us, differentiate between three levels within a quantification device. First, there is what might be called the bedrock level: a quantification device is grounded in a founding vision, and is generally congruent with a form of state or a particular economic system.⁸ Secondly, there is what might be called the intermediate level: a quantification device contains a conception of the objectives and “*raison d’être*” of the entity that is quantified. Thirdly, there is the level of the micro-conventions of calculation: philosophies can be hidden at this microscopic level and give a particular orientation to the device. While it is useful to differentiate these three levels and necessary to analyze them, this does not tell us everything about the orientation of the device and the effects it can produce; we also have to look at the context of its deployment and its uses; the device is part of a larger configuration.

⁸ Desrosières showed several times that for each understanding of the role of the state in the running of the economy there is a particular statistical system that is progressively installed together with the corresponding forms of the state and of public action, cf. for example Desrosières (2014, 33-58).

4.1 First Level: The Bedrock – A Founding Conception

The main strength and the main interest of business accounting for modern capitalism lies in the fact that it constructs the enterprise as an entity that is autonomous with regard both to its owners and to other enterprises. At its foundation, one finds a dividing-up operation, a severing conception that creates the entity “the enterprise.” The calculation of costs is also based on a separation of entities and activities, and then on an effort to make comparisons among these entities or among the same activities performed by other organizations. It is therefore itself based on a separating, individualizing conception, on divisibility.

The second strength and the second interest of accounting for capitalism lies in the fact that it allows for

the valuation and verification of opportunities for profit and of the success of profit-making activity by means of a valuation of the total assets (goods and money) at the beginning of a profit-making venture, and the comparison of this with a similar valuation of the assets still present and newly acquired, at the end of the process; in the case of a profit-making organization operating continuously, the same is done for an accounting period. In either case a balance is drawn between the initial and final states of the assets (Weber 1978, 91).

It thus makes it possible – and this is its aim – to evaluate assets and calculate a result. Assets and economic results are the two fundamentals of business accounting. A device is thus the bearer of some great fundamentals: an ontology, but not necessarily orientations.

4.2 Second Level: A Conception of the Objectives and *raison*s *d'être* of the Quantified Entity

A key idea emerged from our work on the Chinese accounting reform (Eyraud 2003): the idea that accounting conveys a representation of what an enterprise is, what is internal to it (its objectives) and what is external. Within the planned economy a Chinese enterprise thus covered the costs of the production and reproduction of the labor force; its fixed assets included housing, crèches, schools, and clinics. With the accounting reform of 1993, these non-industrial assets no longer figure in the balance sheets of enterprises: the housing will be sold, the crèches, schools, and clinics closed. It is a quite different model of the enterprise: the enterprise as an essentially economic entity. The definition of these internalities (the economy) and externalities (here, welfare) is both written into and produced by accounting documents and categories. The new French State accounting norms integrate, as we have seen, this purely economic conception of the entity, and also the vision of the role of capital and labor in wealth production that is at the foundation of capitalism.

An Analysis of national accounting systems also, as we have seen, shows the strength of this idea. We expressed it rather differently: an accounting device includes as its bedrock a conception of the enterprise and its objectives

and an opinion as to who is or are the stakeholders who matter, the ones who “count.” There is thus a correspondence between an accounting device and a form of capitalism. The dominant form of monetary valuation is, in this framework, a particularly decisive element: “fair value” is set in a capitalism marked by the central role of the financial markets that buy and sell enterprises, which can be called “finance” or “shareholder” capitalism; historic cost depreciation are set in an “industrial” capitalism.

4.3 Third Level: Micro-Conventions of Calculation

Apart from accounting categories and forms of monetary valuation, there are a large number of possible choices at the very detailed, even microscopic, level of each calculation.

The work of two accounting researchers (Ellwood and Newberry 2004, 2007), one British, the other a New Zealander, provides a particularly revealing example. The adoption of business accounting in the British and New Zealand public sectors was accompanied, throughout the 1990s and 2000s, by the obligation for public entities to bill the services they exchanged at full cost, and systematically compare these full costs with the prices of private sector suppliers. The Finance Ministries of these two countries took two accounting micro-decisions of considerable significance: the fixed assets of public entities should be valued at their market value, to be updated each year (in a period of rapidly rising real-estate prices), and public entities should calculate the capital consumption involved in their activities and include in their full costs the corresponding capital charge, set, depending on the year, at between 3 and 6%; the annual revaluation of fixed assets would automatically increase this capital charge, already set at a very high level.

In this way, the public sector is systematically disadvantaged in public-private comparisons: its costs are necessarily higher because of the accounting choices made.

Biases in the detailed rules suggest that privatization is being pursued surreptitiously by Treasury officials rather than openly by politicians. [...] This may help to explain why the privatizing momentum of the earlier reforms continues even under governments seemingly opposed to the original tenet (Ellwood and Newberry 2004, 23).

The politicians were not generally aware of these “technical” choices; to understand them one had to have access to and scrutinize the cost calculation forms or rules used within the Finance Ministries.

4.4 The Life of the Device: Context and Uses

The accounts of the French State have been drawn up in the new accounting framework since 1st January 2006; an opening balance was drawn up at that point. Nicolas Sarkozy was elected President of the Republic in May 2007; in

July, his Prime Minister François Fillon, launched the “*Révision générale des politiques publiques*” (RGPP).⁹ This aimed to review all public policies (hence its name) so as to decide on the modernizations and savings to be made. The main measures were:

- drawing up an analytical accounting to calculate full costs,
- aligning prices on costs (railway fares, INSEE statistical studies),
- imposing responsibility through monetary incentives and the development of internal invoicing based on the costs of the operation (for transport of prisoners so as encourage use of “video-questioning”) or on market value (market rents to be paid by the ministries),
- developing sales of the state’s real estate holdings,
- outsourcing many functions (hospitality, caretaking, maintenance, mail, payroll management, IT system management, etc.),
- allocating state resources on the basis of performance and incentives for increased revenue generation,
- cutting operating budgets by 5% annually from 2011,
- developing PPPs (especially in education, health, justice and defence).

Several of these are linked to the new state accounting, and in particular to the calculation of full costs: alignment of prices on costs, internal invoicing, real-estate sales,¹⁰ which were to be decided on the basis of a cost/benefit analysis, outsourcings and PPPs supposedly decided on the basis of a cost comparison of in-house activity with that of an outside enterprise. The arguments put forward were those of reduced public spending, more efficient, “better” management based on economic criteria. The political determination to outsource was not flagged; some ministers even declared that they would rather have the service provided in-house when the cost difference was not great. One of them was the Minister of Defence, Hervé Morin, who said in 2010:

Each decision to outsource is made after an audit and a comparison between the price of the service provided by private companies and the costs if the service remained internal. If there is no difference, we don’t outsource; if there is little difference in favour of the private sector, again we don’t outsource, but we ask for greater efforts from the department in question; we only outsource when there the differences are great.¹¹

So there would seem to be a preference in the Ministry of Defence (the ministry which saw the largest number of outsourcing and PPP decisions under the RGPP) for in-house services. But what happened in practice? For this one can

⁹ The RGPP came to an end in summer 2012 with the election of a new President, François Hollande. His government drew up another reform called “*Modernisation de l’Action publique*” (MAP), mainly marked by large reductions in operating budgets for all public entities.

¹⁰ These had started from 2005-2006.

¹¹ Rencontres de la Modernisation de l’État, Conférence plénière, 5 July 2010.

consult several public reports produced by the *Cour des comptes* (Court of Auditors) (especially 2011) or the National Assembly (2011).

In a general way, these reports note a very limited use of analytical accounting in the decisions made throughout the RGPP. The choices of properties to be sold were rarely based on costs/benefit analyses and were often made against the wishes of the ministries concerned (Cour des comptes 2011, 187). Outsourcing decisions were not often based on public-private cost comparisons: “The reality of the economic gains secured by outsourcing appears generally difficult to assess. A high proportion of the outsourcings of the last decade were undertaken without precise knowledge of in-house costs” (Cour des comptes 2011, 499). The same is true of a number of PPPs; there was no comparison of the private tender with the public cost. In the case of one of the largest PPPs, for the new Ministry of Defence buildings, the National Assembly report regretted “the absence of examination of possible choices before the political decision” (Assemblée nationale 2011, 272-3). The *Cour des comptes* also looked into the rare examples of outsourcings and PPPs for which a public-private cost comparison had been made, and in each case expressed reservations about the calculations. As in the New Zealand and British cases mentioned above, “Some hypotheses on which the comparisons were built seemed to the *Cour* to disadvantage the scenario of keeping the activity in-house” (Cour des comptes 2011, 505).

Thus the decisions to outsource or to resort to public-private partnerships taken under the RGPP were political decisions that were not, for the most part, based on analyses using accounting data. If, as Weber developed it, what decisively determines economic action is the *actual* tendency to compare a result expressed in money with an investment evaluated in money (Weber 2001, xxxiii), then neither the introduction of business accounting into the state nor the RGPP have signified a progression of economic action into the French State. What has developed is sale of assets (real estate), the assignment to the market of previously public activities and the opening of new markets for public resources (outsourcing and PPP). In recent years in France and as regards the state, a certain rationalization for which the central value is the market, driven by the dominant actors in the political field and some actors in the senior civil service, has advanced at the expense of another form of rationalization, a good management of public funds and goods, defended by other actors in the senior civil service.

Accounting was brought in only as an argument, a justification. This justificatory function of accounting was identified a long time ago within the business field. But two American sociologists, Carruthers and Espeland (1991), go further and argue that in the linkage between the development of accounting and the development of modern capitalism, Weber and Sombart only considered the technical role of accounting, that is to say, what it allows as rationalization of decisions when it is used. They forgot its rhetorical power. Based on

the fact that until the nineteenth century the potentialities of double-entry book-keeping were rarely exploited (company accounts were often poorly kept and not balanced), Carruthers and Espeland suggest that the technical advantages of accounting were for a long time less important than its symbolic interests. Accounting as the embodiment of rationality was brought in to bolster belief in the rationality of the enterprise:

Accounts are a way to display the rationality of decisions and thus enhance their legitimacy. They help to demonstrate that alternatives were considered, trade-offs were made, and potential outcomes compared. Business accounts, as a 'rhetoric of numbers,' engender legitimacy because they document the rationality of decisions in an age when that form of rationality is legitimate (Carruthers and Espeland 1991, 61).

From this point of view, in the early twenty-first century, accounting came at just the right moment into a state undergoing a crisis of legitimacy,¹² in the framework of a conception of the state as having to be accountable, having to prove its efficiency and its good use of public funds.

5. Conclusion

Finally, there are indeed social and political philosophies within a quantification device, potentially at the three levels discussed. One needs to bring to light each of these levels by examining particular elements of the device. The first is the hardest to grasp, because there is no specific place to look for it; one has to try to look through the device to grasp its ontology and see with what form of state, economic system, or organization it is congruent. The second level is revealed, for an accounting device, through analysis of its categories, their delimitations and the forms of monetary valuation used. The third level requires one to scrutinize the actual calculations: the very process of constructing the quantified data on which they are based (definitions, modalities of implementation of the measurement, including computer processing, etc.) and the modes of calculation selected. While it is necessary to analyze these three levels, this does not tell us everything about the orientation of the device and the effects it can produce; for this, one needs to look at the context in which it is deployed. A device, with all the philosophies with which it is charged, may remain more or less unused and without effect. All of these levels, and also the context in which the device is deployed, are the fruit of socio-historical processes in which different social actors participate, bearing different philosophies or value systems.

¹² A legitimacy crisis which, like the financial crisis and the crisis of the efficacy of the states which intervened to reinforce it, was partly constructed by the states themselves or at least by a part of them and some groups within them (cf. for example Eyraud 2013, 176-84).

These processes can lead to a maximum coherence between levels and context. This was the case with the reform of public accounting implemented in the UK and New Zealand in the whole administration and public services from the late 1980s to the early 2000s. The State, local government, and public services were split up into autonomous entities; some of these were turned into independent agencies. All these entities have been required to draw up a balance sheet and a profit and loss account. These entities are purely economic; their productions (education, health, etc.) only appear from the standpoint of the costs that they generate. Most of their activities are indeed seen as products for which a comparison should be made, in various forms, between their public cost and their price on the market, and the best “price” chosen. At the same time, the accounting choices made by the Finance Ministries (fixed assets reckoned at market value and updated each year, setting of a high capital charge) quasi-automatically disadvantaged the public tender. The “inefficiency” of the public sector then justifies privatizations, which were a declared aim of the reforms of the 1980s and early 1990s in those two countries, and which seem to have subsequently been an objective surreptitiously pursued by Finance Ministry officials. Both countries have moreover generally adopted the IFRS for their public sectors. We thus have an accounting device which could be described as entirely neo-liberal or at least entirely congruent with a neo-liberal philosophy. But a political decision to remove the dual obligation to compare public cost and private price and to choose the best price would have sufficed to deprive the device of all its effects.

In France, the situation is much more complex. The device is less integrated and there are many “gaps.” Thus, the drawing up of state accounts has certainly allowed the development of a conception of the state close to that of a business and has contributed to the process of de-differentiation of the public sector. But, at the same time, the accounts are only produced for the state in its totality, there are no divisions for its entities. The state has taken over the two fundamentals of the capitalist enterprise, for which only an economic function is recognized and for which labour is an expense and not a capital. Its non-specific fixed assets are valued at their market value, but this choice has not been made in the framework of the political philosophy in which market value is normally set. This has not prevented micro-choices in calculation that disadvantage the public sector in public-private comparisons from justifying recourse to privatizations. These have, however, remained limited, in comparison with the UK or New Zealand, first because there has not been individualization of separate accounting entities and secondly because there has been no obligation for all activities to make a comparison between public costs and prices on the market.

The three-level distinction that we propose, combined with an analysis of the context in which the device is deployed, thus seems heuristic and capable of

grasping the nature and conditions of the link between a quantification device and social or political philosophies.¹³

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¹³ It functions well, as we have seen, for the understanding of an accounting quantification device, and also has its full meaning in the analysis of a statistical quantification device. We have implemented it in the analysis of the introduction of a device for quantifying performances in French higher education, where it has shown all its pertinence (Eyraud 2013, 197-213, 237-45, 269-81).

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Setting the Habit of Capitalization: The Pedagogy of Earning Power at the Harvard Business School, 1920-1940

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Abstract: »Wie der Habitus der Kapitalisierung etabliert wird: Die Pädagogik an der Harvard Business School, 1920-1940«. The quandaries of business valuation have marked the pedagogy of business administration since early attempts at institutionalizing the managerial discipline. It is however now commonly admitted, at least in legitimate financial and entrepreneurial circles, that the value of a business (that is, the monetary assessment of a functioning enterprise established in a competitive environment) resides primarily in its earning power or, in other words, that what a business is worth equals its capacity to generate a stream of revenues for the investor or investors that provide it with funding. How did this idea take shape and how did it permeate the business mind? An examination of early pedagogical materials at the Harvard Business School (an influential reference for the socialization of the businessperson) and, in particular, of the vagaries of the idea of capitalization and its exercising in the classroom provides a fine occasion to advance understanding of the meaning of such ideals of business and business value, and of their institutionalization. This empirical study can, in turn, be employed in order to discuss and refine critically our interpretation of what a convention of economic valuation is and how it operates.

Keywords: Economic conventions, economics of convention, business valuation, business education, capitalization on earnings, discount rate, case method, Harvard Business School, Arthur Stone Dewing, Cecil Eaton Fraser, John M. Keynes, C. Rufus Rorem.

Introduction

Whatever business we are dealing with, the only criterion is the earning capacity of the business.

Arthur Stone Dewing

The present study¹ approaches the problem of the conventions of business valuation from both an empirical (where do they come from and how do they

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spread?) and a theoretical (in what sense do they operate as conventions?) angle. Conventions of business valuation refer here to ordinary practices, standard techniques and intellectual justifications that intervene in the establishment of a quantitative, monetary evaluation of what a “business” (an economic enterprise established in the form of a company) is worth. These conventions obviously carry great significance in the constitution of the economic world, since they orient, or may orient to a great extent, decisions about which business should exist and which should not and therefore, more largely, about how reality ought to look like. The origins and evolutions of such conventions might not obey a purposeful rationale, and their use may be a matter of organizational routine rather than of personal dictate. But they surely possess some form of intentionality, in the sense not of will of conscience but that of a process of orientation (Deleuze 1988).

The convention of valuation that we are considering here is, in a nutshell, the idea according to which the value of something boils down to its “earning power,” that is, it equals the value of a stream of money that an investor shall receive in return for its financing of that something, with today’s value being, in most sophisticated versions of the intuition, a discounted version of tomorrow’s value due to the fact that the latter remains uncertain, and with this prospective earning capacity basically conjectured from retrospective examination, from informed guesswork, or from a combination thereof. The technicalities of financial analysis, asset pricing, capital budgeting and financial accounting, and the numerous notions – discount rate, discounted cash flow, capitalization of earnings, net present value, time value of money, weighted average cost of capital, and so forth – that characterize these practices can be thought of as variations on that intuition. Of course, no seamless story could be told that would show continuity between the many avatars of this understanding, from 19th century forestry economics to 21st century financial analysis (Doganova 2014; Ortiz 2014). And the purpose of this study is not (and could not be) to find order in such variety. My intention, rather, is to examine one salient step in the constitution of business valuation as a professional convention: one salient

¹ This research received the support of the European Research Council (grant no. 263529). I am grateful to Katherine Fox, Rachel Wise and staff members of the Baker Library at the Harvard Business School for the facilitation of access to materials from the Historical Collections. This work is part of a larger project carried out in collaboration with Liliana Doganova. A preliminary version of this work was presented at the *Max-Planck-Institut für Gesellschaftsforschung* in Cologne (29 January 2015), at the 31st Colloquium of the European Group for Organizational Studies in Athens (2-4 July 2015), and at the 40th Annual Conference of the Social Science History Association in Baltimore (12-15 November 2015). I thank Jens Beckert, Ryan Calder, Rainer Diaz-Bone, Emmanuel Didier, Timur Ergen, Marion Fourcade, Jean-Pascal Gond, Daniel Hirschman, Sebastian Kohl, Philipp Korom, Julie Labatut, Andrea Mennicken and Alfred Reckendrees for their comments and remarks, and Liliana Doganova for her thoughtful reading and her pivotal influence in the formation in the views expressed here.

step in which the relevance of earning power was made particularly explicit and subjected to particularly intense pedagogical energy.

The historical sociology of business education has put a great deal of emphasis in the efforts that business schools have devoted, since their inception, to the institutionalization and professionalization of the practice of business (Khurana 2007; Fourcade and Khurana 2013). The Harvard Business School, originally established in 1908 as the Graduate School of Business Administration of Harvard University, is certainly one of the most influential organizations in the establishment of business education standards and orientations. My hypothesis is that a look at early attempts at stabilizing there the insights and recipes of business valuation can be of great value for the task of understanding its conventional features, especially its requirements in terms of realization – i.e. in the terms of how to figure out and make sense of the problem of business value (Muniesa 2014, 96-107; Giraudeau 2008, 61-6). *The Financial Policy of Corporations*, a textbook widely read in the 1920s and 1930s (MacKenzie 2006; Muniesa 2012), stood as one of the most remarkable pedagogical products of the Harvard Business School in that period, together with the courses given by the like of its author, Arthur Stone Dewing, who taught there on economics and finance from 1911 to 1933 and greatly contributed to the case method of instruction, the school's prime pedagogical vehicle (Dewing 1926; Vermeule 1971). *Problems in Finance*, a series of pedagogical cases edited by another notable faculty member, Cecil Eaton Fraser, directed the attention of early case participants to the practical dilemmas of financial valuation (Fraser 1927; Copeland 1958).² This period – basically the interwar period – is interesting for more than one reason. Punctuated by notable debates in economics, especially in regards to the conventional calculation of value, the period is marked by the reception and discussion of remarked contributions by John R. Commons, Irving Fisher, John Maynard Keynes, Frank H. Knight, Joseph Schumpeter and Thorstein Veblen, among others (Yonay 1998). It is also a period in which the science of finance was still not submerged into the quantitative revolution that sprang from the 1950s onwards (MacKenzie 2006). And it is also the period in which newly founded business schools were on the lookout for legitimate form and content (Khurana 2007).

² There exist several editions of *The Financial Policy of Corporations*. The book was first published in 1920, in five volumes, following an earlier issue of the first two volumes. *Problems in Finance*, first printed in 1927 and followed by a second edition in 1930, refers the reader to the single-volume 1926 edition of *The Financial Policy of Corporations*, in particular to a section titled "The Valuation of a Going Business for the Purpose of Promotion" (part II, chapter II). Substantial modifications were introduced in the two-volume 1941 edition of *The Financial Policy of Corporations*, and finally in the latest 1953 edition. We focus hereafter on the 1926 edition (which is most aptly linked to the period and materials we examine) and on the 1953 edition (that features noticeable clarifications and elaborations of thought).

In what follows, I delve into the articulation of business valuation at the Harvard Business School in that period. I focus on the work of Dewing, using published materials and also archival materials from the Baker Library Historical Collections at the Harvard Business School (especially from the Cecil E. Fraser Papers). I first characterize the problem of the conventions of business valuation with a critique of the idea of convention as employed in the economic-theoretical literature (Dupuy 1989). I then introduce the repertoire of business valuation as articulated by Dewing and offer illustrations of classroom situations in which this repertoire ought to be exercised. I look in particular at “Starkey Grocery Company,” a case that appears prominently in the study materials as an illustration of business valuation. I finally conclude on the intellectual opportunities that this case provides for a reconsideration of the problem of capitalist conventions of business valuation.

2. Business Valuation as a Convention

2.1 The Conventional Idea of a Convention of Valuation

To talk about something in terms of a “convention,” in the particular sense ascribed to this term within the scholarly rubric of the “economics of convention” (Diaz-Bone and Salais 2011), often means to consider it as a matter of representation of a subjective (or intersubjective) nature – i.e. a so-called social construction – that may serve well or not, depending on plausibility and commonality, the purpose of “coordination” in situations characterized by “uncertainty.” This viewpoint can translate, as put forward in some contributions that are central to this line of thought (e.g. Orléan 2014), into a particular blend of a subjective theory of value, a theory for which economic value corresponds to one of such conventions. The idea, roughly put, is that from that perspective economic value depends principally on what people think it is, and that what we have when people think the same, despite some claiming the thought might not be objectively right, is a standing and functioning convention of valuation (and, in some cases, a spiraling one).

This intellectual setup is by large depending on the epistemology of economics and controlled by a classic concern for the veracity of prices. True, it subverts a scientific hope for the neat establishment of the truth of economic value and replaces it with a pragmatic acceptance of the rule of opinion. But it is definitely preoccupied with the market’s capacity to tell the truth about value or not, and it clearly sympathizes with a liberal philosophy for which the market is the prime medium for the free expression of claims on worth (Ortiz 2014). The authors I am dealing with in this research and who bore importance in the articulation of economic valuation in the business mind were visibly partial to this conception. The several editions of Dewing’s *The Financial*

Policy of Corporations certainly provide authoritative guidance on how to estimate successfully the value of a business, but the tricks and recipes advocated for were praised by the author only insofar they approached whatever it was that held as a standing convention among professional businesspersons. In a clarification about where his “principles of valuation” stood, added to the latest editions of his book, Dewing would claim:

Value is subjective; it is based on individual human experience. [...] Value changes from hour to hour; value is different according to the standards of experience and the standards of judgement. [...] In the end the test of value is pragmatic – where does the judgement of most men meet? It is the composite of many judgements, not the reaching of an illusory fixed and unvarying basis of value on which the judgement of all people should agree (Dewing 1953, 277).

The problem of value, at least as expressed in the North-American intellectual mind of the interwar period, was certainly controlled by a set of critical fears on the possible fate of a democratic determination of human affairs (Purcell 1973). The fact that the articulation of the idea of a conventional establishment of value owes a lot to that period is of particular interest. Another author of prominent weight in the Anglo-American liberal landscape, the economist Keynes, who is credited for having provided the prime ingredients for a conventionalist understanding of economic valuation, was certainly partial to the potentials of pragmatism and empiricism, as much as he was preoccupied by the mounting menaces to liberal democracy.

In his very clear articulation of the epistemological foundations of the “economics of convention” – the intellectual trend that formed under that banner in French academic milieus in the late 1980s – Jean-Pierre Dupuy points to the pivotal role of the particular blend of game theory developed by the economist Thomas C. Schelling (1960) and by the philosopher David K. Lewis (1969), both deeply worried with the dilemmas of coordination in the face of uncertainty or, in other words, with the troubles of common agreement in front of the potential breakdown of order. But this typical post-World War II interest is complemented, in Dupuy’s account, by an interpretation of Keynes (1936, 1937) suggested by the economist André Orléan (1986). This is interesting because the bits that are actually culled from Keynes in order to ideate what an economic convention (and the economic analysis thereof) is are precisely about business valuation. They come from a section titled “The Inducement to Invest” of *The General Theory of Employment, Interest and Money*, where Keynes discusses the efficiency of capital and the rate of interest.

Bluntly put, the rate of interest represents the price of an investment: for how much would an investor want to invest, which depends on how the investor values the object of investment (i.e. considered in its capacity to generate a return). What does Keynes want to suggest to his readers about that rate? That it is a convention, and that it is an ideal example of what a convention is. But the nuances are interesting, and I believe that there is more to it than just the famous

beauty contest metaphor featured in chapter XII of *The General Theory*. Keynes explicitly states that the convention is not a belief. It is rather a tactic:

In practice we have tacitly agreed, as a rule, to fall back on what is, in truth, a *convention*. The essence of this convention – though it does not, of course, work out quite so simply – lies in assuming that the existing state of affairs will continue indefinitely, except in so far as we have specific reasons to expect a change. This does not mean that we really believe that the existing state of affairs will continue indefinitely. We know from extensive experience that this is most unlikely. The actual results of an investment over a long term of years very seldom agree with the initial expectation (Keynes 1936, 152).

What counts for Keynes in the tactical establishment of the “conventional method of calculation” is reliance in the “maintenance of the convention.” Turmoil and confusion are of course not good from that perspective. And, in order to temper the likelihood of unsettlement and to find encouragement for investing, the valuation of investment tends to reduce the timeframe and focus on a series of near futures rather than on a too distant one:

Thus investment becomes reasonably ‘safe’ for the individual investor over short periods, and hence over a succession of short periods however many, if he can fairly rely on there being no breakdown in the convention and on his therefore having an opportunity to revise his judgment and change his investment, before there has been time for much to happen. [...] It has been, I am sure, on the basis of some such procedure as this that our leading investment markets have been developed (Keynes 1936, 153).

And, again against an idea of a subjective mechanism or behavioral determination, Keynes further refines his idea of a convention:

It might be more accurate, perhaps, to say that the rate of interest is a highly conventional, rather than a highly psychological, phenomenon. For its actual value is largely governed by the prevailing view as to what its value is expected to be. *Any* level of interest which is accepted with sufficient conviction as *likely* to be durable *will* be durable; subject, of course, in a changing society to fluctuations for all kinds of reasons round the expected normal (Keynes 1936, 203).

Keynes seems to provide quite a reflexive image of the convention. It does not sound as some sort of a game in which an investor is trying to anticipate what others think or would think, contrary to what the above-mentioned shibboleth of the beauty contest would imply.³ It rather sounds as some sort of a habit with which the investor tries to “encourage himself,” “fairly” relying on the fact that there should be “no breakdown in the convention” over a succession of “short periods.” Furthermore, the idea of an economic convention seems to be more

³ But compare to the interpretation favored by Orléan (1986) and Dupuy (1989), who concentrate on a later claim by Keynes on “the psychology of a society of individuals each of whom is endeavoring to copy the others” (Keynes 1937, 214) and precipitates an understanding of the convention in terms of mimetic behavior and cognitive contagion.

about a habit in the method of valuation that about an agreement on the actual figure that springs from it.

A comparable intuition seems to be at work in the considerations that someone like Dewing would offer on the conventional nature of the rate that is used for the valuation of a business, measured by its earning power: “capitalization on net earnings,” in his preferred vocabulary.⁴ There is surely an element of confidence in the continuity of income over a reasonable period of time:

Under our competitive system of economic values, the business is the instrument which created the earnings, and the valuation of the business is the valuation of this instrument. It is true, too, under our competitive system that the price which men will pay for this instrument will depend on the relative certainty with which these earnings can be counted upon to continue. In other words, the rate at which a business shall be capitalized, to obtain its value, will depend on the confidence the buyer may feel in the continuation of the earnings. This is the relative risk of the business itself. The greater the risk, the greater the doubt of continued earnings, the lower is the capitalized value of these earnings; and conversely, the lower the risk, the greater the value (Dewing 1953, 288).

But there is also a conventional understanding of the method of valuation (“guesswork”), and on the tactics of its empirical verification:

Perhaps the most difficult, and so far as results are concerned, the most important point in any theory of value based on earning power, is the rate at which earnings shall be capitalized. [...] Yet the determination of this rate is at best a matter of guesswork, but guesswork supported by the evidence of prices at which businesses of various kinds are being actually valued at any one time. This evidence from current experience with reference to the value of different enterprises can be culled out not only from the prices at which enterprises are actually sold, but also from the valuation put upon them by bankers extending credit to them and by investors who are willing to buy their bonds and stocks. In other words, such guesswork is subject to the best kind of pragmatic test, namely the evidence of actual experience (Dewing 1953, 292; see also Dewing 1926, 273).

2.2 The Business of Accounting for Business Value

For authors such as Fraser and Dewing (and they certainly were not alone in this) the determination of business value was a practical problem: a question called for by the mundane conduct of business rather than by theoretical disquisitions. Although some all-encompassing universal considerations were clearly at work (e.g. the grand claim that everything boils down to earning power), the issues at hand were rather about how value should or would fit into a balance sheet and to what end. Accounting was put in the forefront, rather than eco-

⁴ As Fisher (1906, 194) indicates, the rate of capitalization can be understood as a conversion of the rate of interest, i.e. the price of income in terms of capital, instead of the price of capital in terms of income (his definition of the rate of interest).

nomic theory.⁵ That is certainly what one can gather from a glance at *Problems in Finance* (Fraser 1927), one of the earliest Harvard case books. The book presents a collection of practical cases cluttered with tables: balance sheets of all sorts in particular (more on this below). For example, the “exhibits” displayed in “Starkey Grocery Company,” the case that opens the section on valuation, consist of 4 tables: the balance sheets and estimates of earnings for two companies, displayed in different guises, so as to render realistically the idiosyncrasies of mundane accounting practices. The intellectual scholarly guidance required, if at all, for the preparation of such kinds of pedagogical cases was to be found in the pages of *The Accounting Review* or *The Journal of Business* rather than, say, in *The American Economic Review*, *The Quarterly Journal of Economics* or *The Journal of Political Economy*. The folder that contains materials gathered by Fraser for the preparation of “Starkey Grocery Company” includes, for example, offprints of a couple of papers by C. Rufus Rorem published in 1929 in the two aforementioned journals (Rorem 1929a, 1929b).⁶

Rorem, a reputable contributor to financial accounting theory who has been particularly praised for his contribution to medical accounting (Hendrickson 1991), was arguably useful here, in part, because of his discussion on “the time element in business valuation” (Rorem 1929a, 312), that is, on the problem of the timing of revenue – a problem which is central, as indicated above, to the maintenance of a convention of business valuation which consists essentially of “the prediction and measurement of realized income” (Rorem 1929a, 312). Rorem associates the idea of “business value” to that of “going concern value” – i.e. “the total expected income from the property of an enterprise which conducts its affairs with a view to making income exceed cost by the greatest possible amount” (Rorem 1929a, 313) – as elaborated by Commons in his *Legal Foundations of Capitalism* (Commons 1924, 182-213).⁷

Rorem would give a definition of what an asset is that could strike the reader as quite in phase with the intellectual efforts developed by Fisher (1906, 1907), although with no reference to them:

Assets are conceptual entities having no existence apart from the income expected to be realized from them in the future. [...] The assets are mere esti-

⁵ I sympathize with the critical observation put forward by Ève Chiapello and Alain Desrosières when they suggest that economists tend to develop a rather meagre interest in business accounting, and that this is particularly the case for economists “of convention” (Chiapello and Desrosières 2006, 299).

⁶ Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947. Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

⁷ Expressions such as “going business,” “going business concern,” “going concern” or “going enterprise,” which seemed to heavily populate business valuation parlance in the interwar period and which certainly find in Commons (1924) an intellectual hub, conveyed quite well the idea of the value of business stemming from the continuing capability of return, that is, from earning power (Dewing 1926, 264; Badger 1925).

mates of the portions of future income which can be imputed to certain physical, commodities, contractual obligations, and ‘intangible’ sources of exchange value. Accountants are prone to start with the assets as a given quantity and to speak of income as derived from the assets. On the contrary, it is the income which is the essence of capital value; the assets are mere ‘conceptual’ objects. Creditors and proprietors in reality are not the owners of assets but merely the prospective, recipients of future income. The validity of the asset values appearing in the balance sheet depends entirely upon future income transactions (Rorem 1929a, 316).

The balance sheet, Rorem would then claim, “is merely a present representation of income to be realized in the future” (Rorem 1929a, 317), which carries the quite liberal implication that the correct valuation of the assets “depends upon the intended use” (Rorem 1929a, 318).⁸ The idea that valuation depends on the purpose that the asset is provided with is central to the convention of capitalization that we are scrutinizing here. A salient trait of capitalization follows, of course: that the use of the asset will in turn depend entirely (or almost) on valuation. A businessperson may use an asset in very different manners, depending in particular on the probable income that this asset (i.e. this use of the asset) may yield – or, in other words, depending on the specific path pursued in order “to make income exceed cost.” Rorem links this idea to the economist’s concept of “opportunity cost” (Rorem 1929a, 319).

Rorem also focuses on what we may call the crux of the convention, namely the conventional determination of temporal thresholds in the perception of income:

The value of a business asset arises from the income expected to be derived from it; but the recognition of this fact is much easier than the application of it. A calculation of business value involves a prediction both of the exact quantities of monetary net income which will be realized and of the exact periods in the future during which they will be received (Rorem 1929a, 320).

Practical problems that would characterize the establishment of this convention would be, for example, price movements and variations in the value of the currency, changing estimation of the rate of output, unanticipated business prosperity or decay, but also trends in the regulation of the social order, and, last but certainly not least, shifts in business wishes – or “changes in administrative intent as to use of an enterprise or its assets” (Rorem 1929a, 320). And all or almost all of these problems will revolve around the problem of establishing values in a balance sheet.

⁸ On the policy of the balance sheet, Rorem refers the reader to Eugen Schmalenbach, Herman Veit Simon, and their particular blend of financial accounting (especially to their theorization of the asset).

3. Starkey Grocery Company

3.1 Introducing Valuation with a Practical Case

Let us now move into the setting where the practical concern for the pedagogical exercising of the habit of business valuation – the habit of capitalization – ought to be worked out: the classroom. Let us look at “Starkey Grocery Company,” a case featured in section IX (titled “Valuation, Combination and Reorganization” in the first edition) of Fraser’s *Problems in Finance* (Fraser 1927, 621-7).⁹ The purpose of this case was to introduce and illustrate the topic of business valuation to any prospective reader (the case book was available from a commercial publisher) but also, in particular, to students enrolled in the 1920s and 1930s in the programs offered at the Graduate School of Business Administration of Harvard University (later to be known as Harvard Business School). The case was taught there by Fraser, Dewing and a number of other faculty members.¹⁰

In that period, cases developed in the context of the so-called “case method” that gradually became the distinctive educative vehicle of the Harvard Business School were often still called “problems” instead of “cases” (Copeland 1958, 254-62). Fraser, Dewing and their colleagues were very much focused on the business of refining, legitimizing, perfecting, implementing and publicizing this method which basically consisted of bringing some form of a realistic business situation inside the classroom, and having students learn through the actual experience of participating in it – a simulacrum of business (see Muniesa 2014, 96-107). Fraser, for example, was the editor of a volume titled *The Case Method of Instruction* that gathered contributions from a number of faculty members on topics such as how to document, write and teach a case, and why (Fraser 1931a). The volume opened with Dewing’s “Introduction to the Use of Cases,” which had already been printed in *Problems in Finance*.

⁹ The section of *Problems of Finance* which opens with “Starkey Grocery Company” refers the reader straightaway to background literature on valuation, starting with Dewing (1926, 258-77), followed by Gerstenberg (1915, 499-541; 1924, 37-8, 543-63, 606), with Badger (1925) added also to the 1930 new edition of the book (Fraser 1930, 515).

¹⁰ The primary source materials on which this section is based consist of both the 1927 and 1930 editions of Fraser’s *Problems in Finance*; case teaching notes offered in the 1931 revised edition of Fraser’s *Key to Problems in Finance*; the 1920, 1926, 1941 and 1953 editions of Dewing’s *The Financial Policy of Corporations*; the 1922 edition of Dewing’s *Problems to Accompany The Financial Policy of Corporations*; and documentation for the Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School, in particular from the Fraser’s teaching records (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947). A folder related to “Starkey Grocery Company” (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company), contains handwritten or typewritten notes taken on specific teaching sessions, copies of the case in several versions, and a number of offprints and brochures.

How did a case such as “Starkey Grocery Company” work? Some faculty member would manage to get in touch, usually through personal acquaintances, with an executive in a company facing or having faced a situation of interest for the course. Ties to the industry were more than ties: it was not unusual for professors in the business school to mingle or have mingled with actual business in their professional life. Dewing and Fraser would be considered as reliable introductions to sources, together with Georges F. Doriot, another prominent faculty member (see Dewing 1922; Fraser and Doriot 1932).¹¹ Access to main data (i.e. balance sheets, brochures, a few statements about the problems at hand), though not extremely hard to achieve, was skillfully conducted. The crux resided rather in the writing of the case and the articulation of “specifications.” That task was put into the hands of a “case writer,” that is, a staff member of the school’s Bureau of Business Research, the office in charge of developing intelligence and materials for the case method (McNair 1931, 1954; Copeland 1958). A case was usually tested both in discussions with colleagues and in the classroom, then refined and adapted. The name of the original company was concealed most of the time – we do not know which company stood as the source for “Starkey Grocery Company.” Figures could also be adapted, and formulation of issues tinkered with for the sake of pedagogy. For example, a whole section on warehousing in “Starkey Grocery Company” was “rung in” in spite of the fact that “the source never considered to be part of his problem,” with the purpose of making it fit for an introduction to the topic of business policy.¹² The case would need to be halfway between real and realistic. What ought to be put upfront was definitely one “issue” (McNair 1931), rather than a tedious concatenation of factual exactitudes.

The “Starkey Grocery Company” case (subtitled “Purchase of a Business”) starts like this:

In the fall of 1923, the president of the Elm Grocery Company asked the treasurer of the Starkey Grocery Company whether the latter company would be interested in purchasing the controlling stock of the former company. The

¹¹ Archival material suggests that Dewing stood as a prominent resource for the sorting out of case sources, e.g. mentions like “See Mr. Dewing for letter of introduction” in correspondence about case specifications. Doriot seems to have been mentioned as a correspondent for “Starkey Grocery Company.” Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924–1947 (Box 8, f. 17 PF-1930, S1 – Specifications – Finance – 2; Box 8, f. 20 PF-1930, S1 – Specifications – Finance – 5).

¹² This is suggested in a memorandum, dated 5 January 1926 and addressed by George Russell Cogswell to Melvin T. Copeland, discussing the opportunity and benefits of using “Starkey Grocery Company” as an “introductory problem.” The adaptation is justified as a means to emphasize aspects that would increase the introductory capacity of the case. Cecil E. Fraser Papers, 1919–1947, Baker Library Historical Collections, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924–1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

president of the Elm Grocery Company wished to retire on account of ill health and the loss by death of the services of several of his most valuable assistants. He thought that the long-established reputation and the desirable private brands of his company would make it valuable to its principal competitor, the Starkey Grocery Company (Fraser 1927, 621).

