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FIGURES, WRITING AND CALCULATION THOUGHTS ON THE REPRESENTATION OF ECONOMIC PRACTICES

By

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1. Introduction

In the business reports of large enterprises and in the economy sections of daily newspapers they leap to our, the readers', eyes: columns and more columns of numbers which are, in tables or lists, meticulously assigned to business administration categories, commercial products and periods of time. The table form of assigning numbers and categories evokes an ability in the reader to simultaneously see and compare, while for the makers the table arrangement requires a long process of translation that involves homogenizing, simplifying and leaving out elements. In the work on the vertical and horizontal dimensions of the table the entirely mundane character of the economic practice is brought to disappear; in the sense of Jacques Derrida (1983) the economic mundanity dies in the table's written form and rhetoric. The sociologically interesting core of the double production of economic reality—mundane practice on the one hand, work on the representation on the other hand (cf. on this Knorr-Cetina 1990)—consists of the peculiar, but systematic alternating of “showing something by bringing it into existence” and at the same time “making something else disappear.” It is sociologically interesting because this game of making emerge raises the question about the point of reference of economic representations.

Economic and financial theory approaches do not see a big problem in the representation and calculation of economic activities and things; nothing appears as self-evident to them as the calculability of economic practice. The central assumptions this is based upon reads: firstly, social facts can without further ado be calculated and represented through mathematical procedures, that is, processed through socio-technologies of calculation and, secondly, as an important element of economic practice the media of calculation (numerals or figures, formulas etc.) cannot distort the economic representation. How, one could ask rhetorically, could the medium that is used to perform the daily economic practice depict this practice wrongly in the representation? In the economic or financial theory perspective distortions in the neutral picture appear only if interventions motivated by balance sheet politics are performed. In this sense business management view speaks of “rights to choose approach and assessment” or of “fact shaping” (Baetge 1998: 143; my translation). It is these specific management interests that dodge the in itself neutral depiction of the economic. The contamination of economic representation is usually attributed to interests and intentions internal to the enterprise aimed at producing specific (external) effects by the depiction of the enterprise (i.e. by shareholders or credit institutions). The external effects refer to the

interpretation of numbers, of which it is assumed that as “hard facts” they evoke a specific interpretation, that is, that they define the space of interpretation (cf. Czarniawska 2000).

Within the (new) economic sociology the analysis of economic representation, too, plays only a minor role. In general, representation is quite often conceived of in the same way as it is by economic theory. This realistic approach that does not see any problem in the social activities of representing something is questioned by recent studies in economic sociology (e.g., Kalthoff et al. 2000). In this paper I will raise anew the question of the relation between economic representation and practices referring to semiotic concepts of representation and writing developed within the sociology of scientific knowledge and also philosophy. I show that the representation of economic practice through practices and techniques of representation is not equivalent to an identical copy of economic activities. Here, my emphasis is on the following point: the perception of the representation of economic facts by an audience is influenced by the practice of representation proper. In this respect, representation practices function as a frame of interpretation for what they are supposed to portray. The empirical material my study is based on my ethnographic fieldwork in the risk analysis department of an international bank operating in Poland.

2. Economic Practices and Representation

If one looks at financial theory from the venture point of sociology of knowledge, two aspects can be noted: firstly, it operates with a clear-cut “»enemy image« of the social” (Knorr-Cetina 1988: 85; my translation), according to which subjective interests of firm-internal constituents may have a distorting effect on the representation of economic practices; secondly, it detaches representation work from its local contexts. This decontextualization is based upon the assumption that the methods of bookkeeping and accounting are measurement procedures within which both the instruments of measurement and the individuals employing them (bookkeepers, accountants and risk analysts) are interchangeable because they simply portray the results of economic activities. The central assumption is that social facts can without further ado be processed through a type of writing that makes possible observations of different orders, immanent referring activities and technologies of calculation

In accounting research there exist different approaches; I will briefly describe two of them:

(1) Accounting as a technique: This model of explanation assumes that the techniques of economic calculation are neutral and objective in their essence and therefore have an objectifying power that allows management to recognize tendencies and make decisions that are geared to them. From a measurement theory point of view, in this model the object of measurement remains untouched by the measuring performance. This assumption is based upon the conviction that the transformation of the object of measurement into an alpha-numerical symbol does not add anything to the object’s essence, but that it also does not take away or change anything because there are only certain movements or characteristics being measured. The assumption that the objects of measurement remain identical is the prerequisite for the result of the measurement to refer to an external referent. The model of explanation “accounting as a technique” can be understood as a narration of an objective economic representation (cf. Weber 1980).

