

## Technology and (Post-)Sociality in the Financial Market: A Re-Evaluation

Andreas Langenohl, Kerstin Schmidt-Beck (University Gießen)

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### Abstract

The article takes issue with recent influential work on the paradigmatic relevancy of technologically induced modes of communication and sociality on the financial markets. According to Karin Knorr Cetina and Urs Bruegger, the technological infrastructure of the global financial markets engenders novel forms of sociality and social integration: intersubjectivity with non-present others and (post)sociality with (imagined) objects. The article differentiates these hypotheses by way of confronting them with results from interviews conducted with financial market professionals such as asset managers and financial analysts. They reveal that financial professionals attribute the role of technology a varying meaning and engage in divergent technological practices depending on their market positionality: while, for instance, intraday traders report on an intimate and quasi-social relationship with the technologically institutionalized "object" of the market, equity analysts display a more distanced stance toward the market and attribute the technological nature of mass communication (especially the real-time circulation of information) paramount importance. In conclusion the paper calls for a nuanced and contextualized understanding of the impact of technology upon changing social relations.

## 1 Introduction

This article attempts to evaluate some recent influential work on the paradigmatic relevance of technologically induced modes of communication and sociality in the financial markets. In particular it critically assesses studies presented by Karin Knorr Cetina and Urs Bruegger which argue that the technological infrastructure of the global financial markets engenders novel forms of sociality and social integration, namely intersubjectivity with non-present others and sociality with (imagined) objects. In the present paper these hypotheses, which are empirically based on guided interviews with foreign exchange traders and ethnographic studies in the respective organizations, will be re-evaluated and modified by our confronting them with results from our own empirical studies which we conducted with financial market professionals such as asset managers and financial analysts.

It is not our aim to reject the important work done by Knorr Cetina and Bruegger but rather to supplement and to re-contextualize it on a broader empirical basis. Knorr Cetina and Bruegger's research concentrates on respondents and organizational units concerned with the extremely fast electronic intraday trade in foreign exchange markets (Knorr Cetina/Bruegger 2002: 916-919). In this they are part of a general trend in sociological financial market research to base general hypotheses on the analysis of highly specialized professional profiles, and in particular of traders in bonds, financial instruments, or currencies (cf. Fenton-O'Creevy et al. 2005; Abolafia 1996, 1998). These sociological studies into the financial economy thus rest upon a categorization, which at times amounts to a compartmentalization, of professional profiles. In contrast to this tendency, the sample upon which our research is based comprises traders as well as financial professionals who, although operating in and through the financial markets, are

situated at a somewhat greater distance to the financial flows – i.e. financial market analysts, members of buy-side and sell-side research departments, portfolio managers, and constructors of financial instruments.

This re-contextualization of the arguments made by Knorr Cetina and Bruegger will lead to a re-evaluation of their theoretical and methodological generalizations. Although we agree with their arguments regarding very short-termed and rapid market transactions, we will challenge their generalization that financial markets, which they hold to be the most technologically advanced and globalized communicative level of infrastructure, resemble some sort of avant-garde in regard to the diffusion of "postsocial" forms of sociality (Knorr Cetina/Bruegger 2002: 945). The main thrust of this paper is the argument that the impact of technological infrastructure on modes of sociality can be more thoroughly understood if one takes into consideration the multiplicity of representations and imaginations of technology to be found in the statements and narratives of financial market professionals.

## 2 "Postsociality" in the Global Foreign Exchange Market

Karin Knorr Cetina and Urs Bruegger emphasize as paramount the significance of technological communications infrastructure for the institutionalization of contemporary social relationships. Empirically, this approach rests on investigations into the global financial markets and in particular the foreign exchange (FX) market to which the authors dedicated extensive field work in globally operating banks, document analyses and a number of interviews with FX traders and their managers. At the same time many of the arguments are extensions of more general hypotheses concerning technologically assisted and framed modes of action and communication in general, for example, the relationship be-

tween natural scientists and their objects of knowledge within the socio-technological setting of science labs (Knorr Cetina 1997, 2000): both objects of scientific investigation and financial markets are conceived of as "epistemic objects" in Rheinberger's (2001) sense, as both are "unfolding object[s]" (Knorr Cetina/Bruegger 2000: 152) whose meaning is not fixed but reveals itself only through a constant and open-ended process of investigation, negotiation and redefinition.

As already mentioned, the authors focus on a specific group among financial market professionals, namely FX traders. This group is defined as distinct from brokers, bond traders, portfolio managers or financial analysts in various ways. First, they and their departments are characterized as "institutional hybrids that are placed at the boundary between organizations and markets and that combine principles of both" (Knorr Cetina/Bruegger 2002: 913). This means that they are most directly exposed to financial market dynamics. Second, they trade directly with other traders and not, for instance, through the stock exchange or a broker. Third, thanks to state-of-the-art technological communications infrastructure, their trading takes place in a real-time mode and is processed as highly routinized virtual communication via computer screens. This leads Knorr Cetina and Bruegger to term this interaction between the traders and the FX market, in obvious allusion to fundamental work in microsociology, a "face-to-screen interaction" (Knorr Cetina/Bruegger 2002: 923).