Then the case advances some figures, indicates some details – both quantitative and qualitative – about the two companies: characteristics, sales, balance sheets (presented in different fashion for each company). Emphasis is put on the identification of assets, earnings and taxes, and on the principles used for the valuation of Elm Grocery Company. The president of Elm Grocery Company controlled more than half of the common stock, and the initial offer was to sell these shares at \$125 a share. The accounting firm employed by Starkey Grocery Company to investigate Elm Grocery Company gave a report which concluded that “preferred and common stock of the Elm Grocery Company had a total value not exceeding \$500,000” (Fraser 1927, 625). The officers of Starkey Grocery Company found that “essentially accurate” but, “on account of friendly relationships,” were ready to offer \$525,000, which would translate into \$62.50 per share of common stock. The case then provides details on a shareholder meeting in which one third of the common stockholders of Elm Grocery Company voted to refuse the contemplated offer and made application for “the appointment of unbiased appraisers for a revaluation of the common stock,” contending that “the goodwill of the Elm Grocery Company had not been considered in the proposed purchase price” (Fraser 1927, 625). And so it happened, the case tells. The case then provides elements that emerged in the course of this new investigation. New evidence of earnings previous to the apparently problematic period used in the previous report (1917 to 1923, which comprised indeed a period of governmental price fixing policy) was provided. Importantly, it was shown that the retail stores “purchased their merchandise from the wholesale department at the actual cost to the wholesale department, plus a charge of 3%,” thus hampering the display of “true profits” (Fraser 1927, 626). Further elements are given, for example on the evolution of the line of credit provided to Elm Grocery Company by banks, on problems with a lease with a building, on an estimate from an architect to equip that building for satisfactory use, and on the general situation of increased competition of retail chain grocery stores. The case concludes with the following questions: “What was a fair valuation of the Elm Grocery Company? What offer should have been made per share for the common stock?” (Fraser 1927, 627).

The case’s teaching note (a teaching guide that instructors would use in order to facilitate the pedagogical process in the classroom) opens with a short introductory paragraph that situates the importance of the subject of valuation, especially when a business is to be liquidated, sold or merged, adding one caveat on the case-by-case nature of the problem, and another one on the influ-

ence of bargaining in the determination of value (Fraser 1931b, 106).¹³ Then it indicates that there exist several methods that could be considered in the classroom discussion of the case for the establishment of the value of Elm Grocery Company: a distinction is established between the “book value of the assets” on the one hand, and “capitalized past earnings” and “future earnings” on the other (Fraser 1931b, 106). The note observes that, for determining book value, a distinction should be made between consumer goods in the inventory (liquid) and producer goods (fixtures and fixed assets, less marketable, goods which “will usually bring only a fraction of their cost” in case of forced liquidation), adding that, in evaluating the latter, “one has to look to earnings, either past or prospective” (Fraser 1931b, 106). It then briefly considers the evaluation of goodwill (“probably one of the most difficult problems of valuation”) and suggests a conception that defines goodwill as “the difference between book value of assets and capitalized earnings” (Fraser 1931b, 106). Then it concludes with the following tip:

One valuation might be computed as follows. The total value of current assets is approximately \$1,000,000. If 10% is deducted for possible depreciation, \$900,000 remains. If the current liabilities are deducted, about \$300,000 might be considered the value of the net quick assets of the business. Over a period of 15 years the company has averaged \$57,681 profit. For the past few years a profit of \$30,000 appears a better earnings figure for capitalization. At 10% this would amount to \$300,000. The sum of these figures, \$600,000, might be offered for the business (Fraser 1931b, 106).

The value of a business (e.g. the price that ought to be paid to its owners in order to acquire it) is not based on what the business has in possession, but on the capacity of whatever it has to ensure continuing revenue in the future. This requires a series of interpretive operations. One is to classify what the business has in possession and see what counts as sources of earnings (for example resources that are needed for production, and also particular abilities) and what not (possessions that might at best be sold for profit on spot). Another is to identify past earnings and assess their nature. The “rate of capitalization” (which can amount to a price-earnings ratio for traded company stock) is the convention that links actual average earnings to the envisaged valuation of the company. In this rate resides the core of business valuation here, e.g. in particular the confidence of the continuation of return on investment or, in other words, the perception of earning power.

¹³ The text of the teaching note for “Starkey Grocery Company” in the 1931 second, revised edition of *Key to Problems in Finance* is identical to the one marked “as sent to publisher” found in the archives. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924–1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

3.2 The Craft of Realization

But realizing what business valuation would be about does not come from reading the case. The case method is explicitly about “doing” it, and the ultimate ingredient of the pedagogical experience is the exercising of the case in the classroom. How did it go with “Starkey Grocery Company”? The teaching records available from the Baker Library Historical Collections provide some materials that can help get the flavor of how a teaching session on that case with Fraser or Dewing would look like.¹⁴

Fraser’s teaching style was rather sober and pragmatic, compliant with the case’s pedagogical pace and with remarks kept to the point. His approach to “Starkey Grocery Company” would tend to focus, for example, on the convention of the timespan required for the valuation reasoning. How is earning power guessed from available information? Past earnings can definitely enter the equation, but the question then is how, e.g. what period should be covered, how does this period constitute a trend or not, and what precautions should be taken when drawing conclusions about prospective earnings. Notes from a teaching session would include mentions such as the following:

How many years determine earning power? Is from 1927 back to 1921 enough? Number of years must be enough to include both prosperity and depression. If you can get both in five years, all right, but if not then take more years. Less than five years ordinarily not satisfactory, for usually you have to take more to get the extremes.¹⁵

The pragmatic set of mind is quite apparent too in responses to questions from students. Fraser would for example refer to the juristic situation in an explanation on how to gather a fair assessment for the establishment of valuation:

Student question: How do you find what the average rate for the business is?
Get some reliable man and give him figures which back up your idea and have him testify in court. If you have no figures, you must have many witnesses (ibid.).

Notes on the “Starkey Grocery Company” teaching session are full of emphasis on calculative tinkering, i.e. on the adjustment of estimations based on purpose and circumstance. But there is always a call for demonstration: the businessperson ought to be able to prove the soundness of reasoning, and this is done with direct reference to the fact that “business guess” can be subjected to public

¹⁴ The folder devoted to “Starkey Grocery Company” contains typewritten notes that consist of the transcription of teaching sessions, probably taken by staff members of the Bureau of Business Research. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

¹⁵ “Professor Fraser,” notes on teaching session, dated 18 April 1928. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

scrutiny and legal judgment. Business valuation was certainly a important issue in the midst of the transformations that were characterizing North-American jurisprudence in that period, prompted in particular by the movement that came to be known as legal realism and connected to early instalments of the current of “law and economics” (Purcell 1973). Important cases in public utility valuation, such as *McCardle v. Indianapolis Water Company* (a case argued before the Supreme Court of the United States in 1926 which dealt with the determination of the present value of the property of a public utility) were pivotal in debates about whether or not the law should be established on the grounds of an economic analysis of value, or the other way around (see Field 1998, 318; Menzel and Compston 1996, 209; Bauer and Gold 1934, 98-103; Richberg 1927, 1933). *McCardle v. Indianapolis Water Company* seemed to have been part of the pedagogical concerns addressed by Fraser.¹⁶

The gaze of “earning power,” impersonated in the case’s narrative by the minority shareholders of Elm Grocery Company and the owners of Starkey Grocery Company, was a recurrent token in the classroom: students should espouse this viewpoint, but in a manner that was deemed consistent with common opinion. To value meant to utter a figure, but the figure ought then to be accepted by others. To value meant, in a sense, to testify:

Capitalizing assets at 10% gives \$300,000. Then where do you get \$600,000?

If you are on the stand you will have to show how you arrived at the figures or your whole testimony will be thrown out. Have to get closest business guess.¹⁷

The notes on the teaching sessions record expressions that render a taste for the conditional, the incidental and the plausible: “probably,” “one method,” “play on the safe side,” “around,” and so forth. Even the agreed figure, \$600,000, is presented as an approximation that is justified by the fact that it can be read through a number of possible angles:

Now the assured check is against earnings. Value consumer’s goods at market – \$900,000. Subtract totals current liabilities at full amount. Leaves \$300,000 as value of current assets. Value of equipment is dependent on earnings. Producer’s goods are worth only what they will earn. Goodwill or going value is connected with earnings. No earnings unless you actually use the business. Goodwill does not exist in a strict sense but going value does exist. Determine value by earnings, approximately \$30,000. Have enough years for both prosperity and depression. At 10% \$300,000. Total about \$600,000 for the business. Probably as near correct as you can get (ibid.).

¹⁶ The folder devoted to “Starkey Grocery Company” contains an offprint of the “*McCardle v. Indianapolis Water Company*” court case. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

¹⁷ “Professor Fraser,” notes on teaching session, dated 18 April 1928. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

Dewing's style of teaching provides a contrast compared to Fraser's. The tone is perhaps more ideological, and there are palpable drifts that take the classroom away from the nuts and bolts of the case, into other examples and considerations. Dewing would for example spend considerable time communicating pedagogically the idea of value as earning power, value as "going business" – here, for example, picking up a famous quote from Boswell (1811, vol. 4, 337):

Samuel Johnson is executor of friend's estate – a brewery – 'I am here, not to sell vats and pans, but the opportunity of growing rich beyond the dreams of avarice.' The Doctor's way of saying a 'going business.' Not goodwill in the technical sense, but the 'goingness' of the business."¹⁸

This introduction was immediately followed by an example and further clarification:

Two adjacent mills in Fall River. One with new automatic looms, up-to-date, well equipped, recently sold for \$1.50 a spindle for taxes. The other has old obsolete, hand looms, has the second highest spindleage value of any New England mills. A mess of junk, from the technical standpoint, but operated by two men, one a genius in production-making old equipment produce at low cost, the other a genius in selling. Therefore the real value of A and B lies in the combination of the two. Fixed assets have value only when going, and entrepreneur ability must have something to work on, or is like energy operating in a vacuum. The only basis on which fixed assets and entrepreneur ability can be measured is in terms of economic productivity, or earnings. So we should speak of the value of producers' goods only in terms of capitalization of earnings. The determination of earning capacity is therefore the first step. This leaves several unknown in the equation (*ibid.*).

The translation from earnings to capitalization is, as Dewing makes clear in the classroom, controlled by habit:

Now, what ratio shall be used to proceed from earning to capitalization? Determined by experience, a surprising uniformity exists. The rates are stratified among different business, depending upon the importance of goodwill (*ibid.*).

The fact that five years appear as a decent timespan in the case under consideration is explained along that line of understanding:

The key is the determination of net earnings and the rate of capitalization, and the number of years average. Generally 5 years in industrials. Consider strategic importance of Elm Company to Starkey Company. These intangible factors have to be considered. They were, in a sense, competitors. Buying out competition. Now a tendency to use longer period as business men are aware of the industrial cycle, and want to see top and bottom included (*ibid.*).

¹⁸ "Professor Dewing," notes on teaching session, undated. Cecil E. Fraser Papers, HBS Archives, Baker Library, Harvard Business School (Series II. HBS Teaching Records: MBA and Doctoral Programs, 1924-1947 (Box 4, f. 8 PF-1927, Ch. IX-1: Starkey Grocery Company).

3.3 The Habit of Capitalization

The language used by Dewing in the classroom is comparable to the one used in *The Financial Policy of Corporations*, especially in early editions (Dewing 1926, 258-77). The pedagogical elaboration of value as earning power would rely, for instance, on the explication of differences in the nature of assets. The reasoning would usually start with a distinction between “consumer goods” and “producer goods.” The value of commodities in the business inventory can be established directly, so to say. But, in contrast, the business has things (assets) whose usefulness depends on the capacity to produce commodities, not on their value as commodities. There is a crux in this distinction, which is that the value of goods of the second type (which of course are massive if one considers what a business consists of) is not based on exchange value, but rather on some capacity – or power – that the thing confers: earning capacity. These are called “fixed assets” (as opposed to “quick assets”), but their earning capacity does not come alone, “they require the intangible something that we call management” (Dewing 1926, 262):

The valuation of the fixed assets and the management of the business are inseparably bound together. The fixed assets of a business can earn nothing – have no value as producers’ goods – without management; and skill of management has no value, it is a meaningless symbol, without fixed assets to manage. The problem narrows itself to a method by which the two, fixed assets and skill of management, can be evaluated together. The solution of this enigma is earning power (Dewing 1926, 263).

At the end of a long footnote, Dewing (1926, 264) indicates that this theory of value being based in earning power is more fully developed by Ralph Eastman Badger in *The Valuation of Industrial Securities* (Badger 1925), a source he visibly used for the discussion of the ratios for the capitalization of net earnings. Capitalization of net earnings, which bases the prospect of future earning power on an examination of the records of past earnings, is indeed the methodology favored by Dewing:

What will shrewd business men require as ratio between the earnings and the cost of the business before they will risk their capital in it? This is a question of experience. [...] Or, stating the same idea differently, the greater the risk of the business, the smaller the ratio between past earnings and present value; and, conversely, the greater the stability of the business – and the less degree to which management is a prerequisite to success – the greater the ratio between past earnings and present value. The relative importance of management gives us a key to the relative value of a business in terms of the record of past earnings (Dewing 1926, 265-6).

And the rate certainly depends on the whims of investors and the tastes of bankers, a rather “fickle” ground (Dewing 1926, 267). But there is a “surprising” concurrence, a sort of an emergent, shared habit: “Some kind of guess is necessary. Promoters are forming estimates of value all the time. The surpris-

ing thing is that, so frequently, the independent estimates of value made by different promoters are very close” (Dewing 1926, 268).

Dewing gives an actual example of this, providing abundant details. The case is about the valuation of a natural gas property operating in Pennsylvania in 1925, and a description of five different appraisals is offered, all different in nature and purpose: some adopt an engineering point of view and others are closer to the gaze of a banker. The five ended up considering a similar ratio:

All the estimates of value for the purpose of purchase were based primarily on actual and potential earning power and no one was at all concerned with original cost, plant account on the balance sheet, or reproduction value. Four out of the five employed a ratio of five to one between value and net earnings, that is, they capitalized the net earnings on a 20 per cent basis. Finally, all five of the estimates were so close together, even after the variety of adjustments, that the highest was less than 10 per cent greater than the lowest. Such closeness is indeed remarkable, even for estimates based on capitalized earnings, and shows the unanimity of judgment concerning value of practical business men forced to decide in a relatively short period of time the actual value of a rather complex business structure to be purchased for the purpose of promotion (Dewing 1926, 273).

A convention of valuation thus emerges in the eyes of Dewing, certainly in the form of a convergence of views on the value that is attributed to a particular business, but as a consequence of a coincidence on the valuation principle: namely, earning power. And the convention does not emerge out of the anticipation of what others would propose in terms of valuation, but out of experience, that is, of the habit of observing and experiencing what people in business come up with usually in terms of valuation. And this experience, we shall add, includes of course the experience in the classroom.

4. Conclusion

The problem of coming up with one conventional way of quantifying things, Alain Desrosières once observed, is commanded by the problem of establishing, in quite a performative fashion, what he called “the realism of the aggregate” (Desrosières 1998). In his sparse remarks on the specific case of the balance sheet (e.g. Desrosières 2001), he suggested caution with the sort of realism that an enquirer ought to find there: the problems of realism displayed in business accounting would differ radically from the ones encountered in, say, scientific metrology and probabilistic calculation (e.g. Daston 1994). In the balance sheet, the object submitted to quantification (that is, money), although possibly quite demanding in terms of verification, is also undeniably quite flexible (Mennicken and Power 2015). Desrosières (2001, 342-3) signaled, referring to notable attempts at establishing a science of economic observations, such as in Oskar Morgenstern’s *On the Accuracy of Economic Observa-*

tions (1950; see also Maas and Morgan 2012), how categories such as “error” or “lie” could lose relevance in the face of the evidence of leeway. The value of money wears in fact the characteristics of a bet on what might happen in the future, and this is heavily dependent on common judgment. Of course, errors are possible. But, purposeful concealment or blatant negligence put aside, these are rather about guesswork gone wrong (e.g. judgement being too “optimistic” or “pessimistic”).

The materials examined in this study show a number of things in relation to this problem. The pedagogues that were in charge of forming the business mind in North-American elite educational institutions in the interwar period (at least the ones I focused on at the Harvard Business School) were positively less preoccupied with the problem of telling what is objective (or subjective) from what is not than with the task of realizing what common business judgment boils down to. They were also busy with the project of transmitting this realization, in a somewhat adventurous fashion, to the prospective businessperson, and with the task of coping with the balance sheet. The formation of a convention of business valuation was not, in their view, about the establishment and conservation of an arbitrary belief. It was rather about the cultivation of a tactical habit. That habit was quite counterintuitive, at least to some extent. It had to be realized. The idea of value as “earning power” deserves in this respect special attention. The efforts displayed in the pedagogical vehicles that I have examined here were exactly this: efforts, that is, attempts at extracting a challenging idea, at breaking down flawed stereotypes that would hamper the businessperson’s recognition of the nature of the medium of business. This process of realization, we observe, required an entire philosophy: a philosophy perhaps not in the sense of a scholastic tradition, but rather in the sense of an attitude or disposition. What I have termed “the habit of capitalization” encapsulates that philosophy. This habit resides in the exercising of the capacity to recognize in the objects of valuation (whatever these may be) the qualities of an “asset,” that is, its potentials to produce earnings or, in other words (Dewing’s), the “goingness” of business.

The notion of habit – a staple term of social-scientific vocabulary which obviously suffers from lasting polysemy (Camic 1986) – can certainly take us in the wrong direction, for instance with an overemphasis on unconscious behavioral mechanisms. What this study suggests is that habit ought to be understood as something that needs to be purposefully exercised (Sloterdijk 2013). The key term here is realization. What the businessperson ought to do is to acquire the ability to recognize business value at first sight. The link that there exists between the establishment of the capitalistic convention of business valuation and its realization in the classroom is openly paradoxical. On the one hand, as I have suggested, the right path to business valuation is presented as something counterintuitive, i.e. as something that breaks the rules of common understanding. Like Fisher (1907), the authors that I have followed in this study

struggle to counter the otherwise widespread idea according to which, in business, the value of something amounts to the price you can get from it when you sell it on the market. But, on the other hand, the business pedagogues tended to present the convention of valuation as an explication of something that is readily observable, in an implicit manner, in business conduct, not as a discovery that should be used in order to improve an otherwise flawed reality. Realizing the habit of business valuation involved simultaneously the two sides of the verb “to realize,” e.g. to make sense of something that is already there and to make that thing altogether.

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The Roots of the Millennium Development Goals: A Framework for Studying the History of Global Statistics

*Daniel Speich Chassé**

Abstract: »Die Ursprünge der Millenniums-Entwicklungsziele«. Global comparative statistics have become a major mode of international political communication. One prominent case in point is the Millennium Development Goals as defined by the United Nations in 2000. The article contributes to a critical discussion of their functioning by designing a framework for the study of global statistics. Historians of statistics have so far largely focused on the national level and posited a strong connection between calculating social instances and governing collectives. The category of the nation was one of the foremost effects of statistics, and numbers have helped in strengthening national institutions. But what about the international realm in which the Millennium Development Goals are located? The leading question of this article is to what extent a co-construction of statistics and political institutions can also be found in the analysis of global statistics. The focus lies on statistical practices in East Africa in the epoch of late imperial rule and during decolonization. The Gross Domestic Product (GDP) is of special interest. Statistical knowledge was surprisingly incomplete and became a major issue only with the formation of new states and new international organizations post-1945. Statistical knowledge as represented in the Millennium Development Goals works through a radical reduction of complexity and necessarily renders a biased image of the world. In contrast to the national level, on the international level no single center of calculation emerged with the growing power of statistics.

Keywords: History of statistics, modern African history, history of international organizations, history of development, imperial history, history of economic thought.

1. Introduction¹

In the year 2000, the United Nations set in place eight Millennium Development Goals (MDG) to be reached by 2015 and subsequently defined no less

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than fifty-three groups of numerical indicators in order to monitor compliance.² In 2013, the UN General Secretariat launched a global consultation process including an alleged one million individual voices in order to define post-MDG procedures.³ This general assessment is an opportunity for looking back at the historical roots of the MDG initiative that lie in the history of the statistics of economic development and change. One recurrent issue in the ongoing debates is the question of whether development indicators are biased towards non-sustainable economic growth and whether the statistical form of knowledge at use needed revision (Morgan 2008; Hibou and Samuel 2011; Jerven 2013). The argument here is that before instituting more adequate or better statistics, it might be helpful to recall why and how the problem of global economic inequity became almost completely subject to a global statistical gaze in the first place. While some of the MDG have clearly been missed and the overall success of the initiative is being contested, the UN has achieved through the MDG a very effective homogenization of international political discourse. The roots of this highly successful form of numerical communication across the North-South Divide lie in the political dynamics of decolonization.

It has become a normal assumption that the basic facts and figures about the living conditions of the inhabitants of planet Earth are easily available at our fingertips.⁴ Huge sets of data have been gathered over the last decades and an enormous progress was achieved since the 1950s in standardizing the procedures of data collection, in homogenizing the basic categories, and in constructing mathematical tools that allow for their comparison. These figures prove facts and politicians are invited to govern accordingly. Statistics have become part and parcel of a computerized global social reality and they are constantly being referred to as possible agents of change. But the historians of international politics have so far not been very interested in studying the making of a planetary statistics craze, of which the Millennium Development Goals bear witness. We are neither well informed about the origins of global statistics nor about their historical dynamics. A recent German textbook on international history, for example, completely ignores the technical dimension (Dülffer and Loth 2012). When taking modern world politics into view, historians tend to neglect technical internationalism (Speich Chassé 2014) because their competencies are strong in the analysis of political deliberations but comparably weak in the study of the underlying social-scientific framework. Statistical data are frequently used as a

² See <<http://www.un.org/millenniumgoals/stats.shtml>> (Accessed January 8, 2015).

³ "A Million Voices: The World We Want." See <<http://www.worldwewant2015.org/millionvoices>> (Accessed January 13, 2015).

⁴ The Universities of Pennsylvania and of Groningen as well as the World Bank host such data. See <<http://www.rug.nl/research/ggdc/data/penn-world-table>> (Accessed January 8, 2015) and the "World Development Indicators" at <<http://data.worldbank.org/data-catalog/world-development-indicators>> (Accessed January 8, 2015).

kind of reality-check in consigning past politicians' room of manoeuvre but are only rarely made a subject of historical study in themselves.

In what follows, I suggest some guidelines for writing the history of global statistics by drawing upon recent French sociology (Diaz-Bone 2015). Two findings seem important. First is the observation that statistical facts are the result of conventions and still work as the real. Reality and conventionality need not be considered as the two opposites in a representational order but rather fuse into one world of material concerns. Matters of fact are inseparable from, and constitutive to, all matters of concern (Latour 2004). Second, this has consequences for the analysis of power. Modern governmental authority has increasingly been expressed through the working of numbers while statistics gained strength as a representation of the real, because they were linked to centers of power. Historically, there was a co-construction of scientific statistics and power regimes. Or to put it in the shorthand suggested by Alain Desrosières: modernity means that proving and governing became closely intertwined (Desrosières 2014). These findings invite the historian of global statistics not to separate between the intellectual history of social-scientific knowledge on the one hand, and the political history of governing practices on the other hand. Rather, the scientific production and the political use of statistics need be assessed in a combined narrative.

As a matter of historical fact, the predominant political concern in modernity, the building of nations, could never have been imagined collectively without the compilation of numerical data. As Desrosières and others (Sandl 1999; Behrisch 2015) showed, philosophical conceptions of the state in late 18th century produced a specific demand for statistical knowledge, which then helped the new conceptions of the state to materialize. Desrosières borrowed from Abbé Sieyès the term "Adunation" to name the process of unifying the manifold systems of reference to the nation (Desrosières 1998). The category of the nation was one of the foremost effects of statistics and numbers have helped strengthening national institutions. Recent historical studies on Germany and the United States have substantiated this twofold connection for the 1930s (Tooze 2001; Didier 2009). But what about the international realm in which the Millennium Development Goals are located? Global political communication at the closing of the 20th century was intrinsically connected to comparative statistics of all kinds. According to Wendy Espeland, social scientific quantification has become "a peculiar modern ontology, in which the real easily becomes coextensive with what is measurable" (Espeland and Stevens 2010, 432). Bettina Heintz posits that numbers generate objectivity and offer a kind of generalized language which objectifies social difference. According to her, assumed political neutrality makes numbers especially well-suited for communication on political cleavages and difference (Heintz 2012). The leading question of this paper is to what extent a co-construction of statistics and political institutions can also be found in the analysis of global statistics.

In order to address this issue, the paper asks which institutions have historically produced knowledge about economic development on a planetary scale. It considers global statistical interaction with a focus on East Africa, because one of the MDG masterminds, the economist Jeffrey D. Sachs, ventured out from the Olympic world of international institutions to the Western Kenyan province of Nyanza, where a village called Sauri became his testing ground (Sachs 2005, ch. 12). East Africa played a crucial role when it came to localizing the MDG initiative after the Millennium. It thus seems important to substantiate local historical trajectories. The first section of the paper reconstructs the high hopes that were connected to the end of European imperialism in East Africa around 1960. In this, international organizations such as the UN were of special importance because they incorporated the promise of a rational way of governing the world (Mazower 2012). However, the assumption of a globally transparent space proved largely fictitious. Upon closer scrutiny, a certain tension arises between the political use of global statistical figures and the contingencies in their making. The second section dwells on the ambivalent record of late imperial rule in statistical matters. The East African experience shows that the modern statistical imagination not only cleaned up the intricacies of social life, but also produced a chaotic backside to this governmental fiction. With respect to the economic development of poor countries the name for this backside was the non-Western world. Colonial bureaucrats were unable to cope with the mathematic tools of social-scientific inquiry that came to dominate the domestic policy of industrialized countries in the course of the 1930s' economic crisis. But precisely this mode of "Adunation" became a global template in the second half of the 20th century. The third section recalls that the statistical tools of governance are intrinsically connected to the political form of the modern nation. A methodical nationalism is built into them that was largely useless for the purposes of imperial rule but warmly welcomed by the first generation of African politicians at the moment of imperial decline. The final section connects their developmentalism to the United Nations' Millennium Development Goals. They were defined following a critical discussion in the 1980s that wanted to highlight the prospects of the individual vis-à-vis the dominant fiction of nation-centric growth (Ul Haq 1995). Global statistics cannot easily be connected to the emergence of a single center of power.

2. The UN and Independence in East Africa

Starting in 1947 the United Nations built up a worldwide system of regional bodies that focused on the construction of development knowledge (Berthelot 2003). The first were an UN Regional Commission for Europe located in Geneva, and a same-such organ for Asia and the Pacific in Bangkok, Thailand. Then Santiago de Chile became the main seat of a UN Regional Economic

Commission for Latin America. This Latin American UN Commission strongly influenced UN development discourse through comparative statistical work because its General Secretary Raul Prebisch voiced new theories of global economic dependency (Dosman 2008). Next was Africa. The Ethiopian Emperor Haile Selassie I opened the first session of the UN Commission in Addis Ababa in 1958. He financed the construction of new buildings and connected their inauguration to a very strong African discourse of postcolonial independence. He had commissioned the Ethiopian artist Afewerk Teklé to design a huge transparent window panel in the new premises called “Africa Hall.” It bore witness to an independent African perspective by depicting the UN as a medieval knight who would safeguard the continent against foreign domination.

At the opening ceremony, Haile Selassie I is reported to have said that, in this building, the UN would allow Africans from all parts of the continent – for the first time in history – to sit together on African soil in order to debate the future of their countries in a self-determined way. And Mekki Abbas, the first Executive Secretary of the African Regional Commission, understood the founding moment as the most important date in recent African history,⁵ as it symbolically marked the end of colonial rule. The artist Afewerk Teklé connected this rhetoric of an African rebirth to Ethiopian Coptic theology and put a huge figure of an African Messiah at the center of his transparent glass composition against which the UN knight was dwarfed.

We can understand this African episode as one clear expression of a promise that was voiced by US President Harry Truman in his inaugural speech in 1949. Truman’s program of US postwar policy stated four points: first was an unconditional commitment of the United States to the United Nations; second and third were the tasks of reconstructing Western Europe economically and with respect to military security. And, fourth, Truman designed a worldwide development scheme in order to eradicate poverty and global economic inequality. Statistics and technical knowledge were the American President’s first objective. The founding of the UN Regional Commission for Africa in Addis Ababa aimed at making the benefits of Western scientific advances and industrial progress available to the relatively poor new African countries. The United Nations Regional Economic Commission for Africa was founded as a kind of “clearinghouse for skills and ‘knowhow’” (Lie 1954, 146). It had no executive power and could not open up funding for development investments, but it immediately started collecting knowledge and expertise. Around 1960, scientists from Europe, Australia, Asia, the Americas, and Africa ventured on the Commissions’ behalf into a series of surveys on all possible aspects of African development and one academic gathering followed the other inside Africa Hall. Economic statistics were held to be the chief informant and agent of change.

⁵ Commission Economique pour l’Afrique: Rapport sur la première session (29.12.1958-06.01.1959). E/3201 E/CN.14/18.

The leading idea was to carefully revise the existing body of development techniques and investigate into its adaptation to African demands. The African commission under Mekki Abbas, then Robert Gardiner, and later Adebayo Adedeji, aimed at designing a specifically African body of development knowledge (Misteli 2015). The relative underdevelopment of Africa was understood as a consequence of imperial partiality and arcane administrative techniques. Now, the transparency of modern rationality should tear down imperial segregation and build the foundation for a unified modernizing continent that would play a self-determined and important role in the world economy (Cooper 1981). To Africans of the first generation at independence, the technocratic UN approach seemed a plausible way of making their pan-African visions of unity become real. Pan-African visions of unity also gave rise to the founding of the Organization of African Unity a few years later in Addis Ababa. Thus, much to the satisfaction of Haile Selassie I, the Ethiopian capital became a hub of African science and technology based modernization and unification.

One important issue in these debates was a new technique of comparative macroeconomic measurement. It had become important for international experts to indicate a sum total of national productivity as expressed in the Gross Domestic Product (GDP) for every territory or nation state that was to be developed. Macroeconomic data could be combined with a population census resulting in the GDP per capita. This indicator could then be subjected to a time series analysis resulting in a growth rate of the GDP per capita. For international bureaucrats, this indicator was an absolute necessity in order to reduce the complexity of world economic dynamics. And to African nationalists, this comparative statistical knowledge was very helpful in two respects: Indicating a GDP per capita growth rate allowed them to formulate spectacular promises of future wealth to their people at home. And at the same time, this transparent language enabled them to prove the relative poverty of their nation vis-à-vis the rich industrial countries. This comparison was important to legitimize a massive quest for financial development aid in the course of decolonization and to mark sovereignty (Speich Chassé 2011, 2013). One Western observer of the early 1960s “Wind of Change” over Africa waggishly reckoned after having assisted to debates in Addis Ababa: “Today in many independent countries national accounts are regarded, alongside the national flag and the national anthem, as symbols of independence” (Barkay 1963, 85).

International associations took advantage of the new African location in order to hold their gatherings. A series of meetings of experts in economics took place, such as the convention of the International Economic Association, which held its yearly conference in 1961 in Ethiopia. This organization had been founded a few years earlier by UNESCO and brought together national economic professional associations such as the German *Verein für Socialpolitik* or the American Economic Association under one umbrella. Its president was the British economist Edward Austin Gossage Robinson, who once had stated as

the main task of this body “the carrying of modern economics to parts of the world that were out of touch” (Robinson 1964, x).

According to the British economic statistician Phyllis Deane, who had participated in the International Economic Association’s conference, the 1961 gathering assembled a new set of voices across colonial boundaries. There were three distinct pro-development groups of experts in Addis Ababa. “Each of this very mixed bag of participants had his own special grain of debatable truth,” she said, and continued:

There were the African speakers, with their stubborn faith in industrialization, there were the European Africans, with their equally stubborn faith in the unique virtues of imported capital and enterprise; and there were the international experts bravely grappling with slippery statistics in the attempt to draw up their league tables of comparative economic development (Deane 1965, 422).

We can connect these groups to different uses of statistics. The first group consisted of African nationalists. They appropriated the promise of modern technology in order to reproduce the British historical model of domestic industrialization in their own new nations. Second were colonial administrators and White settlers whom Phyllis Deane called “European Africans.” They picked up the new quest for transparency and stressed the importance of cadastral land titles and imperial bonds of property rights in order to secure capital flows between the metropole and the periphery. And third was a quickly growing new group of international bureaucrats who had evolved out of the pre-War League of Nations. Their agenda was to depict the planet in a coherent world of numbers. In the latter part of the 1960s these three groups molded together into one homogenous social group of statistically minded international development experts. They attempted to depoliticize the problem of global economic interaction by compiling assumedly objective statistical tables. And they quite clearly shared the view that imperial rule was ending. A more equitable mode of global knowledge was requested.

3. Africa in Late-Colonial Statistics

What administrative practices had been in place before 1961 in East Africa? What was the use of statistics in British imperial rule? In 1961 the International Association for Research in Income and Wealth also convened at Addis Ababa’s Africa Hall. At this expert meeting the use of macroeconomic indicators was subject to debate. An official from the East African colonial administrative body explained, that the Colony of Kenya did not possess very sophisticated statistics. This is remarkable, because Kenya was a Settler colony in which more sophisticated modes of colonial rule were in place than for example in the Uganda Protectorate. Generally, he indicated “that the basic statistical information is quite inadequate in many cases with respect to certain important

sectors of the economy” (Kennedy et al. 1963, 389). The British colonial administrator at the Addis Ababa conference had to confess that measured against the norms of a new international discourse of statistical transparency, British colonial administration had little to say. “It is, therefore, not possible to construct a useful series of *per capita* real incomes. Nor, because of the absence of useful price indicators is it possible to produce a satisfactory series showing changes in aggregate real domestic product” (Kennedy et al. 1963, 391). Comparative economic statistics on a global scale were a mere fantasy according to this source: “The National Accounting material is not sufficient to be of great help or assistance in development planning; certainly it has not been used in East Africa” (Kennedy et al. 1963, 410).

It is surprising to learn that colonial authorities lacked comprehensive data on population and economic potential. Current research emphasizes the modernity of colonial rule. Some authors have suggested understanding the colonies as “laboratories of modernization” (van Laak 2004; Tilley 2011). The Indian postcolonial scholar Arjun Appadurai has analyzed the cultural conditions of expanding European notions of modernity into a global scale. In this, he explicitly mentioned numbers and argued that counting was instrumental. He suggested reassessing the study of colonial governmental practices and to further inquire into “the ways in which they employ quantification in censuses as well as in various other instruments like maps, agrarian survey, racial studies, and a variety of other productions of the colonial archive” (Appadurai 1996, 115). Recent work on India has followed his proposal. U. Kalpagam showed how the East India Company used entrepreneurial bookkeeping in the 19th century in order to simplify the representation of socio-economic conditions on the Indian sub-continent and thus paved the way for modern (i.e. rational) governmental techniques when the British state took over governmental responsibility (Kalpagam 2000, 2014). And the anthropologist Akhil Gupta followed this line of inquiry into an analysis of the postcolonial Indian states’ development practices which have led to a notoriously inefficient bureaucracy (Gupta 2009, 2012). In the Indian experience the production of statistics on development clearly has colonial roots. Also for Africa such continuities in practice and staffing have been observed (Bonneuil 2000; Hodge 2007). But it is still remarkably difficult to trace present-day numerical statistics back into the colonial period. In view of the quest for statistical transparency that was voiced around 1960 by international bureaucrats, settlers, and the nationalist administrators of the newly emerging African nations, the British colonial statisticians came under pressure. This finding is historically significant. Obviously we have to be careful in imagining colonial rule to have been ultramodern.

In the European experience, modern national statistics focused on territory, on population, and on economic potential. What was the state of the statistical art in late British colonial rule? With respect to the cartographic survey of the territory, the Kenyan colonial authorities performed fairly well. The Colonial

geodetic survey had produced large-scale maps of East Africa that were still in use in independent Kenyan administration as late as the 1980s, for example, in the management of timber and fuel wood production around Mount Kenya and in the Aberdares. In the Coast Province, the creation of a cadaster in order to legally secure land titles was conducted in the years between 1915 and 1920, but remained highly contested (Cooper 1980, ch. 5). Expanding such a governmental venture into inland territories was a major challenge to the District Officers. Care had been attributed only to a cadastral survey of the “White Highlands” in the Nairobi region, and around Machakos, Nyeri, Nanjuki, Nakuru, Kisumu and Eldoret during the 1940s and 1950s. This included the legal definition of arable plots in order to administrate the contestation of land between the white settlers, the Maasai pastoralists and Kikuyu smallholders. It is well-established that this governmental intervention into questions of land ownership was a concomitant circumstance of the “Mau Mau” uprising during the early 1950s (Leys 1971, 320; Leo 1981; Kanogo 1987). Areal statistics were a major player in Kenyan history as they simplified land tenure and produced evidence on paper that successively turned into a physical reality by means of expulsion and resettlement.

With respect to the census of population, the East African colonial record is poorer. The counting of populations was an important activity for colonial regimes, for the new nations that emerged with decolonization, and for the international organizations that since then came into existence (Hartmann and Unger 2014). Looking back at the connection between Empire and information, counting people had been important for the Early Modern Spaniards as well as for the British in 19th century India. Important books have recently appeared under the headings of “Imperium und Empirie” (Brendecke 2009) or “Empire and Information” (Bayly 1996). It is well known that British colonial administrators tried to count all heads of population under their rule.⁶

But the modern techniques of administration and governance were a huge challenge not only to bureaucracies that were confronted with the problem of long-distance control (Law 1986, 234 et seq.), but also to the authorities of relatively coherent national political bodies within the close bounds of Europe. It had been a huge challenge for a highly industrialized and small nation like Switzerland to produce adequate aerial statistics and a correct population census in the late 19th century (Jost 1995; Gugerli and Speich 2002). In view of this record, one can probably not overestimate the problems that the British colonial administrators must have had when trying to correctly assess the natural features or count the number of their legal subjects in vast areas across Asia and Africa. The colonies might have worked as “laboratories of modernization” in the colonial imagination, but in the daily routines of statisticians working

⁶ “Almost all the Colonial territories took a population census in either the late war or the early postwar years. Nigeria is an exception” (Searle et al. 1950, 18).

overseas most probably more modest visions prevailed. The first census in Kenya was taken as late as 1948 (Dörnemann 2014). Prior to this date, British administrators had but a rough idea of the number of subjects under their rule, and knew little about their economic activities. Colonial rule built less on facts than on speculation and prejudice (Ferguson 1999, 53). For Uganda, the colonial authorities estimated a head number of 5.7 Million in 1958 and 6.3 Million in 1959 – being well aware that this increase was neither due to fertility nor to migration but to ignorance (Kennedy et al. 1963, 392).

With respect to the numerical statistics of economic potential, the African record of British imperialism is especially poor. Only in the 1930s did the British Colonial Office finance a large-scale statistical survey of its African possessions that was coordinated by Lord Hailey. The result was a book with over thousand pages – the “African Survey,” published in 1938 (Hailey 1938). It included descriptions of different African peoples and regions much in the tradition of descriptive statistics (Schlözer 1804). The epistemic basis of this statistical work was the qualitative inquiry of anthropology according to Bronislaw Malinowski that was en vogue at the time (Malinowski 1929). The main idea was to record assumedly ancient forms of collective life that were thought to vanish in the course of the colonial civilizing mission (Tilley 2011).

During this research, one British economist, Edward Austin Gossage Robinson, realized the need to more systematically gather quantitative information on the economic situation in the African colonies. In 1940, Robinson commissioned the young economist Phyllis Deane in 1940 to compile social accounts for Southern African territories out of published material. He wanted to apply the latest techniques of national income accounting that had been tentatively applied to India (Rao 1940), and that had been used by his colleague in the economic profession, Colin Clark, in a worldwide survey of economic development (Clark 1940). The idea was testing the usefulness of the new macroeconomic statistical tools for better planning the economic development of the colonies.

In domestic British economic policy these new statistical techniques as from 1940 gradually gained in importance. Within the larger context of Keynesian macroeconomic theory these statistics became fundamental tools in planning the national economy (Suzuki 2003). Planning generally gained ground in political practice during the final years of the Second World War. It is no surprise that this also started to influence the assumptions about how the colonies should be ruled. Evidence for such a gradual change is a small pamphlet from 1944, which wanted to strengthen the public support for colonialism in Great Britain. In this book, Phyllis Deane presented early results from her statistical work. Many graphs, statistical tables, and carefully chosen pictures gave the impression of the colonies as islands of tranquility, order and prosperity. The authors stated: “No one will tolerate a return to the unplanned chaos of the inter-war years; the chaos of slump and slum, of malnutrition and mass unemployment. A plan is demanded” (Huxley and Deane 1944, 2). In the future,

collective life on the British islands as well as in the colonies should be organized in a rational and transparent way. Statistics were to form a basis.