(2) *Accounting as a means to control and discipline*: In this model of explanation accounting techniques are not regarded as rational and neutral procedures of the calculatory assessment of economic activities, but as mechanisms which obtain effects in the areas of political and social power. According to this, calculations allow the observation of (economic) practice and, linked to this, control and intervention (in the sense of correction). Thus, the effects of accounting lie in the area of controlling enterprises and disciplining individuals. The calculation of the production and therefore of the practice institutionalizes an order of discipline which makes action on other peoples' action "visible" and intersperses it.¹⁸ In these analyses, inspired by the work of Michel Foucault, there is a central thesis that the methods of accounting make social processes visible and thus social knowledge of power accessible (cf. Miller 1992; Miller/O'Leary 1994; Loft 1986). According to this view, something previously imperceptible is brought to light and thus rendered accessible.

It is evident that these modes of explanation do not fully exhaust the variety and differentiation currently present in accounting research.¹⁹ Besides that, the two models of explanation—the rationality model and the power/knowledge model—differ from each other in many respects, for example according to their realistic or relativistic point of view: while in one case a direct relation between number and reality is assumed, in the other case it is a representational relationship of number and object. While in the first case the number represents those events that really happen "out there", in the second case it depicts a certain procedure ("translation") of manufacturing representations, which does not necessarily imply a correspondence theory perspective, but looks at the social effects.

The notion of representation - or inscription, following Latour (1990)—is key to accounting research and economic sociology—and with it the relation between economic practices ("reality out there") and its economic description. In philosophy three meanings of the notion of representation become relevant: firstly, representation is seen as imagination in the sense of cognitive practices or mental attitudes (such as memories), secondly, representation is seen as description in the form of a picture produced by images, symbols or signs, and thirdly, representation is understood as substitution in the sense of an authority something possesses to stand or act for something else (cf. Behnke 1992). The sociology of scientific knowledge has also intensely dealt with the concept of representation and its practices (e.g., Lynch/Woolgar 1990; Latour 1990). Rheinberger (1997; 2001) distinguishes three connotations: representation as vicarship, as embodiment and as realization. So how does the representation relate to the represented object?

If something is conceived as representation with a substitutional character we have to deal with a representation "of" something. In the case of representation as embodiment the representing object does not only hold the place of another object, but tends to completely replace it for good. In this case the representing element stands "for" the represented element in a double manner: it secures its spot *and* replaces it. Representation as physical realization goes beyond this status: what is represented comes to existence only through the process of molding. Representation in this sense means "*manufacture* [...]" within which the represented element only then takes shape at all" (Rheinberger 1992: 73, footnote 22; my translation; emphasis in the original). In other words: holding the place, embodying and making emerge are modulations of the relationship of absence and presence, of presence and representation—

¹⁸ In this context cf. Miller/Napier (1993) for the notions of "calculation selves" and "calculation spaces".

¹⁹ Recall, for example, those contributions analyzing accounting methods as "institutionalized practices" (cf. Peters 2001).

modulations which are determined by the representing object's representational performance and the techniques of representation.²⁰

So what does this mean for a discussion of economic representations? Conventionally, it could be assumed that accounting figures depict the financial circumstances in a specific way; that they stand for, i.e., mirror economic activities. The referent in this connection is a real practice which precedes the economic representation and which the figures and economic categories (e.g., ratios) continually refer to. If we understand economic representations as portraying a practice, then this assumption further implies the possibility to trace the numeric symbol back to the practice. In this view, banking risk analysis renders the symbol's origin (i.e. the practice) visible. From the point of view that understands representation as a mode of manufacture, on the other hand, economic representations would be perceived as sequences of symbols that are detached from economic practices and that owe the fact that they resemble the practice they are supposed to refer to to the very transformation of this practice. From this perspective it hardly makes any sense to intend tracing anything back to the origin, quite in the sense of Jacques Derrida's position (1983). The practice of representation is then not a mirroring activity anymore, but works on a non-identical replication—a replica which does not know an origin, but no final point, either, and which - entirely incomplete—only refers to itself. In this sense one representation succeeds another, one representation becomes legible through another. The reference to an external (economic) reality ("reality out there") is not possible; only as reference to another representation, which, in turn, was technically produced itself.