The results and interpretations presented by the authors suggest that FX traders maintain specific and distinguishable forms of sociality with their colleagues as well as with the "object" of the market itself. The relationship between the traders results in a "global microstructure" (Knorr Cetina/Bruegger 2002): they engender social integration, norm-setting and norm-observation via face-to-screen interac-

tion which is experienced by the traders as intersubjectivity. For instance, traders oblige each other to put calls in order to keep the market liquid even though this might result in losing money. This allows the authors to distinguish their approach from the mainstream social-scientific argument that globalization leads first of all to the anonymous interlocking of the consequences of actions and the emergence of an apersonal "space of flows" (Castells 1996; cf. Albert et al. 1999; Strange 1986). This intersubjectivity with non-present others is paralleled by a sociality with the "epistemic object" (Rheinberger 2001) of the market when Knorr Cetina and Bruegger argue that FX traders imagine the market as a living being with its own rhythms, moods, and strategies, which makes it possible for them to engage in "sociality with objects". This form of interaction with such a living "subject-object" is made possible through the technological "appresentation" and materialization of the market in the computer infrastructure. Interacting with the market thus takes on an intersubjective quality through the self-presentation of the market on the computer screens and its instant upward and downward moves in response to one's own actions. The computer screens thus do not simply represent the market, but are this market in a very radical sense, which is why they can be engaged with through a quasi-intersubjective, "postsocial" relationship.

Interacting with the market, in short, engenders special ways of subjectivization and self-identification. Interaction with non-present others as well as with the object of the market takes on features of intersubjectivity and sociality between human subjects. The main underlying theoretical argument here is that the market can be treated by the FX traders as a "copresent other" (Knorr Cetina/Bruegger 2002: 940) because it is a fundamentally open-ended and evolving object that acts

and reacts seemingly in relation to one's own actions.

The theoretical foundation of this interpretation is the subject of further inspection in section 4 of this paper. At the present stage it is more urgent to focus on the theoretical and methodological generalizations that Knorr Cetina and Bruegger deduce from their empirical work. First, they propose to extend the meanings of intersubjectivity and sociality with objects as met in their work to a general sociological understanding of those terms. According to this proposition, objects are not to be seen as simple instruments or projection screens for social meaning because they can be treated as co-subjects in everyday life. Technical artifacts like computer screens and keyboards turn from instruments and media into interaction partners which allow the traders to subjectivize themselves (cf. also Latour 1996, 2000; Miettinen/Virkkunen 2005; Rheinberger 2001). Second, the authors claim that these forms of sociality with objects herald a more general tendency in the ways human beings interact with their environment and exist in relation to each other (Knorr Cetina 2005). Third, they regard their work as a contribution to general questions in economic sociology, as they show that market players are in no way rational *homines oeconomici* but are entangled within norm-oriented and reciprocal interactions with non-present others as well as within identificatory bindings with their object of attachment, the FX market.

The connecting link between these generalizations and the ground upon which they are erected is the argument that it is the technological communications infrastructure of the global financial markets and, as a consequence, real-time trade that makes global intersubjectivity and sociality with objects possible. We hold that this argument needs to be examined within the context of broader empirical research in order to be re-evaluated as

to its potential for generalization. In the next section two differentiations will be suggested: first, that the imagination of the financial market as subject-object is but one among at least two imaginations, and as such does not necessarily rest upon its embodiment in technological artifacts; and second, that the potential of technology to shape imaginations of the financial markets is by no means reducible to "face-to-screen" interactions.

### 3 Results from Interviews with Financial Market Professionals

The data pool of our analysis encompasses 30 guided interviews with financial market professionals conducted between May 2003 and July 2004 (cf. also Langenohl/Schmidt-Beck 2006, 2007; Langenohl 2007; Langenohl 2007a). The respondents work as financial market analysts, portfolio managers or constructors of financial instruments in banks located in Frankfurt/Main. The interview guideline included questions related to the recent financial market crisis, the respondents' professional biography and general structures of the financial markets. This dual approach, addressing the respondents as experts and as autobiographical subjects, encouraged them to switch between explicatory and narrative modes of clarifying their relationship with the financial market. The interpretation of these data draws a complex picture, challenging the investigator to approach the relationship between the professionals, the technological nature of the financial markets, and imaginations of the market in a cautious manner.

Accordingly, we attempt to investigate technology and its social meaning in its varieties as they surface in our respondents' narratives. First, we review cases which replicate the findings of Knorr Cetina and Bruegger in that they attest to the existence of technologically induced market practices that

generate the imagination of a "living" market and indeed give reason to talk about sociality with objects representing themselves in technologies (3.1). Second, we turn to some respondents in our sample who contradict those interviewed by Knorr Cetina and Bruegger – financial market analysts who operate at a certain distance from immediate market dynamics, use technology merely as a "toolkit", and maintain an imagination of the market entirely different from those observed in FX traders. We also examine the role of the media of mass communication through the eyes of our respondents, because their views make it clear that the technological structure of contemporary mass media – especially their capacity to instantly circulate information to a broad public – has a great influence on how financial market professionals make use of and participate in them (3.2).

### 3.1 Short-Term Trading: Technical Artifacts and Intersubjectivity with Non-Present Others

An attachment to technologically embodied objects reminiscent of that observed by Knorr Cetina and Bruegger can be found in our sample mainly with respondents who work in close proximity to the financial markets and must constantly rely on communications and information technology in their everyday work. This applies, for instance, to professionals who, alongside their obligations in financial market research, spend considerable time in trading and brokerage, but it can also be found in cases of portfolio managers who deliberately rely on short-term instruments like chart analysis or momentum analysis in making their investment decisions.