But this was not an adequate depiction of African realities. Grace Davie has reconstructed the contested nature of knowledge on poverty since 1855 in South Africa (Davie 2015). Despite the fact that social scientific inquiries on economic issues remained incomplete, their authors always found themselves immersed in highly political debates. Phyllis Deane sensed these complications. When the final results of her study on “The Measurement of Colonial National Incomes” were published in 1948, she was very much unsatisfied and called her work “An experiment.” In an introductory note to this pioneering study, E. A. G. Robinson recalled the difficulties of macroeconomic statistics:

Any test of their application to the measurement of a more primitive national income was [...] difficult, since very few attempts had been made to measure colonial national incomes, and none of them were in a form which readily permitted an already accumulated body of data to be rearranged to see whether it could be used to exploit the advantages of the new techniques. Indeed, the development of the measurement of colonial national incomes was in itself almost a path-breaking task, which was capable of yielding great dividends in knowledge of the economic structure and standards of the colonial territories, the limits of which I myself had learned to appreciate in working with Lord Hailey on his *African Survey* (Deane 1948, v).

Systematic quantitative research on economic potentials began in the British Empire only in the 1950s. Step by step, the qualitative studies of anthropology were replaced by the quantitative arguments of development economics. Institutionally, in the British context, the “Colonial Social Science Research Council” rose with these epistemic movements (Mills 2005). Further studies by Phyllis Deane, Alan R. Prest on Nigeria, and Alan Peacock on Tanganyika included the collection of data for the compilation of a Gross Domestic Product (GDP) for the African territories (Deane 1953; Prest and Stewart 1953; Peacock and Dosser 1958). However, all these studies retained a pioneering character. They all gave single figures on the volume of different economic sectors and also compiled sum totals of national products. But they also all strongly questioned the usefulness of such macroeconomic statistics for non-Western conditions. The statistical tools did not seem to be adequate for African studies, because they had been designed for relatively homogenous industrialized national economies like the USA or England. But the colonies represented a different social world.

4. Methodological Nationalism

There is a national bias in the macroeconomic statistics of the Millennium Development Goals. The fifty-three groups of numerical indicators that were set in place for monitoring compliance all referred to sovereign nations as their

basic entity. A methodological nationalism was built into the statistical survey of global conditions. Some authors even argued for statistical knowledge to have been a major driving force in instituting the nation as a predominant political concern in international governance post-1945 (McNeely 1995). In economic matters political nations were subject to a comparative order of knowledge. A universal structural norm of economic life and an assumedly shared outlook of development were set as standards in order to measure manifold historical experiences against each other. But despite their political usability such comparative inquiries met strong resistance within the statistical profession. As Alain Desrosières has pointed out, the “openly political” and the “purely learned” institutions working in the field of global statistics show quite different trajectories (Desrosières 2013, 13). While politicians were quick to use quantitative figures, the learned experts long stayed skeptical. At a conference of the International Statistical Institute (ISI) in Washington in 1947 scholars refuted the comparing of national incomes on academic grounds but held it important pragmatically. One expert said:

These figures have been produced and people use them. They will continue to be produced, and people will continue to use them. If we were starting afresh, I would have a great deal of sympathy with what has been said about not using a single figure, and not even producing one. But the way the thing stands now is that in every governmental problem where a multiplicity of regions or countries is involved, national income figures are used. [...] And every international organization that has been formed has used national-income statistics in one way or another. Therefore, I think the statistician cannot bury his head in the sand in this matter. He should know the practical politicians will use his results and probably will misuse them. And therefore I do believe that it is imperative to make the best single figure that is possible and to use a few very simple rules for its application (Gilbert et al. 1949, 270).

British and US economists hotly debated the possibility of numerically accounting for all sectors and segments of one nation’s economic life. The result from this academic discussion was a standardized “System of National Accounts” that was issued in 1952 by the United Nations Statistical Office and the Organization for European Economic Cooperation (OEEC 1952). This tool has since become the basis for national economic policy in all nations throughout the world. Of considerable importance is the fact that these macroeconomic statistics also became the basis for the new discipline of development economics. As early as 1944, economists like Kurt Mandelbaum or Paul Rosenstein-Rodan applied numerical arguments in designing development advice for relatively poor eastern European countries including Greece, Romania, or Poland (Rosenstein-Rodan 1944; Mandelbaum 1945).

Quantitative findings were very helpful for international politics, because they allowed for reducing complex economic interactions into a system of three interlocking tables that represented all incomes of the workforce, all outlays of the business companies and households and the sum-total of government

spending. National accounts formed a factual basis for central decisions concerning the allocation of scarce resources. According to this representation, poor countries regularly showed an underused rural workforce. And they also showed generally low levels of investment. Thus, within the new discipline of development economics, the rate of investment as measured against the total GDP became a core issue.

This is very clear in the first textbook on development economics that was ever published, W. Arthur Lewis' "Theory of economic growth" from 1955. The first sentence in his book is: "The subject matter of this book is the growth of output per head of population" (Lewis 1955, 9). Lewis continued: "'Growth of output per head of the population' is rather a long phrase, [...] Most often we shall refer only to 'growth' or to 'output,' or even occasionally, for the sake of variety, to 'progress' or to 'development'" (Lewis 1955, 9). From this concise definition of the main topic Lewis set out over a long and highly sophisticated argumentation to conclude that all development policies had to focus on investment quotas. He concluded that:

the central problem in the theory of economic growth is to understand the process by which a community is converted from being a 5 per cent to a 12 per cent saver – with all the changes in attitudes, in institutions and in techniques which accompany this conversion" (Lewis 1955, 226).

The main avenue to effect this change was to open up capital transfers in the form of development aid and foreign direct investment. Once large investment capital sums were available, they would trickle down, miraculously multiply and effect an equitable distribution of general gains in wealth – so ran the baseline of the new statistically minded development policy.

This specific mode of knowledge production, analysis, and policy advice was completely grounded in a statistical depiction of the nation. Indeed, the national body politic was reproduced and reified in all applied categories. Economic circumstances became identical with the nation and economic life was seen as a mechanical device that could be made more efficient by clever engineers in order to further a nation's strength. In this connection, Timothy Mitchell has spoken of the invention of the "economy" as a thing (Mitchell 1998). Such an objective vision materialized in a machine that was built out of tubes, valves and containers in London in the 1940s. The economist Bill Phillips constructed this technical array to represent the flow of economic wealth within a national economy according to the theory of John Maynard Keynes. The London Science Museum holds his accomplishment to humanity on constant display. The Phillips-Machine is a tool for governing social collectives. It visualizes a system of national accounts that produced out of the anonymous multitude of statistical instances the central position of an omnipotent planner.

Colonial administrators in East Africa never reached such a position. District officers in the Kenyan Coast Province, in the Highlands, or in Nyanza had to deal with a multitude of social collectives. On the ground, the logic of impe-

rial rule produced the notion of “tribes” that all had different ways of organizing economic reproduction. Some quantitative estimates were made, but local staff reported stark differences in attitudes towards work, agriculture, and family life (Cooper 1980). The rural-urban migration that was incised by the colonial regime further complicated the analysis (Ferguson 1999). Colonial statisticians thought of Africa not in the terms of nations, but saw a complicated network of tribal interaction that they had to administrate. To this logic, the statistical view of single developmental nations was a full contrast. It proved very attractive to African nationalist politicians at the moment of decolonization because such expert-driven economic policy could strengthen their domestic legitimacy as rulers across tribal difference. The global statistical view also promised to stabilize new relations of power with the former colonial overlords. The first generation of African leaders turned the national bias of statistics into a tool for the building of new nations (Speich Chassé 2008).

Unleashing national machines of development – as were visualized in the London Museum’s Philipps’ Machine – brought a new global imagination to the fore that made all socio-economic problems of the world appear as problems of national development. The Millennium Development Goals still stuck to this methodological nationalism by imagining a global developmental ranking of nations. In postcolonial Africa, these assumedly rational techniques of executing and legitimizing political power offered a way of instituting new nations that were materially inexistent. In the imagination of the heroes of African independence such as Kwame Nkrumah in Ghana or Tom Mboya in Kenya, political sovereignty necessarily had to be followed by major schemes of statistically rendering the body politic in view of national development goals (Speich Chassé 2009). But they needed a stable comparative framework in order to legitimize their claims. Following a technical internationalism, non-governmental, international and supranational bodies such as the International Statistical Institute (ISI), the many associations that gathered in Africa Hall in the 1960s, or the statistical division of the UN built up respective bases of knowledge (Speich Chassé 2011, 2013).

5. Conclusion

The Millennium Development Goals represent a new form of “global governance” that is working without formal government structures. In questioning their historical roots it seems relevant to ask which institutions issued those statistics through which global problems are increasingly being approached. As Ernst-Otto Czempiel and James Rosenau famously stated: “The concept of governance without government is especially conducive to the study of world politics inasmuch as centralized authority is conspicuously absent from this domain of human affairs” (Rosenau and Czempiel 1992, 24). Historians of

statistics have so far not very often studied cases in which central authorities were absent. But this is the main feature of global statistics.

Despite the ubiquitous proliferation of statistics that began with the end of the Second World War, no single center of calculation has emerged and no single government rules the world until today. After 1989, the legacy of a Pax Americana has gained ground in historical explanations. But such analyses are overly simplifying. The statistical check of the Millennium Development Goals depends on aerial surveys, the census of populations, and the accounting of potentials for economic growth. Neither the Soviet Union nor the United States of America can be held responsible for an order of global knowledge that emerged in the period of the Cold War. Rather, a planetary statistical framework came into existence that put the comparison of national numbers at its core. It epistemically strengthened at the same time the foreign policies of powerful industrialized countries and national self-determination against foreign domination in the new states of the Global South.

Comparative economic statistics were very important in turning the whole world into something readable. According to Hans Blumenberg, the phenomenal world is not openly accessible to modern knowledge production. It is not lying out there ready to be read, but must be processed in order to become so (Blumenberg 1986 [1993]). This means that, as historians, we can reconstruct the composition of whole sets of practices that were necessary in order to subject complicated phenomena to governance. Global economic inequality certainly is one such phenomenon that is not accessible without highly sophisticated tools of knowledge. The problem of development only acquired readability through the constant work of scholars like Phyllis Deane or W. Arthur Lewis, and through institutions like the United Nations in Addis Ababa.

With respect to global governance, the roots of this readability of the world date back to late colonial rule. Then the ILO and the League of Nations started compiling tables of comparative economic development. But this statistical worldview was still contested around 1960. In her account of one international conference at the Addis Ababa Africa Hall, Phyllis Deane singled out “international experts bravely grappling with slippery statistics” (Deane 1965, 422). In the years 1961-1962, the economist Wolfgang Stolper designed the first National Development Plan for Nigeria calling this task “planning without facts” (Stolper 1966). Deane’s research and the work by Prest and Peacock on Nigeria and Tanganyika had explored the limits of statistical transparency. However, today, we do not assume anymore these statistics to be slippery. With the UN statistical manual on a “System of National Accounts” (1952) and with the globalization of Keynesian macroeconomic theory post-1945 (Hall 1989; Fourcade 2009), a mechanical metaphor of the national economy became a reality. International bureaucrats strongly advanced this move, because for them seemingly objective indicators like the growth rate of the GDP per capita were an absolute necessity in order to reduce the complexity of the world. Thus, as of

the early 1960s, a new comparative statistical perception of the world became dominant. It was inherently anti-imperial because the concept of independent nations was its basic entity. It functioned without a clear-cut center of calculation (Latour 1987), and it still gave rise to the Millennium Development Goals.

In the age of imperial decline, statistics and development fostered a new interest in rendering global conditions rational and transparent. As the Millennium Development Goals show, this vision is still with us today. But the conditions of its emergence have become opaque. The main argument is that we need to investigate the technical history that made this simplified worldview possible. In doing so, further research seems necessary first into the history of colonial statistical surveys which found themselves locked in an epistemic dead-end around the year 1960. It might be helpful to focus on the uncertainties of units of analysis in this earlier period such as “tribe,” district, region, territory, federation, or Empire. Second, we have to investigate early political voices from the Global South who followed the promises of transparency. And third, the emergence of new international organizations like the United Nations is an important field of future research.

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Statistics and Politics in the 18th Century

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Abstract: »*Statistik und Politik im 18. Jahrhundert*«. The article first gives an overview over the early history of statistics in politics, and then zooms in on the first attempts at establishing a nationwide agrarian statistics in pre-revolutionary France. Attention is given to the obstacles as well as to the long-term successes in standardizing and quantifying agrarian productivity. The corresponding learning experience, both in terms of concepts and practice, was a condition for the institutionalization of statistics in the early nineteenth century. It had its roots in the secular-utilitarian agenda of "enlightened absolutism" and its focus on a systematic and state-sponsored relaunch of the national economy.

Keywords: Agrarian statistics, Ancien Régime, enlightened absolutism, French Revolution, cameralism, physiocracy, political arithmetic, political economy, conventions of equivalence.

1. Introduction

The first uses of statistics in politics can be found in France and the German principalities, and they can be dated, quite precisely, to the last third of the eighteenth century – in other words, to the last decades of the Ancien Régime. It was the politics of "enlightened absolutism" that created the conditions for the breakthrough of statistics as a new form of perception, decision-making, and legitimation.

This apparently straightforward – or to some maybe almost obvious – narrative has only just been fully explored (Behrisch 2015). Until recently, the history of early statistics has been told in two divergent and unrelated ways, which blurred the story.

Historians of statistics have traced the invention of statistics or "political arithmetic" in the late seventeenth century and its subsequent theoretical development, especially in the form of demography. However, they largely skipped its practical implementation by late eighteenth-century governments and administrators and instead zoomed in on the opening of specialized statistical bureaus at the beginning of the nineteenth century, portraying this moment as the birth of "official statistics" or "state statistics," and discounting the decades

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before as “proto-statistical” at best. One reason for this periodization is the confusing semantics of “statistics,” a term that, during most of the eighteenth century, referred to textual descriptions of states rather than to numerical statistics. The main reason for this approach, however, is the fact that only those bureaus started to produce printed material in some quantity, thus making their work more easily accessible not only for contemporaries but also for later historians of statistics. Official statistics and statistical reasoning *before* that time – during the last decades of the Ancien Régime – were generally documented in handwritten form only and have therefore largely been covered by the dust of the archives. Once dug out, they show that economic and demographic factors had become the object of systematic quantification on various political and administrative levels before the end of the Ancien Régime. This activity triggered a general spread of statistical reasoning that was, ultimately, to culminate in the creation of the statistical bureaus. And these beginnings of official statistics in the last decades of the Ancien Régime yield specific insights not only into eighteenth-century politics, but also into the historically conditioned nature of statistics.

To look beneath the printed surface of eighteenth-century demography and of nineteenth-century institutional statistics, and to explore the role of knowledge production in politics and administration, falls into the domain of early modern historians. Most early modernists, however, have *also* overlooked the onset of systematic and aggregative quantification during the late Ancien Régime – because *they* generally tend to subsume any kind of administrative data gathering under the heading “statistics,” ignoring the fundamental epistemic novelty of statistical reasoning properly speaking. Thus, tax lists are regularly called statistics, although they did not provide any general form of quantitative knowledge – they were mere registers for local administrators to log individual households’ tax loads. The same is true for military recruitment lists and parish registers: They too were used for very specific administrative purposes, and were only later discovered as potential sources for aggregated demographic figures.

Hence, the early modernist’s experience of archival research and historical contextualization, on the one hand, needs to be combined with the analytically refined perspective of the historian of statistics, on the other, in order to unearth the beginnings of statistics as a specific medium of knowledge-generation, decision-making and communication in politics – in order to explore, in other words, when, and why figures and calculations started to reshape political perceptions, arguments, and actions.

The statistical interest of late Ancien Régime rulers and governments was geared especially towards demographics and towards agriculture, the basis of both popular subsistence and the economy at large. Vital statistics are comparatively better documented in printed accounts and treatises.¹ Agrarian statistics

¹ To the extent that eighteenth-century official statistics have been explored, this concerns mainly vital statistics; see esp. Rusnock (2002).

were much more intricate and therefore also less publicized – but they were arguably more relevant: First, they were closely linked to everyday political and administrative questions of popular subsistence and economic policies, both loaded by the fervent debate about free trade in grain. Second, they confronted almost all levels of Ancien Régime polity, administration, and society with the new challenge of statistical knowledge generation – from politicians and economic theorists through regional administrators and provincial elites to the peasants. Vital statistics could rely on parish records compiled by priests; data on agriculture had to be won at the basis – in the very course of agrarian production and with the support of those who performed it. At the same time, such data had to be distilled from a complex process involving diverse natural as well as cultural factors, and made compatible across different regional regimes of denominations and measurements.

For all these reasons, the slow but rigorous advances of agrarian statistics give particular insight into both the obstacles to be overcome and the changes in mentality and communication gradually wrought by them. They tell an important part of the story of when and how perceptions were beginning to be geared towards the notion of systematic measurement, standardization and quantification, and of their impact upon politics and society.

In this article, I will try to give a sketch of the prehistory and early history of statistics in politics, zooming in, towards the end, on the concrete practices, obstacles, and successes of agrarian statistics in pre-revolutionary France. First, I will characterize what might rightfully be called proto-statistical data gatherings – namely, the creation of tax lists, cadastres, and other administrative registers in the early modern period (Chapter 2). While they helped to prepare the conceptualization of statistics in certain ways, they did not, in and by themselves, produce generalized forms of quantitative knowledge.² Rather, the decisive turning point from these administrative data gatherings to statistics came – in theory – with the genesis of the concepts of “political economy” in the second half of the seventeenth century (Chapter 3), and – in practice – with their political implementation a century later, especially in France and the German principalities (Chapter 4). Of central importance, as argued before, were agrarian statistics – and at their core, harvest statistics – particularly so as they were considered key for deciding the question whether or not to liberalize the grain trade (Chapter 5). By zooming in onto a more local level, the problems involved in the new statistical approach to agricultural production become visible – as do the advances in both the practices and the conceptions of quantification (Chapter 6).

² To use the terms coined by Alain Desrosières (Desrosières 2005a, 13-4), they did not yet produce “conventions of equivalence” or, as he and others also frame it, of “commensuration” (Espeland and Stevens 2008, 408).

2. Proto-Statistics and Cadastres (16th-18th Centuries)

By the sixteenth century, and even earlier in the case of late medieval city states, European governments had begun to register their core resources in the form of rent rolls, tax and customs lists, tariff registers, conscription records, and the like. The ever-increasing generation of such information was abetted by the growing demand for fiscal and military resources in a highly competitive state system and by the concomitant desire for a comprehensive and efficient system of taxation. However, such information gathering did not yet constitute statistics proper since the data collected were not summed up and generalized in order to buttress more abstract analyses or arguments for a political agenda. They were used for concrete administrative purposes in their specific local and factual contexts: It was the entries in the horizontal rows that interested the data-collector. How many people live in the household of peasant x, how much land does he own, how much does owe me this year? Of no or little interest was a vertical column, indicating such things as the sum of people living in the district or the total surface area of acres under cultivation.

Two modifications have to be brought to bear on this general rule. First, there were instances of proper statistics in the sense of numerical data gatherings with the purpose of gaining a more abstract and general knowledge – such as, in particular, population counts, carried out in Italian city states since the fourteenth century and later elsewhere. These occasional counts, however, in themselves served specific purposes and – in contrast to what we can observe in the late eighteenth century – did not lead to comparisons among different figures, let alone to continuous and ever growing series of data gatherings. They almost always contained only one single parameter – such as, notably, the number of inhabitants in a given place – that was not further correlated with other kinds of data to allow insights beyond the given purpose and thus stimulating further data collections. The same is true for what we may call fiscal statistics – calculations of income resulting from various kinds of taxation – as well as for their further elaboration by seventeenth-century descriptions-of-state: They often featured detailed enumerations and calculations of different sources of income – and occasionally population figures – but made little or no effort at relating such figures to each other and did not serve as tools for further analysis or planning.

The second modification concerns the creation of cadastres – systematic registers of (especially) the distribution and quality of rural property that were created from the late seventeenth century onwards in order to standardize taxation levels. Although cadastres potentially provided governments with an overview of territorial tax income, they too were designed primarily to serve as a practical administrative tool. On the other hand – and increasingly so towards the middle of the eighteenth century – cadastres and comparable systematic and centralized forms of fiscal data collection were employed as analytical instru-

ments to review the efficiency and equity of the taxation system as a whole and to adjust it to changing property and productivity structures. In this sense, they were indeed statistical tools creating a more general and abstract knowledge that reached beyond individual taxpayers' obligations and beyond the prospective income from a given form of taxation. However, not only was this kind of analysis and planning restricted to fiscality, but few cadastres actually came to completion before the end of the century.³

Nevertheless, the creation of cadastres constituted an important springboard for the genesis of statistics. On a practical level, it trained state officials and local administrators in the complex routines of information gathering. On a conceptual level, it nourished the idea of a homogeneous, or at least potentially homogeneous, state territory whose resources could be systematically monitored and quantified. Some eighteenth-century cadastral surveys also entailed ambitions beyond the strictly fiscal purpose by charting additional cartographic, infrastructural, or agronomic information alongside the data on property distribution. Although these ambitions were rarely satisfied, and although the material thus gathered was not designed for numerical compilation, such ventures did point towards a more systematic and aggregative quantification of a territory's economic and demographic resources, too. And yet, even by the middle of the eighteenth century, governments and administrators still lacked interest in such a general analysis.

3. "Political Economy" and "Political Arithmetic" (Late 17th Century)

The decisive leap from administrative data gatherings to statistics was brought about by a new desire for systematic and exhaustive knowledge of states' economic and demographic resources. This desire, in turn, was the direct corollary of the concepts of "political economy" – that is, the notion of a complex and dynamic territorial economy that could be and should be controlled and managed by the state (Perrot 1992; Simon 2004, 431-562; Plumpe 2009). This notion was born in the second half of the seventeenth century, elaborating on and expanding the older idea of "mercantilism."⁴ This older concept had also

³ During the first half of the eighteenth century, few countries produced accurately charted tax cadastres: Starting with West Pomerania, the Swedish province on the German Baltic coast (1691-1709), then the seminal Milanese cadastre (1719-1733, implemented around 1760), and later Castile, as well as a number of German principalities.

⁴ The term "mercantilism" was coined only much later (and derogatively) by Adam Smith, aiming precisely at its focus on the external trade balance. Evidently, there were many different strands of 'mercantilist' thought and practice, some of which were closer in some respects to the new concepts of political economy than others.

conceived of a territorial economy, but in a much more static way and mainly in terms of its trade balance with other countries – rather than, as was the case with political economy, in terms of a complex economy driven by the dynamic interplay of production and consumption and capable of genuine, and maybe permanent, growth. For political economists, the population, too, was a both complex and dynamic factor of the economy, rather than just a basis of resource extraction. Last but not least, they considered it of paramount importance to create comprehensive data on such things as “population,” “production,” and “consumption” so as to analyze their functioning and interplay, to monitor the workings of the system as a whole, and to facilitate its management.

As a matter of fact, it was in direct conjunction with the earliest models of political economy that “political arithmetic” emerged – the idea of quantifying and calculating economic and social particulars. In 1662, the London merchant John Graunt extracted figures from the London “Bills of Mortality,” weekly lists of the deceased in each parish, in order to compare them along various parameters such as district, month, or sex (Graunt 1665). He was fully aware of the novelty: Whereas his fellow Londoners took the Bills only “as a *Text* to talk upon in the next Company,” he discovered their “other, and greater uses” and “reduced into Tables [...]” so as to have a view of the whole together, in order to the more ready comparing of one *Year, Season, Parish*, or other *Division* of the City, with another.” From this bird’s-eye perspective, he was able “not only to examine the Conceits, Opinions, and Conjectures [hitherto based] upon view of a few scattered *Bills*” but to find new insights and correlations “from my *Tables*,” until now hidden among the heterogeneous, unaggregated information of the Bills (Graunt 1665, 1-3, italics in the original). Graunt was thus the proud first practitioner of the “alchemy” of statistics – “converting the stale lead of a myriad of individual bits of information into the pure gold of general knowledge” (Desrosières 2005b, 18).

Graunt called his tables and the conclusions drawn from them “Natural and Political Observations Made upon the Bills of Mortality,” as he distinguished between the interest in “natural” demographics, on the one hand, and the interest in their political dimension, on the other. This “political” interest also included economic factors, such as the quantity of harvests and the numbers of cattle. Graunt conceived of the territorial economy as a complex system, and – just like other political economists – he conceived of it as a system capable of growth. Like them, he also associated politics with the task of coordinating that (demo-) economic system in a way to facilitate that growth.⁵

⁵ “the Art of Governing, and the true *Politicks*, is how to preserve the Subject in *Peace* and *Plenty*; [...] the Foundation [...] is to understand the Land, and the hands of the Territory [...]: As for example; It were good to know the *Geometrical* Content, Figure, and Situation of all the Lands of a *Kingdom* [...]. It were good to know how much Hay an Acre of every sort

For his inspiration, Graunt referred to Francis Bacon, insisting on empiricism and methodology; but also to “the Mathematicks of my Shop-Arithmetick” (Graunt 1665, Epistle dedicatory to the Royal Society, 5.2.1662, n. p.). Here, as elsewhere, commercial accounting techniques were another important ingredient next to science – reflecting the parallel now drawn a private business and a state’s economy, with the prince being its manager and his administrators its accountants.

A second important figure for the genesis of statistics was William Petty who, about ten years later, coined the very term “political arithmetic.” Similar to Graunt, and influenced by him, Petty wanted “intellectual arguments” to be replaced by sheer “terms of number, weight, or measure” (Petty 1690, Preface, n. p.). And just like Graunt, he advised the government to collect and process data on population and economy, so as to comprehend their workings and to steer and optimize their dynamics through systematic state action.

This advice, however, fell on deaf ears. The title of Graunt’s work of 1662, “Natural and Political Observations,” also helps to understand the twofold reception of the method devised by him: The “natural observations,” that is, the purely demographic calculations carried out by Graunt, were picked up and developed further by British, Dutch, German, and, later, Swedish and French scholars. They were successfully applied, among others, in the fields of medical and insurances statistics.⁶ The “political observations,” however, i.e. the political use of quantitative demographic and economic data and calculations advocated not only by Graunt and Petty, but also by Vauban, Leibniz, and others on the continent, were largely ignored. Although Charles II personally promoted Graunt to the Royal Society, neither he nor his successors showed any interest in his methods as a device of decision-making, planning, and legitimation. For some hundred years after its invention, political arithmetic was a private and academic venture that as yet failed to convince rulers and governments. As such, it also continued to rely on very rudimentary and incomplete data: Although Petty no less than Leibniz or Vauban – all of them high-ranking officials – used existing administrative registers, such as tax lists and parish registers, and ventured to create some additional sets of data, they all insisted

of Meadow will bear; how many Cattel the same weight of each sort of Hay will feed and fatten; what quantity of Grain and other Commodities the same Acre will bear in one, three, or seven years, *communibus Annis*; unto what use each soil is most proper. It is no less necessary to know how many People there be of each Sex, State, Age, Religion, Trade, Rank, or Degree, &c. by the knowledge whereof, Trade and Government may be made more certain and Regular; for, if men knew the People, as aforesaid, they might know the consumption they would make [...] a clear knowledge of all these particulars, and many more, [...] is necessary, in order to good, certain, and easie Government.” Graunt (1665, 146-51, italics in the original).

⁶ See in particular (with ample further references) Rusnock (2002); Martin and Thierry, eds. (2003).

that without large-scale, state-sponsored data collections the true potential of quantitative analysis could not be exploited.

But apart from a few sporadic, inchoate, and isolated attempts at such centralized data gathering for such statistical purposes around the middle of the century, notably in Prussia and Sweden, it was not until the 1760s that governments became interested in political arithmetic and began to put its ideas into practice on a broad, lasting, and growing scale. The reason: It was only now that the concepts of political economy, envisaging economic systems amenable to state-induced, long-term growth – and as such crucially underpinning political arithmetic – became popular with political elites.

4. The Breakthrough of Statistics in Politics (Late 18th Century)

Statistics was congenial to the specific political culture of the late Ancien Régime termed “enlightened absolutism” – a latently paradoxical combination of authoritarian rule with an “enlightened,” that is, essentially secular and utilitarian agenda. The latter element brought forth the quest for a methodical – and if possible, mathematical – approach to nature as well as to human society.⁷ Statistics incorporated both aspects: a focus on the material, secular and utilitarian aspects of society and politics, and a methodical approach based on quantification and calculation. The mathematics of late eighteenth-century official statistics were admittedly hardly sophisticated – they mostly relied on simple correlations such as the number of births compared to the number of deaths in a territory, the number of inhabitants compared to the amount of grain produced in a year, and so forth. But the massive deployment of such hitherto relatively unknown operations in turn strongly underscored the new secular-utilitarian perception of the objects and methods of politics.

The first breakthrough of systematic quantification, calculation and statistical reasoning in politics can be observed, from the 1760s onwards, in France and the principalities of the Holy Roman Empire.⁸ These states featured a long-standing interventionist tradition in society and in the economy – hitherto still

⁷ Diderot (1751) “did not doubt that [...] the world of politics, just as the world of physics, can be regulated in so many ways through weight, number, and measure” (“je ne doute point [...] que le monde politique, aussi bien que le monde physique, peut se régler à beaucoup d’égards par poids, nombre et mesure”). The last words echo William Petty (see above).

⁸ The principalities of Northern Italy seem to have been the first ones to follow. Britain as the motherland of both Political Economy and Political Arithmetic had seen a Census Bill rejected by the House of Lords in 1753 and introduced officially government-sponsored statistics only at the beginning of the nineteenth century, but there was a similar upsurge in semi-official and notably parliament-sponsored statistical enquiries also since the 1760s: Hoppit (1996); Innes (2009).

in a more “mercantilist” mold – as a consequence, among other things, of authoritarian forms of governments, of a perception of economic backwardness, and of frequent involvement in (cost-)intensive warfare that consistently overstretched their fiscal and economic capacities. The rulers and administrative elites of these states also shared, from around mid-century, an “enlightened,” i.e. more secular and utilitarian outlook on politics than their predecessors. At the same time there surfaced a growing bulk of publications on political economy in its (by now) more continental, state-centered form – in Germany mainly in the guise of cameralism, in France most famously, but by no means exclusively, in that of physiocracy.⁹ The final catalyst for the breakthrough of the concepts of political economy, and consequently of statistics, was the Seven Years War (1756-1763): It plunged state budgets, economies and general subsistence into severe disarray on both sides of the Rhine¹⁰ – and forced rulers to search for new ways of providing economic stability and growth, ways such as promised by cameralists and physiocrats.

Common to both concepts, once again, was a clear departure from the hitherto dominant theories and practices of “mercantilism”: Instead of focusing on the external trade balance and on the flow of precious metal into and out of a state, physiocrats and cameralists concentrated on the economic mechanisms *within* it. They conceived of the economy as a complex and dynamic arrangement of agricultural, industrial, and other commercial factors and activities; they focused on production rather than on trade; and, as a consequence, they envisaged economic growth as possible independently of the trade balance. For physiocrats and cameralists alike, economic growth hinged on agricultural output as the ultimate basis for both industrial and commercial activities, as well as for a prosperous population. Furthermore, both systems stressed the importance of state action in order to promote economic growth, and more specifically, of state-induced *agrarian* innovation as the cornerstone of economic dynamism and competitiveness. *And* they both relied on the deployment of quantitative data on states’ economies and potentials. Therefore, when governments and administrators seized upon their ideas in the early 1760s, they set out, too, to count and calculate the resources of their territories so as to analyze the factors determining their economic potentials, and to discern the best ways to stimulate and sustain their development.

To be sure, there were major differences in the ways that state intervention in the economy and, consequently, information policies were conceived. German

⁹ On Cameralism, see Garner (2005); Simon (2004, 440-562); Sandl (1999). On Physiocracy, the most relevant title is still Weulersse (1910); on political economy in eighteenth-century France generally, see Perrot (1992).

¹⁰ It should be added: And undermined the political legitimacy of those regimes that had to concede defeat, as was particularly the case with France which lost most of its colonial possessions to Britain.

cameralism was more conventional: It continued the tradition of “Gute Policiey” (good policing) by favoring direct and, if necessary, detailed intervention as demanded by the particular circumstances of each time and place. To facilitate such well-designed intervention, cameralists admonished governments and administrators to count and measure the economic and demographic resources of their territories in all possible detail. This approach led to comprehensive censuses, carried out in numerous German principalities that counted and sorted not only the population by the categories of age, sex, and profession, but also collected data on their territories’ agrarian and commercial economies. Based partly on such censuses, partly on older forms of administrative data collection – tax rolls, cadastres, parish registers – governments then proceeded to aggregate, compare, and calculate the data in order to analyze their states and to base any planning and decision-making on the figures obtained. Also notable in the German context is the active involvement of regional administrators in the rush to produce and interpret numerical data. This involvement, too, was encouraged by cameralist writers, and it was particularly pronounced in the smaller principalities.

French physiocracy was more abstract, more original, and more ambitious than cameralism. Other than the heavily pragmatic German version of political economy, it was full of French esprit. But also unlike cameralism, it was arrogant and elitist: Convinced that they had analyzed the economic world once and for all, physiocrats instructed the government exactly what to do. Unlike cameralism, physiocracy broke with the tradition of “bonne police” (good policing) in that it despised the activity of local administrators. To stimulate agricultural production, physiocrats propagated a radical liberalization of commerce, especially of the commerce in grain, and an equally radical recast of the taxation system into a single tax on the net revenue of landowners. Yet, in order to assure the primacy of agriculture, physiocrats were ready to harness other branches of industry, check demographic mobility, and employ taxation as a means of indirect regulation. Rather than abandoning intervention altogether, they wanted it to be more consistent – and freed from the diversity of localities, from the arbitrariness of administrators, and from the back and forth of changing governments. And, in spite of what is often alleged by historians of economic theory eager to see the roots of market liberalism, their ultimate goal was not free trade and laissez-faire, but a sweeping revival of the monarchy’s fiscal and military power.¹¹

Nonetheless, physiocracy was more systematic than cameralism by setting a schedule for one-time government action rather than for the flexible day-to-day activities by provincial or even local administrators proposed by cameralists. This difference in the level of abstraction and, consequently, in the level of uniformity of political and administrative action, also led to a more abstract use of figures and calculations. Instead of encouraging administrators to quantify

¹¹ Apart from Weulersse (1910), see also Kaplan (1976), and the brilliant early analysis by Tocqueville (1856, part 3, ch. 3).

the objects of their activities, physiocrats created and propagated ready-made calculations proving – among other things – the relative backwardness of French agriculture in order to underscore the necessity to systematically re-launch it. They also purported to show – somewhat paradoxically, one might say – the surplus of grain production over consumption, so as to bolster the call for free trade. Mirroring their more abstract function to ground and defend their theory, rather than to assess particular situations and circumstances as was the case with the cameralists, the physiocrats' figures were not based on comprehensive data collections but mostly relied on rather selective data sets.

The same spirit of generalization, it should be added, obtained in French demographic data collection and calculation: They too were mainly driven, at least in the beginning, by a comparatively abstract (but nonetheless fervent) debate over the alleged long-term depopulation of France that Rousseau, among others, proclaimed to prove the decay of the monarchy (Rousseau 1762, 193-4).¹² This more generalized approach to economic and demographic issues was, at least partly, a reflection of the size and heterogeneity of France that made any kind of nationwide grass-roots data collection all but impossible.¹³

To sum up, inversely to the German development – from counting to calculating – one might say that the French proceeded from calculating to counting. But in both contexts alike, we witness a massive shift towards the quantification of facts and arguments – a shift fueled by the new desire of governments and administrators for systematic planning geared towards long-term economic expansion and growth. And in both the German and French contexts, the production and publication of ever more quantitative data stimulated discussions around them and brought them to the center of public attention as a measuring yard of political action, success and legitimacy. Only as statistics was implemented in actual political and administrative practice, so did the idea and, indeed, the imperative of demo-economic quantification impose themselves within and beyond politics.

5. Agrarian Statistics in France

It might not be surprising that the spirit of the scientific revolution, the rationalism of the Enlightenment, and a preoccupation with economic issues would merge at some point. And yet it is remarkable that, unlike the very similar efforts of Vauban half a century earlier, the physiocratic figures and calcula-

¹² On the *enquête Terray*, a demographic survey based on the birth rates from a number of selected parishes, carried out in 1770-1772 (and disproving the depopulation thesis), see Esmonin (1964). On industrial statistics, see Minard (2000).

¹³ As a case in point, it proved to be beyond the monarchy's grasp to establish a nationwide cadastre.

tions were now so eagerly picked up. François Quesnay, the founder of physiocracy, relates a discussion he purportedly had with finance minister Henri Bertin in 1761. The minister doubted the physiocratic view that the luxury industry was harmful to the economy: “Expenses for luxury,” he asserted, “are said to be nothing but a continuous exchange from the left pocket to the right and vice versa.” Quesnay retorted that “there is no doubt about the exchange, but [there is] about the scale; and it is not by reasoning that we can decide this question, but by counting.” When Bertin wondered whether calculation was not too hazardous, Quesnay replied: “This kind of hazard is very much relied upon for the prediction of eclipses” – a reply that “cut deep” (quoted after Weulersse 1910, vol. 1, 82).

Apocryphal though this incident may be, it nevertheless illustrates the fact that, by the early 1760s, the physiocrats’ abstract and figure-based promise of sustained economic and fiscal renewal coincided with the urgent desire for economic and especially agricultural reform – a desire boosted by military defeat, notably against Britain, by war-induced bankruptcy, and by the trauma of national decline. Thus, the same minister Bertin opened a department of agriculture within his ministry, inaugurated agricultural societies across the country, and adopted a central demand of physiocratic doctrine by beginning to liberalize the grain trade in 1763. The physiocrats were not the only ones clamoring for major economic and especially agricultural reforms, but with their clear-cut analyses and solutions, they spearheaded a general movement for state-induced economic growth.¹⁴ At the same time, precisely because their analyses and solutions were so suspiciously clear-cut, because they were so arrogant, and because the policies they recommended failed to bear fruit – the liberalization of the grain trade ultimately had to be revoked in 1770 due to massive shortages, price rises and popular resistance – they also aroused a lot of antagonism. And yet, their opponents resorted to figures and calculations, too: There was a growing sense that arguments were convincing only to the extent that they rested on statistical evidence.¹⁵ Both in politics and in the public debate, numerical arguments thus became increasingly important – and they triggered comprehensive data collections, especially on agriculture, across the country. This dynamic has often been overlooked because, again, it left its traces mostly in the archives.

Tackling the issue of agricultural growth and debating the ideas of physiocracy, especially its core dogma of the free trade in grain, the government wanted to obtain data on agricultural production. Seasonal harvest reports, so-called *états de récolte*, had been drawn up since the 1720s, but they were intended to

¹⁴ There existed a vast bulk of literature on fiscal, economic, and agrarian reform that was not identical with and often hostile to Physiocracy. See Perrot (1992); Bourde (1967).

¹⁵ See, for example, the protocols of the later governmental Agricultural Committee with Physiocratic outlook: Pigeonneau and Foville (1882).

foresee regional shortages and prevent dearths in due time by redistributing grain or imposing trade restrictions. In this function, they supplemented the local price indexes (*mercuriales*) sent to Paris. Those early reports were compiled in ways that essentially precluded comparison or aggregation. Only in the late 1750s did the government start to make serious efforts to improve the quality and regularity of the reports (Behrisch 2015, 404-46): *Printed* tables were produced to assure a higher degree of uniformity among the provinces, twelve different columns were to account for differentiated harvest reports, and the provincial governors (*intendants*) were to calculate total sums instead of simply listing the local data supplied to them. Accordingly, the *intendants* now urged their subordinates, the *subdélégués*, to fill in the tables accurately and uniformly and to send them in at the same time so that a general table of the province could be compiled.¹⁶

It quickly turned out, however, that the obstacles on the road towards clarity and uniformity of the data were massive and, indeed, insurmountable for decades. Until around 1760, the entries in the *états de récolte* were, more often than not, simple statements about harvest qualities without any attempt at quantification. From this time onwards, quantitative indications became the norm, albeit only in the form of proportions of a so-called *année commune* – a “standard” or “normal” year: The harvest was said, for example, to be “roughly a third” or “no more than half” of a “normal year.” As a matter of fact, the reference value itself was almost entirely spurious – nobody really knew what a “normal year” referred to. If anything, as the comparative study of the reports strongly suggests, it referred to something like an *ideal* harvest: Owing to a long-standing practice of tax reductions conceded on the basis of damages to an otherwise supposedly “normal” harvest, for both peasants and local administrators a “normal year” was a harvest occurring only under ideal conditions – conditions that in fact rarely obtained. Little wonder, then, that the *états de récolte* rarely featured harvests that equaled, let alone surpassed, a “normal year” (Behrisch 2015, 407-13).