3. The Economic Writing Game

Let us now turn to an empirical example for the processes discussed above by looking at the risk department of a bank. The "risk analysis" department of a bank can be described as a kind of ring laboratory ("Ringlabor", Knorr-Cetina 1988). The central characteristics of a ring laboratory are the networked computers on the risk analysts' desks. From the risk analysts' point of view the computers and programs are merely tools which make applications possible. They have neither constructed the computers nor programmed the software; they are the computers' users, that is, they are users of software programs, namely of those software programs that the group's department in charge has developed and installed for risk calculation. While the risk analysts themselves are tied to their desks, it is the data that are mobile, which are moved and transformed by the analysts. The risk analysts' activity is individualized, there are only few direct personal connections with other risk analysts on the horizontal level, but ties exist predominantly with the "business side" equivalent, that is, with the relationship managers. In the observed bank this was due to the division of labor according to branches: the segmentation of the economic field was taken into the bank, so that there were only partial overlaps. Thus, risk analysts are sealed off by the division of labor and at the same time integrated into the data network.

The computer-assisted data to which the risk analyst has access are data on enterprises and branches as well as on the economic development of regions and countries. But the computer

²⁰ With Hacking (1983) it can also be assumed that reality comes only after representation so that a sharp separation of facts and artifacts does not make sense any more; see also Latour (1999). It should be noted that these three forms of representations form a continuum of meaning.

does not only provide data for the analysts to observe or calculate economic developments or an enterprise, it also provides the formats in which these activities can be performed. Thus, the cashflow sheet, for example, is a formatted table with different types of fields which - defined by the program - may save numerical values or perform arithmetic operations corresponding to financial models (such as the DuPont formula). Thus, the risk analyst is not working on a neutral basis, but on a basis of standardized forms that embody financial knowledge (cf. Law 2000). These forms (such as software programs) or instruments are “materialized theories” (Bachelard 1988: 18; my translation); they “embody and [...] carry the tremendous weight of the knowledge regarded as secure at a given moment” (Rheinberger 2001: 115; my translation). This also means that the *investment in the form of calculation* is completed in the instant of its application. In the risk department, one will look in vain for negotiations about the implications of calculation models or the implementation of different calculation possibilities. In this constellation, one cannot find the fact that things can/could also always be calculated differently and thus that results reached and represented differently. In this sense risk analysts do not use a “neutral” calculation program. Rather, they bring theoretical assumptions to a representationally accessible existence.

If we ask now “what does a risk analyst do?”, the answer is: he reads, he compiles data, and, above all, he writes – and of course it is also the computer and the software that perform the writing and the calculation. At this point the debate about the concept of writing and the relationship of orality and writing cannot be discussed at length. According to the conventional theorem there exists an ontological superiority of the oral versus the written, speech versus writing, phoné versus graphé. This understanding that makes writing a derivative of spoken language appears in two versions. On the one hand, as a mirror version which states that writing represents spoken language; on the other hand, as a compensation version. Writing serves as a depot of spoken language and thus preserves it from being forgotten. Jacques Derrida (1983) criticizes two aspects: firstly, a phonocentrism, which he considers to be deeply rooted in occidental philosophical tradition, and secondly, the unreflected notion that writing cancels the spatio-temporal limitation of orality, leaving it untouched in the process (cf. Derrida 1988: 293).²¹

This criticism of phonocentrism and of the “secondary nature” theorem is taken up by Krämer (1996): following Nelson Goodman’s symbol theory of notation as a disjunctive and potentially differentiated symbol scheme she suggests an extended notion of writing which allows to conceive other forms of written symbols as equally included in the writing concept. According to Krämer (1996) it hardly makes any sense to restrict writing to the written form of language; conceptually, writing should include other modes of notation as well. Her predominant concerns are operative modes of writing (“operative Schrift”). Operative modes of writing “do not emerge from writing down phonetic language, but are graphic systems *sui generis* which might at best then be rendered spoken form. What is specific to this mode of writing is that it does not refer to spoken sounds, but to *cognitive objects*” (Krämer 1997: 115; my translation and emphasis). Operative modes of writing then assume a double function as *symbolic machines*: they represent objects (such as economic figures) and at the same time allow operating with these objects, while they are also indifferent towards the symbols’