As mentioned above, these types of activity can be regarded as taking place in close proximity to the financial markets. The flow of information is continuous and gives a real-time picture of the financial markets' tendencies. This information is visualized

and appears on a number of computer screens which can be watched simultaneously. It is interpreted not so much as information engendering reflection but more as an imperative to act – that is, to trade. The imperative and, in this sense, performative meaning of technologically appresented financial market information is exemplarily indicated in the following sequences from our interviews:

"We got systems – if you see them next to each other you get 10 news per second from all over the world (...) this comes across instantly and the rates react (...) I can see it here it's coming – I got point and figure charts – that is, black pictures are coming I say o-o what's up? Immediately to the news and – I know everything, right? And the most important thing now is not to overreact." (F12w, pp. 9-11)

"If I see a movement I must instantly decide whether to jump on it or not". (A-H14w, pp. 22-3)

Much in line with Knorr Cetina and Bruegger's interpretation, the respondents seem to be inserted into a "timeworld" (Knorr Cetina 2005: 39) which obliges them to react instantly to very short-term movements in the technological communications and information infrastructure. This reaction cannot but manifest itself again when respondents manipulate technological artefacts, thus producing mutual dependency between the market and those trading: "instantly here the market moves up moves down you can see the losses or the gains." (F12w, p. 47) The interplay between the systems visualizing information and the professionals' practices, alongside the impression of mutuality and interaction that accompanies it, has three implications:

First, technical artifacts like the software visualizing the development of rates as charts appear to be aggregates of a market happening, showing the actions of all involved actors, their consequences and their interconnections. So, for instance, the chart is seen as "in fact only the image of what ahhm a human being can actually

stand" (F12w, p. 36). In this way, the market constitutes and presents itself as a collective actor (cf. also Knorr Cetina/Bruegger 2002a). It is ascribed motives and intentions which must be deciphered and understood, as when a professional trader tries to find out how the market's "hobby horse" is developing.

Second, the professionals experience themselves as continuously involved in the market precisely because they are able to trace their own actions and their consequences along with those of others within the market as collective actor. This involvedness also entails an aesthetic fascination with the epistemic market-object in addition to the emotionally charged attachment to it: "how beautifully you can draw lines and the market touches down exactly on that line..." (F12w, p. 39).

Third, the simultaneity of the sensual (visual) experience of the market and of one's own practices on that market produces an experience of intersubjectivity with non-present others and along with it a sense of belonging to an imagined life-world "market" constituted through the technological system (cf. also Knorr Cetina 1997): "the market touches down precisely on the line – and turns upward again – and – because everyone is looking at that – it works." (F12w, p. 39) Accordingly, intersubjectivity and belonging cease to exist as soon as the system no longer presents the market, which was what happened on 9/11: "Because simply between 20 positions there is no price anymore because nobody is doing anything..." (A-H14w, p. 22)

To sum up, our results are quite in line with those of Knorr Cetina and Bruegger insofar as they concern professionals who perceive themselves mainly engaged in short-term investments. These refer in their imaginations of the financial market explicitly and regularly to technological systems visualizing and in a certain sense producing the market, and see themselves

with their own actions and their consequences as an organic part of the market as a collective actor. Consequently, if the system crashes, the market disappears not just as a source of information but as a partner, a situation inspiring what might be termed *horror vacui*.

### 3.2 Long-Term Market Orientations: Reflexivity of the Market and the Use of Technology

In contrast to the views just analyzed, we now turn to the second group of professionals identifiable from our interview data: those who prefer not to operate within a short-term investment horizon but rather focus on long-term developments in their investment and research strategies. In our sample, this group is mainly represented by those who call themselves "fundamental analysts" and operate at a much greater distance from the everyday short-term developments of the financial markets.

This group differs from the one discussed above in two relevant aspects. First, they are not themselves engaged in the stock markets but are concerned with the analysis of "fundamental" business, micro- and macroeconomic data such as the turnover and the profit of a company, the development of the GDP, interest rates and inflation. They are expected to compile the analysis of these data into comprehensive reports intended either for external clients like institutional investors or for the investment departments of their own organizations. Like short-term oriented professionals, they rely on technological communications and information systems as well as in-house expert systems for the production of their reports, as these quickly become outdated. However, their relationship to technology seems to be of a rather instrumentalizing nature, comparable to how one might see a tool box. Technological artifacts thus function as instruments for conducting the work proper and are not experi-

enced as providing imperatives for action. On the contrary, they are seen as processing data that help the analysts to maintain a reflexive and distanced attitude toward the financial markets. Action in their case does not mean constant and continuous trade but the articulation of well-founded judgments about the probable development of this or that rate. The attitudes toward technology remain within the framework set by that goal: "it is all about pulling the right instrument out of one's toolbox at the right time and using it properly." (A11m, p. 29)

Fundamental analysts thus have no affective object relationship to technology, to which they also refer as "set of tools" or "analytical framework" (A3m, pp. 5, 11). Non-technological forms of obtaining information, like meetings with company board members or industry representatives, are generally valued more highly than the technical instruments, as are analyses of company or industry data. At the same time, analysts tend to differentiate themselves and their style of work from those colleagues, like chart analysts, who work in closer proximity to the market and rely more on the market dynamics themselves to make forecasts. These form their "own different sector" (A7m, p. 34) and are asked for advice only sporadically. Technological artifacts thus do not contribute to constituting an imagined community of financial professionals, as is the case for traders.