As they compared harvest reports from different quarters of the kingdom, the curious fact that *most* harvests counted only as a fraction of a “normal year” did not escape the attention of the government. Successive finance ministers asked for more precise indications and also inquired into the relationship between a “normal year” and the grain consumption. Joseph Marie Terray (1770-1774), in particular, demanded *absolute* figures instead of mere proportions of the elusive “normal year.” In future, the harvest results were not to be “only vaguely indicated by approximate fractions [of the ‘normal year’] [...] devoid of any calculation; [rather] the real quantities will be determined by the precise

¹⁶ In the theoretical terminology employed by Alain Desrosières (Desrosières 2005a, 12), this is a case of “investment in forms.”

number of bushels [*boisseaux*] harvested from each type of grain.”¹⁷ Significantly, Terray was vigorously opposed to physiocracy: With the expected results, the minister hoped, among other things, to refute a core argument of physiocratic doctrine – the substantial surplus of grain production over consumption, a theoretical prerequisite for free trade and export. Clearly, thus, not only the desired content, precision, and standardization, but also the underlying purpose of the harvest reports changed: From instruments of short-term monitoring and local interference, they came to be seen as tools for the (in)validation of general assumptions about the economy and for decisions to be based upon them. This is further corroborated by the parallel effort of Terray to quantify the population of France, and thus its demand in grain, on the basis of church registers.¹⁸

The results of Terray’s intensified initiative were, once again, mixed. The *intendants* urged their *subdélégués* to fill in the tables more precisely and promptly; the latter complied in the usual Ancien Régime mixture of temporary obedience, makeshift solutions and, occasionally, return to routine. And yet, there was a permanent progress in the long run: Merely qualitative statements disappeared, the proportions of *année commune* became more precise and were expressed more and more regularly in digits rather than in words. However, while in some provinces the harvest results were increasingly indicated in absolute figures, as Terray and many others wished, this was not or only partly the case in others, notably those – like the Auvergne or the Limousin – with weaker economies and infrastructures. As a result, the figures were not compatible and could not be added up for the kingdom as a whole. Nevertheless, before the Ancien Régime collapsed, administrators had gone a long way towards gathering and processing quantitative data. Even though physiocracy had not aimed at such administrative capacities, its calculating spirit had had a considerable influence on this outcome. Government officials and provincial *intendants*, seeking new ways of fostering economic and agricultural expansion and taking up the theoretical challenge posed by physiocracy and its figures and calculations, had developed an acute and sustained interest in the collection and examination of data on the monarchy’s economic and, especially, agricultural potential. Slowly but surely, this interest generated new standards and practices of counting and calculating at grass-roots level as well. *Both* that desire for quantitative arguments *and* these practical capacities, developed in its wake, were preconditions for the application and professionalization of statistics in the next century.

¹⁷ Archives Départementales Puy-de-Dôme C 181, Circulaire Terray, 9 September 1773 (probably only later intitled “Mémoire méthodique adressé par M. l’Abbé Terray aux Intendants des Généralités”), 4.

¹⁸ On the *enquête Terray* (1770–1772), see footnote 13.

6. Quantifying the Harvest

We will now zoom in on the actual practices applied to quantify the harvest, especially in grain. The peasants commanded two crucial sets of data which, assembled nationwide, could have furnished absolute figures on the yearly harvest: The amount of seeds sown for different products, and the ratio between them and the harvest, gauged approximately by the number of sheaves reaped on a given field and the amount of grain won from such a sheaf. Due to the lack of a competent local administration, however, this detailed peasant knowledge could only be very partially tapped. Therefore, the government experimented – ultimately unsuccessfully – with various kinds of indicators.

One option: Tenth collectors who kept good records (and were willing to do so) could indicate the number of sheaves on certain fields, as they used this figure for their own collections; once threshed, they could also quantify the average amount of grain won from a sheaf. It was hardly possible to make a projection from such samples onto whole provinces, as there were no reliable data on the surfaces of arable land. But the procedure, repeated over a number of years in a number of fields or villages, might at least have established a relative reference value for a *true* average or “normal” year: Although absolute figures could not be obtained in this way, the yearly harvest of a given region might, on the basis of certain sample fields, be quantified in its relation to an *actual* yearly average. This is what Anne Robert Jacques Turgot, *intendant* of the south-western province of Limousin during the 1760s and early 1770s – before becoming an acclaimed economist and, briefly, also a much deviled finance minister – set out to do, albeit unsuccessfully, in response to the first of a series of initiatives by above-mentioned minister Terray to improve the harvest reports.¹⁹

A few years later, minister Terray suggested using another potential indicator: the number of ploughs in a given community, a figure relatively easy to establish by local administrators.²⁰ It was also easy – or so thought the minister – to extrapolate from that number onto the size of fields harvested, or else to the amount of seeds sown (two figures that were homologous in most contexts). From a sample ratio between the seeds sown and the harvests reaped, the current harvest could be calculated. The specification of that same ratio for a “normal year” could also furnish absolute figures on the average harvest. At least the latter indication, however, would still rely on the peasants’ notion of what a “normal” – i.e., supposedly average – harvest was. Other problems, as

¹⁹ Archives Départementales Corrèze C 1, nr. 2: Lettre aux Subdélégués sur les recherches à faire concernant les variations annuelles des récoltes (print), 30 July 1771; Behrisch (2015, 414–8). Terray had also suggested to use decimators’ figures on sheaves but had not been precise about how to do so.

²⁰ Archives Départementales Puy-de-Dôme C 181, Mémoire Terray, 1 August 1773; Behrisch (2015, 419–21).

some administrators pointed out, resided in the fact that the use of ploughs varied from place to place and that the same fields could be used for different products in different years. To tackle these obstacles, Terray then further suggested that the amount of seeds sown for each product, differentiated by soil qualities, ought to be measured as precisely as possible in every single village; likewise, the ratio between seeds and harvest was to be assessed according to each specific product and type of soil.²¹

It becomes clear at this point that there was a dilemma between, on the one hand, the representativeness of too simple indicators (such as sheaves or plows) and, on the other hand, the difficulty of obtaining more complex and differentiated indicators, such as the ratio between seeds and harvests of different products on different soils. The results were bound to be unreliable *either* because of the crudity of the indicators, *or* because peasants and local administrators would not, or truly could not, furnish the more detailed indications needed. Administrative personnel that could have collected more comprehensive data directly on the ground was lacking, as was a reliable extrapolation factor – notably, the existing arable surfaces, not to speak of their differentiation by crops, soils, and forms of cultivation. Such data could to some extent have been provided by cadastres, but only a few of them had been created in some provinces or regions, and even they differed in format (Blanchard 2001, Touzery 1994).

This latter fact is symptomatic for the heterogeneous makeup of the French monarchy on the eve of the Revolution, concerning almost everything beneath the level of central legislation and the provincial *intendants* – and including, very notably, the implementation of statistical efforts launched in Paris. While none of the *intendants* could afford to just ignore those efforts, they did so in varying degrees of enthusiasm, and they interpreted the often imprecise demands in different ways. This was necessary also in view of the divergent character of the provinces in terms of natural conditions, agrarian traditions and administrative structures, not to mention the variety of nomenclatures and measuring standards. Last but not least, they had to rely on the will and capacity of *subdélégués* and – on the local level – of tax administrators. The latter not only had their own interests and local affinities, but often challenged the very right of the *intendant*, and a fortiori of the *subdélégué*, to order them about to divulge any of their data, let alone to collect new ones.

As a result of vastly diverging strategies and successes in overcoming these and other obstacles, some provinces – such as, for example, the Franche-Comté in the east – furnished absolute rather than just relative figures already by the early 1770s. Others, such as the northern Picardie, produced them for some regions, and yet others, none at all – notably those in the center of France, such as

²¹ Archives Départementales Puy-de-Dôme C 181, Circulaire Terray, 9 September 1773 ("Mémoire méthodique adressé par M. l'Abbé Terray aux Intendants des Généralités").

the Limousin or the Auvergne, that suffered from poor transport connections and were weakly positioned economically, infrastructurally and administratively.²²

In the Franche-Comté, in fact, already by the 1750s, some *subdélégués* collected yearly data from peasant communities pertaining both to the ratio between seeds and harvests and to the amount of surface sown in order to calculate the harvest of their regions in absolute figures (Behrisch 2015, 445-7). Some of these administrators went further and checked the traditional indications of *année commune* by comparing the number of sheaves reaped and their yield in grain in a “normal year” with the results of the current year. In one exceptional case, a *subdélégué* distinguished very meticulously between fourteen different products and specified the surfaces used for them in each village during the current year in order to precisely quantify the harvests.²³ Not incidentally, he had already tried to establish a cadastre of his district over a number of years.²⁴ In yet other cases, administrators even took different categories of soil quality into account, again in parallel to efforts at creating cadastres. Some, to be sure, were overambitious: The *subdélégué* of Amiens (Picardie) calculated the yearly production of wheat and rye of his district to be 240 million *setiers* – six times the estimate for the *whole* of France!²⁵

When in the first, enthusiastic months of the Revolution, the entangled and opaque administrative structures of the Ancien Régime had disappeared, peasant communities furnished much more detailed and differentiated figures on the harvest. This can be observed even in relatively backward provinces such as the Auvergne: Here, the results even exceeded the demands of the government (Behrisch 2015, 443-5). Peasant communities now suddenly cooperated with

²² A last major effort to create reliable harvest statistics for the entire realm came in 1778 from finance minister Jacques Necker (1776-1781), motivated at least in part – like Terray – by a desire to refute the physiocratic belief in a substantial production surplus. Necker tried to combine the methods sketched by Turgot and Terray described above: Yearly samples of the number of sheaves harvested in various places were to form *both* the basis of a ‘true’ average year *and* of absolute values by extrapolating the figures obtained to the total arable surface – a project doomed to fail. See Behrisch (2015, 435-7).

²³ Archives Départementales Doubs C 1162, subdélégation Lons-le-Saunier, 15 September 1771: Tableau ou État pour connaître le nombre des personnes [...] ainsi que la quantité des terres de chaque paroisse, et les productions que l’on en a tirées. As the title suggests, the table (with 34 columns and more than 50 rows) also included differentiated figures of inhabitants.

²⁴ In order to create a fairer tax evaluation or *taille tarifée*, as it existed in some other regions, too; see Brossault (1999, 240 et seq., 459), and on the *taille tarifée* generally Blanchard (2001), Touzery (1994).

²⁵ Archives Départementales Somme C 94, État du produit, Subdelegation Amiens 1778. The figure of 40 million *setiers* for France was François Quesnay’s, taken up by many, and somewhere in the middle between other, often hugely diverging estimates. The discrepancies were due partly to different definitions of the *setier* (accounting in part also for the error of the *subdélégué*; his main blunder, however, was an absurd overcalculation of the surface of his district).

the new administrative and participatory bodies whose local members often had long-standing experience with the laborious issues of standardization and quantification. Their experience could now bear fruit – and encouraged hopes in Paris that comprehensive harvest statistics were finally within reach. These hopes, like so many others, were soon shattered, but the knowledge and skills underlying them stayed on.

7. Conclusion

From the 1760s onwards, there was a massive shift towards the quantification of facts and arguments both in France and Germany. This shift was fueled by a new desire of governments and administrators for systematic planning geared towards long-term economic expansion and growth, a desire concomitant with the secular and utilitarian agenda of “enlightened absolutism” and mediated by the concepts of political economy, notably in its recent guises of cameralism and physiocracy. In both France and Germany, the production and publication of ever more quantitative data further stimulated discussions around them, and ultimately brought them to the center of public attention as *the* measuring yard of political action, success and legitimacy.

As the example of agrarian statistics in pre-revolutionary France shows, of course, it took a long time before the concepts of standardisation and quantification took hold in the country at large. Nevertheless, the efforts to create reliable accounts of national grain production and consumption resulted in ever more comprehensive and detailed regional harvest reports from the 1760s onwards. And, as agrarian statistics involved so many different levels of Ancien Régime polity and society and had to go such a long way towards grasping, defining, and measuring its objects, its laborious implementation made statistical reasoning all the more pervasive: In the long run, it took the concepts of standardization and quantification into every corner of the state, from governmental offices to peasants’ households. To witness this process, in turn, serves once again to understand the historically contingent dimension of defining and measuring the objects of (agrarian) statistics – the historically contingent dimension, in other words, of “commensuration” or of “conventions of equivalence” (Espeland and Stevens 2008, 408; Desrosières 2005a, 14). The efforts at standardisation involved here – different fruits had to be subsumed under one label, differences of soil quality and production method had to be ignored, the various techniques of measuring, weighing, and numbering had to be standardised and measuring units had to be unified nationwide – were fully implemented only in the nineteenth century, but they all stemmed from the first statistical endeavours of the late Ancien Régime.

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Risky Calculations: Financial Mathematics and Securitization since the 1970s

*Martin Lengwiler**

Abstract: »Risikokalkulationen: Finanzmathematik und Verbriefung seit den 1970ern«. The article investigates the history of securitization in order to analyze more general transformations in the social and political approaches towards various types of credit risks. The history of securitization reveals a long-term shift in the conventions addressed when dealing with risks. Socio-political conventions were gradually replaced by financialized, market-oriented conventions in which investors would take responsibilities and replace other actors, like the state or private corporations, which were previously involved. The first part of the article examines the epistemic and economic origins of securitization. In the second part, the analysis focuses on the golden age of securitization, from the 1980s to the mid-2000s, discussing decisive factors for its expansion. The third part reflects the role of securitization in the financial crisis of 2007/08 and debates the extent to which mathematical expertise can be made responsible for the collapsing securities market.

Keywords: Securitization, financialization, quantification, financial markets, financial mathematics, insurance, risk, conventions.

1. Introduction¹

The increased social relevance of economic values and market-based interactions over the past decades – not least since the financial crises of 2001 and 2007/08 – has provoked a growing interest, within social sciences and historiography, in economic issues beyond the traditional fields of economics and economic history. In recent years, several authors, by combining approaches from sociology, anthropology, institutional theory, and the history and sociology of science and technology, pointed to the social conditions, conventions, and implications of economic practices and market-related interactions. One field of research is represented by studies on the relation between economics and the economy – more precisely on the epistemic and technical conditions of financial markets, such as the role of theoretical models and technical systems for

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¹ This article is dedicated to the memory of Stefan Beck (1960-2015).

the performance of markets, or the relation between modern finance theory and transformations of investment practices in financial markets. Alain Desrosière's work on the co-constitution of statistics, economics, and the modern state has provided an ongoing stimulus for these critical studies of financial markets (seminal: Desrosières 2008a, 2008b; Callon 1998; see also: Orléan 2014; Beckert, Diaz-Bone and Ganßmann 2007; for an exemplary case study: MacKenzie 2006). A second area of research focuses on the transfer and adoption of economic logics and practices to social contexts outside their traditional field (for a historical perspective: Mass 2016).

2. Securitization from the Perspective of the Sociology of Conventions

This article investigates a specific type of financial transactions: the process of securitization of credit risks that is the transformation of financial risks into investment products in order to sell them on the financial market. This financial instrument has massively expanded since the 1970s and has infiltrated crucial parts of the financial sector. Securitization gained much prominence in the 1990s and 2000s, and was made responsible – at least partially – for the outbreak of the financial crisis in 2007/08. It has continued to spread after the recent recovery of the markets. Securitization has the potential – as will be argued below – for transforming social and political attitudes to risk, and introducing and diffusing changing forms of ownership and responsibilities towards risks. The trend towards securitization is not only relevant for a changed understanding of risk. By using highly mathematized investment products, it also offers an exemplary case to analyze the relevance of processes of quantification for the diffusion of financial values and techniques.

On a theoretical level, the article is based on the sociology of conventions. For several reasons, this approach offers a promising analytical tool for studying financial markets. It combines the study of institutions – here: financial markets – with a pragmatic, actor-centered focus on the conventions used by actors – the modes of justification or reasoning (Diaz-Bone 2011, 23 et seq.). Moreover, the sociology of conventions is based upon the idea that economics and markets are socially embedded. In light of constructivist approaches, not least of Desrosière's analysis of the “politics of large numbers” and the role of conventions of equivalence – technical norms, measurements and standards – in the formation of modern nation-states, the sociology of convention shifted the focus from the state to the economy and the market, where similar epistemic processes are at work (Diaz-Bone 2015, 291-320). The types of conventional frameworks are defined in an open, flexible, and empirically grounded way, distinguishing a plurality of modes, such as industrial, market-related, family-based, civic, or welfare-related conventions (Diaz-Bone 2011, 23 et seq.; Diaz-

Bone and Salais 2011). This flexible understanding of conventions makes the concept highly appropriate to understanding the transformations of values involved in securitization.

In line with this theoretical tradition, Eve Chiapello recently introduced the concept of financialization in order to understand the changing forms of valuation in the financial sector and in other parts of society.² Financialization means, according to Chiapello, a process with which financialized valuations and conventions expand and colonize other political, social, or cultural practices. Financialized conventions are marked by approaches from the disciplines of financial economics and mathematical finance – academic fields dedicated to studying, with highly formalized and quantified models, the mechanisms of financial markets, in particular the calculation of prices and values. In this sense, financialization is understood as a particular – and particularly influential – form of economization, marked by a high degree of mathematization and quantification. That process is also seen as a key aspect of recent transformations of capitalism (Chiapello 2015, 13-7). Also drawing on the sociology of conventions, André Orléan argued that the formal and mathematical conventions of economics were exemplary practices for the emerging financialized capitalism. They acted as normative claims and thus created the specific forms of financialization. The recent crisis of financial markets is for Orléan also a crisis of the epistemic basis of economics. By criticizing rational choice paradigms, he calls for a more sociological understanding of the concept of value (Orléan 2014, 259-71, 311-21).

Securitization is clearly one of the more prominent and exemplary business fields related to the process of financialization as understood by Chiapello or Orléan. Here too, quantification is a key issue. The construction and calculation of securities in this context is linked to highly sophisticated mathematical and actuarial models. The process of securitization thus operates by quantifying assessments about credit risks, defining a price based on these calculations, and selling the risks – in a repackaged form – as securities to investors. Against this background, the article also asks about the conditions and effects of processes of quantification in the context of securitization, drawing on the pertinent literature on the social and cultural implications of calculation and quantification (Porter 1995; Callon 1998, 6-12; Lampland and Star 2008; Desrosières 2008a, 2008b). What role does scientific expertise – in particular mathematics and actuarial theory (the insurance-related sub-discipline of mathematics) – play in the process of securitization? To what degree did these “conventions of equivalence” (Desrosières) accelerate the trend towards securitization? How important were mathematical models for legitimating innovative investment products, given that quantification is generally understood as a “technology of

² See also the contribution of Chiapello and Walter in this HSR Special Issue.

trust” (Porter 1995)? And to what degree were mathematicians and actuaries responsible for the failure of securitization in the context of the crisis of 2007/08?

What exactly is meant by securitization? The concept, used since the late 1970s, refers to a relatively new instrument for transforming financial risks – usually credit risks – into securities, that is, into investment products to be sold to investors, either directly or via financial markets (Gorvett 1999, 138-40; Kothari 2014). Securitization, as a technique to turn rights to future cash flows into tradable securities, emerged in the 1970s and played a controversial role in the financial crisis of 2007/08. The products of securitization belong to the category of structured investment products, themselves being a subcategory of the large variety of derivatives. Securitization thus became infamous for some of the notoriously opaque forms of investment vehicles, in particular for the families of asset-backed securities (ABS) and mortgage-backed securities (MBS). In retrospect, securitization is thus seen as a crucial factor for the quick spread of financial risks after the collapse of the U.S. market for subprime mortgages in 2007, leading directly to the liquidity crisis of the U.S. and international banking system in the following year (Lybeck 2011, 141-70; Cox, Fairchild and Pedersen 2000, 158).

But securitization is more than just an element of the financial crisis of 2007/08. The technique established itself in the banking and insurance industry long beforehand and independent from the immediate pre-history of the crisis. Moreover, many actors in the financial industry grant securitization the potential of transforming the industry as a whole. It is still debated – and will be analyzed in this article – whether securitization marks a structural shift in banking and insurance, transforming the way financial institutions and societies deal with credit and other social and natural risks. Thus, the article also addresses the question of how much securitization transformed the social responsibilities towards risks and the related mechanisms of solidarity. To what degree are risks, previously seen as a social or political issue, currently being treated as part of the mechanisms of financial markets?

The rise and spread of securitization was fueled by two factors. The basic conditions were laid down in the 1950s by epistemic innovations in economics and actuarial science, in particular the development of mathematical models for option pricing and other price mechanisms on the financial markets. The other factor is constituted by the drastically increased demand for innovative financial products which emerged in the 1980s, and has ever since driven the trend towards securitization.

Both factors are related: Mathematical expertise was an important condition for the legitimacy and the reputation of securitization, as illustrated by the positive ratings for asset-backed securities by the major credit rating agencies. And the expanding demand for products of securitization led to a quickly growing market, which reinforced epistemic processes by attracting parts of the

mathematical community and strengthening the new field of mathematical finance. These interactions shall be analyzed, together with their range and social implications, in this article. The argument is structured in three parts. The first part examines the origins of securitization – both on the epistemic and the economic level. The second part analyzes the golden age of securitization, from the 1980s to the mid-2000s, pointing at the decisive factors for its expansion. The third part investigates the role of securitization in the financial crisis of 2007/08 – in particular the debate to what extent mathematical expertise was responsible for the collapsing market for securities. It also looks at the recovery of securitization since the peak of the crisis, discussing the reasons for its resilience. The conclusion summarizes the fundamental changes, provoked by the rise of securitization, in the social responsibilities towards the concerned risks.

The article is marked by a special interest in the specific, historically important area of securitization in insurance. Insurance is indeed an exemplary field for the history of securitization. As a technique against the risk of financial losses, securitization gained particular prominence in insurance from early on, especially in reinsurance. Today, securitization is seen as a prominent form of an alternative risk transfer. Risk transfers lie at the heart of the reinsurance business. In their common form, they consist of distributing the risks between the insurer and the reinsurer, as specified in the reinsurance contract. If an insurer chooses some alternative risk transfer, it usually means that the insurer tries to bypass the common deals with reinsurance companies. Insurance related securitization implies that the insurer, instead of going to a reinsurance company, turns its risk into an investment vehicle. Although securitization is usually more expensive than reinsurance, primary insurers still use it as a more efficient allocation of risks, especially in cases with the risk of huge losses (where reinsurance is often unavailable) or in areas where long-term guarantees are needed (given that reinsurance contracts are usually short-termed, often just for a one-year delay; Cox, Fairchild and Pedersen 2000, 158, 184). In certain fields of the insurance market, like the insurance of natural catastrophes, securitization established itself as respected alternative to reinsurance, with a current market share of about 10 per cent (Swiss Re 2013; Philips 2014).

3. The Origins of Securitization: Emergence of Mathematical Finance and Booming Demand for Investment Products

The mathematical foundations for securitization stretch back into the 1950s and are closely linked to the growing influence of mathematical approaches in economics, in particular to the emergence of the field of mathematical finance (Bühlmann and Lengwiler 2015). Before that, mathematicians and actuaries

considered financial markets too complex for mathematical analysis. The lack of tools, like the computer, for calculating highly complex data strengthened this conviction. The analysis of financial markets by econometricians was limited to analyzing the economic role of interest, in particular to calculating interest rate term structures (the calculation on the dependency of market interest rates on the time to maturity; Nitzsche 2012; Aase 2012).

In the 1950s, economists increasingly began to adopt mathematical approaches for their models. Figures such as Kenneth Arrow and Gérard Debreu revived the concept of a general economic equilibrium, classically defined by Léon Walras in the 1870s. Arrow had already tried to use the idea of complete markets (a market with full transparency and no transaction costs) in order to mathematically calculate the price of securities (Arrow 1951; Debreu 1959). These models were already based on the theoretical assumption of no-arbitrage, according to which markets are complete, transaction costs nonexistent, and prices set in complete transparency. The breakthrough for the calculation of market-based price mechanisms came in the early 1970s with the design of a model for option pricing, based on the principle of no-arbitrage, by Fischer Black, Myron Scholes and – independently – by Robert C. Merton (Black and Scholes 1973; Merton 1973). The Black-Scholes model allowed for the calculation of specific forms of option trading at stock exchanges and opened the door to a wide range of applications. It became an important factor for the boom of derivative markets in the 1980s, especially at the Chicago Board Options Exchange (CBOE), an exchange installed by the Chicago Board of Trade in 1973. The seminal works of Black, Scholes, and Merton also marked a crystallizing moment for the development of mathematical finance, a new and immensely successful combination of economics, applied mathematics and – partly – actuarial science (for a detailed account of the emergence of financial economics: MacKenzie 2006, 119-78; see also MacKenzie 2007).

In actuarial science, the emergence of mathematical finance prepared the ground for the foundation of a sub-section of the International Actuarial Association (IAA) in 1988 – only the second sub-section in the IAA’s history – dedicated to the “Actuarial Approach for Financial Risks” (AFIR). The foundation of AFIR was marked by a controversial debate within the IAA on the relevance of financial markets as a topic for actuarial research (Bühlmann and Lengwiler 2015; Bühlmann 1987). But since the 1990s, the field of mathematical finance has firmly established itself at the crossroads of economics and actuarial science. Today, it is widely accepted that mathematical finance has the potential of transforming traditional approaches of actuarial theory, for example in the understanding of risks of financial markets and the calculation of reserves invested at the financial markets (Bühlmann 1998; Bühlmann and Lengwiler 2015).

Apart from this epistemic factor, the emergence of securitization also profited from the stock market boom, especially from the expansion of the market

for derivatives, fueled by the increased demand of investors since the 1980s (Cassis 2010, 248-55). In its current form, securitization was first used on the U.S. mortgage market in a social-political logic. In the mid-1970s, after the recession of 1973/74, the U.S. government tried to counter the mortgage and credit restrictions of the U.S. banking system by creating a secondary market for mortgages based on government guarantees for mortgage loans and provided by government agencies like Fannie Mae, Ginnie Mae, and Freddie Mac (Cassis 2010, 252 et seq.; Hill 1996). The socio-political side of it was that securitization was meant to make mortgages more affordable for the lower-middle classes, especially in the context of the credit crunch, widespread in the late 1970s as banks restricted the availability of credits. Securitization proved to be an important element in improving the financial stability of the government-sponsored mortgage agencies. Already in 1968, the Johnson administration created the “Federal Home Loan Mortgage Corporation” (“Freddie Mac”), a private organization for sponsoring home ownership, which joined its sister agencies “Ginnie Mae” (“Government National Mortgage Association”), and “Fannie Mae” (“Federal National Mortgage Administration”), two organizations with origins stretching back to New Deal legislation of 1938. Ginnie Mae and Fannie Mae were originally designated for government employees and veterans. Since 1970, Fannie Mae and Freddie Mac were allowed not only to buy mortgages on the secondary market, but also to pool them and sell them as mortgage-backed securities; Fannie Mae sold the securities to the government owned Ginnie Mae, Freddie Mac sold them to the financial market. As all three organizations profited from a de facto government guarantee, investors were keen to buy the papers (Lybeck 2011, 120-9, 141; Geisst 2013, 225-9; Hill 1996, 1064-76, 1119-21).

Also in the 1970s, the banking sector began to adopt the new instrument. Banks first used securitization for their mortgage business, following the example of the government sponsored mortgage agencies. The practice spread especially in niches of the mortgage market, for example for lower quality mortgages or large mortgages. Bank of America introduced securitization in 1977, in particular to raise its capital basis and to be able to meet the growing demand for mortgages. Securitization expanded in the 1980s, when it was taken up by a variety of financial institutes, for securities based on credit card debts, auto loans, and other assets (Hill 1996, 1120 et seq.; Gorravett 1999, 138-40; Cowley and Cummins 2005, 194 et seq.). Between the 1980s and the 2007 crisis, securitization became a widespread phenomenon in investment banking. In the U.S. market just before 2007, mortgage- or asset-backed securities represented nearly one third of all banking assets, amounting to nearly 3,000 billion dollars (De Mey 2007, 37). By 2007, the subprime mortgage sector, in which securitization was widespread, represented 12 per cent of the U.S. mortgage market (Lybeck 2011, 127-9). All sectors contributed to this growth: mortgage-backed securities, insurance-backed securities, as well as those backed by car

loans, credit card debts, or student loans (Cummins 2004, 7 et seq., 48). The popularity of securitization is illustrated by the fact that the technique even spread to the entertainment industry in the form of “celebrity bonds.” As one of the first artists, David Bowie used securitization in 1997 to raise 55 million dollars, backed by the royalties of his past albums (Fabozzi and Kothari 2008, 3).

The expansion of securitization was combined with a redefinition of its logic. Whereas in the 1970s, securitization was embedded in a social policy framework (to make mortgages more accessible), in the 1980s and 1990s it gradually became a financial instrument to improve corporate profits and appease the appetite of investors for profitable investment products. The rise of securitization to an exemplary practice of a financialized capitalism and its redefinition from a socio-political to a financialized convention can be explained by three factors.

First, securitization profited from a general deregulation of the financial sector since the 1980s – in the U.S. as well as in the European Union. The market was opened for new competitors, whereas traditional corporations – banks and insurances – also expanded their business activities. As an effect of this, banks increasingly had to compete with money market funds, mutual funds, life insurance companies, and other financial service providers. This was paralleled by a wave of corporate mergers and the launch of new financial products. In this context, securitization was used as an instrument to improve the competitiveness of financial institutions, not least by reducing credit risks and thus increasing the capital basis, liquidity, and credit ratings of the respective companies (Orléan 2014, 264-71; Cummins 2004, 2, 15-21; Hill 1997, 1122-5).

A second factor was supportive government legislation, especially in the U.S. In the 1980s, U.S. tax regulation was reformed to offer tax advantages for the new investment products (Hill 1996, 1120 et seq.). A third – and probably the most important – factor for the spread of securitization was the rapidly growing demand of investors for new financial products. This was partly an effect of a structural change in the banking business: the rise of investment banking and the relative decline of commercial banking. That trend gained momentum since the 1970s and led to a proliferation of financial products, among them also derivatives like the products of securitization. During the stock market boom of the 1980s, investors not only asked for traditional products but also took up the quickly developing range of derivatives, in particular those that did not follow the cyclical performance of traditional stocks and bonds. Securitized products often had an acyclical or an anticyclical performance, which allowed investors to diversify their portfolio and hedge against high levels of risks in their portfolio or generally against the risk of a cyclical development of stock markets. In this sense, securitization has been called a “low-cost sweetener for lemons” (“lemons” being poor investments; Hill 1999; see also: Cassis 2010, 243-53; Cummins 2004, 13).

Whereas in banking, securitization mirrors the attempt of financial institutions to improve their profitability as well as the increased demand for innovative investment products, the interest of insurance corporations had a different background. The market for insurance-linked securities also expanded on a lower level than the one in banking. Just before the 2007 crisis, the total amount of securitized risks in insurance was 10 billion dollars (compared to 3,000 billion dollars in mortgage- and asset-backed securities; De Mey 2007, 37, see also: Cummins 2004, 7 et seq., 48). Between the 1980s and 2007, 35 billion dollars of insurance liabilities have been securitized. The total of securitized assets is worth less than a thousandth of all reinsurance liabilities (figures of 2007, Baig and Choudhry 2013, 24-7). In insurance, securitization remained a technique for niche markets. It is mainly used for large risks, such as catastrophe risks, where it gained a prominent role. In reinsurance, for example, the extent of securitization amounted to 11 per cent of its non-life premium income in 2004 (De Mey 2007, 37).

Nevertheless, the case of insurance-related securitization is relevant because it can help to illuminate not yet mentioned factors and implications of the history of securitization. It shows that a traditionally risk-averse industry – at least in its use of capital reserves during the decades after the Second World War – started to open itself to more speculative policies since the 1980s. This was a direct consequence of the stock market boom of the 1980s. At that time, insurance companies realized that investing their reserves in stocks and bonds increased their profits, and that their earnings were increasingly linked to the development of capital markets. Some corporations earned their profits more so from investments in capital markets than from their traditional insurance business (Bühlmann and Lengwiler 2015).

This trend was followed, in the 1990s, by a structural transformation of the insurance business as a whole: its increasing integration with the banking business under the term of “bancassurance.” The trend is mirrored by a series of mergers between banks and insurance companies. Examples are the merger between Citicorp (a bank) and Travelers (an insurer) to Citigroup (1998), or the take-over of Winterthur (an insurer) by Credit Suisse in 1997. Bancassurance fueled the development of combining banking and insurance products, delivered by one and the same company, and increased the technical cooperation between insurance actuaries and business economists for developing investment products and modelling insurance and investment risks (Bühlmann and Lengwiler 2015; Cummins 2004, 15-21). As a business model, bancassurance did not prevail and was abandoned after the crisis of 2001. Still, many forms of cooperation between insurance and banking remained, not least in the development of investment products.

This was the fertile ground on which insurance-related securitization emerged in the late 1980s. The first insurers to deviate from the established way were companies trying to avoid the common procedures and costs of rein-

insurance. Though reinsurance can offer less expensive contracts than the comparable costs for securitization, it has also, as mentioned above, important disadvantages when compared to coverage over financial markets. Reinsurance contracts are usually short-termed, often with a contract period of just one year. Moreover, some unconventional or excessive risks were usually not covered by reinsurance. In these cases, securitization offered an alternative with fewer transaction costs, mainly because capital markets were able to mobilize far more capital and in a more flexible way than insurance or reinsurance companies (Cummins 2009, 466, 475; Cox, Fairchild and Pedersen 2000). The capital basis of the reinsurance sector (estimated at around 300 billion dollars) is still a dwarf – around 300 times smaller – against the dimensions of the financial markets (estimated at over 100 trillion dollars; Hewitt EnnisKnupp 2014, 2).

Thus, insurance-based securitization became an instrument to mobilize capital for over-sized, catastrophic risks like windstorms or earthquakes. American life insurance corporations started the securitization of their insured liabilities in 1988. An important step was made when, in 1992, the Chicago Board of Trade, the leading stock exchange for futures, options, and derivatives, accepted the first “catastrophe bond,” a security based on catastrophic property risks (Cummins 2004, 2). Around half of these bonds were addressed specifically to extraordinary, “once in a century” events. The category of Cat bonds became the motor for the development of securitization in insurance. The 1990s and the early 2000s witnessed a boom of securitization in insurance, spurred by a series of catastrophic events with excessive losses for the insurance and reinsurance industry, such as hurricane Andrew (1992), the Northridge earthquake (1994), the attack on the World Trade Center (2001), and hurricanes Katrina, Rita, and Wilma (all in 2005; De Mey 2007, 37-42; Cummins 2004, 2009, 463 et seq.). Another driving force was – similar to securitization in banking – the rising regulatory demands, in particular for capital reserves, in the aftermath of Basel I (1988), during negotiations of Basel II (which started in 1999 and were concluded in 2004), and in the context of the European Union solvency prescriptions for the insurance industry (Solvency I, 2002; Lybeck 2011, 230-5; Cummins 2004, 13; 2009, 482-8).

Last but not least, securitization also expanded as part of corporate policies for tax evasion. Many corporations, among them Swiss Re, founded so-called “captive” – sub-companies for covering particularly high risks, mainly domiciled in tax-saving offshore places like Bermuda – for their securitization business (Cox, Fairchild and Pedersen 2000, 166-168).

The insurance corporations active in securitization included some of the leading companies. One of the first movers was AIG (“American International Group”), an American insurance company, which earned a reputation for aggressively entering the new securities market. AIG launched in 1992 the first cat bond due to cover against wind and earthquake risks. In 2008, it had to be saved by a government loan, becoming the largest victim in the insurance sec-

tor of the crisis (Shelp and Ehrbar 2009; Greenberg and Cunningham 2013). The US company USAA and the French AXA also belonged to the pioneers in securitization (AXA for its car insurance branch, USAA rather for Cat bonds), as well as Zurich Financial Services and Winterthur (De Mey 2007, 38; Wemmer 2008, 1 et seq.; Cox, Fairchild and Pedersen 2000, 159, 165-7).

Reinsurance companies found themselves in a difficult situation. The reinsurance industry was split over how to deal with securitization. Some companies avoided the securities market as they saw it as an alternative and a competition to their core business. Others entered the new market in an attempt not to miss out on a structural transformation of their business. Some of the leading reinsurers, most notably Swiss Re and St. Paul Re, decided for the second option – at the beginning reluctantly – and became important promoters of securitization by the end of the 1990s (De Mey 2007, 38; Wemmer 2008, 1 et seq.; Cummins 2009, 464; Cox, Fairchild and Pedersen 2000, 159; Bühlmann and Lengwiler 2015).

Although the life insurance market played a minor role in insurance-related securitization, it was not untouched by the trend (Cowley and Cummins 2005). Such securities were primarily based on mortality and longevity risks. Technically, these bonds were based on mortality or longevity indexes, constructed by experts. The profit for the investor depended on whether or not the observed mortality or longevity rate exceeded the assumption calculated by the index (Cipra 2010, 549-52; De Mey 2007, 38). Longevity bonds in particular are seen as an innovative and promising field for securitization, though they are also known to be notoriously difficult to calculate. The number of unsuccessful securities is comparably high (De Mey 2007, 39 et seq.). The first companies to enter this field were American Skandia and Hannover Re – already in the late 1990s – followed by a series of life insurers and reinsurers, such as AIG, Prudential, MONY, Barclays Life, AXA, Swiss Re, Scottish Re, and Munich Re. Banking houses like the European Investment Bank and BNP Paribas also contributed to this quickly growing market (Cipra 2010, 549-53; De Mey 2007, 38 et seq.; Cox, Fairchild and Pedersen 2000, 163; for detailed lists of companies and bonds: Cowley and Cummins 2005, 209; Larson 2012, 8 et seq.).

The growing interest in life insurance securitization is also due to the extraordinary social and political significance of this sector. Mortality and longevity rates are affecting not only life insurance, but also the pension system in general. Pension funds – in private and social insurance – do not have many instruments to safeguard their business against the rising life expectancy. It is no coincidence that calls for securitization were also embedded in socio-political conventions, for example in the case of the OECD, which called to improve the instruments to securitize against longevity, not least as a policy to act against the demographic pressure on public and private pension systems

(De Mey 2007, 38).³ Business economists too argued for a quick development of life insurance securitization, also for socio-political reasons (Lorson 2012, 2 et seq.). The topic has recently attracted much scholarship. Most studies focus on how to define an appropriate price for securities based on longevity and mortality risks (Lorson and Wagner 2012; Lin and Cox 2005, 227-52). In all these debates, implicitly or explicitly, the responsibility of the state for providing social security for the elderly gradually shifted to the financial market and the community of profit-oriented investors. Here too, the conventions addressed by actors like the state, changed from a socio-political to a financialized context.

4. The Mathematical Basis of Securitization and the Mathematicians' Role in the 2007 Crisis

As mentioned at the beginning, securitization was a crucial factor in the financial crisis of 2007/08, especially in the context of the subprime crisis of the U.S. mortgage market. Current assessments of the crisis argue that there is not one single factor, but a complex cluster of factors causing the breakdown. These include: the extremely low interest rates since 2001, lenient lending practices in the markets for subprime mortgages, a shadow banking system with high leverage investments, questionable accounting practices, and misjudgments of rating agencies. The collapse of parts of the U.S. mortgage market triggered several other crises: the banking crisis in the U.S. and in European countries, and – indirectly – a budgetary and sovereign debt crisis of several European countries, followed by the currency crisis of the Euro (Lybeck 2011; Baig and Choudhry 2013, 26-9; Senate Subcommittee on Investigations 2011; Reinhart and Rogoff 2009; Kobrak and Wilkins 2013).

Securitization was involved because the subprime loan market and parts of the derivative market were backed to a large degree by complex and intransparent securities. When the U.S. Federal Reserve started to raise interest rates in 2004/05 in order to act against the rising inflation, many lenders of subprime mortgages had to default. In 2007, the subprime market quickly collapsed, and several structured products, in particular mortgage-backed securities and credit default swaps, lost their previous value. Although the market for insurance-linked securities suffered less than that for other securities, insurance and reinsurance companies still took severe losses from their engagement in securitization. After the collapse of Lehman Brothers – an investment bank intensely engaged in the securitization business – markets for mortgage- and asset-

³ See also <<http://www.artemis.bm/blog/2014/12/09/oecd-calls-for-capital-markets-to-embrace-longevity-risk-hedging>> (Accessed July 20, 2015).

backed securities also collapsed. AIG – one of the market leaders – had to be saved by a government bailout. Fannie Mac and Freddie Mac also only survived after massive government interventions. Other banking and insurance corporations also suffered; Swiss Re for example wrote down its portfolio by more than 1 billion dollars (Lybeck 2011, 112-8, 145-62; Kindleberger and Aliber 2011, 257-72; James et al. 2013, 349 et seq.; Cummins 2009, 485; Shelp and Ehrbar 2009; Lengwiler 2012, 164 et seq.). Some measures against the crisis proved counter-productive. At the beginning of the crisis in 2007 and 2008, asset-backed securities were accepted by central banks as securities for the balance sheets of banking institutions – a decision that fueled the spread of securitization in the midst of the crisis (Baig and Choudhry 2013, 28).