²¹ Historical and archaeological studies have underpinned this criticism and shown that the origin of writing is precisely not oral language, but number symbols and thus economic calculations (cf. Schmandt-Besserat 1992). So in the beginning there were not words, but numbers.

meanings. Characteristics of this operation are, firstly, a decoupling of construction and interpretation, of access and understanding - understanding and interpretation which only set in later, and secondly, a shift from truth to correctness: for a symbolic operation all that is relevant is a procedure according to the rules and thus internal plausibility. This is due to the fact that number symbols do not simply represent an object, but an operation which is performed on them or whose result they are.²²

This means that a financial calculation (e.g. “return on equity”) as a formal calculation technique configures symbolic artifacts and thus perennially forms and re-forms symbol sequences. So the operative use of symbols becomes a central prerequisite and consequence of the *re-constitution of the enterprise in the banking laboratory of risk analysis*. But this connection also renders the banking business relatively independent of the mundane activities of economic practice. Specifically, this means the procedure and the technical equipment of the banking business fabricate the enterprise, give it a calculable contour which can then be processed in the bank; in this sense enterprises are constituted anew in the banking business - and confront the enterprises as a strong heterorepresentation (Fremdrepräsentation). So does this reconstitution use the enterprise’s economic practice as its point of reference? No, the concrete observation of economic practice, as it is undertaken by the relationship manager during her visits with clients, is rather felt to be disturbing or incompatible. This sealing off can be traced back to the fact that to banking risk analysis “the symbolic [is] [...] the immediate” (Derrida 1983: 268; my translation) and that it has therefore shifted the focus to *activities on the paper document* which is to be viewed as a supplement. These activities on the document produce more documents mutually referring to each other “[b]ecause a representation can only be worked off on another representation” (Rheinberger 1997: 272; my translation).

So if we look at the practice of financial calculation there appears a repetition phenomenon: financial calculations in operative business are not—even though the number basis is generally considered a hard fact—carried out just once, but frequently repeated, with the same or with altered figures, with the same or with slightly altered results. On the one hand, this is due to the fact that not all numbers prove to be “hard”, on the other hand it is due to updated figures the bank receives from the enterprise, and finally it is also due to the fact that the risk analysts’ assumptions enter the calculations. In the calculations the standard risk costs or the provision, for example, can be altered. These frequently repeated simulated calculations follow the “provided that” scheme: An enterprise does not simply possess something like a “return on equity” which could, as one might assume, be calculated simply and unequivocally on the basis of “hard facts”. Rather, during the credit process the enterprise is assigned many repeated returns on equity, these calculations always remain incomplete. In doing this, no one calculation is more correct than another one, but they all have their essential function until the next calculation.

The repeated calculations do not reveal discretionary or arbitrary proceedings, but the provisional character of the calculation, a missing harmony with other representations, an assimilation to new conditions and objectives as well as the fact that they are the first probing attempts. At the same time they refer beyond these matters to a central problem of risk

²² Historically speaking, this has to do with the fact that, through the introduction of Indian-Arabian digits and the decimal place system, there is a shift from an ontological to an operative use of symbols which is reflected in the number concept (cf. Krämer 1997).

analysis, the problem of representation. Risk analysts ask themselves again and again how a credit risk is presented to the bank or how an enterprise can be portrayed: Two examples:²³

Example 1: Market development

RA1: ... well, market is developing a little differently from what NBP says, yes. Yes, but I have actually shown that this risk exists, but have such -

RA2: I'm just thinking whether or not we put something - whether we put something additional in there, something - we can use to - we can use to show that this risk is indeed there, but, I mean, after all there is a speculative component in it...

Example 2: Accounting rules

RA1: ... Yes, of course, US-GAAP shows the higher and Polish the lower one, but it naturally shows the higher cashflows, doing this, of course, by way of a quite different approach, quite a different system, but after all we have shown this.

RA2: Yes, we have. ...