The second feature distinguishing the fundamental analysts from the traders and those portfolio managers who have a short-term orientation is the nature of their imagination of the market, which is closely related to their respective temporal horizon. As a rule, fundamental analysts make forecasts for several months up to one year, which implies that markets may actually deviate from their fundamentally justified base line without completely losing touch with it. The market thus is

imagined as "returning" over time from a deviation to its "normal" level: "if you look at it from a long-term perspective, since the middle of the 1990s we had moved away from the normal trend" (A4m, p. 4). This deviation from the norm and the ensuing return to basic standards vindicates the accuracy of the "fundamental" rules: "in the end, though, I think that the fundamental values always prevail. That means, also in the medium term." (A7m, p. 35)

This fundamental logic is regularly opposed in the interviews to the supposedly "irrational excesses" of the financial markets which are observed in so-called "bubble" phases or hypes. While the fundamental dynamics that keep the financial markets in touch with the developments of the "real" economy articulate the norm of market behavior, the deviation from that norm is associated with short-term "speculation", exaggeration and "psychological" (read irrational) factors. The following quotation from an interview with a fundamental analyst, who is discussing the recent downturn in the stock market, exemplifies the element of morality inherent in the confrontation between short-term and long-term dynamics as perceived by the respondents:

"What takes place here is a downward exaggeration on a massive scale – which eventually will be corrected, right? By now, all reasonable rules are still invalidated. And in the long run they do apply. Well of course the markets can so-to-speak deviate from the world of let's call it economic facts – but not in the long run." (A3m, p. 28)

In contrast to the imagination of the financial market as a living being following its own moods and rhythms, which is prominent among traders and more short-term oriented asset managers, the analysts interviewed imagine the market as a long-term law-like rational order based on fundamental economic data. At times, this order is given a metaphysical ontology, as becomes apparent in statements denying the possibility to fully grasp and un-

derstand the laws of the market: "the market – if you are engaged with it for some time, it forces you into humility." (A3m, p. 30) This hypostatization of the market, despite giving it a certain essence and even personhood, is a far cry from the imagination of the market as an "other" that one can be attached to and that enables novel forms of sociality.

A recent study on traders by Fenton-O'Creevy et al. (2005), combining psychological, economic and sociological viewpoints, distinguishes between two aspects of traders' professional everyday life, namely theories about "how the world works" and theories about "how to work the world", with the first being related to abstract knowledge about market laws usually acquired in university and the second referring to practical rules of thumb that structure action. As a result of our observations, though, it might be contended that for traders, short-term oriented asset managers and professionals working in close proximity to the markets in general, these two aspects tend to coincide, thus producing the imagination of a market-subject present in its technological manifestations. The technologically produced self-presentation of the market gives way to holistic views of it, where sense-making and the production of meaning directly from trading via the professional "technoscape" (Appadurai 1990: 8). In contrast to this amalgamation of practical knowledge and reflexive sense-making, "fundamental" analysts seem rather to keep both aspects of their work separate from each other. The instrumental aspect manifests itself in the strategic use of technological means, while the construction of meaning assumes the existence of an abstract law-governed market not subject to immediate experience. Therefore, for professionals working at a greater distance from the financial markets, their technological nature cannot produce new forms of sociality by itself.

It would be one-sided to say, however, that analysts and professionals with a long-term perspective do not see themselves exposed to the impact of technological infrastructure at all. This becomes apparent if one considers the importance that the professionals in our sample attribute to the influence exerted on the financial markets by the media of mass communication and information like TV, the press, and online information services. Thus, alongside the technologies that provide for direct exchange between professionals, the market and other expert systems, there may be other ways in which communications and information technologies structure financial market practices.<sup>1</sup>

We shall briefly exemplify this, with reference to our interviews. The first example comes from an interview with a stock market analyst, who characterizes the significance of the media of

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<sup>1</sup> Discussions in the sociology and political economy of the financial markets also highlight this dimension of the technological institutionalization of the markets, as they address technology primarily as communications and information infrastructure (cf. Strange 1986; Castells 1996; Albert et al. 1999). Many investigations into the financial economy have capitalized on the decisive role of such infrastructure in the institutionalization and maintenance of the global financial markets. For instance, Saskia Sassen (1991, 2005) has argued that what underlies those markets is a technological and organizational substrate concentrated in "global cities". This substrate is not confined to the information highways that circulate capital in a real-time mode, but also encompasses expert data systems and communications infrastructure linking banks with non-bank organizations such as law firms, advertising companies, and news companies. Communications and information infrastructure that serves to keep the financial markets working thus combines principles of what Arjun Appadurai (1990) calls technoscapes, financescapes and mediascapes, and consequently resists being reduced to the technical equipment that facilitates the (in a way atypical) direct communication among foreign exchange traders.



mass communication for financial analysis as follows.