In relation to securitization, the crisis of 2007 raises two questions. First, it challenges the seemingly sound mathematical basis of the products of securitization, provoking a debate about the technical solidity of securitization. Second, as securitization was deeply entangled with the escalation of the crisis, the economic downturn provoked fundamental criticisms against securitization itself (Orléan 2014, 259-71). Both criticisms will be discussed in the following paragraphs and illustrated with the exemplary case of insurance-related securitization.

First to the question to what extent the mathematical basis of securitization was to be blamed for its failure in the financial crisis since 2007. The question also points to the possible responsibility of mathematicians and actuaries involved in the construction of securitized investment products for the aggravation of the crisis. It is undisputed that actuaries and mathematicians had a say in the design and the implementation of processes of securitization. The whole expansion of the market for derivatives was partly based on the possibility of mathematically calculating an adequate pricing of options based on the Black-Scholes-Merton models mentioned above (MacKenzie 2006, 143-84). In this context, insurance and reinsurance actuaries often acted as experts on catastrophic and other risks, and provided the calculation of the necessary indices for the construction of securities. They did this not just for their own companies, but also as consultants for commercial banks and other bond issuers. In the insurance sector, the policy of securitization was promoted mainly by actuaries, which saw in the new market a potential for their companies' business. In the banking sector, securitization was mainly promoted by managers and business economists, while actuaries – at least at the beginning of the process – only played a marginal role (Bühlmann and Lengwiler 2015).

It is also worth noting that the actuarial community, up to the outbreak of the crisis, remained split about securitization. The major part of the actuarial profession remained skeptical, whereas a small but influential minority embraced the new technique as a way of diversifying insured risks. At least the launch of Cat bonds in the 1990s apparently happened without much defining influence of the actuarial profession. Actuaries were mainly providers of data

(loss indices) for the construction of securities, whereas the construction and pricing of securities was executed by accountants and business economists (Bühlmann and Lengwiler 2015). Thus, some observers, as late as 2000, noted that, due to the marginal status of actuaries in securitization, the mathematization of the process, at least in insurance-related securitization, was not very developed at all, and that a lot of theoretical work still had to be done, for example on risk measurement and adequate pricing of securities (Cox, Fairchild and Pedersen 2000, 158). Despite these obstacles and reservations, the influence of mathematicians and actuaries had been gradually growing since the 1990s, and some important figures of the actuarial community were involved in the design of insurance-related securities, for example James Tilley (*1950) who worked for Morgan Stanley (at that time one of the leading U.S. investment banks) on the construction of Cat bonds, or Prakash A. Shimpi, who until 2004 worked for Swiss Re in senior management positions and lead a subsidiary of Swiss Re dedicated to trading insurance risks (Cox, Fairchild and Pedersen 2000, 185).

Against this background, there is no doubt about the active and decisive engagement of at least part of the actuarial community in policies of securitization. The more important issue is whether their work – the mathematical formulae upon which securitization was based – can be blamed for the collapse of the market for asset-backed securities. There is no clear answer to this question. The literature takes two opposite positions.

The more critical perspective insists that mathematicians and actuaries were responsible as one of several involved actors for the collapse of the market for securitization and for the respective parts of the crisis. Mathematicians and actuaries at least tolerated structured products being constructed in an intransparent and far too complex way. These critical voices argue that mathematical finance might be good in the construction of theories while conceding that the reality of the financial markets had nothing in common with the theoretical assumptions. Markets cannot be modeled – according to this criticism – as a perfect and efficient entity. The related no-arbitrage theory is also criticized for lacking any empirical ground and helping to confuse theory and reality so that investors assumed that the models were built after objective statements, whereas they merely reflected theoretical assumptions. Another problem is seen in the strong and effective alliance between mathematics and economics. Economists referred to mathematical expertise in order to provide an aura of objectivity and trustworthiness for their investment products, and mathematicians were eager to help economists because financial markets provided a promising and highly prestigious field of application for their theorizing (MacKenzie 2006, 243-60; Bieta and Milde 2014a, 2014b).

Authors who avoid blaming mathematicians for the crisis argue that the work of mathematicians and actuaries was mainly a theoretical endeavor and not meant to give a clear, objective assessment of the dynamics of financial markets. They

make a sharp differentiation between the model and the reality of financial markets. The models mathematicians built were meant as regulative ideas with heuristic value – in order to get a rough, approximate understanding of the real world –, but not as objective descriptions with a prognostic value. Models are seen as full of insecurities, not to be held for eternal truths. These authors deem it unfair to put the blame on the mathematicians when the fault actually lies with the public and its misunderstanding of the validity of mathematical models (Schweizer, Soner and Teichmann 2015; Bühlmann 1998). Some economists and actuaries even argue that it was unavoidable that securitization included a certain lack of transparency. Relying on a perfect market model and on the principle of no-arbitrage, they argue that lack of transparency and asymmetries of information are inherent elements of financial markets, not least offering the necessary incentives for securitization. A complete market with full information transparency and no transaction costs – a situation of no-arbitrage – would not offer a price for the repackaging of risks in the form of securities, and therefore no profits for securitization. Only if markets became more efficient would the incentives for securitization decrease (Cummins 2004, 9-14; Cox, Fairchild and Pedersen 2000, 158; Hill 1996, 1101-5).

This defending argument is not denying the involvement of mathematicians and actuaries in securitization. Rather, it asserts that their influence has not been strong enough to prevent false conclusions of their calculations and an exaggerated belief of the public in the solidity of their assessments. Actuarial figures retrospectively stress that the market was driven by management decisions and by investors' demand, whereas the warnings of actuaries and mathematicians were mainly overheard. Actuarial scientists like Hans Föllmer, Catherine Donnelly, or Paul Embrechts argue that the collapse of the market for derivative products rather depended on the application of actuarial assessments – beyond the reasoning of the involved actuaries – and the questionable business practices of securitization like the lack of corporate control, fraudulent management practices, and an exaggerated confidence in the accuracy of the mathematical models. They assert that some actuaries did point at the uncertainties of their assessments, the lack of sufficient data and of modeling capacity, the problems of standardizing data in order to make comparisons and general assessments, and the difficulties in calculating an appropriate price (for example: Wemmer 2008, 1 et seq.). If these self-critical voices would have been heard, some dimensions of the crisis might have been prevented (Föllmer 2009; Donnelly and Embrechts 2010; for an early cautious voice: Bühlmann 1998, 174-6). Embrechts also concedes that the reliability of mathematical models has been overestimated and that the issue of “model uncertainty” is still not properly understood and needs to be dealt with more deeply in future actuarial research. Such calls for more detailed analyses of the mechanics of securitization have become a common theme in the post-crisis literature (Das, Embrechts and Fasen 2012; Cummins 2009, 477). However, most of these self-

critical voices only emerged during or after the crisis. Clearly, the normative effects of mathematical and actuarial expertise in constructing and legitimating new forms of market transactions, and in transforming capitalism as a whole, have clearly been underestimated by the actors (Orléan 2014, 318-20). However, that investors and the public put so much confidence into the accuracy of the mathematical models was not just the fault of the model constructors. The problem lies also with the rating agencies. Their negligent policies of warranting high credit ratings for asset-backed securities despite their lack of transparency was an important factor to foster the general belief in the mathematics underlying securitization (Orléan 2014, 264-71; Lybeck 2011, 141 et seq.; Hill 1996, 1076).

The answer to the other question of whether securitization in general is a tainted form of developing financial products can be derived from the development of the markets. There is much evidence that securitization is here to stay and will also expand in the future, despite the setback and the dubious reputation it gained during the crisis. Most market observers agree on this positive assessment. Inspired by the rhetoric of the presidential election campaign, Morton Lane, a prominent mentor of insurance-related securitization, argued that the new investment forms were “a change we believe in” (Lane and Beckwith 2009; see also: Albertazzi et al. 2011; Cummins 2009, 463 et seq.; Wemmer 2009).

The development of the markets, at least in the U.S., endorses this view. Currently, in 2014/15, the markets are not far away from where they stood before the crisis. The issuance of asset-backed securities in the U.S. reached 225 billion dollars (2014), close to the all-time high of 289 billion dollars in 2007. And the U.S. market for mortgage-backed securities reached issuance of 850 billion dollars for the first half of 2015, with a clear growth tendency against 2014 – compared to the all-time high of 2,692 billion dollars (for the whole of 2005). Only in Europe has securitization not recovered from the breakdown of the market in 2008. Issuances in the securitization market reached highs in 2007 and 2008 (819 and 1,210 billion dollars respectively), but are still clearly below 300 billion dollars in 2013 and 2014 (SIFMA 2015). In insurance, for example, the market for Cat bonds has recovered from the crisis, reaching a value of 23 billion dollars in 2014; that is about 10 per cent of the global market for non-life reinsurance. Even a mega catastrophe like the nuclear disaster of Fukushima in 2011 only produced a temporary decline of the Cat bonds market. Similarly, though on a much smaller level, markets in life insurance securitization are growing again (Swiss Re 2013; Philips 2014; Cummins 2009, 485 et seq.).

The recovery of securitization counts even more as the regulatory policies after the 2007 crisis has identified securitization as an operational risk for financial institutions and has strengthened the regulatory expectations against the process, especially in the context of Basel III, for which the first draft was

published in 2010 and which was introduced in the European Union in 2014, and the insurance related Solvency II, published in 2009 (Lybeck 2011, 274-9; Baig and Choudhry 2013, 33 et seq.).

The growing confidence of the market is also reflected in recent discussions of new growth areas for securitization, for example in the insurance of nuclear risks. The Fukushima catastrophe put the question of how to insure the risks of nuclear catastrophes under the spotlight. The arguments are still cautions. But some observers, such as the French economist and insurance specialist Pierre Picard, argue that, despite technical difficulties, there was no fundamental obstacle to transferring large-scale nuclear risks to the financial markets. According to Picard, the main problem for securitizing nuclear risks lies with defining their price. Damages from nuclear accidents are extremely expensive, and their long-term consequences, often over decades, make it difficult to calculate their exact costs. That is the reason why currently nuclear risks are only partially covered by the insurance industry, mostly up to a certain amount of damage. The state is covering the remaining risk as an insurer of last resort. But Picard and others argue that the instrument of securitization allows the tapping into the vast resources of financial markets and that this could shift significantly the distribution of responsibility between the state and the private industry. They see nuclear risks as insurable and a market price even for large-scale nuclear risks as feasible (Picard 2011; Louaas and Picard 2015; more skeptically: Koletschka 2013, 138). Obviously, this would also change the logic of covering for the consequences of a nuclear disaster risk. At the moment, the responsibility for dealing with such disasters lies primarily with the state, the political authorities, and ultimately the citizens. In a world of securitization, dealing with nuclear disasters – at least paying for the damages – would become a commercial issue, dealt with by investors under the logics of the financial markets.

5. Conclusion

What conclusions can be drawn with respect to the larger social implications of the rise of securitization? What conventions were addressed in the context of securitization, and how has the setting of conventions changed since the 1970s? Three points should be highlighted. First, the history of securitization reveals important aspects of the emergence of financialized capitalism, notably a long-term shift in the social responsibilities and policies towards risks. The examples of mortgage credits, catastrophe risks, nuclear risks, or longevity and mortality risks all show a similar pattern. These risks were originally addressed – at least partly – within the logics of political or socio-political conventions, often with the state as an insurer of last resort or in the context of the welfare state. The trend towards securitization usually meant that the socio-political conventions

were replaced by financialized, market-oriented conventions, in which investors would take responsibilities, bear the risks, and eventually cash in the profits or pay the losses of the financial transactions. The settings of these two conventions are very different. The socio-political convention is part of the institutional logic of politics, ultimately of the community of citizens, whereas the financialized convention is based on an anonymous community of investors, driven by a bet on future profits.

Secondly, some of the examples, notably in the area of longevity risks and nuclear risks, show that the transformation from socio-political to financialized conventions often comes along with a privatization of formerly public responsibilities. In both cases, securitization is still at an early stage and it is not clear how transformative the future development will be. But the vision of advocates of securitization is clear: The state will lose some of its current responsibilities – in the pension system and the insurance of nuclear risks – and delegate them to the financial markets. A similar process takes place in the securitization of credit and insurance risks. Here, responsibilities are transferred between private actors. Private corporations like insurances and banks delegate their previous business to the actors of the financial markets.

Thirdly, the history of securitization clearly shows that mathematical and actuarial forms of expertise were driving forces for this trend. They acted as conventions of equivalence, making different forms of risks comparable and marketable. And with their normative authority, they increased the legitimacy of such transactions.

Finally, it is important to note that the spread of securitization is still an ongoing and dynamic process. It is too early to predict how far this process will actually go. Some questions will have to wait further for a final answer: Will Europe take the same path as the more securitization-friendly U.S.? And will mathematical calculus be ultimately an instrument to stabilize practices of securitization or will it continue provoking exaggerated confidence in a basically unstable technique?

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Reverse Engineering and Emotional Attachments as Mechanisms Mediating the Effects of Quantification

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Abstract: »Reverse Engineering und emotionale Bindungen als Mechanismen, die die Effekte der Quantifizierung vermitteln«. Alain Desrosières understood statistics as simultaneous representations of the world and interventions in it. This article examines two mechanisms that mediate how numbers do both. The first, reverse engineering, describes how working backwards from a desired number shapes organizational routines. The second, emotional attachment, describes the processes by which numbers generate a variety of emotions that sometimes stimulate collective identities. Focusing on educational rankings but including examples of other types of numbers, it argues for the importance of disclosing the effects of specific causal mechanisms in the analysis of particular performance measures.

Keywords: Quantification, reverse engineering, emotional attachments, causal mechanisms, Alain Desrosières, rankings.

1. Introduction

Alain Desrosières taught us how important it is to understand numbers as representations and interventions (Desrosières 2010, 2014; Didier 2016, in this HSR Special Issue). At the same time, numbers signify and change. This insight is central in an outpouring of scholarship in fields ranging from anthropology to accounting, much of it informed by his pioneering work. I wish to describe here two broad mechanisms and describe some of the interactions between them in how the impact of numbers as representations intervene in people's interpretations and the places to which they are applied. The first mechanism, *reverse engineering*, is strategic; the second mechanism, *emotional attachment*, is not. These two mechanisms describe both causes and patterns of change that numbers induce in a wide array of contexts and they produce changes in individuals, organizations and organizational fields in which they are introduced. Relying extensively on an extended case study of media rankings of education, work done jointly with the sociologist Michael Sauder, I

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want to explain these mechanisms and suggest why they would be useful in the analysis of other kinds of quantification.¹

2. Reverse Engineering as a Rankings Mechanism

Most definitions of reverse engineering emphasize the process of working backwards from an object in order to understand how something works. Legal scholars Samelson and Scotchmer (2002, 1577) define reverse engineering as “the process of extracting know-how or knowledge from a human-made artifact.” No doubt the practice is an old one – an experienced cook can reconstruct a recipe from careful tasting, just as a good tailor can replicate an article of clothing with close examination – but according to the Oxford English Dictionary the term’s origins were from the Cold War, with the first published record appearing first in 1957 hearings before the U.S. Senate Select Committee on Small Business in discussions about military procurement.

Now widely understood as a standard logic of investigation, the term has expanded beyond its origins in manufacturing and engineering to describe styles of inquiry or innovation in many fields. In genetics, scientists speak of reverse engineering genes; property law is filled with examples, most of which are lawful because reverse engineering is labor intensive in a way that mere copying is not (excepting a few instances in intellectual property). Network scholars have argued that reverse engineering is a helpful strategy for understanding network structures in both social and natural scientific fields, arguing that it helps to close the bedeviling gap between describing networks and explaining why they emerge and how they function (Alderson 2008). Currently, the most conspicuous use of reverse engineering is in computer programming where it describes widespread practices of decomposing code to debug it, copy it, or improve on it. Its cachet is conveyed in the idea that learning by emulating successful companies, hence the rather breathless title of a recent book *What would Google do? Reverse-engineering the fastest growing company in the history of the world* (Jarvis 2011).

Reverse engineering describes an almost universally deployed tactic law schools use to improve their rankings. By deconstructing their rank into its component parts, schools decide which factors they believe are most amenable to their control and develop strategies to improve those factors. Some common examples of reverse engineering strategies include the careful parsing of test scores and grade averages to create “target” numbers and devising an admission “formula” for improving these selectivity factors; less directly observable

¹ Some of this work includes Espeland and Sauder (2007), Sauder and Espeland (2006, 2009). Details about our data and methods are described in these articles.

but also widespread is the practice of marketing faculty accomplishments to improve scores on reputational surveys. Many schools also cultivate a robust “transfer” market in second year students as a way to improve their selectivity statistics since their grades or test scores do not count for rankings purposes. There are many other examples of gaming rankings, not only among law schools but by universities and graduate programs worldwide.

Reverse engineering encourages two widespread practices: keeping careful track of all the elements of rankings statistics and using them to project future rankings, and learning as much as one can about how U.S. News and World Reports [hereafter USN], the dominant university ranker in the U.S., calculates rankings. To do the former, schools invest in elaborate record keeping and statistical analysis of their data, something rankings encourage whether or not reverse engineering is an explicit tactic. Nearly every administrator we spoke with described how such demands have increased as a result of rankings. Many schools have either university or law school institutional research departments whose job it is to create and sometimes massage the requisite statistics.

There have been educational rankings for over a century but these early rankings were episodic exercises in evaluation that were intended for insiders, for educators. Educational rankings produced by media were first introduced in France in the 1970s but it was not until the 1980s that media rankings took off.² The catalyst this time was a new editor at an American weekly news magazine, USN created its first annual university rankings in 1988. Then a mediocre weekly news magazine, editors decided to rejuvenate its brand based on the slogan, “news you can use,” in order to distinguish it from the far more prominent *Time* and *Newsweek* magazines. As part of this consumer-oriented framing, USN saw its university rankings as providing useful consumer information to help potential students and their parents in order to help with the often overwhelming decisions of where to apply and attend college. The magazine’s motives did not include any effort to “improve” education or hold educators more “accountable.” These “services” provided by rankings only emerged years later as rankings acquired new uses for new audiences. In this, rankings differ from other performance measures that are intended to encourage people to improve their performance. In Alain Desrosières’ terms, the rankings were originally intended as descriptive measures but given the attention they received they quickly became prescriptive (Desrosières 2010, 1-6). As he points out, the tension in these two contradictory uses of statistics is a prominent feature of quantitative information.

² Julie Buchard (2015) has written an illuminating account of the emergence of media rankings in France as a joint effort of educational reformers, wishing to challenge the hegemony of the elite *Écoles*, and journalists who, hired during the heyday of the student movements, were looking for things to do and ways to challenge the established status of universities.

USN expanded its wildly successful annual university rankings to include graduate schools in 1990. For law schools, the organizations we studied most intensively, USN uses four indicators: reputation, 40% of the overall score, is determined by two surveys sent to faculty and practitioners; selectivity, 25%, is based on first year students' grade averages from their undergraduate university, standardized test scores from the required admissions test, and the percent of applicants who were admitted; placement success, 20%, is based on the percent of students employed at graduation, nine months after graduation, and the bar passage rate; faculty resources, 15%, is composed of four separate measures: expenditure rate per student (for instruction, library, and supporting services), student-faculty ratio, "other" per-student spending (primarily financial aid), and volumes in library. To compute the final ranking, each school's score is standardized. These scores are then weighted, totaled, and rescaled so that the top school receives a score of 100 and other schools receive a percentage of the top score. It is important to point out that while USN consulted educators, rankings were created by staff with no training in methods, statistics, or education. USN initially did not provide much information about how it computed its rankings but over time, due to pressure from educators, it included more information.

To learn more about how USN calculates rankings, schools scrutinize its published methodology, follow its social media, which is where changes in measures are usually announced, and monitor ranking stories in a wide array of media, including the many blogs on rankings written by law professors, journalists and others. Colleagues exploit professional networks, both formal and informal, for information and gossip. Tips for manipulating rankings are often carefully guarded secrets passed on only to trustworthy friends. On multiple occasions interviews we were asked to not reveal what many considered "trade secrets" for managing the numbers; nearly as often, we were asked for "insider" information about USN's methods. Schools also "learn" from past experience, accumulating techniques and for manipulating rankings, not all of which are demonstrably effective. Several times we have been contacted by administrators hoping to learn more about how some component is constructed. Robert Morse, the director of rankings, reports that he hears from many schools eager to learn more about how rankings are calculated or offering advice about how USN "improves" rankings.

It is important to examine the reasons why so many schools resort to manipulating ranking indicators rather than engage in more sincere efforts to improve their performance. There are a number of factors that contribute to "gaming" statistics. First, with rankings, most people believe they are not legitimate measures of performance. USN methods for producing rankings have been widely denounced by experts and the media. For example, the rankings leave out important educational criteria such as quality of teaching or even the goals of particular schools. The internal validity of the measures are dubious at best.

Does the money spent on library books affect the quality of education? Moreover, the scores of schools are tightly bunched together, even tiny changes in measures can produce dramatic shifts in outcomes. Rankings flunk all sensitivity tests that try to establish the robustness of a measure. Educators resent the influence of these poor measures.

More importantly, and more relevant to other kinds of performance measures, is that the gap between the number and that which the number purports to measure is so great it is far easier to manipulate a number than to try to change the characteristics that is supposed to be measured. A school's reputation is an important feature of the benefits it confers on its students. But reputation is a nebulous quality that changes only slowly over time. It is much easier to try to change reputation by gaming survey results, e.g. collecting surveys sent one's school and filling them out in tandem in order to maximize one's standing in relation to schools with rankings close to one's school, than it is to change one's reputation. For factors, such as selectivity, which are easier to control, schools do treat the measure quite literally.

They change admissions procedures to produce higher selectivity numbers by encouraging applicants they reject, admit students with higher test scores and offer them scholarship money, and so on. The larger question of whether these are the best students to admit is one that is pushed aside.

Finally, another reason why so many schools and likely so many others whose performance is measured resort to manipulation is the temporal dimensions of these measures. Most measures, like rankings, are produced annually which strongly encourages a short-term orientation. People are forced to care about the numbers *this year* when the goals behind the numbers are often complex and would take longer to address. Long-range strategy becomes a luxury in the realm of short-term measures.

While each performance measure will have particular effects on those it governs, if the rewards and punishments attached to the measure are important, if the measures are publicized, if the gap between the measure and the goal is great, or if it is extremely difficult to accomplish the goal behind the measure, the temptation will be to manipulate the number. Conversely, if the measures are seen as legitimate, if managers are given ample time to implement new policies, if efforts are rewarded as well as outcomes, we would expect less gaming and more efforts to change the substantive goals behind the measures.

"Reverse engineering" is a fruitful way to conceptualize the motives for rankings manipulations, first, because it is such a common strategy, one that members often use to name a bundle of practices used to make sense of and manage rankings. The people we interviewed routinely described what they did either explicitly or implicitly as "reverse engineering" and some reported that it is a helpful tool in explaining their rankings to various audiences or overseers. Reverse engineering is simultaneously a way to know something (how rankings work), a way to do something (manufacture the number you want), and a way

of checking something (are our plans working? are people doing their jobs properly?).

Conceiving of reverse engineering as a mechanism of change is helpful for several reasons. First, it allows scholars to connect this practice with other related strategic social processes such as creating “audit trails,” which make it possible to trace backwards the calculations performed, “transparency,” “accountability,” or “reproducibility.” It also encourages intellectual engagement with the broadly relevant literatures on auditing (Power 1994, 1997), risk assessment (MacKenzie 1993; Hutter 2000; Hutter and Power 2005; Power 2007), performance evaluation, strategic management and balanced scorecards (Johnson and Kaplan 1987; Kaplan and Norton 1996) and governmentality (Foucault 2007; Miller and O’Learly 1987; Rose and Miller 2008; Mennicken and Miller 2012). Moreover, reverse engineering is closely related to how others, including many of our respondents, talk about such practices. Reverse engineering can also be deployed as a “check” on the calculations or, more broadly, the methods of others – a form of doing and communicating and creating “reliability” or whatever notion of scientific respectability you desire, or for debunking, debasing the same.

It is useful to unpack some of the dimensions of reverse engineering to reveal how this form of thinking and action shapes organizational members’ understanding of rankings. Deconstruction is the primary cognitive practice associated with reverse engineering and it is built on the assumption that something can be known if it is taken apart, if we somehow reduce to its parts. This is a sensible approach to understanding end-products but one that depends on other largely implicit assumptions. First, in many cases, it is extremely difficult to reverse engineer something, especially if crucial information is missing, which is typically the case. Although calculation is considered one of the most transparent and therefore reproducible forms of knowledge, scrutinizing proprietary algorithms is hardly easy. The classifications that create the definitions that are used to construct measures create a complex cognitive infrastructure for rankings, one that undergirds all measure but is often obscure to those who make and use rankings. This infrastructure is made, rather than given, and rests on the fundamental idea that the equivalences that rankings produce – within and between schools – are social conventions rather than relations exterior to measurement. They are created rather than given, and reflexive in ways that shapes the categories through which we understand ourselves as members of groups or as individuals. Desrosières calls this process a “convention of equivalences.” Understanding calculation this way opens up measures to sociological analysis. Alain Desrosières was one of the central figures in elaborating this way of thinking about statistics and INSEE (the French National Institute of Statistics and Economic Research) was one of the central locations for this work. Other important researchers associated with the economics of convention are Laurent Thévenot, Robert Salais, François Eymard-Duvernay, Olivier Fa-

vereau, André Orléan, and Luc Boltanski.³ The production of equivalence, at its most general, is the assumption that all universities are somehow the same and have the same goals. More concretely, the dimensions that rankings are intended to measure are made equivalent with one another so that one can easily compare the performances of people in different parts of the university; for example, one can “see” how well admissions staff are doing in comparison to career services staff by looking at their relative contributions to the rankings and comparing their performance over time.

Initially, USN did not provide much detailed information about its methods, something that came up often in criticisms. It reported the categories and weights assigned them in its methods but this left many unknowns. For example, for years USN did not disclose how its reputational surveys, a factor that determine 40% of a school’s score and is the most heavily weighted component of rankings, were conducted or how many people responded to it. Only later did schools learn that a consulting company was hired to write and administer the surveys of both practitioners and law school members, that the response rate was very low, especially that for the practitioners, that within law schools four people were surveyed, the dean, dean of academic affairs, chair of appointments committee, and last tenured professor. But USN has never revealed how its sample is drawn and what are the biases of this likely non-random sample. Even today, one of the biggest mysteries surrounding the rankings is how respondents in the practitioner survey are selected.

Providing details about methods is a crucial part of producing “valid” social knowledge; however, as the extent of gaming became more known and threatening to undermine (further) the credibility of USN rankings, USN reversed its pattern of increasing disclosure in order to impede gaming. It was common practice for schools to “improve” their placement numbers by counting any job, even the most menial, as a “placement,” hiring their own unemployed students until the numbers were reported, and even paying firms to hire their unemployed students. When during the Great Recession, angry unemployed students started challenging schools’ glowing job statistics, including filing law suits against them, when members of Congress began to threaten to regulate the reporting of job statistics, the American Bar Association, the accrediting agency for American law schools and USN began to require more nuanced employment statistics, including whether reported jobs required a law degree, were part-time or temporary, or were at a graduate’s law school. In compiling the overall placement statistic used in its rankings, USN announced it would no longer provide all the weights to the various sub-factors as a way to deter gaming. Consequently, even though reverse engineering might seem an obvious

³ I cite works in English. French titles appeared earlier.

strategy of management, it is not as easy to accomplish as it might seem at first, despite claims to transparency and rigorous methods.

Sequencing is another key feature of reverse engineering. The end product, the ranking, is a summary statement of worth or merit but in order to deconstruct this summary there are multiple intermediate processes that pertain to particular variables. The presumption underneath reverse engineering is the salience of the logical connections that create its integration; put differently, the ranking is a sturdy object that must be worked on in order to reveal itself, and that its ultimate commensuration or integration is a logical sequential connection rather than the arbitrarily accumulated and weighted parts that it is. An orientation to reverse engineering, in other words, encourages logical connections that are not necessarily there. In contrast to the reverse engineering of computer code or manufactured parts, the connections among rankings are more arbitrary.

Part of the sequential orientation of reverse engineering is a particular cognitive and temporal orientation toward its objects: one thinks backwards from the present in order to project forwards into the future. But this is not as one-directional as it might seem; the backwards and forwards of deconstructing rankings is more of a dialectical process for organizations as adjustments to organizational routines are often more continuous than a strict before and after approach to this disassembling. Whereas the motivation for much reverse engineering is innovation and improvement in the object under scrutiny, as well as copying something but with ranking these motives are irrelevant as schools have no control over the ultimate object, other than persuasion. For example, some schools may work on decomposing only one rankings factor, while others might work on multiple factors. Schools may abruptly change course as they learn more about factors (e.g. promotional material has little apparent effect), or as other schools adopt strategies that they feel they must also adopt, or as new information is revealed or changes made by USN.

Perhaps the most salient consequence of reverse engineering to encourage an already prevalent attitude of focusing on the number rather than what the number is supposed to measure. One school had the unhappy experience of falling out of the first tier (top 50 schools). When asked if they were strategizing about how move back into the top tier, the dean said: “Oh, absolutely. Absolutely. We’ve done a lot of careful studying of the USN methodology to figure out what counts the most and what is perhaps the most manipulable, because those are not necessarily the same things.”

One law professor we interviewed described how at the retirement part of a retiring dean, he was presented with a crystal numbers that commemorated the schools rise in the rankings *one place*, as if this were his greatest accomplishment as dean.

We can find many examples of reverse engineering in the scholarly literature on performance rankings. From civil engineers who invented elaborate

benefits while ignoring obvious costs for their projects in order to produce positive cost-benefit analysis (Porter 1995; Espeland 1998), to New York surgeons who refuse to operate on risky cases in order to boost their scores on state-mandated “report cards” (Narins et al. 2005), to accountants at Ernst & Young who approved the practice of “Repo 105” in which Lehman Brothers investment bank bought back shares of its debt and reported these as sales in order to appear less leveraged than it was shortly before its collapse during the Great Recession (Jauhar 2015; Reed 2010), whenever there are fateful, public numbers in play, the temptation to produce positive numbers will be pronounced.

In sum, reverse engineering is a broadly adapted strategy that encourages an orientation toward rankings that strongly influences how schools respond to rankings, how they understand them as kinds of measures, and their legitimacy as such. As forms of “scientific” knowledge the publishing of methodology is an important part of what the magazine and some consumers see as the validity or respectability of rankings. Yet, the requisite public rendering of methods at the same times makes them more vulnerable to gaming, which undermines their legitimacy. This tension between publicly producing methods and data, a fundamental feature of scientific accountability and the manipulation of numbers to produce better looking results, is why many performance metrics provide a very tenuous and selective accountability. Many people know this but this seems to do little to dampen their power.

3. Emotional Attachment to Numbers

As Emile Durkheim has famously argued in *The elementary forms of religious life* (Durkheim 1995), the more abstract the relationship, the harder it is for people to invest it with emotion. That is why he believed it was so necessary for people to use symbols and rituals to produce the proper intense emotional attachments to society such that we are willing to sacrifice individual goals and interests to the needs of the collectivity. While they may seem less evocative than a totem or a flag, numbers can also become powerful symbols of belonging, identity, and status. Sometimes we become invested in a particular number or set of numbers: being “number one” or in the “top ten” appeals to many sports fans, students, and educators.

Scholars have mostly neglected people’s emotional attachments to numbers, this despite their importance for the founders of the discipline of sociology. Marx wrote about the distinctive alienation associated with capitalism. Anomie was fundamental to Durkheim’s modernism and he believed that “collective effervescence, the powerful emotional attachments forged through ritual,” is crucial for our attachments to groups that is the antidote to anomie. For Weber, the capacity of rationalization to drain from life its meaning was crucial for understanding the stakes of modernity, and while calculation was crucial for capi-

talism to develop, it contributes to the flattening of our emotional lives. And Simmel described cynicism and apathy as responses to the pace of modern life and the effects of a money economy. Nevertheless, these early investigations of emotional responses to broad changes in economic and political life were seldom emulated by more contemporary scholars, at least as systematically as in these classical accounts. This “prolonged marginalization of emotion,” as Von Scheve (2013) terms it, lasted some sixty years. It was only in the 1980s due to, in part, the pioneering work of Arlie Hochschild, that the sociology of emotions became a legitimate sub-field in North American sociology.⁴ Hochschild (1983) analyzed the emotional labor demanded and produced in service occupations and at home (Hochschild 1989); Robin Leidner investigates the emotional labor in the fast food industry, while Jennifer Piece analyzes it in law firms; Jim Jaspers (1997) and other social movement scholars (Goodwin, Jaspers and Polenta 2001) see emotions as central to social movements; and scholars such as Wharton (2009), Stevens (2009), and Hallett (2010) attend to the crucial role that emotions play in business and educational organizations. Understanding the production of emotions is now an important part of many fields within sociology. Key to most sociological analyses is conceiving of emotions as dynamic and relational, and therefore fundamental social and transactional, the subject of negotiation, interpretation, and suppression. As such, emotions cannot be understood as the product of individuated selves.

One important facet of contemporary social life is that we are increasingly governed by numbers and so it is important to understand how numbers shape our emotions.⁵ Here I follow Randal Collins’ (2004) prescriptions by first understanding emotion as a primary driver of most interaction and, second, focusing on the situation as the unit of analysis rather than the individual. The situations that matter most in this analysis are those that are shaped by rankings. And, as Sara Ahmed (2004) as argued, emotions are dynamic, increasing or decreasing in interaction and that emotions often become stronger and more salient as they circulate among actors.

When we speak about numbers we often use the language of social distance. Numbers are abstract, hard, devoid of passion, cold or even heartless. Numbers allow us to create knowledge without the distortions of politics or feelings; they are impersonal, such that we sometimes describe assaults on personhood as someone being “reduced to numbers.” This way of thinking about numbers is also, of course, crucial for their usefulness and their power. Abstraction, because it strips away so much of the local and specific, makes it easy for num-

⁴ For reviews of this literature see Thoits (1989), Turner and Stets (2006), and Wharton (2009). Important efforts to theorize emotions include the work by Katz (1999), Turner and Stet (2006), and Collins (2004).

⁵ Recent work on the importance of numbers in governance include Davis et al. (2012), Rottenburg et al. (2015), and Merry et al. (2015).

bers to travel, to be put to new uses, to be inserted into new places. Numbers are also supposed to be bland and boring but as the historian, Theodore Porter (1995) has suggested, that is also part of their power.

As Lorraine Daston (1992) might put it, numbers help to produce “aperspectival objectivity”—a “view from nowhere,” where the places and persons are extracted from their use (see also Daston and Galison 2007). Numbers also permit “mechanical objectivity,” a set of rules about how to make and deploy numbers that contains the discretion and biases of those using them. Mechanical objectivity is especially welcome when there is conflict, mistrust, or social or cultural differences, conditions that make it hard to trust those charged with making decisions, or when decisions must be justified to others (Porter 1995). But despite their capacity for producing distance some numbers become obsessive objects of intense identification and internalization. Some produce emotions that run the gamut from pride to revulsion. Some become the embodiment of aspirations or a shorthand for identities. And just how numbers do this is worth exploring.

Educational rankings are one example of quantification that produces powerful emotional responses. As a relatively recent innovation, it is possible to trace their trajectory from what many saw as a silly novelty to a device that reorganized the status system of higher education. I begin my discussion of the emotional consequences of rankings with a brief taxonomy of some of the most prevalent emotions that rankings generate. After that, I suggest of the processes that provoke and direct these emotions and provide examples of reverse engineering and emotional attachment for other performance measures.

When USN rankings first appeared, a few deans, including those at Harvard and Yale, denounced them but they were ignored by most law schools. It was not until administrators realized that prospective students were using them that they began to take them seriously. Media reported how local law schools were doing and this increased pressure on deans to focus on rankings. The release of rankings in March became a predictable annual story about whether regional law schools were moving up or down and they compared with each other. For example, one headline in *Chicago Magazine* (October 23, 2013) declared: “Does University of Chicago’s slip in the rankings matter?”

Before long, current law students would anxiously monitor their school’s ranking, concerned for the effect it would have on their job prospects. One administrator described reactions at his school this way: “The students will get very upset. I’ll get letters and comments from students, ‘Man we dropped from 30 to 35th. Can you believe it?’”

Another dean described his experience as:

[The reaction to rankings] was primarily student-driven. The student body took a very aggressive stance with the dean and said there is absolutely no reason why we should suffer in our job prospects and salary outlooks because of this phenomenon, and we want you to do something about it. So she invested in areas where the school would tend to get points.

If rankings were popular with prospective students and local media, they were widely loathed by professionals in legal education. It is not hard to understand why. Created by journalists at a for-profit magazine with no experience in survey research, statistics or education, rankings were viewed as misleading information that threatened the authority of specialists. Administrators and faculty became angry at what seem like an affront to their expertise and their status, and a danger to legal education. Administrators and faculty described rankings as “oppressive,” “loathsome,” as an “assault.” One dean likened them to a cockroach. They reported “hating” the rankings and “resenting” time spent on them. A dean who had worked four law schools described the effects of rankings this way:

I never thought about [rankings] except to think about how silly they were, when I was a faculty member [...] And it was really only when I became a dean that I started to think about their extraordinarily perverse effects on the decisions that get made in institutions, and also to appreciate what a brilliant public relations scam has been pulled by the editors of USN. One of the remarkable scams of the 21st century and how they’ve pulled the wool over the eyes of the corporate-academic world is to their credit.

3.1 Anxiety

Anxiety is the most widespread emotion generated by rankings. Over and over, everyone from students to deans reported how anxious they were that their school might drop in the rankings. One experienced dean of admissions remembers the first time he became aware of the power of rankings. He was at a forum for prospective students when a colleague at the next table rushed out to buy the latest edition of the rankings “and was shocked to find that his [top-ten] school had slipped [three spots] and was frankly worried for his job. And I was absolutely baffled at this phenomenon.” One dean reported:

The tiers can be devastating. As you know we’ve been fortunate enough to be in the second tier, but every year we live in fear because to fall again is probably going to hurt contributions, is going to hurt relationship with faculty, with prospective students.

Other deans offered similar responses:

You know it’s not so much pressure to move up as it is a negative impact if you should move down. Somebody told me about a school that I actually know a lot about which is a school in the top – probably the top ten [...] And they experienced a drop of two positions and the Dean really kind of went into overdrive to send out letters to alumni and in their alumni magazine to make a very elaborate explanation of that. And you say, ‘Why would anybody care?’ It doesn’t mean a thing. It’s just one of those minor statistical variations that is always going to occur from time to time. But that sort of tiny little change was seen as very threatening to the school and really required some sort of emergency program to combat. That’s a little nonsensical.

So the effects were sort of immediate hysteria. So I had alumni writing me left and right, I had my board of directors asking me what had suddenly happened that [...] it was an irrational response because the people writing mostly actually knew about the school. I had my student body protesting, and they're here and they know in the course of one year that nothing had happened. But they all essentially were saying, 'What did you do?' So I had to spend a lot of time answering questions and calming people down, and that's a waste of time.

It is not hard to understand why rankings make people anxious. They offer a precise and public comparison of one's school to every other school. They are extremely portable and circulate at impressive speed on the internet and in print media. They are tightly bunched such that only very small differences separate many schools; it is not unusual for six or seven schools to tie for the same position. In the 2016 edition, for example, 4 schools tied for 22th and 6 schools tied for 34th and 87th.⁶ When annual rankings are published, rankings of nearby schools are widely reported in local media and in online forums. Blogs devoted to law or legal education meticulously deconstruct changes in rank.

Most importantly for their impact, rankings are relative, a zero-sum affair. The rise of one school can mean that many schools can drop, depending on their location. Moreover, the force of rankings became magnified as new groups began to use them for new purposes; so, for example, as when some law firms started to incorporate rankings into their hiring criteria and central administrators started using them to evaluate deans or to make decisions about where to distribute resources.