When risk analysts are talking about whether or not a risk can indeed be *shown* or be *represented*, they do not mean another reproduction or a mental idea, but working the risk into the operative mode of writing of financial calculations, because by way of being calculated it has been recorded on paper and thus brought to existence.

4. Economic Imagination

Balance sheet figures and performance ratios are signs derived from signs. They express economic practices only through other signs. And because the numerals are transmitted over a multitude of intervals (steps) they rather appear to be a metaphor that has to be interpreted by the risk analyst. The order of the risk calculation is performed by the "hand of the writer" (Derrida 1983: 168; my translation), be it human or non-human. In this writing process actors are using operative writings because it is possible to complete arithmetic operations within the medium of representation. In this context, devices of representation are used as cognitive means of knowing or cognitive instruments (cf. Carruthers/Espeland 1991). But until now, nothing has been said about the representations which are performed by risk analysts as mental images. What is going on when risk analyst are looking at figures and perform interpretations of these figures? I will discuss this point in more detail taking into consideration a statement of a senior risk analyst of an international bank.²⁴

A risk analyst about figures and imagined economic scenarios:

"... One can say that figures do speak, that they provoke images. This means that we aren't like robots. Every time I see figures, they provoke images and a certain behavior. I will give

²³ Note on the transcription: RA = Risk Analyst; NBP = National Bank of Poland; US-GAAP = United States Generally Accepted Accounting Principles.

²⁴ Cf. Michael Power (1996: 20) who describes accounting as a hermeneutic enterprise, e.g., a form of economic interpretation; see also the notions of eco-graphy and eco-hermeneutic (cf. Kalthoff 2000; 2002).

you an example. Let's say we have an enterprise: The margins are not particularly good, the cashflow is not very good, we also have liabilities. I see that immediately, I immediately imagine the workers doing their jobs. I also imagine the problems with the stock, which is very important. I imagine the clients who are not paying their debts in time. All this. I simply have a mechanism, a logic, which starts moving inside my head. What happens is that the figures are a pretext with which you can go further. Therefore, figures do speak. But the figures speak because they make other things speak. It is not a transmission of naked figures. It is a transmission of images. The image is communicated in a written note. This is to say that we deliver a note and we legitimate what we are thinking. We explain ourselves. This note is never very long, only two pages..."

The first impression one can get reading this statement is that the risk analyst tries to transmit a complex image of risk analysis proceedings contradicting the popular image of "robots". Furthermore, one can get the impression of a reflexive statement: the combination of facts, an example which is quite simple, and a certain kind of self-reflection generate the impression that one has to deal with a quite complex process. The emergence of these impressions is firstly related to the use of certain words (like "to see immediately", "to imagine immediately") and secondly to the described automatism of "seeing" and "imagining", as though the figures were the substances which get cognitive processes going.²⁵

In the eyes of this risk analyst, the situation of a corporate client is communicated through images within the bank. In order to be able to proceed this way, ratios have to be produced and calculated because their function lies in the stimulation and regulation of cognitive processes based on which a picture of a client is imagined and reasoned. Who are the speakers within this context? From the point of view of the risk analyst the figures are the real speakers. But what they say is only transmitted through other speakers and therefore audible. This is to say: the figures themselves would not say anything if these other entities remained silent. At the same time they seem to indicate these other entities and to refer to these entities as well. By consequence, a figure represents economic knowledge as a metaphorical sign of an economic movement.

Furthermore, in his statement the risk analyst establishes a chain of connections which starts with the highly aggregated ratios and ends with a two-page note in which the analyst lays down and legitimates his position against the corporate client. Between them we find sensual perceptions ("to see figures") and cognitive associations ("to imagine") and effects ("to produce pictures"). When the risk analyst speaks about "pictures" or "imagination" which he can produce on the basis of figures, then he does not mean he has produced a copy of reality, but that he is in the picture about the meaning of the figures. This reminds of Martin Heidegger's (1977: 129) discussion of the notion of "world picture": "«We get the picture» [literally, we are in the picture] concerning something. This means the matter stands before us exactly as it stands with it for us." To this being in the picture belongs, following Heidegger (1977: 129), a knowing about and a being prepared. In this sense, to imagine something or to have an image of something also means to *produce* or to *build* something.