"It ahm quite often happens that – in the morning in the newspaper there is an article referring to an enterprise – ahm hm hm then you need to comment on that and you need to – your own point of view – is there some truth in a certain speculation or not – is it taken out of the blue – or not – hh you need to comment on that – and therefore we naturally need – to intensively know in which way the media refer to our reports." (A15m, p. 3)

From this example it becomes evident that the practice of using information circulated in mass communications and information technology is bound up with reflexive participation in the initial generation of that information. The practices of using information technology reported by our respondents resemble a mode of coming to terms with the reflexivity often attributed to the financial markets in sociological theory. This reflexivity, in its structural dimension, consists in the fact that the dynamics of the financial markets are conditioned by assumptions about how these dynamics work and assumptions about the assumptions of other market participants. Studies in financial market sociology have confirmed that market participants make use of their own actions and the responses these generate in order to orient themselves in the reflexive market environment (Clark/Thrift 2005; Fenton-O'Creevy et al. 2005; MacKenzie 2005). Coinciding with the findings of other investigations, however (Clark/Thrift/Tickell 2004), the analysts interviewed in our research study see the flow of information in the mass media as of paramount importance to the reflexive development of the financial markets. This is exemplified by the following statement from an equity market analyst:

"Well we rather tend to perceive the media as contra-indicator. That is – if for example you see certain companies or ahm company CEOs on the front pages of international magazines – now – then you know that you face a turning point." (A3m, p. 8)

Information about financial market processes, once circulated in the mass media, is not just descriptive but affects the developments it sought to describe. It is a typical example of what Anthony Giddens (1994) termed "social reflexivity" – information about social processes is invalidated (and policies aimed at steering them frustrated) precisely because it is appropriated by those driving the processes. The way that the respondents report how they make use of information technology, along with their reflections upon their own role in generating information which is instantly circulated, indicates that they appropriate the technological structure of mass communication in order to get a grip on the social reflexivity of the financial markets. Thus, their practices of cautiously using the media replicates on a cultural level the media's structural reflexivity which is grounded in their specific technological institutionalization. In other words, their capacity to instantly and grossly circulate information undermines its descriptive power.

Knorr Cetina and Bruegger maintain that there is a link between the technological institutionalization of the financial market and their ability to produce and allow the emergence of new forms of sociality with objects. We have supplemented this argument by way of two observations. First, not all financial professionals and market participants refer to the market as a sociable other, and not all of them use technological and communications infrastructure as a means to establish object-centered sociality. Second, the technological architecture of media of mass communication, and in particular their capacity to circulate information in virtually no time, is reflexively "built into" the practices professionals deploy in order to come to terms with financial market dynamics.

Our critique of Knorr Cetina and Bruegger is thus a twofold one. While their claim that sense-making prac-

tices on the financial markets are exclusively determined by technology is too bold, their implication that it is primarily or even exclusively electronically institutionalized trading where technology affects such practices is too restrictive. In order to estimate the theoretical importance of these findings, though, it is necessary to come back to Knorr Cetina and Bruegger's theoretical argumentation and to inspect it more closely, which will be undertaken in the next section.

#### 4 Short-term and Long-term Practices and the Attachment to the Market

Knorr Cetina and Bruegger's theoretical argument is dense and variegated. The authors do not confine themselves to basing their hypotheses on just one theoretical paradigm but make reference to three theoretical approaches in order to theorize intersubjectivity among non-present others and sociality with objects. For instance, they refer to Jacques Lacan's concept of an economy of desire constituting the unconscious relationship between two subjects to characterize how traders subjectivize themselves in relation to the market (Knorr Cetina/Bruegger 2002a; Knorr Cetina 2005). On the other hand, their notion of "face-to-screen-interaction" is explicitly based on George Herbert Mead's elaborations on "taking the attitude of the other" as a fundamental human capability and a cornerstone of intersubjectivity. However, in the context of the present paper it seems most promising to review the authors' reference to Alfred Schutz's notion of intersubjectivity, because this reference is most crucial to their argument, permitting them to characterize intersubjectivity with non-present others and sociality with objects (Knorr Cetina/Bruegger 2000, 2002).

Schutz' conception of intersubjectivity is important for the authors because of its implications concerning the tempo-

ral coordination among traders and between them and the market. According to Schutz, a "we-relation" (Schutz 1964: 55) necessarily presupposes face-to-face-interaction, since the defining feature of intersubjectivity – the simultaneous orientation of two actors toward each other's actions – necessitates their co-presence in one spot at one and the same time. This mutual orientation toward each other's actions and motives has as its sociological substrate the intersubjective interlocking of two types of motive: "because motives" and "in-order-to motives". In-order-to motives can be described as action incentives which, due to their habitualization and routinization, cannot be reflected upon while they are in play (much like Mead's "I"). It is only in retrospect that they can be reflected upon, in which state they appear as rationalized because-motives.

In the financial markets, then, traders manipulate their keyboards *in order to* make a certain deal, but this capacity to affect the market via a technical artifact is not accessible for reflection while in use. Instead, traders would later explain their actions by saying that they manipulated their instruments *because* making that deal at that time appeared to them to be a promising move. Intersubjectivity, according to Schutz, consists of a transformation of one's own in-order-to motives into the because motives of the other and vice versa; that is, it presupposes that one's own implicit motivations become explicit and meaningful through interpretation by others and ascription to others' actions. In Knorr Cetina's argument it is thus plausible to talk about intersubjectivity on the financial markets, in that the traders interpret their own actions as reactions to the motivations ascribed to non-present others or to the market itself (Knorr Cetina/Bruegger 2002: 927, 2000: 162-3). They constantly question what the market "wants" and see their actions as reacting to the thus interpreted and

constructed desires of the market as it appresents itself onto their screens.