Research shows that stress levels at work are mediated by whether or not people feel they have control over their work (Sauder and Espeland 2009; Bond and Bunce 2001). The most stressful situations are those in which workers are accountable for outcomes but without having the resources or discretion to shape outcomes in significant ways. This stress and lack of control manifests itself in various ways. As Robert Merton (1957, 195-206) pointed out, those without much power become hyper vigilant over that which they do control and this often takes the form of meticulously enforcing rules, even if doing so is counter-productive. Anxiety is a predictable byproduct of accountability without control.

Each of these features of rankings – clarity, visibility, lack of control, speedy discrimination, finger-pointing – are elicited by the intense competition that rankings generate.

¹¹ This is the 2016 edition, published in 2015, based on data from 2014 found at: <<http://www.usnews.com/education>>.

3.2 Resentment, Frustration, and Anger

Because rankings are seen as a coercive intrusion promulgated by unqualified third parties, they generate outrage as well as anxiety. Administrators repeatedly complained about the time they spent preparing information for USN, which they see as subsidizing a for-profit enterprise. They complained about having their lives governed by journalists. They complained about the bad behavior of colleagues in manipulating rankings. And they complained about feeling impotent in their efforts to curtail the effects of rankings. Two deans described their reactions this way:

We didn't even care, but we didn't want to be hurt with such a bizarre [...] for such a bizarre reason. If we were going to be hurt, we wanted to deserve it. Like we have a shitty faculty, we have a 42,000 to 1 student-faculty ratio. You know, something [...] we wanted to deserve it and we knew we didn't.

I wish Al Queda would make USN their next target. When sitting in people's offices watching them talk about rankings it was hard to miss the passion.

3.3 Embarrassment and Shame

Irving Goffman (1967, 105) describes embarrassment as having “to do with unfulfilled expectations.” Participants have a sense of their identities and what is appropriate behavior in a given context and when these do not align, they are embarrassed. When people's identities and their sense of what is appropriate behavior for the context do not align, they are embarrassed. Katz (1999, 15) describes shame as “impotence to organize conventional behavior.” Many of those interviewed for this project were embarrassed by how much time and attention they paid to rankings. While they did not often say this directly, their discomfort was expressed in avoiding eye contact, and their gestures and tone of voice when they talked about how much rankings mattered in their work routines. People said things like ‘I can't believe how much time I spend on them’ or ‘I should be spending my time on things that matter.’ Beneath this embarrassment, I believe, is a generalized sense of impotence, of having to compromise professional values for inappropriate or even harmful policy. Catering to rankings is professionally demeaning because it means being complicit in harming rather than improving legal education and the legal profession. One former dean expressed it this way:

I think [rankings] have turned educational institutions, not all of them, thank God, but it's turned many educational institutions to gamesmanship, and a feeling that there's a winner and a loser. For God's sake, we're about educating students. You know, I spent twelve years of my life with the daughters of policemen, firemen, and sanitation workers [...]. It's about vocation, right? And the rankings change it from a vocation and encourage a ‘race to the bottom’ in turns of manipulation. And that's getting to the essence of professional life that I won't compromise.

Another dean said:

Now the other thing I've heard – and I've heard this only as rumor, but I think it's true – that our Dean this year hired a statistician from the business school to help us better game the USN and he's obviously not talking about that. That's a pretty disgusting use of university resources.

When asked about gaming strategy, someone who had been dean at four different law schools spanning three tiers put it this way:

I think it's awful. I think the inducement to act dishonorably is not good. We are supposed to be teaching people about an honorable profession. We are what we are – that's what I say to people here – the school is what it is and it took 115 years to be what we are and if we want to be something different – being something different isn't being higher ranked, it's about the actual outcomes. And I think we've lost sight of a lot of what's professional.

Similar views came up often:

I've heard of some stuff that I think is really, really underhanded, especially in the admissions area. If we can't be ethical when we get these kids in the door, how can we possibly give them an education in which we preach that ethics are important? What you do preaches a lot louder than what you say.

[Rankings] create a lot of day-to-day anxiety. The most important thing is the ability to develop better resources for the students. And it's shameful that we can't do what we're hired to do.

Disgusting, awful, dishonorable, underhanded, shameful – this is strong language that reveals the depth of people's feelings about rankings. It was enlightening to witness how quickly an interview summoned such strong reactions.

3.4 Cynicism

Scholars disagree about how to define emotion and how many emotions there are. Some restrict the definition to five or six primary emotions such as fear, anxiety, joy, envy, disgust, or shame. It may be that cynicism is more accurately described as an attitude but I prefer to include it in my more expansive definition. Cynicism is generally understood as distrusting the motives of others and resulting in a sense of detachment from some aspect of social life. For Georg Simmel, cynicism is closely associated with what he describes as a "blasé attitude." He sees both cynicism and feeling blasé as effects of the pace of modern life and being closely linked the modern money economy where values and interactions come to be seen as transactions.

Rankings are, quite literally, the commodification of reputation and they accentuate the force of market logic in understanding education. Applicants now talk quite explicitly of the trade-off between (scholarship) money and the status of one's school. Administrators talk about "buying" high test scores with scholarships. And when the editors at USN launched rankings they framed them as consumer information so people could know what they were buying. Those in-

interviewed described with contempt people who “sold out” for rankings. While it is not possible to pin down how much the further infusion of market values shapes people’s emotional responses, it is clear that efforts to game rankings produce a form of fatalistic detachment from the process that makes it easy to comment wryly on how corrupt the system is while remaining passive. This reaction often took the form of an ironic, detached, scornfulness. It is common for people to feel that corruption is rampant under the rankings regime, that colleagues cannot be trusted, and that there is no way to control rankings. As one faculty member commented wryly, “the most innovative thing about law schools now was the invention of new gaming techniques.” Cynicism produces a passivity, a paralysis that offers the superficial comfort feeling superior to those understand less and so attempt change. It is an excuse for not acting.

3.5 Happiness

Of course not all of the emotions evoked by rankings are unhappy ones. When a school moves up in the rankings, when administrators receives bonuses, when deans are praised, and when alumni send in more checks, these are occasions for celebration and pleasure. As Austin Parrish, dean of Indiana’s Maurer School of Law put it: “As much as deans rail against [the rankings] they celebrate pretty hard when they move up” (Odendahl 2014). Whether with champagne or pizza, bonuses or raises, ‘good news’ is broadly shared with prospective students, alumni, and others. The response of Tom Campbell, dean of Chapman University’s law school, which moved up 13 slots to 127 in the 2015 rankings, is typical of schools receiving good news:

I could not be more pleased to see Chapman University’s Fowler School of Law making a solid move up the rankings; but I am not surprised. In a climate where students have been more selective in making the decision to pursue a career in law, we continue to attract top candidates with excellent credentials. Our renewed rise in the *U.S. News*’ Top Schools list can be attributed in large part to the strength of those students, along with our early adoption of a powerful practice-ready curricula and a world-class faculty that includes four former U.S. Supreme Court clerks and a Nobel laureate.⁷

But the pleasure associated with a move up is always tinged with worry about falling back down. As one dean relayed: “We get excited for about 5 minutes and then we start to worry again.” This view was reiterated by others:

I think everybody is aware of [rankings]. When we went from the third tier to the fourth tier, there was despondency, and when we went from the fourth back to the third there was euphoria. And I think the rankings are remarkably important, much too important.

⁷ March 10, 2015 <<https://blogs.chapman.edu/law/2015/03/10/chapman-universitys-fowler-school-of-law-moves-up-in-new-u-s-news-rankings>>.

I noticed one year [when we] moved into the top tier. There was this sort of internal gratitude and elation. People were really happy and there was a lot of politicking, and we put a lot of effort into specifically increasing our rank [...]. But then we fell back out again.

One dean of an elite school seemed less concerned about volatility during an interview: “I think students are very smart, most people we deal with are very smart. As far as trustees go, if we do well we celebrate and if we do poorly, we don’t burn down the house.” But faculty who taught at this school reported that this dean was “obsessed by rankings” and when this school moved down, even one or two positions, “he went crazy trying to figure out how to fix it.”

3.6 Competition, Suspicion, and Seduction

Anxiety, anger, embracement, shame, cynicism, and happiness are just some of the more common emotions that rankings elicit. It is helpful to consider in more detail some of the interactive processes that help promote these feelings. Here I identify three: competition, suspicion, and seduction.

Law schools have always competed against each other over their reputational standing, the best faculty and students, the prestige of their students’ jobs, or for the most celebrated alumni. But rankings have escalated and transformed the competition among law schools. One way it did so was by eliminating useful ambiguity. If, before rankings, the stature of schools like Harvard, Yale, and Stanford were securely elite, there was uncertainty about how other less famous schools fared. Depending on which characteristics one cared about, many schools could make believable claims being highly ranked. After rankings there was no longer ambiguity about which schools were among the top ten or the top twenty five. One administrator put it like this:

[Rankings were] a huge change. I mean, it’s kind of a standard line that there are 50 schools in any discipline think that they’re in the top 20. In the old days it was very easy to convince yourself that that was true because there was nothing out there to show otherwise. And when there were these various, not very influential rankings, they were easy to ignore. But USN is so pervasive and it has the aura of objectivity.

Competing over rankings has become the norm. This emerged when people talked about how rankings came up in discussions at faculty meetings, with colleagues at professional meetings, or in hallway conversations. Administrators also talked about how competition shapes those in charge of producing the statistics that USN uses.

[Staff] do get very competitive, especially with things like the faculty-student ratio. Maybe told you about this, but we were trying to figure out how to get our faculty-student ration to get better without falsifying anything. So went to the seminar that the ABA put on about the report, and there are so many classifications.”

An associate dean talked about the practice of filling out reputational surveys strategically: “And then you can’t tell me people vote without thinking about who they are voting for in terms of their competition. It’s bogus.”

Law professors also described how opportunities to publish are shaped by rankings. U.S. law schools publish journals called law reviews that are edited by their students. The status of these journals often map the status of the law schools that produce. Because scholars can submit the same article to as many law reviews as they like, the journals are inundated with manuscripts. Professors believe that student editors use rankings as a proxy for the quality of an article. One professor reported:

Students who work on the law reviews pay attention to that ranking process, so even though you have some sort of great paper, if you are coming from a school that doesn’t have a good ranking the competition is much more stiff. They look at where it comes from; it’s not blind at all. Relentless competition is exhausting and some schools give up. Recognizing the uneven playing field that makes it impossible for them to be more successful, or refusing to adjust their goals to comply better with rankings criteria, some unhappily accept their more or less permanent inferior status. For others, the churning that accompanies rankings may generate shorter appointments, whether from stress or dismissal. Rankings turned inchoate competition into precise, public and hard to control numbers, which is a recipe for anxiety. Rankings generate suspicion that colleagues cannot be trusted to behave ethically. This suspicion, in turn, increases anxiety and competition.

As three administrators relayed:

I think that some deans have been forced into mendacity. But they’re probably people who had flawed characters to begin. It wasn’t the rankings that did that. It’s one of the sad facts of our society, that that kind of thing can be rewarded in some contexts. I think that the nature of being a dean has changed dramatically over the last 10 or 15 years, but only one small reason for that the rankings.

I will look at the rankings each year and I will look particularly at the placement part of the ranking. And if you do this long, you sort of get a sense of where people stand with their statistics and I’m always a little amazed, or at least curious, because there are some institutions that are putting out numbers that for the life of me do not jibe with what I know is reality.

There is lying that goes on. Basically on the LSAT scores and the GPA scores of students. And it’s tragic that people who get into education who are presumably there to pursue some vision of truth. And I know of at least several instances, I know for a fact that people in the face of this pressure to do well in the rankings, exaggerated or out-and-out lied.

Suspicion encourages more gaming which also encourages people to adapt cynical attitudes about legal education.

In spite or maybe because of the hostility many feel towards ranking there is still ambivalence and this often takes shape as seduction.⁸ To withhold affection and then succumb is a familiar pattern in courtship but it has parallels with metrics. Efforts to game rankings create an emotional investment in “winning,” one that is largely unconscious, at least at first. There is the satisfaction of feeling clever, of “outsmarting” something odious, and of trying to reassert one’s agency in the face of uncertainty and the loss of control. A new dean reported:

I actually found myself this year, for the first time, looking at what are the elements of faculty resources [...] because most of those numbers now *USN* takes out of the ABA [American Bar Association] questionnaire that law schools have to file every year. And I actually sat down and quizzed the person who is primarily responsible for doing that document about how they do it. For example, we do have one endowed fund that lets us bring a visiting professor every year, and we usually aim very high in terms of the kinds of people, so we pay that person probably as much for a semester almost as we pay some of our faculty for a year. And I actually found myself saying, ‘Louise, now when we do the instructional budget, we do include money from the endowment that goes to instruction, right?’ Because I just am finding myself thinking that we have never thought about the elements of it in terms of *USN* [rankings] and I realized that, ‘Oh God, I’m getting the disease’ (quoted in Sauder and Espeland 2009).

Emotions, even negative ones, can be vehicles of investments. They energize, focus attention, evoke interpretations, and prompt action. They also become a means by which we internalize rankings. In doing so, they create relationships with rankings that members use make sense of the organization and its members in particular ways.

The power of collectivities to inspire and direct passion is a crucial insight in sociology. Returning to Collins, it is important to consider how specific contexts shape emotional responses to rankings. As we know, simultaneity is an important component of ritual, one that heightens emotional response. That *USN* rankings are released all at once at the same time each year means that schools’ attentions are all focused on rankings at the same time. That rankings become the subjects of lots of articles and posts only heightens their salience and the emotions they generate.

Moreover, when a school dips in the rankings, administrators swing into action to try and mollify the anxiety this provokes. Typically, deans will hold a “town meeting” for students to explain the drop, reassure the students that it is

⁸ Eve Chiapello and Norman Fairclough (2002) use the concept of “stimulation” to depict a feature of the “new spirit of capitalism” that “generates enthusiasm.” While this is similar to my conception of “allure” it differs in my emphasis on its focus on gaming as the primary mechanism of seduction. See also Boltanski and Chiapello (2007). See Sauder and Espeland (2009) for a description of the allure of rankings.

a meaningless blip, and explain what they are going to do about it. Whether rankings move up or down, whether they engender celebrations or public therapy, they elicit lots of “we” talk that reinforces members’ ties to one another. Schools may hang banners announcing an improved rank, print tee-shirt or coffee mugs that make tangible this new status. All of these actions heighten emotions.

I have argued that it is important to specify the causal mechanisms that propel the organizational changes that performance measures produce. I selected two kinds of mechanisms that demonstrate the importance of both highly strategic responses to such numbers and less deliberate responses. While reverse engineering and emotional attachments can be independent causal processes, it is important to consider how these interact. In some cases, one mechanism produces the other. For example, reverse engineering a ranking may produce a cynical response to the power of rankings as members come to see the number as something to be manipulated rather than as a goal to achieve. The opposite might also be true, too, as cynicism about rankings prompts members to deconstruct them in order to manipulate them; their illegitimacy makes crass manipulation seem appropriate. Anxiety is also a powerful impetus for reverse engineering. And in the case of rankings, emotions seemed to play less of a role in particular decisions and were most important in the more general processes of helping people understand what was happening to them and their organization.

While I have relied mostly on rankings to illustrate the role played by emotions and reverse engineering in prompting changes such as organizations to change routines, budgets or recruitment, these mechanisms are widespread. One famous example of reverse engineering took place in 1982 when the Manville Corporation declared bankruptcy.⁹ The Manville Corporation had made a fortune in mining asbestos since its founding in the 1860s. Its bankruptcy filing was puzzling, given that at the end of 1981 the company reported almost \$2 billion in revenues, was listed at 182 in the Fortune 500, was part of the 30 Dow Jones companies, and had an A3 debt rating (Delaney 1989, 650). The reason for this “strategic bankruptcy” was a series of lawsuits. The first time there was evidence suggesting a link between asbestos and the pernicious cancer mesothelioma was in 1906. But it was not until the 1970s when thousands of victims first began suing the company. The company was well insured, had more than 2 billion in assets and fought the litigation vigorously. It also took out full page ads in the *New York Times* and *Washington Post* declaring that “Nothing is wrong with our businesses.” So what changed in less than one year?

Manville’s annual report in 1981 stated it was good financial state but its accounting firm, Cooper and Lybrand, did add a qualifying footnote, acknowl-

⁹ Details about this case come from Delaney (1989).

edging the litigation but stating that the firm's liability was impossible to calculate. In 1982, a new CEO and a new accounting firm, Price Waterhouse, found that the liability from litigation was calculable and this made it possible for the firm to file for bankruptcy. The firm had commissioned an epidemiological study of potential liability produced an estimate but one that it acknowledged could be half as large or twice as big. Yet, this number along with flexibility in calculating when liability damages would be awarded permitted the company to completely alter its financial outlook. In this case, outside expertise was used to produce the requisite financial profile that permitted the firm, under pressure from its insurers and creditors, to declare bankruptcy, restructure its organization and avoid millions of dollars of liability.

More often, reverse engineering is directed toward boosting numbers. The conglomerate era of the 1960s largely revolved around companies using mergers to sustain the high price/earnings ratios that were attracting investors. The price earnings ratio is used to evaluate the market value of a stock by the market price per share to the earnings per share. Anytime a firm buys another firm that has a lower P/E ratio, it improves the buyer's ratio. Another common way to manipulate P/E ratios is for firms to buy back their own stock, which reduces the denominator of the ratio. Investors often rewarded improvements in P/E ratio with increased prices of shares. Both strategies fueled mergers in the 1960s, as well as subsequent merger movements.

Metrics were central feature of change and control in Stalin's efforts to industrialize the Soviet Union. His infamous Five Year Plans launched in 1928, 1932, and 1937 included exhaustive and sometimes unrealistic production targets for industries, factories, shifts, managers, and individual workers. Harrison (2010) describes the production system as "target-driven culture" in which the Politburo fixed priorities that were turned by planners at the ministerial or regional level into production quotas or "plans." Under Stalin, those who did not meet goals were punished, often severely, and managers would manipulate numbers to meet targets. Even in less draconian times, the rewards and reputations of most officials and managers, according to Harrison, were determined by how well they met these plans. The systematic manipulation of these numbers was referred to as "pripiski," a term that was used beginning in the 1930s and was common throughout the Soviet era; the verb for adding on was *pripisyvat'* and the noun for what was added on was *pripsika*. If small manipulations of numbers was commonplace, big manipulations was dangerous and uncommon.

Emotional attachments can also be formed with unlikely numbers. As the sociologist Martin de Santos (2009) shows, Argentina, in 2001, became obsessed with an unlikely object, the country risk indicator known as "riesgo país." This indicator, more formally known as Emerging Markets Bond Index (EMBI), is a benchmark produced by the investment bank Morgan Stanley to help investors gauge how the risk associated with the bonds of a particular country. It is a daily comparison of the interest rates between what is consid-

ered to be the safest bonds, the U.S. Treasury bonds, and three bond indices of a given country's bonds. Beginning in 1998, Argentina experienced a painful depression that shrunk the economy, destroyed jobs, created frightening inflation, eventually toppling the government.

The country risk factor saw a huge jump during 2001. The jargon, normally restricted to finance professionals, became the topic of daily conversations of housewives and cab drivers, was an almost daily news feature in local and national media, and became what de Santo calls "powerful collective representation" that shaped how Argentines understood not only their economy but their country and its place in the world. It was the subject of nearly daily coverage in the newspapers and Argentina's most prominent newspaper, *Clarín*, ran front page stories about the country risk indicator 4-6 times a month. A key part of Argentina's national identity is that it is a modern "European" country in Latin America. The economic boom during the 1990s gave rise to a self-consciousness of becoming a first world nation. This view of itself was hard to reconcile when its economy was rated as riskier than some of the poorest African countries. This indicator, which contradicted Argentines' understandings of themselves, evoked shame, anger, anxiety, as well as satire and humor. De Santos (2009) conceptualizes numbers that are simultaneously facts about the world and symbols of community "fact-totem" in order to highlight the importance of this dual quality.

As these examples show, the mechanisms of reverse engineering and emotional attachment can help us understand the effects of a variety of numbers that both represent and intervene in what they measure. These examples show broad reactions that people sometimes have in relation to numbers that affect them: they can become strategic goals, encouraging an instrumental manipulation of their components; they can become evocative symbols of self and community; and they can become both at once. These mechanisms can operate in many different conditions that will be amplify or diminish their power. Numbers that affect resources or reputations, or become symbolically attached to groups, or are widely disseminated will be more prone to these orientations. Ratings, which pit individuals, organizations or countries against one another often may be more subject to reverse engineering. By considering in careful empirical analyses how mechanisms such as these drive changes in organizations and communities we can better understand the impact of the numbers that organize our lives.

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Societal Malaise and Ethnocentrism in the European Union: Monitoring Societal Change by Focusing on EU Citizens' Perceptions of Crisis

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Abstract: »*Gesellschaftliches Unbehagen und Ethnozentrismus. Eine empirische Analyse der subjektiven Stimmungslage des sozialen Wandels in der EU.*« During the last years a vague sense of discomfort with current societal developments is spreading all over Europe and is particularly affecting lower social classes of society. It seems necessary to theoretically derive new concepts of quality of society and to take these crises perceptions of EU-citizens more adequately into account. In this article a new multidimensional concept of societal wellbeing is proposed to understand and evaluate new cleavages in societal embeddedness, social recognition and social belonging. It is hypothesized that those restrictions concerning quality of life are also mainly responsible for the rise in ethnocentrism and radicalization in many European societies. A macro-micro explanation of causes, characteristics and consequences of societal malaise is developed as a theoretical framework and also addressed empirically. As a first step, a cluster analysis of indicators of societal developments is used to justify the conceptualization of a highly diverse Europe. The empirical approach on the micro-level is based on two survey waves of the European Social Survey (2006 and 2012). After testing the cross-national equivalence of the new concept of societal wellbeing, which is based on 14 indicators, the evolution of certain crises feelings in society is documented for several European regions in the aftermath of the financial crisis. Finally, separate multiple OLS-regressions within those regions were conducted to derive crucial factors which are responsible to explain ethnocentrism. It is notable that feelings of societal malaise exert a high influence on perceptions of an ethnic threat – especially in Western Europe. These value polarizations between social groups have to be considered as a future threat of social cohesion.

Keywords: Societal wellbeing, ethnocentrism, European developments, crises perceptions, malaise, European Social Survey, cross-national equivalence.

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1. Introduction: The Necessity of Considering Societal Malaise and its Consequences

Eight years after the financial collapse, which began in the United States, Europe is still in a state of crisis; we can even observe an accumulation of current challenges for the EU. All the critical events of recent years – the European debt crisis, the conflict in Ukraine, and the current refugee crisis – have led to the emergence of new divisions across Europe that threaten solidarity between EU member states and social cohesion within European countries. Such a breakdown in solidarity paralyzes the European Union’s ability to act in unity to meet global challenges. The extent of the refugee crisis took the European Union somewhat by surprise in 2015 and the crisis management strategies for combatting the tremendous challenges and consequences of present refugee flows seem to have little prospect of success. As a result, pessimism regarding the future of the European Union is on the rise almost everywhere in Europe.

National governments find themselves in a dilemma where they must reestablish order (partly through the reinstatement of borders) at the national level, while at the same time they must negotiate general agreements to reach Europe-wide solutions. The European method of dealing with the crises is now strictly dedicated, on the one hand, to securing the external boundaries of Europe in order to maintain, on the other hand, the four central European freedoms within. This two-step procedure (increasing the pressure for Europe-wide solutions that recognize national demarcations in order to restore a functioning Schengen Area as soon as possible) reflects the new strategy of the European Union to establish a “fortress Europe” (see Albrecht 2002). This concept of an externalization society (see Lessenich 2015) means defending our own liberties and life chances in a post-growth economic society by excluding and depriving needy people inside and outside of our borders. This new doctrine in a period of economic stagnation is becoming more and more socially acceptable. It is notable that the new politics of exclusion gradually undermine democratic and legal achievements and the central European value of solidarity, which is clearly described in the European constitution (see European Commission 2004).

The refugee crisis’ impact on Europe can thus be seen as the main driving force behind strained solidarity between and within the member states of the European Union, an attendant gradual exhaustion of democracy (see Klein and Heitmeyer 2011), and political and institutional alienation. New enemies to Europe are regularly identified by its citizens and populist politicians, who move the societal climate in certain directions. They accuse clearly defined actors, such as elites, banks or refugees, of being solely responsible for the current societal malaise. This scapegoating strategy reflects citizens’ need to search for easy solutions to complex societal problems. In particular, European bureaucrats and the political establishment in Western countries are blamed for precarious societal

conditions, which leads to the impression that Western democracies are facing a systemic political crisis (see Crouch 2008; Blühdorn 2013).

Rapid societal changes, clearly visible as a consequence of the refugee crisis, economic stagnation (in the aftermath of the economic crisis), Euroscepticism and a lack of political trust, and the widespread insecurities of citizens (expressed in fears of societal decline) all lead in the same direction. These factors diminish solidarity and facilitate radicalization. As Zygmunt Bauman clearly states, “Postmodernity is a chance of modernity. Tolerance is a chance of postmodernity. Solidarity is a chance of tolerance” (Bauman 1995, 313). In his recent work, Bauman (2012) identifies the contemporary period in the development of Western societies as an “interregnum.” The key promises of modernity turned out to be empty (Lyotard 1987; Habermas 1994) and many authors claim that widespread transformations in the economic, political, and cultural sphere have led to the impression that we are stuck on a treadmill (see Rosa 2013). Consequently, belief in progress fades away, capacity for tolerance diminishes, and solidarity is put under strain, becoming a “volatile tie” (Hondrich and Koch-Arzberger 1992, 24) between our highly individualized societies. There is the danger that vulnerable groups – as the victims of globalization – may influence politicians to turn the clock back to a period of national homogeneity and erode the principles of European collaboration.

It is the aim of this article to view fears of societal decline, political alienation, and exclusionary attitudes as symptoms of one central development: a rise in societal malaise. The central concept of restrictions in societal well-being is introduced in order to explain new divisions in societal cohesion, social recognition, and social belonging in contemporary Europe. The term malaise is derived from medical science and describes general feelings of discomfort or a lack of well-being (see National Institute of Health 2016). But in recent years the term has also been used in a different sense to refer to societies that are “afflicted with a deep cultural malaise” (see Online Oxford Dictionary 2014). This second connotation of societal malaise encompasses latent feelings that a society is not in good health. Certain uses of the term describe visions of decline, feelings of anomie, and a lack of political and personal trust (see Elcharodus and de Keere 2012, 103 et seq.).

A theoretical model, which connects the causes of limitations in societal well-being (societal conditions in Europe at the macro-level), restrictions in living conditions and the characteristics of societal malaise (at the micro-level), and the potential consequences of societal malaise (such as ethnocentrism and radicalization) serves as the starting point of this article and presents a macro-micro-macro explanation scheme (see Coleman 1991; Esser 1993) for potential future developments in Europe (see Section 2). This theoretical approach highlights societal developments in Europe, which increase divisions between certain regions of the European Union and threaten social cohesion within EU member states. In terms of the characteristics of societal malaise, it is crucial to

theoretically define certain dimensions of perceptions of crisis that have a damaging impact on views of social integration and societal functioning. The widening of value polarizations and the rise of the political right and left is the logical consequence of these precarious living conditions. The current trajectory of the European Union toward increasing transnational exchange is widely seen as a barrier to maintaining cultural homogeneity, protecting national interests, and guaranteeing social order. It is particularly right-wing populists who benefit by utilizing a “hard” Eurosceptic view (see Szczerbiak and Taggart 2008) to justify their anti-immigrant positions. In psychological literature, Jost et al. (2003) provide a comprehensive cognition framework to explain differences in ideological outlook. People tend to embrace right-wing ideology because “it serves to reduce fear, anxiety, and uncertainty; to avoid change, disruption, and ambiguity; and to explain, order, and justify inequality among groups” (Jost et al. 2003, 340). We can therefore assert the presence of a rise in ethnocentrism in Europe, which can be described as a resistance to cultural diversity and an acceptance of inequality. It is assumed that this ethnocentric attitude is mainly found within societal groups who feel left behind in society and who are characterized by a lack of social integration or hold widespread views of a societal malaise.

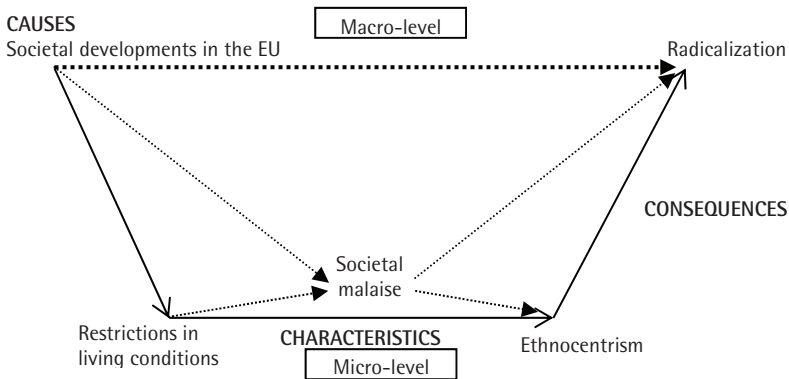
All three levels of explanation are also addressed empirically. A cluster analysis of crucial macro-indicators of societal developments is used to justify the conceptualization of European divisions, which lead to breaks in solidarity within the constellation of a highly diverse Europe (see Boatca 2010). The multifaceted dimensions of societal well-being at the micro-level are then quantified using public opinion data from the European Social Survey (2006 and 2012). This multidimensional approach should allow the monitoring of societal change in the aftermath of the economic crisis in various regions of the European Union. The third objective of the empirical study is to provide a differentiated measurement of restrictions in living conditions to describe – together with the dimensions of societal malaise – certain driving forces of xenophobia. It is assumed that it is still possible to explain exclusionary attitudes using socio-structural divisions and value polarizations, particularly in Western Europe.

2. A Macro-Micro-Macro Explanation Scheme for Contemporary Societal Challenges

The theoretical approach, which is adopted in this article, systematizes and links approaches at the macro- and micro-level and can thus be illustrated using a bathtub model (see Coleman 1991). The guiding logic of this classical sociological explanation scheme holds that social phenomena have to be explained

with reference to the micro-level because they are always influenced by individual actions.

Figure 1: The Macro-Micro-Macro Explanation Scheme for Ethnocentrism



Note: Based on Coleman's 1991 Bathtub Model.

In this theoretical approach, contemporary societal developments (principally summarized using the three **I**s of political **i**mpositions, economic **i**nequalities, and cultural **i**nsecurities) are seen as major factors that influence objective living conditions and societal well-being at the micro-level. At the individual level, it can be measured when current restrictions in living conditions, combined with perceptions of crisis (which are conceptualized using the three **D**s of fears of societal **d**ecline, political **d**isenchantment, and social **d**istrust) exert an influence on ethnocentrism (the dependent variable). A higher degree of ethnocentrism within a society may thus be strongly connected to the rise of right-wing populism and radical tendencies in Europe, threatening social cohesion not only within certain countries but also between EU member states. The theoretical model explains potential future developments within Europe, but the empirical analysis sticks predominantly to the micro-level. The hypothesis is that societal malaise is the dominant explanatory factor for the degree of ethnocentrism and radicalization in many European societies.

3. The Influence of Societal Developments in Europe on the Current Malaise

3.1 Political Impositions in the EU

When we review the political transformations in the European Union, the political architects of European integration find themselves in a dilemma. On the one

hand, further European integration and common agreements are clearly required, since complex European challenges, such as the refugee crisis, can only be solved through joint efforts. On the other hand, the implementation of a European crisis intervention policy is often prevented by national interests and blocked by large parts of the population. Thus national governments – backed by significant parts of society – follow the “not in my backyard” strategy and favor independent approaches instead of European collaboration. As a result, EU bureaucrats are widely perceived as inefficient in providing sustainable solutions.

In addition, optimistic advocates of a united Europe (see Münch 2008) have also expressed concern about further European integration. In a recent contribution, Münch (2014) clearly states that the spill-over process from an economic to a legal then to a political union require a transformation of democracy in order to gain public support. The EU is mainly suffering from a large deficit of input legitimacy and is offering less output legitimacy due to the ongoing states of crisis of the past few years (see Münch 2014, 62 et seq.). Thus, during the last decade, the general “success story” of European unification has clearly shown signs of rupture. In particular, the Eastern enlargement of the EU and the deeper integration that followed to cope with the needs of a Union of 28 members have encountered resistance from national governments and citizens. The *finalité* of European integration remains unclear and European solidarity is perhaps more contested than ever before.

Contrary to neofunctionalist approaches, several authors (see Bach 2008; Haller 2009) consistently conclude that European elites have constructed a multi-level democracy that is not approved by European citizens. Haller (2009) highlights four developments that impede strong social integration in Europe: there is no common European language; the EU has no clear authority; there is no coherent European identity; and specific social structures in several European regions result in groups of countries that are internally homogenous but highly diverse in comparison to one another (see Haller 2009, 287 et seq.). In connection with these factors, the positive image of the European Union has changed dramatically in recent years. In particular, the victims of societal transformations see the opaque apparatus of the European Union as a sovereign association (see Lepsius 2006), which threatens prosperity and economic growth in certain countries or even destroys the life chances of some citizens. From the periphery of Europe, the EU’s center in Brussels is often perceived as a parallel universe, which is removed from the experiences of the people but nevertheless massively influences their way of living. As a result, Euroscepticism is on the rise in many European countries as the aims of political institutions and the perceptions of citizens drift further and further apart (see Immerfall 2000). Regarding the nature of Euroscepticism, it is important to differentiate between hard and soft forms of EU critique (see Szczerbiak and Taggart 2008). Whereas hard Euroscepticism principally opposes the EU itself and European integration, soft forms of EU critique reflect a high level of dis-

satisfaction with EU policies, as well as a desire to improve the democratic deficit of the European Union. Empirical analysis clearly indicates that those who are better educated perceive a higher level of political efficacy and are more positive about European integration (see McLaren 2007). Since the beginning of the financial crisis, Euroscepticism has become increasingly embedded within European member states. It has reached the mainstream of society, putting high pressure on European elites in terms of how they determine the future direction of the EU (see Brack and Startin 2015).

3.2 Economic Inequalities between and within EU Member States

Despite the central aim of the EU's policy of cohesion to reduce regional discrepancies, inequalities between European member states have also started to rise again, particularly after the Eastern European enlargement in 2004 (see Fredriksen 2012, 18). The financial crises and their aftermath have dramatically increased the divergence between Northern and Central European states and peripheral Southern and Eastern European countries. The south of Europe was particularly hit by the crisis and seems unable to cope with high public debt (see European Commission 2013, 17). According to Bach (2008), political efforts to establish the European monetary union are a crucial factor in the increasing regional disparities within the Eurozone. Political actions were subordinated to economic rules, while citizens became more and more exposed to market dynamics.

In one of his recent publications, Ulrich Beck (2012) highlights three demarcation lines for inequality within the European Union. The first division is between groups of countries with the common currency and powerful European nations that choose to follow an independent development path. A clear example is the United Kingdom, which tries to push its interests but remains largely involved in common European decisions. Gaps between the wealthy countries of the north and the countries of the south challenge the European Union's status as a functioning community of states. These new outsiders within the European project join the long-standing outsiders in Eastern Europe. Several new EU member states are still perceived as insufficiently economically mature to fulfill the economic standards needed to join the monetary union or insufficiently politically mature to meet the standards of established Western democracies.

In line with Kreckel (2004), a center-periphery model is best suited to provide a framework for economic discrepancies between EU member states. The current European Union is a united territory characterized by concentration of power in the center and fragmentation of influence at the periphery (see Kreckel 2004, 42). Rising social inequalities reflect one general division, which widens the gaps between countries as well as within them. Comparisons over time, using the GINI index as one classical measurement of income inequality, confirm that inequalities have grown in most of the European Union member states

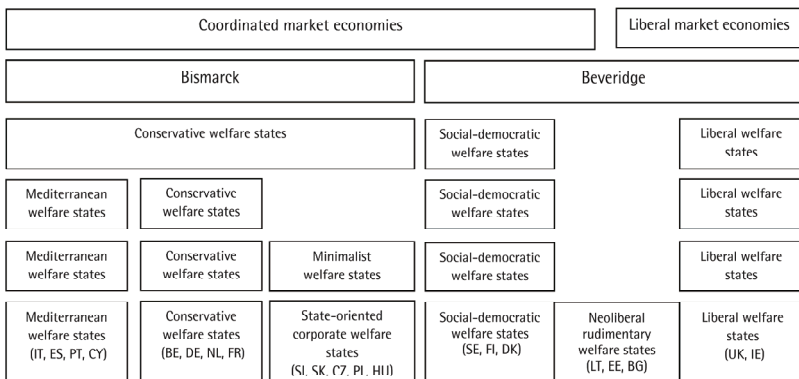
over the last three decades (see Fredriksen 2012). This is mainly caused by rapid income growth among the top 10% of earners, while the poorest 10% of the population are losing more and more ground. As such, privatization, deregulation, and technological progress have mainly profited the wealthy. Citizens in the top social strata perceive new opportunities to develop their skills and may interpret trends of flexibilization (see Sennett 1998; Bröckling 2007) as presenting new possibilities, while the lower classes, who are often considered the losers of modernization, endure precarious work and unemployment (see Spier 2010).

The economic tensions Europe is facing today have increasingly created the impression among the public that decades of social progress have come to an end and maximum levels of wealth have been reached. Growing inequality, which is in turn related to neoliberal policies that facilitate the process, therefore leads to strong fears of social decline that is increasingly affecting the squeezed middle classes in European societies. Reviewing the history of capitalism during the previous decades, Streeck (2013) proposes that the capitalist class itself has triggered the current renaissance in market dominance. They succeeded in reestablishing neoliberalism in the 1980s, which has led to a gradual erosion of the modern comforts of the welfare state (see Streeck 2013, 44). But it is notable that welfare regimes are historically grounded and seem to be somewhat resistant to significant cutbacks (see Schmidt 2010, 63). Research on the welfare state reveals notable discrepancies within Europe and strengthens the impression that Europe is a diverse family of countries. The most important work in this regard is the typology of Esping-Andersen (1990). His three worlds of welfare help to distinguish at least three types of regime within Western Europe. Liberal welfare states such as the United Kingdom or Ireland emphasize the role of the free market, while conservative welfare states (such as Germany, Austria, and France) are based more on the Bismarck model, where social security is linked to social status and employment relationships. The original aim of Beveridge to guarantee a universal security system for the whole population is more closely fulfilled in the social-democratic welfare regimes of Scandinavia. In those states, a high level of decommodification has led to the protection of a higher number of citizens from labor-market risks (see Schmidt 2010, 99 et seq.).

Following Esping-Andersen, many researchers have tried to extend his typology to accommodate more substantial distinctions between European regions. A fourth type of welfare regime has been suggested for Southern European states, which have been classified as rudimentary (Leibfried 1992), catholic (Begg 1994), post-authoritarian (Lessenich 1995) or familialistic (Ferrera 1996). Social benefits are strongly interwoven with labor-market participation, which leads to a lack of social security for labor-market outsiders (see Buchholz and Blossfeld 2009). Precarious groups in Southern European societies thus remain largely dependent on traditional forms of support, such as the church or the family, which strengthens the role of conservative family constellations, such as the male breadwinner model (see Keune 2009, 62). To establish a finely

tuned and comprehensive typology of European states it is necessary to include recent contributions on the role of the welfare state in Eastern Europe. Kollmorgen (2009) clearly states that Esping-Andersen’s typology is not able to integrate Eastern Europe. He instead opts for a further distinction of three additional welfare types, arguing that the Baltic states demonstrate similarities to liberal welfare regimes, while the Visegrad countries, together with Slovenia, are best classified as minimalistic welfare states in line with the Bismarck model. The last group of countries is represented by the economic latecomers Bulgaria and Romania. The strong role of state actors and institutions are still evident in these countries and social security benefits only exist in a rudimentary sense (see Kollmorgen 2009, 84). These insights in contemporary welfare-state research justify a theoretically driven distinction between six European regions (see Figure 2).

Figure 2: A Typology of Six European Regions Based on the Varieties of Capitalism Approach and Welfare-State Research



Note: Modified and extended according to Schröder (2013, 59).

The typology of six European regions combines research on different capitalist systems (see Hall and Soskice 2001; Hall and Thelen 2009) with current developments in welfare-state research (see Schröder 2013) and includes the post-socialist welfare states studied by Kollmorgen (2009). It covers the 21 European Union member countries that took part in the European Social Survey in 2012. This theory-driven typology will also be used for cross-country comparisons at the macro- and micro-level (see Section 5).