If we consider it from this perspective, we can say something more about the statement of the risk analyst. Using figures, economic conditions or facts are imagined—to be precise: the way

²⁵ The word "to see" is used to describe two different activities: On the one side it means "to read" figures or "to look" at figures; on the other side it means "to imagine" something.

they could have been—and fixed in a written note. In other words: imagining a corporate client on the basis of his figures and producing his economic standing goes hand in hand. In this perspective, the economic world can only be translated by figures, which are in turn legitimized by the methods of their production, and by empirical knowledge as well (cf. Czarniawska 2000). At the same time we have to distinguish between the imagined scenario on the one side, and the economic situation (“reality”) of the enterprise on the other side. This difference leaves room for negotiations between banks and clients, relationship manager and risk analyst.²⁶

But it is maybe not surprising that in his statement the risk analyst does not speak about the fact that his “seeing” of the figures is embedded in a twofold way. On the one hand through their content as ratios, which is defined by economic or financial theory; on the other hand the “seeing” is embedded by the way the figures are represented. This is to say that the architecture of economic representation is situated in the aesthetic and logical principles that organize and order quite different rhetorical devices. All these devices of economic representation are not representing the economic world as it is, but they systematically organize a certain view on this world. Through their principles of organization separate identities and entities can be seen simultaneously (cf. Desrosières 1993; Porter 1995). In other words, the enterprise and its figures are not just given objects 'out there' but a result of activities using socio-technologies of calculation and devices of representation which are in turn no neutral at all but effect producing ‘machines’ (e.g., effects of homogenization and simplification; cf. Law 2000).

The encounter between the risk analyst and the figures of an enterprise is an encoded encounter and an encounter over a distance. The future potentiality of the enterprise is made accessible by interpretation. The risk analyst sees the figures not only as figures, but as figures which refer to something else which is not represented in this medium but which make the figures ‘tick’. He sees *something as something*. For instance, he sees the enterprise *as* a good or risky credit business or *as* well placed on the market. I take the quote discussed here as an example of what, within the phenomenological tradition, is called “appresentation” (cf. Schütz 1971: 339ff.). This means that economic practices of an enterprise are rendered present through decoding economic figures. In other words: Risk analyst use economic figures as objects which refer to economic activities. The process of rendering present something is based on the explicit and implicit knowledge of the actors involved. In this case it is the theoretical knowledge about the meaning and the arithmetical definition of economic ratios, and the understanding how one should read these figures, which is in turn related to experience and imagination as well. (cf. Callon 1998).

5. Concluding Remarks

The focus of this paper has been on conceptualizing the banking activity of risk analysis as a process of manufacturing, processing and shifting economic representations, that is on the manufacture and processing of writing and number materials and thus on a shifting of economic practices that can now only be perceived as imprints, signs, tracks, shadows. In this process, stations are implemented which repeat and transform figures, for which it is assumed

²⁶ The relationship manager is a hybrid figure because within the credit process he becomes the enterprise-in-the-bank (cf. Kalthoff 2000).

that the number symbols easily keep their identity—an identity that they obtain first of all from the calculation technology. Different questions that would have to be discussed further in this context have remained without mentioning here, as there would be questions from the sociology of technology or on the relation of writing and visuality.

The aspects discussed here (such as the technical production and the incompleteness of representations) do not mark any surprising findings in the context of the new sociology of science (cf. Knorr-Cetina 1999; Latour 1999), but they do harbor a need for clarification and discussion in economic sociology. Economic sociology can learn from the new sociology of scientific knowledge to distinguish between two levels. On the first level (first order observation) acting and deciding is only possible if it is based on correspondence theory of truth, that is convictions about the relationship of economic reality and its representation; this focus can be called objectivist conviction. On the second level (second order observation) the correspondence theory is replaced by an analysis of economic practices and practices of economic representation; this focus can be called constructionism or relativism. On a first level there are economic practices, on a second level representations of these economic practices are constituted through practices of representation (cf. Rottenburg et al. 2000). With this distinction in mind, economic sociologists may come to appreciate, for instance, that the notion of a sphere that is sealed off from practices of representation and contains economic practices which follow certain inherent laws and which can be depicted in a scientific-technical manner *without* the representations affecting the practices, has become questionable.

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