This argument rests on the idea that the intertemporality between the traders and the market is central. It consists of three dimensions: synchronization, that is, the sequential interlocking of in-order-to and because motives; continuity, guaranteeing an unrestricted sequentiality and leading to the impression that one shares the "same time" with the market; and immediacy, which means that one action (or even the lack of an action) can instantly be interpreted as a reaction to a preceding action (Knorr Cetina/Bruegger 2000: 162-163, 2002: 921-924). In this use of the term intersubjectivity and its grounding on the three dimensions of intertemporality, it is indeed plausible to talk about intersubjectivity with non-present other traders as well as about sociality with the imagined object of the market. The reference to formal phenomenology thus permits the authors to claim intersubjectivity as one major dimension of sociality and socialization on the financial markets. They sum up their argument in the following way:

"[S]ynchronicity refers to the phenomenon that traders and salespeople observe the same market events simultaneously over the same time period; continuity means they observe the market virtually without interruption, having lunch at their desk and asking others to watch when they step out; and temporal immediacy refers to the immediate real time availability of market transactions and information to participants within the appropriate institutional trading networks." (Knorr Cetina/Bruegger 2000: 162)

This statement, though, also makes it clear that the link between the formal phenomenological notion of intersubjectivity and the hypothesis of sociality with objects is restricted to *very short-termed* actions in the markets. Without the temporal specifications of synchronicity, continuity and immediacy, which owe their existence to the technological character of the FX markets, it is much harder to envisage intersubjectivity with non-present others or

sociality with objects. It is only by way of constant trading at very short notice that the quasi-interactive bond between traders and markets can materialize. Obviously unaware of this circumstance, Knorr Cetina and Bruegger extend their argument to other social mechanisms of financial market coordination in that they also observe synchronicity and continuity in, for instance, the transferring of order books between time zones or the simultaneous reaction of traders all over the world on the occasion of important calendar dates (for instance, before the end of the financial year, Knorr Cetina/Bruegger 2000: 163, 2002: 928-932). These occurrences, however, have strictly speaking nothing to do with sociality with objects in that they are not technologically induced forms of sociality which have the power to extend the cohesion of micro-structural bonds to global networks and imagined objects. Instead they belong to other phenomenal categories: in the case of order books, they are processes of coordination within transnational companies (Clark/Thrift 2005; Thrift/French 2002; Power 2005), while the joint orientation toward fixed calendar dates rather resembles a quite classical case of the ritual construction of collective identity in imagined communities (Anderson 1987; Spillman 1997). These forms of social coordination and imagination, which Knorr Cetina and Bruegger associate with their general argument of (post)sociality with the market, should thus rather be analyzed as quite traditional forms of sociality. They also ought not to distract attention from Knorr Cetina's and Bruegger's core argument: that postsociality in the financial markets, due to real-time reciprocity and the imagination of the market as a "time-world" in its own right engendered by high-performance communication infrastructure, is grounded in technology.

It is this argumentative kernel that the empirical results presented in the pre-

ceding section partially contradict. These results show that the imagination of a market as a co-present time-world with which the professionals literally interact is only one among at least two imaginative possibilities. Depending on their market proximity or distance, some professionals maintain an imagination of the market which is opposed to a self-sustaining timeworld in terms of temporality, namely that of the long-term rational and efficient market following eternal laws which compensate for and outweigh its short-term dynamics. Most of the respondents interviewed actually take a position between these two poles of market temporality. What is especially important for a contextualization and re-evaluation of Knorr Cetina and Bruegger's theoretical argument – that the sociality with the imagined object of the market is grounded on synchronization, continuity and immediacy – is the empirical finding that the imagination of the long-term rational market is diametrically opposed to all those dimensions of short-term temporal coordination. The imagination of the rational market thus articulates a threefold denial of sociality with imagined objects (in each of the three Schutzian dimensions).

#### *Synchronization*

In the first place, the long-term rationality and efficiency of the financial markets, which couples their development to that of the productive economy, never reveal themselves to the involved subject in real time, but presuppose either a representation of the past or an extrapolation into the future. The rationality of markets can never be experienced in the "contemporaneity of an event" (Knorr Cetina/Bruegger 2000: 922) but instead resembles a fiction cast into the future or the past which gains its plausibility precisely from its resistance to validation or falsification in the present. This fictive understanding of rationality is clearly evident in the following se-

quence from an interview with a financial analyst:

"looks like the markets, the investors, it's like there's some sort of collective ahm collective unit which surely tends to overreact but on the other hand doesn't assess things that badly, even those things which the analyst in the short run underestimates and doesn't assess correctly and is surprised by some movements, which of course afterwards turn out to be correct." (A2m, p. 22)

#### *Continuity*

Secondly, this fiction of long-term rational and efficient markets does not presuppose a continuing interaction in or with the market but can be maintained at a distance from the markets. Indeed, there is reason to assume that it might depend on a greater distance from the market than that associated with FX traders. This is illustrated in an interview with an asset manager who comments on his bank's decision to refrain from exploiting the financial turbulences on 9/11 for short-term investments of a speculative character, his argument being that the rationality of the market might be strengthened precisely by abstinence on the part of institutional investors from getting involved in short-termed investment strategies:

"basically we don't tend to – let's say exploit overreactions. As a global player in this area we rather should ahm try to pour oil on troubled waters here and there. ... that we actually have receded to a relatively neutral position... that is ahm we didn't do anything anymore." /F5m, p. 7)

#### *Immediacy*

Finally, as has already been mentioned, the long-term rationality and efficiency of the financial markets can never be immediately experienced by the subject in his/her market life-world, but, almost by definition, must remain remote and abstract.