3.3 Cultural Heterogeneity between and Diversity within EU Member States

The classification of six highly diverse European regions can be made more clear-cut when cultural patterns and differences, still prevalent in European societies, are included. Schröder (2013) highlights that variation in capitalist

systems and welfare structures go hand in hand with certain cultural characteristics of the nation states. The prevailing ethic of Calvinism is – in his view – mainly responsible for the implementation of liberal forms of capitalism in Anglo-Saxon countries. Catholicism in Continental and Southern Europe has favored the development of social hierarchies and influenced the formation of conservative welfare states together with coordinated market economies. In contrast, the Lutheran influence in Protestantism strengthens the support for national solidarity, which has enabled the establishment of social-democratic welfare regimes (see Schröder 2013, 157). Even in Eastern Europe, the different features of the countries' welfare states are based on cultural and religious foundations. In the Central Eastern European states, Catholicism has maintained its influence, whereas the Baltic States were more strongly affected by Protestantism. The peripheral countries in South Eastern Europe form a third region, where the Christian Orthodox Church has prevailed, leading to a cultural proximity to the Soviet Union (see Kollmorgen 2009, 83 et seq.).

It is notable, therefore, that not only institutional structures but also cultural specificities have emerged due to historically grounded lines of division and center-periphery relations (see particularly Rokkan, ed. by Flora, 2000). The sense of a boundary between Christianity and Islam is deeply grounded in history and has long served to define European identity (see Belafi 2007). The tensions of the Reformation and Counter-Reformation and the frontiers between the Roman Catholic sphere of influence and the Christian Orthodox zone have created significant cultural divisions in Europe that still exist today. Boatca (2010) suggests abandoning the idea of a united Europe to alternatively propose an idea of a plural Europe that has followed divergent paths to modernity (see Eisenstadt 2001). She states that Europe is still labelled a “moral,” geographical space, a morality which underlines European politics and intercultural understanding. Orientalism (see Said 1995) is largely responsible for significant divisions between the West and the Islamic world and is also important for explaining the European strategy to unify Eastern and Western Europe. The East could be understood as a Christian region and was soon constructed as Western Europe's Other and an incomplete part of the continent (see Todorova 1997, 18). Simultaneously, Southern Europe was gradually excluded from the European center due to the weakening of the Spanish empire, its Moorish heritage, and proximity to Northern Africa. According to Boatca (2010), it is still possible to observe a prevailing view of Western Europe as heroic and superior (perceived as the center of progress and modernization), alongside a decadent and nostalgic Southern Europe (characterized by loss of power), and an epigonic East (with strong ambitions to catch up with Western European standards of living).

These historical roots of cultural heterogeneity still influence contemporary European discourse and impede the construction of a united Europe. It is obvious that political measures are always driven by economic prosperity and the

public mood. In times of economic prosperity, public resistance toward European integration will remain relatively silent, while in periods of economic stagnation and rising social inequality, criticism of the political establishment will gain ground. As long as the peripheral regions share the opinion that membership of the European Union is an economic and political path to progress, and as long as the prosperous countries do not view their European neighbors as useless deadweights, there is still hope for establishing European unity in diversity (see Haller 2009, 289).

At the present moment, we are not only witnessing a breakdown in solidarity between the member states of the EU, we are also confronted with the challenge of cultural diversity within the nation states and widespread impressions of Muslims as posing a threat to European culture. As a result, the Islamic population in particular is experiencing prejudice, due to perceptions that they are a backward culture, incompatible with the West. Islamophobia is on the rise, especially in the aftermath of various terrorist attacks within Europe and the refugee crisis; as such, Muslims are “no longer the enemy ‘other’ but are viewed much more contemporarily, the enemy ‘within’” (Allen 2007, 152). Due to key cultural clashes (such as the incidents of sexual harassment in Cologne), European states have predominantly decided to abandon the concept of multiculturalism and instead to introduce strict rules on integration, which often require the assimilation of immigrants (see Aschauer 2011). Civil and human rights are rapidly reframed in order to reestablish social order and introduce new security measures. Language examinations, knowledge tests, and behavioral guidelines are on the agenda everywhere with the aim of enforcing a strong commitment to Western society. Due to these high requirements and the illusion of equality of opportunity (see Bourdieu and Passeron 1971), integration often fails and creates a new underclass of Muslim immigrants among whom poor educational performance, underprivileged positions in the labor market, and unemployment are widespread realities. All these developments, which have predominantly structural causes, are interpreted through a cultural lens, leading to a new form of cultural racism (see Hall 1989). It would be impossible to solve the integration challenge by simply intensifying the requirements for refugees since they must overcome a great number of internal and external disadvantages when they start their lives from scratch in Europe.

4. The Impact of Social Developments in Europe on Societal Well-Being

Interestingly, although social integration was always a popular topic in sociological theory, one that was addressed by various founding fathers of the discipline (see in particular Durkheim [1897] 1983; Parsons [1973] 2003), an empirically wide-ranging examination of subjective feelings in relation to societal

progress is largely lacking. However, many sociologists have contributed extensively to the theoretical foundation of the concept of societal integration. While some theorists (see Glatzer 2008) favor a broad conception of quality of life that encompasses objective living conditions (such as labor market integration, political participation, and social inclusion) and the subjective level, other authors refer more specifically to high levels of discontent (see Ehrenberg 2004) and rising feelings of uncertainty (see Castel 2000, 2009) in Western states. It is thus important to also foreground the concept of societal well-being empirically, since subjective perceptions of crisis in society are often neglected in cross-national research.

To clarify the influence of societal conditions on societal well-being, it is useful to refer to the dichotomy of system integration and social integration as developed by Lockwood (1971), and further elaborated by Habermas (1981) and Giddens (1990). System integration refers to the economic and political order (the integration of societal systems), while social integration refers to the individuals' potential for integration. Nations may be considered integrated if both processes mutually enforce one another (see Heitmeyer 2008, 11 et seq.). According to the last section, gaps between system and social integration within the EU arise as a result of the rapid imposition of political models without the involvement of citizens (see Fligstein 2008; Haller 2009), increasing inequalities within (see OECD 2011) and regional disparities between EU member states (see Vobruba 2007), and the impact of cultural diversity in triggering widespread insecurities (see Bauman 2008). Some authors, such as Castel (2000), insist that strategies to cope with these insecurities depend primarily on the life situation of an individual and on socio-structural characteristics. Others authors (see Ehrenberg 2004; Rosa 2005) claim that widespread transformations in the economic, political, and cultural sphere have resulted in a serious overstress syndrome and have led to the general malaise of late modernity (see Ehrenberg 2010).

The approach of the Bielefeld research group in Germany, led by Heitmeyer (see 1997a, b), aims to systematize contemporary restrictions in objective living conditions and subjective perceptions of crisis and provides a sophisticated model to frame processes of social destabilization. According to Anhut and Heitmeyer (2000), the majority populations are also confronted with disintegration, which has led to states of crisis for Western societies. Economic difficulties within nation states (such as rises in unemployment or high poverty rates) can be seen as indicators of a crisis in social structure. On an individual level, these crisis states are accompanied by expressions of fears of social decline together with feelings of relative deprivation. The crisis of regulation refers to the political level. Political alienation is manifested in low voter turnout and reduced political engagement. On a subjective level, these processes go hand in hand with low levels of political trust and clear signs of dissatisfaction with societal developments. Insecurities, resulting from global or individual threats,

can influence the social climate. In times when flexibility and competition are crucial trends, social relationships become fragile and may result in a lack of solidarity (see Heitmeyer and Endrikat 2008). These findings correspond to prominent theories of individualization (see Beck 1986; Giddens 1990), where the question of how the flexibility of individuals leads to new forms of social embeddedness is still unresolved. Theories of social recognition (see Honneth 2010), social capital (see Putnam 2000), and the erosion of community values (see Etzioni 1995) are well-known theoretical approaches that address the challenge of reintegration in contemporary societies.

Societal malaise should be described using three key perceptions of crisis, which are interconnected with economic, political, and cultural conditions in Europe: EU citizens express *fear of societal decline*, show increasing levels of *political disenchantment*, and react with *social distrust* to the challenges of cultural diversity.

4.1 Fear of Societal Decline

Within the European Union, social mobility is predominantly guaranteed through the meritocratic principle. The current conditions of the global market economy indicate that individual efforts to enhance one's social status may not always be effective. Precarious groups at the bottom of society compete for scarce resources and experience the bitter reality that structural causes often counteract attempts at social advancement. The societal malaise manifests itself not only at the margins of society, where the potential of the precariat (Standing 2011) is widely neglected. The middle classes also face constraints in societal well-being, and are beginning to view the upper classes critically. Fearing a loss of social prestige, they try to secure their wealth by excluding certain groups. The middle classes are often still able to achieve stable positions in the labor market, but they are increasingly confronted with their own vulnerability due to signs of economic stagnation (see Castel 2000). Consequently, although stratification research presently mainly deals with precarization (see Castel and Dörre 2009), it also focuses more closely on the vulnerable middle classes (see Burzan and Berger 2010), and is beginning to analyze subjective fears of social decline (see Kraemer 2010). It is notable that middle-class insecurities are often not connected with real experiences of social decline but based on individual or historical comparisons. People feel underprivileged in comparison to other groups or a previous point in time. Citizens in Western Europe often assess the "golden age" of the second half of the 20th century as an era of peacebuilding, economic growth, political stability, and European integration. Current middle-class fears can best be attributed to changes in expectations for the future, as EU citizens seem to realize that European stability is illusory. Alongside the prosperous regions in the West, there are several trouble spots (such as in the Middle East); new conflicts (such as in Ukraine) weaken the European position

in global power relations, and new borders between the West and radical Islam (combined with the terrorist threat posed by the Islamic State) threaten social cohesion between Christians and Muslims. Fears of societal decline are reflected in high levels of pessimism for the future. It is important to distinguish expressions of fear among the middle classes from the perceptions of social groups who are clearly underprivileged. In many Southern European states we can observe a worsening of the lives of the poor, where restrictions in objective living conditions are clearly apparent. There is a big social question posed by a young and lost generation who are experiencing shortcomings in education and limited chances in the labor market. They try to survive with occasional jobs or are confronted with unemployment and material deprivation. These marginal groups in Europe are becoming more and more visible in certain regions and urban districts, which are largely characterized by a lack of prospects. People at the lower bottom in contemporary society all suffer from neglect and are ideal breeding grounds for radicalization.

4.2 Political Disenchantment

At the beginning of the 21st century, the predicted intrusion of the economic sphere into society (Bourdieu 1998) has become a reality in many world regions of capitalism. Even system theory is more and more committed to analyzing the dominance of the economic system (see Schimank 2013). Political efforts to combat the economization of the social have subsided in many societies, which has led to an extension of capitalist power (see Dörre 2009). These processes have favored significant shifts in political decision-making processes as the political establishment becomes increasingly infiltrated by global market dominance (see Crouch 2008). National governments in the European Union have to overcome particular discrepancies since they are forced to execute supranational decisions but are solely legitimized by their national citizens. Ineffective solutions at the European level create the strong impression that there is a crisis of legitimacy in EU politics, indeed that the EU is the new “sick man of Europe” (see Pew Global Attitudes Project 2013). As a result, national politicians profit from the backlash against national regulations, and are put under pressure to propose short-term solutions to reestablish institutional trust and fulfill the need for social order. One sociological theory that is suited to explaining political disenchantment is the anomie concept (originally developed by Durkheim 1983 [1897]). In Durkheim’s model, citizens witness significant disruptions to social order (due, for example, to unforeseen high refugee streams), which leaves them feeling like uninvolved bystanders in a nation state with porous borders. Anomie in contemporary society thus reflects not only the violation of societal norms but, most significantly, a relative lack of certainty in expectations within a highly differentiated society (see Bohle et al. 1997, 48 et seq.). While people with a higher social status remain active in civil society,

disadvantaged groups tend to react with increasing apathy. The concept of societal malaise can be seen as a broad framework for the current societal situation, encompassing feelings of political alienation and a lack of political efficacy at various levels. Enraged citizens (see Kurbjuweit 2010) at the bottom of society share the deeply felt opinion that the complex conditions of an internationally connected world obstruct the possibility of (progressive) social change. It is notable that protest groups (such as Pegida in Germany) resolve to build a firewall against “otherness” without presenting constructive solutions. They unleash their anger in a defensive way, fueled by powerlessness and a sense of exclusion (see Blühdorn 2013, 169). There has been a widespread failure to address these far-reaching forms of institutional alienation and to judge them as temporary phenomena. The representation crisis of democracy (see Linden and Thaa 2011) has already reached a deep level, signaling a post-democratic turn in Western societies (see Blühdorn 2013).

4.3 Social Distrust

One clear symptom of a developing crisis of cohesion is the rise in social distrust in many European societies. Diminishments in social capital and forms of social exclusion are well-known research areas in the field of social cohesion, which were prominently addressed by advocates of communitarianism (see Taylor 1995; Walzer 1993; Putnam 2000). Individual strategies that undermine solidarity result from subordination under the normative goal of achievement, since in highly individualized societies (see Münch 2010) all responsibility for decision-making is assigned to the individual. People experience a lack of freedom (as a paradoxical consequence of high levels of autonomy) as they are forced to make decisions and incur debts, but often have no real opportunities for advancement within society. In many European societies, the pressure to achieve social mobility is growing and the impulse of competition may win out over that of solidarity. The egocentric attitude that exists under the shadow of neoliberalism is furthered by new processes of cultural uprooting due to institutional alienation and rapid societal change. It is not only economic conditions but also political disruptions to order in particular that provoke individual reactions that go hand in hand with widespread feelings of distrust. The issue of immigration is mainly responsible for the sharp polarization of values in society. Specific groups in society may respect or even appreciate cultural heterogeneity, while those in denial of late modern transformations may shift their values in a defensive direction. The rejection of cultural diversity results in an increased commitment to one’s own nation and a renaissance of social values that aim to preserve order by opting for strong leadership and denying egalitarianism and a commitment to tolerance. People tend to simplify the complexity of social relations by enhancing the status of the majority ingroup and devaluing the status of marginal outgroups.

All these dynamics of societal malaise increase the danger of an erosion of solidarity. We particularly witness a rise in ethnocentrism at the bottom of society due to the fact that disadvantaged groups choose to defend their precarious wealth by bullying the more underprivileged. Particular groups come into the fore, who are judged as “significant others” (Triandafyllidou 1998, 593) and perceived as a threat to achievements in Western society, such as equality and wealth. Disputes in relation to cultural diversity are expressive of significant identity conflicts in contemporary society, which have the potential to initiate a new “age of irreconcilability” (Dubiel 1997, 429). That which is foreign is perceived as a powerful invader in our ancestral territories, which can no longer be protected from the side effects of globalization. The rise in xenophobia is thus a direct consequence of rapid societal transformations in Europe.

5. Is a Key Consequence of Social Malaise a Rise in Ethnocentrism?

In Europe, individual, sociodemographic, and structural predictors, as well as significant attitudes, for explaining and measuring ethnocentrism are the focus of important national (see Allbus 1996, 2006 in Germany) and cross-national research tools (see ESS 2002, 2014) and have thus been extensively empirically documented (for a recent review see Ceobanu and Escandell 2010). Several empirical analyses highlight structural as well as cultural explanations for ethnocentrism but the influence of current societal developments is often only taken into account through rather imprecise contextual factors (see Billiet, Meulemann and De Witte 2014). Following the famous conceptualization of Allport (1954), who defined prejudice as an antipathy based upon inflexible generalization, the concept of ethnocentrism is usually seen as an attitude accompanied by negative feelings and beliefs held in relation toward different ethnic groups. People try to enhance their own social status by devaluating certain marginal outgroups in society (see especially social identity theory by Tajfel and Turner 1979). Such unilateral worldviews may relieve the individual’s sense of disempowerment, but they can have severe consequences for social cohesion.

Evidence regarding socio-structural and sociodemographic causes of prejudice is quite consistent and often replicated in research. The educational level is generally identified as one key determinant of prejudice (Hello et al. 2002; Coenders and Scheepers 2003) but only a few studies address the question of what causal mechanism is responsible for this repeatedly confirmed relationship. In a new study Meeussen, de Vroome, and Hooghe (2013) discovered that cognitive skills seem to play a role in coping with social complexity and feeling more secure in different social settings. Higher socioeconomic status is also often found to be negatively correlated with prejudice (see Semyonov et al.

2004). Another consistent finding is that people who live in urban areas exhibit lower levels of prejudice (see Scheepers et al. 2002).

Duckitt (1992) tries to give a chronological overview of the key theories that explain ethnic prejudice. Early approaches were focused on the personality of the individual. Authoritarian personality theory (see Adorno et al. 1950) argued from the beginning that family dynamics (parental demands for obedience and placing a high value on authority and discipline) are directly responsible for ethnic prejudice, specifically anti-Semitism. Criticism now challenges the psychological reductionism of this theory and its neglect of sociocultural influences. As Oesterreich (1996) puts it, a modern understanding of authoritarianism should view these tendencies as a pursuit of security and should give the societal dimension of authoritarian attitudes more weight. Social dominance theory (see Sidanius and Pratto 1999) addresses ethnocentrism more directly and highlights the competitive element between ingroups and outgroups. Power orientation is a key factor that leads to strong identification with the majority. Pettigrew (1998) was one of the first to state that regional and national differences in the extent of prejudice expressed cannot be fully explained by psychological characteristics. In his later works, he elaborated the contact theory, which was originally developed by Allport (1954). In a recent meta-analysis (see Pettigrew and Tropp 2006) it was confirmed that intergroup contact is a reliable factor in the reduction of prejudice. But Pettigrew (1998) defined several preconditions for this reduction, such as equality of status, both groups sharing common goals, and the support of intergroup contact by opinion leaders. Recent studies (see Semyonov and Glikman 2009) even suggest that there is a nonlinear relationship between these elements, asserting that anti-minority attitudes are lowest in mixed neighborhoods and highest in solely European neighborhoods (see Semyonov and Glikman 2009, 701).

Until the 1960s, other theoretical models, originally developed in social psychology, focused on the effect of values on prejudice. The Schwartz (1992) value model plays a central role in current cross-national research. While values of self-transcendence, such as universalism, correspond to positive attitudes toward immigrants, traditional values exert a negative influence (see Sagiv and Schwartz 1995). This is not surprising, as these values relate to authoritarianism. Davidov et al. (2008) confirmed that these value dimensions have a stable influence on ethnocentrism in 19 European states (based on the first wave of the ESS 2002), which was also robust after controlling for several other influencing factors.

In terms of sociological approaches on prejudice, ethnic competition theory has grown rapidly in popularity in the past two decades (see Quillian 1995; Scheepers et al. 2002; Kunovich 2004; Semyonov et al. 2006). In an influential article, Quillian (1995) tried to confirm his group-threat thesis, which states that the increasing size of the minority population and deteriorating economic conditions contribute to increased feelings of threat and ethnic prejudice. In

general, immigrant size is widely used as a contextual predictor and the group-threat theory has often been confirmed in analyses of the United States (see Taylor 1998). However, the results in Europe are more mixed. While Scheepers et al. (2002) confirmed that the size of the immigrant population has a positive effect on ethnocentrism, Semyonov et al. (2004) found that this factor has no effect on negative attitudes toward immigrants in Germany. Additionally, in his longitudinal study (Semyonov et al. 2006), he suggests that there was a larger effect of group size on prejudice in the 1990s but not in the year 2000.

Until now the size of the immigrant population and economic conditions are the most commonly used group-level indicators to explain ethnic prejudice but the results are often controversial. This could be also due to imprecise contextual indicators that are only used at the national level.

Several studies consistently conclude that economic competition between groups might play a smaller role than often assumed and that the threat of cultural diversity (see Raijman et al. 2008) and distance (see Schneider 2008) are stronger explanatory factors for ethnic prejudice in Europe (see Sniderman et al. 2004). Examples of new approaches include the studies of political climate and anti-foreigner sentiment in Europe between 1988 and 2000 (see Semyonov et al. 2006), the role of the media in influencing ethnic prejudice and right-wing voting behavior (see Boomgarden and Vliegthart 2007), and public views concerning the impact of immigrants on crime (see Ceobanu 2011).

Cross-national research demonstrates that the aforementioned conditions considerably influence negative attitudes toward immigrants in Western European states, whereas in the new EU member states only weak explanations are found (see Zick, Pettigrew, and Wagner 2008; Coenders and Scheepers 2003; Hjerm 2001). According to Kunovich (2004), poorer economic conditions in Eastern Europe may affect both lower and higher classes of society, and therefore the differentiation of prejudice tends to be weaker. Nyiri (2003) warns against viewing Eastern Europe as a homogenously xenophobic region and instead highlights that differences between Eastern European countries are as significant as those between Eastern and Western European states. Economic and cultural explanations are only weak predictors of prejudice in Eastern Europe and therefore the focus should be directed more toward the role of politics and public discourse (see Nyiri 2003, 30 et seq.).

This short overview of the most important findings demonstrates that explanations of ethnic prejudice have a long tradition in empirical research. Sophisticated analysis of disintegration processes and societal malaise should integrate new perspectives and aim to take the shifting perspectives of contemporary societal transformations in Europe more adequately into account. Until now there have been only a few studies that focus on the evolution of xenophobic attitudes. Meulemann, Davidov, and Billiet (2009) measured the attitudinal change toward immigration between the first three waves of the European social survey (2002-2006). They concluded that there is no uniform

rise in ethnic prejudice but rather a slight tendency toward more openness in relation to immigration, at least in countries with insignificant immigration flows and low unemployment rates. Differences between European countries have even increased in recent years, which indicate that there is a need to explore the different societal conditions more closely.

6. Research Questions and Sample Characteristics

The main empirical aims of this article are, first, to empirically confirm a highly diverse picture of European societies (by implementing a cluster analysis), to test a multidimensional conception of societal malaise (using structural equation modelling), to monitor societal change in Europe (by making mean comparisons), and to operationalize a broad concept of social integration (based on restrictions in objective living conditions and subjective perceptions of crisis) to advance a sophisticated measurement for actual causes of ethnocentrism, which is implemented by several sequential regression models in separate European regions. In general, the empirical study should provide a first explorative test of the theoretical approach, which was presented in the previous sections. The whole operationalization process is thus theoretically driven and leads to four guiding research questions:

- First research question: “Is it justified to distinguish between six European regions based on statistical data for contemporary economic, political, and cultural developments?” This refers solely to the macro-level. It is intended to operationalize political impositions, economic inequalities, and cultural differences based on comparable data from official statistics (mainly from Eurostat) and to evaluate the relevance of the typology that was developed in Section 3 (see Figure 2).
- Second research question: “Is it possible to develop a cross-culturally valid measurement of societal well-being vs. malaise based on European survey data?” This moves to the micro-level and deals primarily with methodological requirements for establishing a new understanding of societal malaise. A big challenge for future cross-national research is finding equivalent indicators of societal well-being, which can be used for cross-national comparisons. Implementing structural equation modelling and using MGCFAs (Multi Group Confirmatory Factor Analysis) is a common method of testing for the cross-national invariance of the concept (see in detail in Bachleitner, Weichbold, Aschauer and Pausch 2014).
- Third research question: “Has there been an increase in societal perceptions of crisis based on the new measurement in recent years in Europe and what differences occur between European countries?” This gives initial insights into the quality of the concept for monitoring societal well-being in Europe from a spatiotemporal perspective. Mean comparisons are used to provide a

first overview of which EU countries have experienced a sharp increase in societal malaise in recent years or which nations continuously suffer from restrictions in societal well-being.

- Final research question: “Which predictors of social integration (objective living conditions and subjective feelings) are able to explain ethnocentrism and the differences that occur between major European regions?” This requires the most complex methodological procedures. It was decided to abstain from a multilevel analysis in order to maintain the perspective of a highly diverse European Union and to put a higher emphasis on specific regional dynamics. A comprehensive list of relevant explanatory factors was considered so that a sequential multiple regression design could be implemented. All the models were controlled for methodical bias (such as multicollinearity and missing values) to provide empirically sound evidence about the dynamics of societal malaise and ethnocentrism in different European regions.

While the empirical test of the first research question is based on macro-indicators (mainly derived from databases of official statistics), the empirical analysis concerning the micro-level is based on survey data. Two waves of the European Social Survey, currently considered the leading cross-national survey in Europe, were used in this study to measure the political and social attitudes of citizens. The European Social Survey started as a biannual survey in 2002, and the data from the seventh wave was released in October 2015. To analyze the effects of the financial crisis and its aftermath in Europe, the third wave in 2006 has been compared with the sixth wave in 2012.

The European Social Survey has several advantages compared to other survey instruments. The data quality fulfils the highest standards in survey research, which is demonstrated by their extensive efforts of documentation, a high number of participating European countries (from 22 countries in the first wave up to 30 countries in the fourth wave), large probability samples for each country (the minimum sample size is 1500), equal survey modes (in the form of face-to-face interviews), and a high target response rate (70%) (see Lynn et al. 2007). Table 1 gives an overview of the sample sizes, fieldwork periods, and response rates for all countries that were included in the analysis. The list of countries follows the typology of six European regions, which was theoretically elaborated in Section 3.2. The table illustrates that despite the survey’s high-quality criteria, comparable fieldwork periods could not be achieved in all countries (see Sweden, Denmark, France, Italy, Spain, Lithuania, and Bulgaria in 2012, for example). Additionally, the target response rate of 70% is only rarely fulfilled. Although the ESS is considered to be the gold standard in cross-national research, the results should still be treated with caution since complete representativeness and comparability is very hard to achieve in cross-national survey data (see Bachleitner et al. 2014).

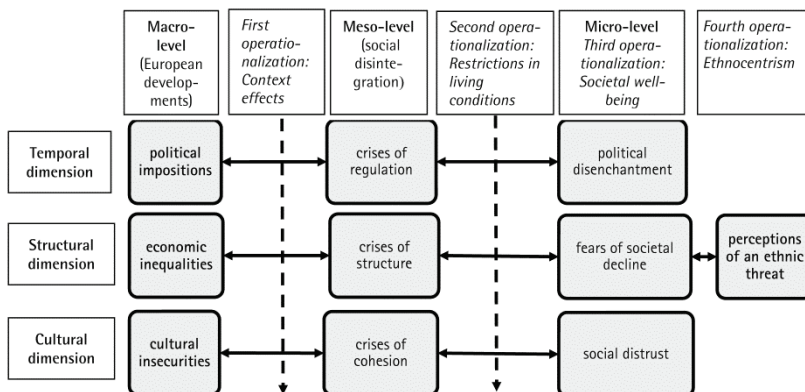
Table 1: Overview of Sample Used to Analyze Attitudes of the EU Citizens

Typology of European regions	EU members	Overview of the sample: 2006			Overview of the sample: 2012		
		n	Fieldwork period (Target: 1.9.2006-31.12.2006)	Response rate (Target: 70%)	n	Fieldwork period (Target: 1.9.2012-31.12.2012)	Response rate (Target: 70%)
Social-democratic welfare states	Sweden	1927	21.09.06-03.02.07	65.9	1847	01.10.12-05.05.13	52.4
	Denmark	1505	19.09.06-02.05.07	50.8	1650	10.01.13-24.04.13	49.1
	Finland	1896	18.09.06-20.12.06	64.4	2197	03.09.12-02.02.13	67.3
Conservative welfare states	Netherlands	1889	16.09.06-18.03.07	59.8	1845	28.08.12-30.03.13	55.1
	Belgium	1798	23.10.06-19.02.07	61.0	1869	10.09.12-24.12.12	58.7
	Austria	2405	18.07.07-05.11.07	64.0			
	Germany	2916	01.09.06-15.01.07	54.5	2958	06.09.12-22.01.13	33.8
	France	1986	19.09.06-07.04.07	46.0	1968	08.02.13-30.06.13	52.1
Liberal welfare states	United Kingdom	2394	05.09.06-14.01.07	54.6	2286	01.09.12-07.02.13	53.1
	Ireland	1800	14.09.06-31.08.07	56.8	2628	15.10.12-09.02.13	67.9
Mediterranean welfare states	Italy				960	01.06.13-20.12.13	36.0
	Spain	1876	25.10.06-04.03.07	65.9	1889	23.01.13-14.05.13	70.3
	Portugal	2222	12.10.06-28.02.07	72.8	2151	24.10.12-20.03.13	77.1
	Cyprus	995	02.10.06-10.12.06	67.3	1116	01.10.12-31.12.12	76.8
State-oriented corporate welfare states	Slovenia	1476	18.10.06-04.12.06	65.1	1257	01.10.12-31.12.12	57.7
	Slovakia	1766	01.12.06-28.02.07	73.2	1847	24.10.12-06.03.13	74.1
	Czech Republic				2009	09.01.13-11.03.13	68.4
	Hungary	1518	21.11.06-28.01.07	66.1	2014	10.11.12-17.02.13	64.5
	Poland	1721	02.10.06-13.12.06	70.2	1898	19.09.12-08.01.13	74.9
Neoliberal rudimentary welfare states	Estonia	1517	25.10.06-21.05.07	65.0	2380	01.09.12-28.01.13	67.8
	Lithuania				2109	21.05.13-25.08.13	49.6
	Bulgaria	1400	20.11.06-10.01.07	64.8	2260	09.02.13-30.04.13	74.7
Total sample (unweighted)		35007			41138		

7. Operationalization Strategy for Cross-National Comparisons

As mentioned before, the whole operationalization process is theoretically driven and leads on to a comprehensive evaluation of the theoretical model. This is clearly illustrated in Figure 3, which gives an overview of all the dimensions of analysis, as well as the forms of measurement. Political impositions, economic inequalities, and cultural insecurities are all measured on the macro-level (using context indicators) and generally reflect the temporal, structural, and cultural processes of change which are the central consequences of societal malaise. Apart from these macro-developments, the meso-level (the living conditions of citizens within EU member states) has to be taken into consideration. Different varieties of capitalism (see Hall and Soskice 2001), welfare-state arrangements (see Esping-Andersen 1999), historical conditions (see Boatca 2010), as well as political and media discourses function in an interface and influence the extent of perceptions of crisis in certain countries. The operationalization of citizens' lack of resources is mainly based on the concept of social disintegration developed by Anhut and Heitmeyer (2000). The authors propose three crisis states that are highly relevant for European citizens: the crisis of regulation may be reflected by a decline in voter turnout and political participation; the crisis of social structure manifests itself in rising social inequalities; and the crises of cohesion may reflect difficulties in guaranteeing social inclusion. These objective processes go hand in hand with various perceptions of crisis and form the core concept of societal malaise. It is important to operationalize feelings of discontent through a multidimensional perspective and to include a sophisticated measurement of ethnocentrism as the study's main dependent variable.

Figure 3: Overview of Explanation Model and Operationalization Strategy



7.1 Operationalization of Macro-Indicators

In the first step, it is necessary to define the key societal conditions that are able to indicate political impositions, economic inequalities, and cultural insecurities. Table 2 gives an overview of the statistical indicators (based on the year 2012) that were used for a cluster analysis of 21 European Union member states.¹

The GDP per capita in Purchasing Power Standards (PPS), the GDP annual growth rate, the GINI index, the annual unemployment rate, and the extent of poverty and social exclusion were selected to show the economic context in the European Union. All measures were derived from Eurostat and reflect key indicators of economic development. Current political conditions are represented through a general measurement of public debt (percentage of GDP) and expenditures on social protection (based on PPS per capita).

All other indicators are based on alternative sources in order to provide deeper insight into the state of democracy in various EU countries. The Index of Democracy (KID) by Lauth and Kauff (2012) combines data from Freedom House, the Polity Project, and selected governance indicators of the World Bank (rule of law and political stability) in order to overcome the shortcomings of single measures. This index is generally closely related to the Corruption Perceptions Index,² which measures the extent of corruption from a worldwide perspective. It was decided to additionally add a measurement for integration policy. The Migrant Integration Policy Index is based on the prominent MIPEX study,³ which aims to give a general picture of migrants' opportunities for participation in society. The index value is based on 167 diverse indicators, which measure integration policies, contextual factors, and integration outcomes.

The last three macro-indicators deal with cultural diversity between and within the countries of the European Union. Cultural heterogeneity within EU member states is measured according to the proportion of citizens with immigrant backgrounds (based on Eurostat). The other two indicators highlight the cultural characteristics of European societies by analyzing their value priorities. Schwartz's value concept (1992) reflects an empirically sound model for basic values and is well-suited to cross-national research. Schwartz proposes 10 individual values that are positioned in a circular arrangement. These values form two higher-order bipolar dimensions that present a spectrum with successive closely related values: the dimension of openness to change (individualistic efforts and action) vs. traditionalism (preservation of the existing order), and the dimension of self-enhancement (pursuit of one's own success and dominance) vs. self-transcendence (acceptance of others as equals). The two bipolar

¹ Austria, Greece, Croatia, Latvia, Luxemburg, Malta, and Romania were not included in the analysis as these states did not participate in the sixth wave of the European Social Survey.

² <<http://www.transparency.org/cpi2011/results>>.

³ <<http://www.mipex.eu>>.

dimensions were constructed using ESS data and the national values were computed according to Schwartz’s guidelines (2009).

Table 2: Operationalization of Macro-Indicators

Levels of Analysis	Indicators	Data Source
Economic sphere	GDP per Capita in PPS	Eurostat: Code tec00114
	GDP Growth Rate (compared to previous year)	Eurostat: Code nama_gdp_k
	GINI Index	Eurostat: Code ilc_di12
	Unemployment Rate	Eurostat: Code une_rt_a
	Poverty and Social Exclusion	Eurostat: Code t2020_50
Political sphere	Public Debt	Eurostat: Code tsdde410
	Expenditure on Social Protection	Eurostat: Code tps00100
	Quality of Democracy (KID)	University of Würzburg
	Corruption Perceptions Index	Transparency International
Cultural sphere	Integration Policy	MIPEX Study <www.mipex.eu>
	Proportion of People with Migration Background	Eurostat: Code migr_pop3ctb
	Traditionalism vs. Openness to Change	ESS Computation based on Schwartz (1992)
	Self-Enhancement vs. Self-Transcendence	ESS Computation based on Schwartz (1992)

These contextual indicators of societal conditions were used in a cluster analysis to support the theory-driven typology of heterogeneous European regions. Three indicators (the unemployment rate, expenditures on social benefits, and the Corruption Perceptions Index) are marked in bold as they were not also considered in the cluster analysis. This is due to high intercorrelations with other indicators: GDP is strongly related to social expenditures ($\rho = 0.93$); both measures of quality of democracy appear interchangeable ($\rho = 0.73$); and unemployment is strongly connected to poverty and social exclusion ($\rho = 0.76$).⁴

7.2 Operationalization of Restrictions in Living Conditions

The selection of indicators to measure individual capacities to achieve social integration takes into account several control variables. Besides age and gender, as well as marital status, the number of children in a given household, domicile, migration and religious background were also used to show the potential sociodemographic impact factors on ethnocentrism. To differentiate clearly between social groups and to highlight contemporary living conditions, the study used Anhut and Heitmeyer’s (2000) concept of integration.

⁴ Using highly correlated indicators is not recommended in cluster analysis since this can have a large effect on measures of distance, which are crucial in the formation of homogenous groups of countries.

- The structural sphere refers to *individual-functional system integration* and covers the resources needed for advancement in society (access to jobs, education, and income). Several grades of employment relationships were used to assess the structural position of citizens. Apart from the employment status of citizens, education, income, and social status (based on the ISEI measurement by Ganzeboom and Treiman 2003) were included as objective and comparable measurements of structural positions in society. These indicators were supplemented by two subjective measurements that address feelings of belonging to the top or bottom social strata and impressions of whether it is easy or difficult to manage with one's household income.
- The *communicative-interactive social integration* measure refers to the political sphere and institutional participation. This level is only roughly measured using three indicators. The first variable deals with trade union membership. Two indices indicate the extent of conventional and unconventional political participation in society (Uehlinger 1988).
- The *cultural-expressive social integration* measure is operationalized using indicators of formal and informal social engagement (see Putnam 2000). One variable refers to involvement in voluntary organizations, while the other measure indicates levels of social contact and social inclusion (friendships, intimate relationships, and social activities). Schwartz's (1992) bipolar value dimensions of were also included at the individual level, as it has frequently been found that values exert an influence on ethnocentrism (see Davidov et al. 2008).

All ordinal variables measuring restrictions in living conditions were dichotomized to guarantee unbiased use in sequential multiple regression models.

Table 3: Overview of Operationalization of Restrictions in Living Conditions

Level of Analysis	Objective Predictors	Subjective Predictors	Indicators
Control variables (7 indicators)	Socio-demographic factors		<ul style="list-style-type: none"> -Age (ESS Code agea) -Gender (ESS Code gndr) -Marital status (ESS Code maritalb) -Children in household (ESS Code chldhhe) -Domicile (ESS Code domicil) -Migration background, part of ethnic minority (ESS Codes: brncntr & blgetmg) -Religious background (ESS Code: rlgdgr)
Structural sphere (6 indicators)	Employment status		<ul style="list-style-type: none"> -Full time job with unlimited contract -Self-employed (ESS Codes: emplrel & emplno) -Part-time (<=30h) (ESS Codes: mnactv & wkhct) -Temporary contract (ESS Codes: mnactv & wrkctra) -Unemployment (ESS Code: mnactic) -Permanently sick or disabled (ESS Code: mnactic) -In education (ESS Code: mnactic) -Housework (ESS Code: mnactic) -Retired (ESS Code: mnactic)

Table 3 continued...

	Education (ISCED)		-Low education level (ISCED 0-2) -Middle education level (ISCED 3-4) -High education level (ISCED 5-7) (ESS Code: eisced)
	Income social status (ISEI)		-Income in deciles (ESS Code: hincnta) -ISEI for ISCO 08 < http://www.harryganzeboom.nl >
		Subjective status Managing with income	-Subjective Top-Bottom Scale (ESS Code: plinsoc) -Managing with income (ESS Code: hincfel)
Political sphere (3 indicators)	Trade unions		-Membership (ESS Code: mbtru)
	Conventional political participation		-Contacted a politician (ESS Code: contplp) -Worked in political party (ESS Code: wrkppty) -Index of participation (0 = no, 1 = at least one activity)
	Unconventional political participation		-Took part in demonstration (ESS Code: pbldmn) -Signed a petition (ESS Code: sgnptit) -Boycotted products (ESS Code: bctprd) -Index of participation (0 = no, 1 = at least one activity)
Cultural sphere (4 indicators)	Formal social capital		-Involved in work for voluntary organization (ESS Code: wkvlog)
	Social inclusion		-Meeting with relatives and friends (ESS Code: sclmeet) -Number of people with whom individual can discuss intimate matters (ESS Code: inprdsc) -Taking part in social activities (ESS Code: sclact) -Index of social inclusion (linear transformation, 1-7)
		Value orientations	-Traditionalism vs. Openness to change -Self-enhancement vs. Self-transcendence

7.3 Operationalization of Societal Malaise and Ethnocentrism

All those indicators that refer to the objective level are enhanced by a multifaceted measurement of perceptions of crisis. Societal malaise vs. societal well-being is conceptualized as a second-order factor constituted by various feelings of unease toward society. All measurements belonging to societal well-being are again framed by the concept of structural, regulative, and cohesive crisis states based on Anhut and Heitmeyer's approach (2000). Table 4 provides a list of all indicators that are used to measure social integration at the subjective level in European societies. In total, 14 indicators belonging to different subordinate factors are included in the measurement.

- Political *disenchantment* is composed of two first-order factors contributing to societal malaise. Political trust represents a classical measurement where similar items are used in several cross-national surveys (such as the European Values Study and the World Values Survey). A central measurement to

- capture regulative crisis states in society is dissatisfaction with societal developments.
- Structural crisis states are measured by fears of societal *decline*. The first two items refer to future pessimism while the other three predominantly deal with individual feelings of recognition in society.
 - A cohesion crisis is operationalized using the concept of social *distrust*, which is measured through three classical items. Mutual trust between individuals is seen as a key influencing factor in the avoidance of insecurities (Kollock 1994).