To sum up, the "attachment" to the long-term rational and efficient market is grounded not on sociality with (imagined) objects appresenting themselves in technological artifacts but on the self-ascription to a sort of "imag-

ined community" in Benedict Anderson's sense (1987) which resists being experienced in the subjects' life-worlds. It also helps the long-term oriented professionals to distance themselves from strategies and professional groups operating at very short notice, for instance from, as one respondent put it, the "die-hard futures traders", who are represented as belonging to a different tribe. The imagination of the long-term rational market is therefore to be conceived of not as a fantasized "unfolding object" with which the professional subject can engage in a postsocial relationship but as a professional fiction or a counterfactual norm that serves to construct a professional identity through self-ascription to a rationalized principle and through the exclusion of those not adhering to it. The use of Schutz's elaborations to characterize the relationship between subject and market as intersubjective and sociable, which allows Knorr Cetina and Bruegger to discard the notion that normativity structures sociality, thus is more suitable for very short-term market action and the resulting emergence of the imagination of a market timeworld. However, in order to grasp alternative ways in which technological structures and dynamics channel professional practices of sense-making, like those of long-term oriented professionals reported on above, one has to take into account that norms (even if counterfactual) still do play a role in the financial markets. This leads us, in a final argument, to a theorization of the notion of normativity and its implications for approaches to the technological embeddedness of financial markets.

## 5 Norms, Imaginations, and Communications Technology in the Financial Markets

The idea that the normative mode of coordinating financial market action is outdated does not belong exclusively

to the postsociality argument. Recent system-functionalist work on the financial markets also maintains that the markets, as part of a post-industrial society whose defining feature is its reflexive grounding on knowledge processes and their frame conditions, shift from a normative mode of regulation (e.g., through laws and law-like regulation) to a cognitive one (for instance, through negotiations between legislators and financial market participants). According to this argument, "normative arrangements of (inter)national economic policy are being replaced by structures, processes and regulation systems that incorporate the risk of a purely cognitive orientation to price and market fluctuation" (Strulik 2006: 17; cf. also Willke 2006). This is an application of the more general hypothesis of modernization theory that normative modes of integration prove increasingly ineffective in steering societal subsystems which largely follow their own semantics (Luhmann 2000). Knorr Cetina's and Bruegger's studies are based on the same conviction that contemporary societies cannot be held together through reference to shared norms, and spell out its consequences on the micro-level of interaction and intersubjectivity. The reference to Schutz in their studies is thus not accidental. It serves not only to argue for the possibility of technology-induced sociality with objects but also, on a deeper level, to discard the meaning of norms in the constitution of interactions and intersubjectivity in general.

This becomes clear if one takes for a moment the theoretical counterperspective that communication is characterized by its potential to be developed into a meta-communication, i.e. a communication about communicative acts (Watzlawick/Bavelas/Jackson 1967). This necessarily implies the negotiation of norms and their validity and meaning because linguistic symbols are prototypical of social norms (cf. Habermas 1987). From this

perspective it might be argued that so-called interactions between traders and the market are deficient because they lack the capacity to be complemented by a meta level. There is no such thing as negotiation with the market. On the contrary, what behavioral finance describes as "herd behavior" – people's psychological vagaries and insecurities that drive them into a quasi-instinctive behavior of imitating each other (DeLong et al. 1990; Froot/Scharfstein/Stein 1992) – looks from a sociological viewpoint like abortive communicative interactions and failed procedures of social coordination. The thesis of technology-induced sociality in Knorr Cetina and Bruegger's approach, it might be suspected, is predetermined by their implicit reference to technology as "epistemic objects".

Still, the interpretation that acting and trading in the financial markets still has very much to do with the enactment of social norms can actually be deduced from Knorr Cetina and Bruegger's own studies. The hypothesis of the "global microstructures" engendered through face-to-screen interaction between traders says nothing else than that traders do obey certain norms that cannot be reduced to the aim of increasing one's own profit, because they have to do with the normative imperative of guaranteeing reciprocity in order to keep the markets working, to enable other traders to make their trades etc. (Knorr Cetina/Bruegger 2000: 924-8; cf. also section 2 above). For Knorr Cetina and Bruegger, the meaning of this finding has a role mainly within their major frame of reference, that is, the technological nature of FX trade and the new forms of sociality it is supposed to engender. For us, this evidence constitutes a call to address the relationship between norms, technology, and market imaginations.

Communications and information technology as well as the technological expert systems that serve to make the

financial markets work are heterogeneous. To cope with this diversity, it seems useful to revisit the classical sociological notion of the "norm". According to such eminent scholars as Ralf Dahrendorf (1964) or Helmuth Plessner (1985 [1960]), a norm is an expectation that differs from other kinds of expectations in two crucial ways. First, if normative expectations are not fulfilled, it is usually possible to "sanction" the offending party. Thus norms refer to *power differentials* within society. Second, unlike cognitive expectations, normative ones will be maintained even if they are not fulfilled because the disappointment of the expectation is ascribed to the person trespassing against it and not to an error in one's own expectations. Therefore norms can also be related to a highly effective *orientation function* that they fulfill even if not obeyed.

This twofold definition of norms, when applied to the dynamics of the financial markets and their technological substrate as addressed in this paper, reveals that the first and second characterization of norms can be respectively aligned with the different time horizons and uses of technology found in professional agency on the markets. Direct trade between market participants in a real-time mode obviously gives rise to norm-obedient behavior because it is possible to sanction anyone who deviates, that is, to exert power over him/her. Knorr Cetina and Bruegger state that if market makers do not conform to the reciprocity norm, they face negative sanctions from other traders in the form of discontinued trade. Employing the term "norm" in this context highlights the sanctions and the social power that norms are equipped with. This characterization of norm-obedient behavior on the financial markets is in line with investigations into more privative real-time exchange practices found in the global technoscape, namely Internet exchange forums. Their main point is that the Internet will never be the

norm-free area that many theorists associate with it, arguing that people engage in exchange practices which are based on reciprocity as the basic mode of normativity with the functional aim of *reintroducing* the possibility of normative expectations into communications-technological settings which, in principle, can do without them (Slater 2002).

Market distance and a certain instrumental attitude toward communications technology, which is specific to professionals not directly involved in trade, is accompanied by a sort of normativity largely leaning toward the second feature of norms, namely that they are preserved even if not adhered to. This aspect of norms, which forms the basis of the rational market imagination, may be termed normative counterfactuality. It is ultimately grounded outside market dynamics and erected against their technological institutionalization. Here it is not the communications and information infrastructure that lends itself to the diffusion of reciprocity norms, as with short-term oriented financial professionals, but, on the contrary, the expectation that markets will be rational and efficient despite the irrationality and hectic pace that real-time communications and information technology imposes on the financial economy. Imaginations of the market thus become a ground for probing adequate uses and understandings of technology, not the other way round. Therefore the counterfactual norm of market rationality is not to be challenged by technologically induced market dynamics. What is more, the fact that for financial professionals there is hardly any possibility to sanction those who do not adhere to that norm is precisely what gives it its imaginative and sense-making power. What is highlighted by the use of the notion of normativity in regard to the assumption of rational markets is the orientation function of norms for financial professionals

against all technological odds, and contrary to any systemic imperatives.

To sum up, our results indicate that it might be worthwhile to engage in a discussion on the role of technology in the context of normativity, not because technology by itself invalidates the working of social norms but because it recasts their sociological meaning.

## 6 Conclusion: Re-evaluating Technology-Induced Sociality

In this paper we have argued that the aptness to generalization of the consequences of technological infrastructure in regard to modes of sociality on the financial markets can be more thoroughly understood if one takes into consideration the multiplicity of representations and imaginations of the financial markets that professionals maintain. In particular, we have demonstrated that one encounters at least two representations of the financial markets at work in professionals' narratives: a short-termed market which appears as a living being with its own rhythms and moods, inviting participation in its temporal and spatial self-representation; and a long-termed market to which is ascribed a mode of rationality and which is the ultimate focus of some professionals' self-concepts, although its efficiency transcends the immediate professional life-world experience and insofar remains fictive. This complicates the picture drawn by Knorr Cetina and Bruegger in regard to the generality of postsocial relations in contemporary societies. While they argue that those relations no longer require adherence to shared norms and thus meticulously fit post-traditional societal settings, we maintain not only that norms are inherent to short-term trading actions, but also that the rational abstraction of the efficient market is precisely the establishment of norms, albeit fictive and counterfactual ones. This finding, which rests on the function of the rational abstraction of the efficient mar-

ket as a counterfactual norm, suggests that normative structures are at work in a site which has been rightly characterized as one of the most technologically imbricated and by virtue of that, most socially and culturally disembedded: the global financial markets (Baudrillard 1992, 2000; Castells 1996; Albert et al. 1999).

The role of technology in this site must therefore be discussed not only in regard to its tendency to alter modes of sociality or to herald society-wide postsocial developments. Instead, we opt for a discussion of the potential of technology not to invalidate social norms, but to recast their meaning. In this respect, there are two main conclusions to be drawn at the end of this paper.

First, communications and information technology, insofar as it forms part of social practices, not only attests to the importance of object relations in contemporary societies, but may also serve to extend the spatial and temporal scope of norm diffusion. The "global microstructures" that are part of the financial markets promote reciprocity norms beyond face-to-face social situations across the globe. It is as if the fluidity and apparent anomia of the virtual networks were being fought back through the materialization and diffusion of social norms (cf. Slater 2002: 228-9).

Second, technology alone does not shape social practices unless placed within social contexts and cultural orders of preference. For instance, the ways in which financial professionals orient their action with respect to the media of mass communication cannot be understood without taking into account that they experience them as part of the *economy*. Reflexivity thus occurs not only as a consequence of real-time modes of diffusing information but also because people *expect* it to direct other people's *economic* actions. In fact, real-time interaction and self-subjectivization on the FX market

is quite different from that in Internet chat-rooms, although the technological systems enabling both practices are comparable to each other. While the *general* impact of technology on social relations and societal integration should not be taken from the agenda of Science and Technology Studies, it is necessary to bear in mind that technological practices are, first of all, related to *specific* contexts and problematics.

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