Table 4: Operationalization of Societal Perceptions of Crisis and Ethnocentrism with ESS Indicators

Crisis Level	Dimensions	Indicators
Crisis of regulation (disenchantment)	Dissatisfaction vs. satisfaction with societal developments	-Trust in parliament (ESS Code: TRSTPRL) -Trust in politicians (ESS Code: TRSTPLT) -Trust in political parties (ESS Code: TRSTPRT) (11-point scale from 0 = no trust to 10 = complete trust)
	Political distrust vs. political trust	-Satisfaction with economy (ESS Code: STFECO) -Satisfaction with national government (ESS Code: STFGOV) -Satisfaction with the way democracy works (ESS Code: STFDEM) (11-point scale from 0 = dissatisfaction to 10 = satisfaction)
Crisis of structure (decline)	Fear of societal decline vs. feelings of societal progress	-Difficult to be hopeful for the future (ESS Code: NHPFTR) -Situation of people in country is getting worse (ESS Code: LFWRS) (5-point scale from 0 = disagree to 10 = agree)
	Lack of recognition vs. acknowledgment of own talents	-Free to decide how to live my life (ESS Code: DCLVLF) -Feel accomplishment in what I do (ESS Code: ACCDNG) -What I do is valuable and worthwhile (ESS Code: DNGVAL) (5-point scale from 0 = disagree to 10 = agree)
Crises of cohesion (distrust)	Social distrust vs. social trust	-Most people can be trust-ed (ESS Code: PPLTRST) -Most people try to be fair (ESS Code: PPLFAIR) -Most of the time people try to be helpful (ESS Code: PPLHLP) (11-point scale from 0 = no trust to 10 = complete trust)
	Perceptions of an ethnic threat vs. approval of multicultural society	-Immigration bad or good for country's economy (ESS Code: IMBGECO) -Country's cultural life undermined or enriched by immigrants (ESS Code: IMUECLT) -Immigrants make country worse or better place to live (ESS Code: IMWBCNT) (11-point scale from von 0 = left pole to 10 = right pole)

To answer the last research question and to explore the influence of the various indicators on ethnocentrism, the dependent variable “ethnic prejudice” is also included in the table. All three items form a short one-dimensional scale that points to either perceptions of an ethnic threat or approval of cultural diversity.

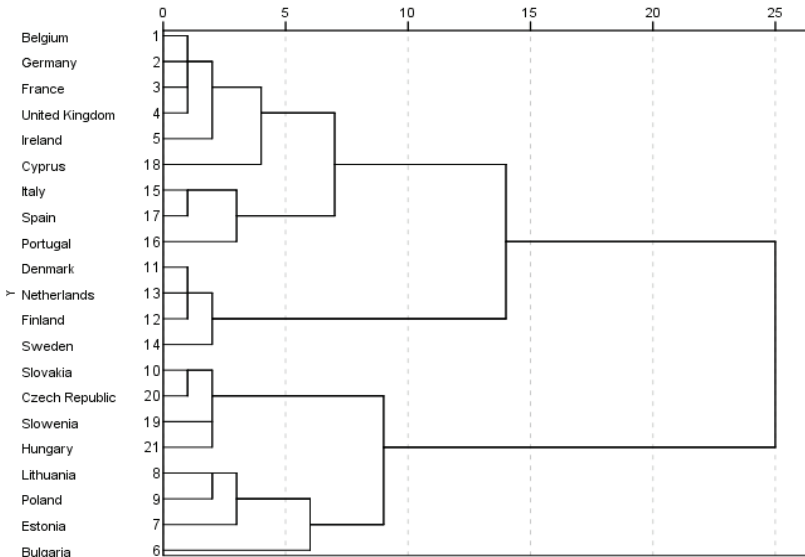
8. Empirical Results

8.1 Is it Justified to Identify Six European Regions Based on Statistical Data Related to Contemporary Economic, Political, and Cultural Developments?

Table 2 illustrated that 10 out of 13 indicators, which describe the economic, political, and cultural conditions of European Union member states, could be included in a cluster analysis in order to test the theory-driven identification of six European regions. In an ideal case, a cluster analysis allows the grouping of countries within homogenous regions based on similar empirical characteristics. Nevertheless, the results of a cluster analysis are always dependent on the researcher’s decisions, so it is necessary to give sound reasons for all steps taken in the analysis. Due to substantial correlations between the variables, it was decided to exclude three indicators (the CPI, the unemployment rate, and social expenditures: see Table 2). The different scaling of the indicators and the small sample size (21 countries) requires a z-standardization of the indicators and a selection of the mode of a hierarchical cluster analysis. The quadratic Euclidian distance is taken as an ideal distance measure and the linkage method of Ward is generally interpreted as the most empirically sound method to gather particular clusters (Wiedenbeck and Züll 2010, 532). The decision reached on the adequate number of clusters is based on a visual interpretation of the dendrogram (see Figure 4). This graph standardizes the distances between the countries on a scale from 0 to 25 and thus illustrates which countries form homogenous groups. If the threshold of a normed distance of 5 is used, it appears to be a realistic measurement for distinguishing six European regions. The first group of countries consists of Belgium, Germany, France, and the United Kingdom; Ireland and Cyprus can also be included in the first cluster. The second class of countries is represented by the Mediterranean region (Italy, Spain, and to some extent Portugal). It is also possible to group the Scandinavian countries together (along with the Netherlands). When Eastern Europe is taken into account, notable similarities can be identified between the EU member states of Central Eastern Europe (Hungary, Czech Republic, Slovenia, and Slovakia). Poland forms a fifth cluster, together with the Baltic States, while Bulgaria must still be regarded as an outlier. The societal conditions of Bulgar-

ia differ clearly from other European states, which indicate Bulgaria's rather isolated position as a latecomer to the European Union.⁵

Figure 4: Dendrogram of the Cluster Analysis (Quadratic Euclidean Distance with Ward's Linkage)



Fromm (2012) recommends justifying the typology of countries and securing the homogeneity of the cluster through an observation of the distribution of clusters compared to the total sample. Following Fromm's recommendation, Table 5 details the mean values and gives clear insights into the economic, political, and cultural circumstances in the European Union. The highest GDP can be observed in Scandinavia and the Netherlands, closely followed by Western European countries. Southern European countries occupy the third position, although most of the countries are still exposed to economic decline in the aftermath of the economic crisis. Therefore, lower levels of economic wealth in Eastern Europe have to be put into the perspective of higher economic growth rates during recent years. Only Bulgaria still has a very low economic performance and clearly lags far behind compared to the other states.

⁵ It is notable that also broader classifications of Europe seem plausible. A threshold of 10 allows the separation of the prosperous European region of Scandinavia and the Netherlands from the slightly lower standards of living in Continental and Southern Europe. Eastern European countries are still situated in the peripheral zone of the European community of states. A threshold of 15 allows a clear distinction between Western Europe and Eastern Europe.

Table 5: Mean Values of Indicators in Relation to Clusters of European Regions

	Scandinavia and the Netherlands (DK, SE, FI, NL)	Western Europe and Cyprus (FR, DE, BE, UK, IE, CY)	Southern Europe (IT, PT, ES)	Central Eastern Europe (SI, SK, CZ, HU)	Poland and the Baltic States (PL, EE, LT)	Bulgaria (BG)	Total
GDP per Capita in PPS	123,50	112,67	90,67	77,00	70,00	47,00	95,57
GDP Growth Rate (previous year)	-,42	-,22	-2,40	-,85	3,40	,60	-,13
GINI Index	26,05	29,85	33,80	25,20	31,80	33,60	29,26
Poverty and Social Exclusion	16,70	23,58	27,80	21,98	27,53	49,30	24,36
Public Debt	52,15	94,30	112,37	58,28	35,30	18,40	69,95
Quality of Democracy (KID)	9,70	8,90	8,27	8,73	8,80	7,30	8,84
Integration Policy	69,50	54,50	70,00	46,75	44,33	45,00	56,19
Migration Background	10,18	14,98	10,20	5,48	7,53	1,20	9,85
Traditionalism vs. Openness to Change	,09	-,25	-,56	-,49	-,59	-1,00	-,36
Self-Enhancement vs. Self-Transcendence	1,60	1,43	1,30	,78	,86	,79	1,21

The indicators of social inequality, and poverty and social exclusion largely confirm the notion of precarious economic states, particularly in Southern Europe and some Eastern European states (principally in Bulgaria). Wider gaps between the rich and the poor are more effectively absorbed in Scandinavia and in Central Eastern Europe. On the other hand, the quality of democracy is clearly higher in Western Europe than in Eastern Europe. In particular, Southern Europe is more exposed to political instability and a higher level of corruption, which leads to the lowest mean value in comparison with all the other groups of countries (except Bulgaria). These lower levels of democracy in Southern Europe are connected with extraordinarily high rates of public debt. This clearly indicates that Southern Europe has lost ground compared to the other European regions in the aftermath of the economic crisis. Public debt is also significantly higher in Western Europe and equally high in Scandinavia in comparison with the Eastern European clusters. Additionally, notable discrepancies are found with regard to integration policy. While political measures

seem to increase the amount of change immigrants experience, particularly in Scandinavia and Southern Europe, there is a lot of room for improvement in integration outcomes in Continental and Eastern Europe. The hesitation to provide equal opportunities for immigrants could be due to high rates of cultural diversity, particularly in Western Europe. While some Eastern European states (especially Poland or Bulgaria) can still be characterized as rather homogenous societies, the whole Western hemisphere of the European Union in particular is more and more exposed to immigration and cultural diversity. This long history of multiculturalism may also have left an imprint on cultural values. According to the Schwartz value model, it can be clearly observed that Scandinavian countries (together with the Netherlands) are the leading countries in terms of progressive values and stand out for their clear orientation toward tolerance and equality. The value priorities seem to be somewhat similar in Western Europe, while people in Southern Europe express a higher orientation toward conservative values. A sharp decrease in values of self-transcendence can be observed in Eastern Europe. People there tend more often to possess a materialist orientation (opting more strongly for achievement and power) and to refrain from values of equality and tolerance.

The main aim of the cluster analysis was to empirically confirm the theory-driven establishment of six diverse European regions. The first research question can largely be answered positively, since all the proposed regions of Europe were widely confirmed by the cluster analysis. When we compare the theoretical model with the empirical results, only a few small deviations appear. The Netherlands seem to exhibit large economic, political, and cultural similarities to Scandinavia. It is also not possible to distinguish between a cluster of conservative Western welfare states and liberal welfare countries. This is perhaps due to economic and political similarities between Continental Europe and the United Kingdom. The most important deviation is reflected in the position of Cyprus, which was classified together with Western European states in the cluster analysis. This is due to large discrepancies between Cyprus and Southern Europe with regard to various selected indicators. Cyprus has a larger proportion of people with immigrant backgrounds and its integration policy is far more critical compared to other Southern European states.

In Eastern Europe the distinction between certain groups of countries converges largely with Kollmorgen's model (2009). The Visegrad states – together with Slovenia – form a homogenous group of countries, although Poland seems to have more similarities to the Baltic states. Apart from those groups of countries that were classified as neoliberal by Kollmorgen, Bulgaria occupies an isolated position. This confirms his argument for grouping Bulgaria together with other South-Eastern European states as a rudimentary welfare state where state actors and institutions still play a dominant role (see Kollmorgen 2009, 84).

The cluster analysis clearly supports the center-periphery perspective on structures in Europe (see Vobruba 2007) and strengthens the view on the exist-

ence of highly diverse regions, not only with regard to welfare-state systems but also concerning democratic achievements and cultural characteristics. Due to small deviations between the proposed categories and the cluster results, the decision has been reached to maintain the theory-driven model (see Figure 2) for further analyses.

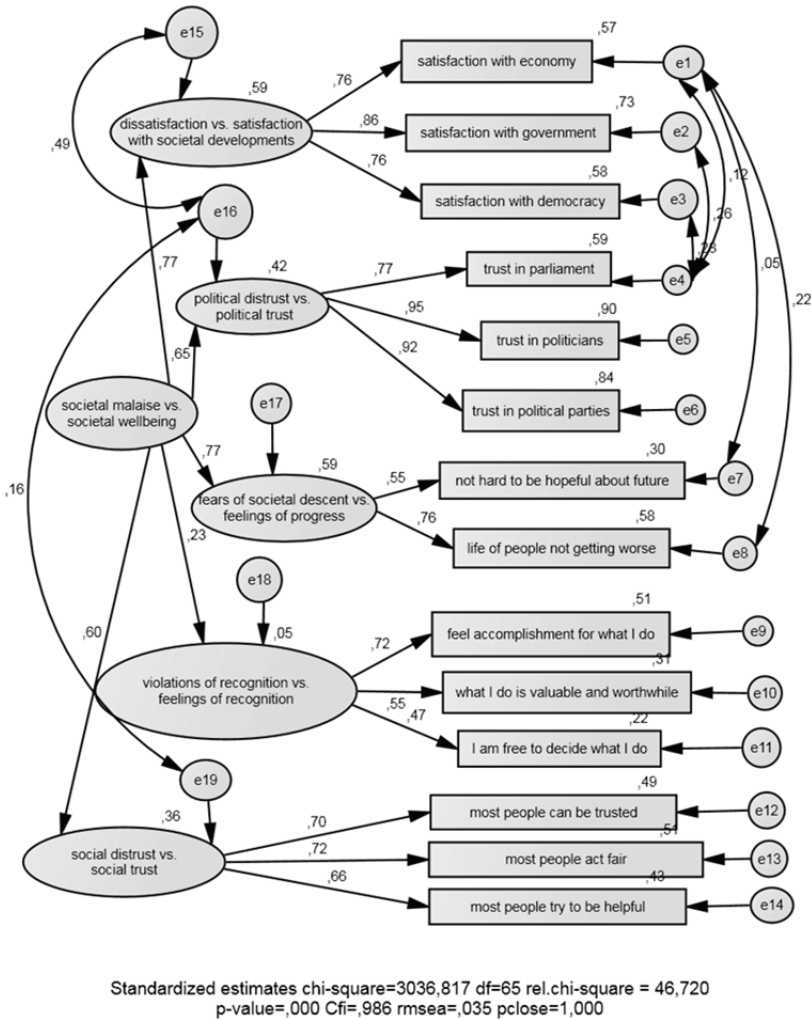
8.2 Is it Possible to Develop a Valid Cross-Cultural Measurement of Societal Well-Being vs. Societal Malaise Based on European Survey Data?

The following empirical analysis evaluates the empirical model for societal well-being. The multidimensional measurement can be seen as second-order model, since it is composed of five first-order factors (political trust, satisfaction with society, future optimism, feelings of recognition, and social trust) that all contribute to societal well-being. A factor analysis that confirms this structure of relations, based on the total individual sample, is illustrated in Figure 5. If one evaluates the general fit measures shown at the bottom of the figure, the coefficient Root Mean Square Error of Approximation (RMSEA = 0.035) and the Comparative Fit Index (CFI = 0.986) are well below or above the necessary criteria (RMSEA < 0.05 and CFI > 0.90 respectively) (see Hu and Bentler 1999). The χ^2 remains too high to achieve an adequate model fit, but this indicator is sensitive to large sample sizes and is therefore hardly used in cross-national survey research (see Cheung and Rensvold 2002).

The results of the first-order factors measuring structural, regulative, and cohesive crisis states lead to high-factor loadings and to a clear empirical distinction between the different levels.⁶ All loadings of the indicators are above 0.5 (except one item loading of feelings of recognition), which demonstrates a high-quality measurement of the latent variables. Also, the correlations with the higher-order factor of societal malaise vs. social well-being are generally substantial. Impressions of societal functioning are closely related to those of satisfaction with society, future optimism, and political and social trust. There is only one weaker correlation between feelings of recognition and societal well-being. This is plausible, since recognition corresponds more directly to the individual level.

⁶ Otherwise, some high-error correlations between the factors appear. From a theoretical standpoint, it can be argued that trust (on the personal and political level) correlates with a general satisfaction with societal developments.

Figure 5: Factor Analysis Confirming Concept of Societal Well-Being



Note: Based on total EU sample, 2012.

Besides evaluating the empirical quality of the model, it is additionally important to test for cross-national equivalence. The same model of societal well-being should converge in every nation state. This precondition allows a comparison of means over time and across nations. The cultural invariance test is often done using the method of Multi-Group Confirmatory Analysis (MGCA). According to Chen, Sousa, and West (2005) measurement invari-

ance should be tested at different levels. The first step of invariance testing is configural equivalence. This means that the same items should belong to the construct in every single country, but the factor loadings can differ. The second level of equivalence is achieved if the loadings of each item on the underlying first-order factors can be considered equal. In second-order models it is necessary to test for the factor loadings on the higher-order factors as well. Therefore, full metric invariance can only be reached if all first- and second-order factors constrained as equal lead to a sufficient model fit of the data. If this stage of metric equivalence is achieved, relations between the construct and other variables can be tested, and it is therefore allowed to use the operationalization of societal well-being for regression analysis. However, the latent means of the underlying concepts can only be compared if scalar equivalence is fulfilled. To test for scalar invariance, the intercepts of the items and factors are constrained as equal. Recent methodological articles (see Davidov et al. 2014) clearly demonstrate that full scalar invariance is barely fulfilled in cross-national research. Thus several authors suggest testing for partial scalar invariance. They claim that releasing the equality constraints on a small number of indicators does not necessarily degrade the quality of mean comparisons between countries (see Steenkamp and Baumgartner 1998; Davidov 2010).

Table 6: Evaluation of Cross-National Equivalence (Fit Indices Based on MGCFA)

Sample	Equivalence test	Chi ² based models				Global fit indices		
		Chi ²	df	Chi ² / df	Sig.	RMSE A	pclose	CFI
21 EU countries 2012 (Model 5: release of intercept invariance concerning items 1,3,4,6,8,9,11,12, 14)	Configural invariance (Model 1)	5821,4	1344	4,33	<0,001	0,009	1,000	0,980
	Metric invariance (Model 2, first-order factor loadings)	7288,3	1524	4,78	<0,001	0,010	1,000	0,974
	Metric invariance (Model 3: first- and second-order factor loadings)	8055,6	1604	5,02	<0,001	0,010	1,000	0,971
	Full scalar invariance (Model 4)	41791,1	1884	22,2	<0,001	0,023	1,000	0,819
	Partial scalar invariance (Model 5)	24371,7	1704	14,30	<0,001	0,018	1,000	0,897

To assess and evaluate the different stages of equivalence, various quality of fit measures are used in literature.⁷ To assess the fit of the five models, the changes in the Comparative Fit Index (CFI) were analyzed. According to Cheung and Rensfold (2002), a difference larger than 0.1 in the CFI value indicates a substantial change in model fit. Applying that rule, metric invariance concerning at least the first- and second order factors could be achieved in a cross-national comparison of 21 countries. This confirms that the factor loadings between factors and items are similar across different nations (see Vandenberg and Lance 2000). But there is a clear decrease of the CFI value in model 4 and model 5. It was neither possible to reach full scalar equivalence nor partial scalar invariance, which is a necessary precondition for comparing the means between countries. But it was possible to establish partial scalar invariance within at least most of the European regions and also over time (between the two survey waves) in most of the countries (see Aschauer 2016 for further computations).

8.3 Is There an Increase of Societal Perceptions of Crisis Based on the New Measurement during Recent Years in Europe and What Differences Occur between European Countries?

The third part of the empirical analysis provides a descriptive insight into contemporary trends of societal well-being in European countries. All 14 indicators measuring societal functioning were aggregated within two indices. The first mean value is computed based on political distrust, political dissatisfaction, and fears of societal decline to analyze the rise of societal perceptions of crisis during recent years. The second index value refers to trust in social relations. It combines the items of social trust with individual feelings of recognition. This procedure for monitoring societal change based on the attitudes of citizens should draw attention to important societal developments in Europe. It is assumed that many states are currently confronted with a deep crisis in political trust. Several authors additionally fear that this representation crisis in democracy (see Linden and Thaa 2011) may affect trust in social relations and proceed to a crisis of cohesion (see Heitmeyer 2010). Figures 6 to 9 permit initial hypotheses on the evolution of societal malaise from 2006 till 2012. Both country-wide indices are illustrated by their scale means (based on the combination of items that belong to the relevant first-order factors).⁸

⁷ The chi-squared difference test is often used and should lead to insignificant changes between the models. On the other hand, the chi² test is sensitive to large sample sizes and is not recommended for ESS data.

⁸ Most of the indicators were evaluated by the citizens on an 11-point scale (from 0 to 10). All items that employ a different scale were adapted to those scales through linear transformation. The values in the figure can thus be seen as average values for societal well-being at a specific time point. Country means below five (the middle of the scale) indicate societal per-

The figure on the upper left shows the continuous rise of a societal malaise even in Western and Northern Europe. There are only four countries left in the year 2012 with a level of trust and satisfaction above the scale mean of 5. These countries are Denmark, Sweden, Finland, and the Netherlands. While societal well-being appears to be increasing in Sweden, there is a slight downward trend in Finland. Also in Denmark and the Netherlands, the most recent data from 2012 shows a decrease in societal functioning compared to the year 2006. The other Western European countries clearly rank behind in this respect and achieve a mean value between 3.5 and 4.5 (see Figure 6).

Figure 6: Trust in Society: 2006 and 2012 (Northern and Western Europe)

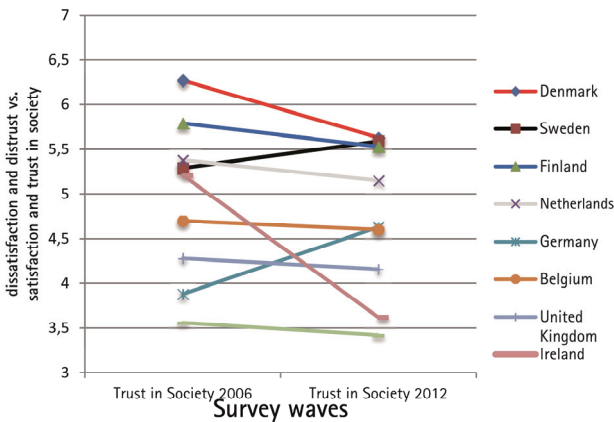
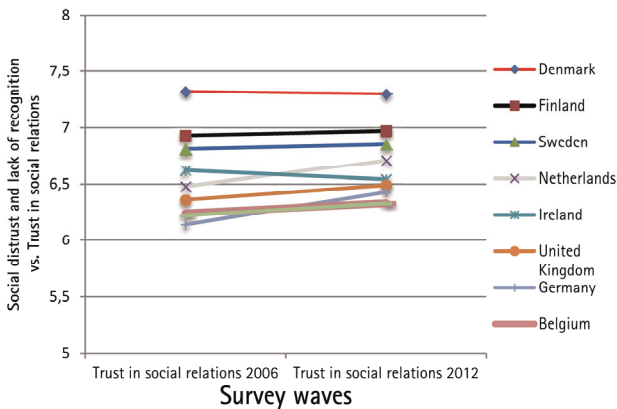


Figure 7: Trust in Social Relations: 2006 and 2012 (Northern and Western Europe)



ceptions of crisis (as people tend to voice feelings of dissatisfaction or distrust in social relations) while mean values above five reflect the relatively positive judgements of citizens.

Figure 8: Trust in Society: 2006 and 2012 (Eastern and Southern Europe)

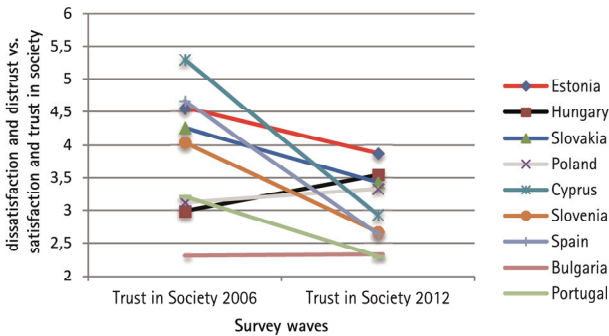
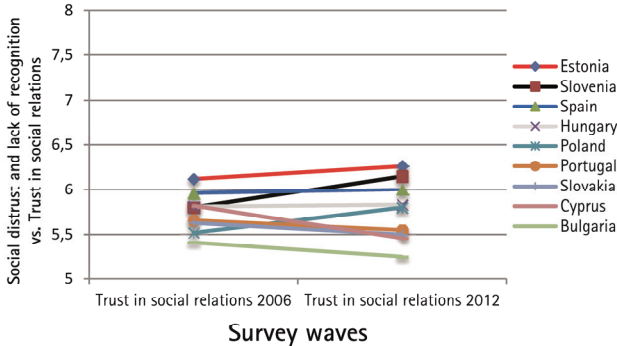


Figure 9: Trust in Social Relations: 2006 and 2012 (Southern and Eastern Europe)



Belgium and Germany occupy roughly the same position, although both states were confronted with different developments. Belgium faced an increase in societal malaise during recent years, while Germany was able to enhance the societal well-being of its citizens. The level of perceptions of crisis seems to be growing slightly in the United Kingdom and in France as well. The sharp decrease of societal well-being in Ireland is a clear example of how economic difficulties can cause dramatic changes in citizen's attitudes and how social integration is threatened by economic downturns. On the other hand, Figure 7 clearly demonstrates that – at least in the year 2012 – there is no evident crisis of cohesion in Northern and Western European states. People express a high amount of social trust and normally feel appreciated within society. Thus social trust and recognition is still widely guaranteed in Western Europe as all countries achieve a scale mean far above the threshold of 5. It is notable, however, that feelings of recognition and social trust have changed slightly in Ireland, the only country in Western Europe that was dramatically affected by the economic crisis in the year 2009.

If Eastern and Southern Europe are taken into consideration, sharp declines of trust in society (see Figure 8) can be observed. In particular, the economic difficulties of Cyprus, Spain, and Portugal are clearly reflected in the data on societal well-being. Portugal and Bulgaria have sustained low levels of societal satisfaction over the last few years, while Spain and Cyprus experienced a rapid rise in societal perceptions of crisis due to the European debt crisis. Also in Eastern Europe, the global financial crisis had significant negative impacts on societal well-being in most of its constituent countries. There are only two notable exceptions: Poland and Hungary can mainly be characterized by positive developments, and particularly Hungary seemed to recover in 2012 from high-level perceptions of crisis in 2006. The financial crisis has exerted a strong negative effect on societal functioning in Slovenia and the Czech Republic. It is striking that many countries only achieve a scale mean between 2 and 3, reflecting high levels of general dissatisfaction with societal developments.

This crisis of institutional trust is again not connected with a crisis of trust in social relations (see Figure 9). Although most of the Southern and Eastern European states rank behind Northern and Western European countries, the amount of social trust and feelings of recognition is still within a mean range of 5 to 6.5, indicating a functioning level of cohesion. Societal well-being seems to be threatened at the institutional level but not at the level of social relations. It is clearly apparent that those countries that have suffered most from the economic crisis are also often affected by a decrease in social trust. This problematic constellation of societal malaise is still observable in Bulgaria, Cyprus, and Portugal.

8.4 Which Predictors of Social Integration (Objective Living Conditions and Subjective Feelings) are Able to Explain Ethnocentrism and What Differences Occur between Major European Regions?

The last part of the empirical analysis turns back to the micro-level and tries to explore the link between restrictions in contemporary living conditions and societal perceptions of crisis and ethnocentrism. Due to the heterogeneous constellations in Europe, it is imperative to take cross-national differences sufficiently into account. To achieve a comprehensive view of European societies it was decided to compute separate sequential multiple regressions for all six European regions that were theoretically extrapolated in the article (see Figure 2). All models are computed based on regional samples of social-democratic welfare states (SE, FI, DK), conservative welfare states (BE, DE, NL, FR), liberal welfare states (GB, IE), Mediterranean welfare states (IT, ES, PT, CY), state-oriented corporate welfare states (SI, SK, CZ, PL, HU), and neoliberal-rudimentary welfare states (EE, LT, BG). To control for additional country effects, the first regression model only includes each individual country (as dummy variables) within the regions. The second model deals with

country effects and sociodemographic predictors. The third model integrates the political and cultural explanations, and the fourth model additionally considers structural parameters. Model 5 adds the five first-order factors of societal malaise to the explanation of ethnocentrism. Model 6 additionally uses the income categories and the ISEI values, and simultaneously controls for missing values. All regressions were computed based on the listwise procedure, which is still seen as a robust method to control for artefacts in regression analysis (see Allison 2002, 7).⁹ Only the final models are illustrated in Table 7.¹⁰

If we look at the r^2 values of the first models, country effects appear in continental Western Europe, where Germany is more tolerant toward immigrants and Belgium is more critical toward cultural diversity in comparison to the Netherlands (reference country). Large country differences are visible in Central Eastern Europe and in the Mediterranean countries. People in Spain, Italy, and Portugal are much more in favor of cultural diversity in comparison to Cyprus and particularly Polish citizens, who largely share positive attitudes toward immigrants in comparison to the other countries. The inclusion of societal perceptions of crisis markedly increases the effect sizes in Western Europe, while they only weakly contribute to the explanation of ethnocentrism in Eastern Europe.

It is possible to explain about one third of the variance in ethnocentrism by all predictors, but the effect sizes are again considerably lower in Eastern Europe.

The impact of sociodemographic indicators on ethnocentrism is rather weak in all countries, especially if all other explanatory factors are included in the models. Age exerts only a small influence, with elderly people being more critical toward immigrants in Bulgaria and the Baltic states. Domicile has marked impact on ethnocentrism in Western Europe, where people in large cities are more tolerant in comparison to citizens who live in the countryside. It is obvious that people with a migration background largely share positive opinions about ethnic diversity with people who migrate to Europe.

⁹ In many regions the sample size of the regression analysis dropped considerably when income and status was taken into account. Model 6 was only considered if the deviations between Model 5 and 6 were negligible.

¹⁰ Due to the high number of missing values with regard to income and ISEI, it was decided to disregard those explanatory factors in the Eastern European countries and to illustrate model 5.

Table 7 Results of the OLS Regressions in Relation to Ethnocentrism

Levels of analysis	Predictors	Indicators	Dependent variable: Perception of ethnic threat vs. approval of cultural diversity					
			Social-democratic (DK, SE, FI) n = 4520 Model 6	Conservative (NL, BE, DE, FR) n = 6767 Model 6	Liberal (GB, IE) n = 3068 Model 6	Mediterranean (CY, IT, ES, PT) n = 3016 Model 6	Corporate (CZ, SK, HU, PL, SI) n = 7016 Model 5	Neoliberal-rudimentary (EE, LT, BG) n = 5489 Model 5
Effect size (korr r ²)	Model 1 (Countries)		0,9%	5,1%	0,9%	15,7%	11,1%	0,1%
	Model 2 (Countries and socio-demographic predictors)		4,3%	9,2%	6,9%	20,5%	12,6%	3,5%
	Model 3 (+ political-cultural level)		10,1%	15,5%	11,3%	23,6%	15,5%	4,9%
	Model 4 (+ structural level)		16,3%	21,3%	20,6%	27,3%	17,1%	5,5%
	Model 5 (+perceptions of crisis)		27,7%	35,0%	31,7%	34,2%	22,8%	9,5%
	Model 6 (+ income, ISEI)		28,8%	35,6%	32,5%	38,2%	25,3%	9,7%
Countries	Reference country		Denmark	Netherlands	United Kingdom	Cyprus	Czech Republic	Estonia
	Country 1		0,13 (0,50)*** (Sweden)	-0,06 (-0,30)*** (Belgium)	0,21 (0,98)*** (Ireland)	0,29 (2,02)*** (Italy)		
	Country 2		0,09 (0,33)*** (Finland)	0,07 (0,28)*** (Germany)		0,40 (1,93)*** (Spain)	0,11 (0,56)*** (Hungary)	0,21 (0,92)*** (Bulgaria)
	Country 3					0,32 (1,78)*** (Portugal)	0,40 (2,02)*** (Poland)	
	Country 4						0,13 (0,81)*** (Slovenia)	

Table 7 continued...

	Solo-/self-employed								
	Education	0,05 (0,36)**			0,06 (0,69)**				0,05 (0,38)**
	Housework								
	Unemployed								
	Disabled								
	Subjective social class assignment								
	Managing with household income								
	ISEI	0,09 (0,01)***	0,11 (0,01)***		0,07 (0,01)**				
	Income deciles								
Key features of societal malaise	Dissatisfaction vs. satisfaction with societal developments	0,13 (0,15)***	0,22 (0,24)***		0,14 (0,16)***		0,08 (0,10)***		0,11 (0,11)***
	Political distrust vs. political trust	0,17 (0,17)***	0,11 (0,11)***		0,09 (0,10)***				
	Fears of societal decline vs. feelings of progress	0,08 (0,08)***	0,08 (0,08)***		0,14 (0,15)***		0,04 (0,06)**		0,08 (0,08)***
	Violations of recognition vs. feelings of recognition								
	Social distrust vs. social trust	0,12 (0,15)***	0,14 (0,17)***		0,17 (0,23)***		0,22 (0,28)***		0,16 (0,17)***
									0,12 (0,13)***

Notes: ESS data 2012 (weighted by design weight); only highly significant predictors are illustrated – $p < 0,01^{**}$, $p < 0,001^{***}$ – as well as standardized and unstandardized coefficients.

In terms of the political and cultural level, the impact of value orientation is also confirmed in this study. This effect on ethnic prejudice can be viewed as stable across all regions. People who favor openness to change and who give higher priority to equality and tolerance (instead of self-enhancement) demonstrate more positive opinions in relation to cultural diversity. Citizens who respond to societal challenges through unconventional political engagement also tend to favor cultural diversity. The educational gap within anti-immigrant sentiment is still clearly observable in Western Europe, but the effect sizes are smaller in Southern and Eastern Europe. Interestingly, the lowest effect of education on these sentiments was observed in the Mediterranean countries. Also the effect of social status (based on the ISEI measurement) is widely confirmed in all regions where this variable was considered.

It is striking, however, that all dimensions of societal malaise clearly exert the strongest influence on ethnocentrism and seem to be predominantly relevant for explaining perceptions of ethnic threat. Social trust is a particularly stable predictor in all analyzed countries of the European Union. It is especially the case in Western Europe that dissatisfaction with societal developments and political distrust is additionally related to ethnocentrism. While feelings of recognition are not connected with ethnic prejudice, fears of societal decline are especially relevant in the liberal welfare states but exert only a low influence in other European regions.

9. Discussion and Conclusion

The main aim of this article was to present a theory-driven model of societal malaise and to introduce a new phenomenon of significant divisions in societal trust and societal belonging as a prominent feature of contemporary crisis states in Europe. Another important task was to empirically evaluate new divisions that have arisen within and between European Union member states and to apply a comprehensive empirical perspective to crucial societal developments in Europe, restrictions in contemporary living conditions, subjective expressions of societal well-being, and potential societal consequences of those rapid processes of social change. The current social turbulence in Europe can be roughly characterized by social inequalities, political impositions, and cultural insecurities. It has to be stated that the economic divisions between European states and rising social inequalities within EU member states have led to a negative image of the European integration process and to public impressions of a renewed colonialization of the continent's lifeworlds by neoliberalism (see Habermas 1973). It is assumed that at least the victims of these societal transformations experience severe deficits in recognition (see Honneth 1992) and that the middle classes also react with fears of societal decline (see Kraemer 2010). The futility of politics to combat these economic impacts has been in-

terpreted on a general level as a growing helplessness and increasing powerlessness, which strongly creates the impression that political impositions are negatively affecting Europe. EU citizens thus express high levels of political disenchantment and raise deep concerns about future societal developments.

During recent years, there has been a shift away from GDP so as to assess social progress according to quality of life by not only including classical subjective measures, such as happiness and life satisfaction, but also indicators of societal well-being (see Glatzer 2008; Harrison, Jowell and Sibley 2011). In the sociology of Europe, there are also demands to look more closely at the micro-level and highlight future challenges of social integration (see Bach 2008; Vobruba 2009). Consequently, it is one of the principal future challenges in comparative research to take European citizens' subjective perceptions of crisis more adequately into account, to monitor societal well-being over time, and to search for comparable and equivalent indicators of this concept. The multidimensional model of societal well-being is a first major step in this direction. The results of the cross-national invariance test in this study seem promising, as at least metric invariance (meaning the acceptance of a model with equal factor loadings across several European countries) could be achieved. The heterogeneous results of the mean comparisons suggest that there is no unidirectional path toward perceptions of crisis in Europe and that the nation-state still plays a crucial role in mitigating the effects of crises on citizens. The theory-driven system of differentiating European welfare states was largely confirmed by the cluster analysis. It is based on the varieties of capitalism approach (see Hall and Soskice 2001), combines welfare-state research (see particularly Schröder 2013), and tries to integrate the new post-socialist types of regime in Eastern Europe (see Kollmorgen 2009). The empirical cluster analysis, which was conducted to confirm impressions of the existence of highly diverse European regions, even extends those views. It was clearly visible that welfare-state regimes (see Esping-Andersen 1999) and historical conditions (see Boatca 2010) influence the formation of basic cultural values and indicate a high level of cultural diversity within Europe that cannot be easily be dismissed through reference to the spill-over effects of European integration (see original findings of Haas 1958). It is notable that Eastern European countries still express a high degree of materialist values and perform lower in self-transcendence, which confirms the initial idea of an epigonic East trying to catch up with the economic wealth of Western Europe (see Boatca 2010). Within the reality of large divisions within Europe, Euroscepticism is moving into mainstream discourse (see Brack and Startin 2015) and increasingly divided societies should be seen as a real challenge to enhancing and guaranteeing European solidarity.

It was possible to empirically confirm the evolution of a societal malaise in European countries that ran in parallel to the economic crisis. The descriptive results based on mean comparisons demonstrate that societal causes (such as

political transformations, economic inequalities, and broad insecurities) have the potential to gradually erode societal functioning. Although societal disturbances may not be clearly visible yet, there is danger in underestimating societal changes in countries trying to overcome certain crisis states (see Streeck 2013, 14). In particular, trust in society is disappearing in many countries, and we are already witnessing a gathering crisis of institutional trust, particularly in Southern Europe and in some Eastern European countries. A promising sign from the temporal comparison is that there appeared to be no cross-over effects on trust in social relations until 2012. On the other hand, it has to be assumed that the impacts of the refugee crisis in particular have further intensified the extent of the societal malaise. This new unsolved challenge for Europe may particularly affect levels of social trust and cohesion in society. Thus it has to be feared that societal dissatisfaction is growing larger, transgressing borders, and manifesting itself in intercultural distrust and radicalization.

The last research question addresses the challenge of ethnocentrism, which is a clear consequence of impressions of a societal malaise. A sophisticated regression analysis, which takes into account the diverse dynamics within European regions, aimed to directly link social destabilization with ethnocentrism. A comprehensive list of predictors included country effects, sociodemographic characteristics, restrictions in living conditions (objective level), and specific feelings of discontent (subjective level). It was possible to confirm various findings concerning ethnocentrism in cross-national research and to provide new evidence in relation to societal perceptions of crisis. The positive age effect on ethnocentrism (see Chandler and Tsai 2001) seems less significant and could only be found in the Baltic States and Bulgaria. It is notable that low levels of education mixed with feelings of malaise exert a high influence on perceptions of an ethnic threat in particular in Western Europe, while in the Eastern European countries the explanatory power of these factors is considerably lower (see also Coenders and Scheepers 2003; Hjerm 2001). The dimensions of societal well-being that were included in the models clearly confirm that the diverse attitudes of citizens (primarily in Western European states) lead, to a certain extent, to a polarization of values where societal threats (such as cultural diversity) are major sources of dissent. The widening gaps between social groups in European societies have to be considered as a future threat to social integration. It can also be predicted that these gaps may grow even wider in Eastern Europe as the new European Union member states become more and more involved in the European challenges of cultural diversity. The rise in hate crimes and arson attacks against facilities for asylum seekers clearly indicate these new tendencies of a barbarous civicness (see Bauman 2008). Defensive solutions have the potential to gradually erode fundamental European values and democratic achievements. It is, therefore, more important than ever to monitor processes of social change and comprehend the general pessimistic

mood in European society, which should neither be neglected in research nor underestimated in political conceptions of a united Europe.

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**Special Issue: Rainer Diaz-Bone & Emmanuel Didier (Eds.):
Conventions and Quantification – Transdisciplinary Perspectives
on Statistics and Classifications**

In the last few decades, the field of "quantification" – namely the "sociology of quantification" – has evolved and it has shown an impressive development. There are many different strands of science contributing research on processes of quantification and the impact of quantification within social contexts. The concept of quantification is positioned at the crossroad linking approaches such as accounting theory, convention theory (*économie des conventions*), sociology and history of statistics, analysis of commensuration, sociology of standards and of standardization, analysis of benchmarking, and others.

Alain Desrosières was an internationally renowned scholar in the fields of sociology of quantification and history of statistics. His work can be regarded as the most important contribution to this field. Desrosières was also a "compagnon de route" of the French movement of the so-called "*économie des conventions*" which postulated the convention-based (and therefore social) nature of qualities, categories and quantities. Consequently, Desrosières' work was also one of the main inspirations for this HSR Special Issue.

This HSR Special Issue presents recent and transdisciplinary research on the history and sociology of quantification. Building upon the work of Desrosières, this issue includes contributions on the history of science from the eighteenth century to today, covering topics such as: the millennium development goals, financial quantification, and quantification in higher education environments. All in all, the contributions work out the "political economy" as well as the "political sociology" of statistics, categorization, and quantification.

