Lecture

Pandora's Box: Opening Up Finance to STS Investigations

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Abstract. Only two decades ago, finance was mainly the province of economics, a territory into which only few outsiders wandered. Nowadays, finance has become a central topic and various social science and humanities disciplines, have made inroads into this territory. Should the social sciences (and STS in particular) just analyse finance, or should they mainly criticize it, or maybe even provide what some have called an alternative narrative to capitalist finance?
Stemming from an ironic and innovative overview of social studies of finance (SSF), the paper presents the core characteristics of such a perspective, taking into account also the main critique that SSF attracted. The contribution concentrates then on the three issues where STS investigations of finance promise good yields: (1) agency and robots; (2) epistemic cultures; (3) expertise.

Keywords social studies of finance; financial crisis; epistemic cultures; expertise; agency and robots.

Only two decades ago, finance was mainly the province of economics, a territory into which only few outsiders wandered (but see Adler and Adler 1984; Baker 1984; Abolafia 1996). STS scholars didn't mingle much with the finance crowd. Nowadays the situation is significantly different. Various social science and humanities disciplines, not least among them science and technology studies, have made inroads into this territory.

Research projects have been completed, and PhD dissertations have been brought to fruition. Books and scholarly articles have been published, and some have won prizes. It is perhaps time to take a step back and assess the situation, perhaps even more so since the expectations about how STS should approach finance have been somewhat complex.

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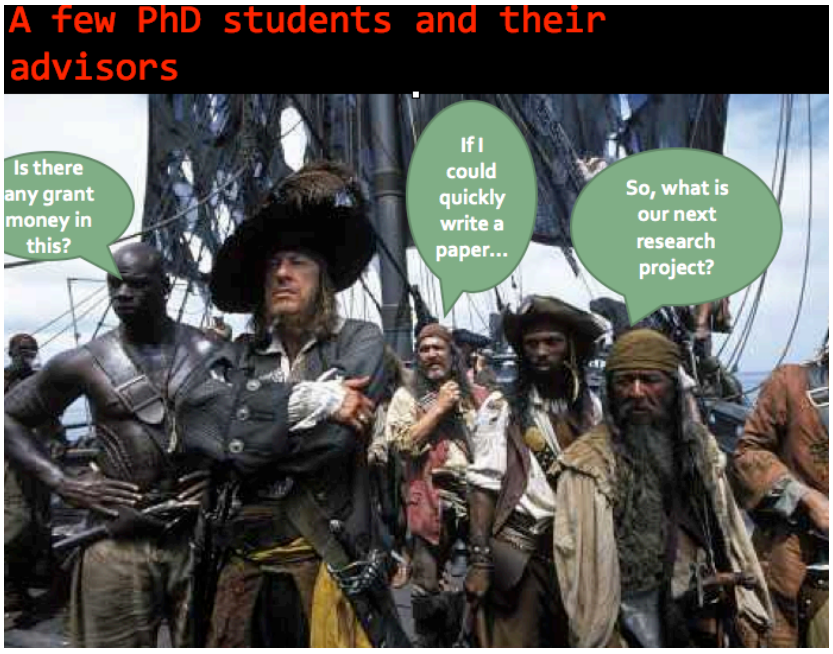
Should the social sciences (and STS in particular) just analyse finance, or should they mainly criticize it, or maybe even provide what some have called an alternative narrative to capitalist finance? And if yes, how could this narrative look like? It seems that finance as an object of investigation has morphed into a veritable Pandora's Box, creating more discord than unity.

Sometimes concerns have been voiced at conferences, in book reviews and in more or less polemical articles, that STS is too technical and not critical enough with respect to finance. Sometimes, and especially in these times of crisis, it has been argued that social studies of finance (SSF) – the offspring of STS – do not offer an alternative critical project, that they do not provide a much needed broader narrative of financial capitalism, focused as they are on small technical details. Some have also voiced the concerns that SSF strayed away from the parent discipline, STS. Akin to a teenager acting against the will of the parents, SSF have eloped to Vegas together with finance, whereas they should have remained within the solid walls of the parental home.

All these debates and criticism makes it perhaps even more necessary to take a look back at the journey undertaken by SSF scholars and scholarship over the past fifteen years or so and review the projects lying ahead. In any enterprise of this sort, one which wants to be both retrospective and prospective, a good metaphor helps. The one I used above – elopement - does not work so well, unfortunately: the road taken by SSF is no journey to Vegas. I might need here to look for a different metaphor encompassing the notion of journey as well as that of adventure, a metaphor which contains the prospect of future, hopefully productive instalments.

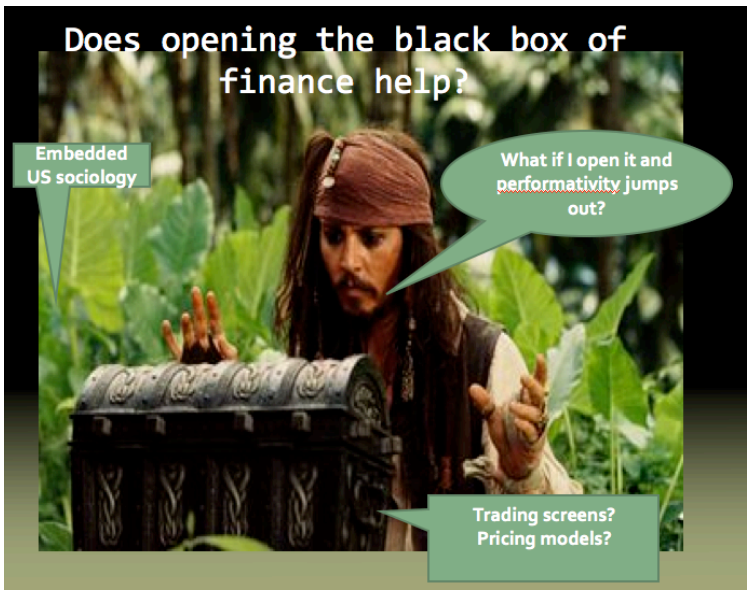
As far as I can see or remember, SSF didn't start as a thoroughly organized and programmatic project, but rather with a more or less ragtag group of PhD students who, together with their then supervisors, were embarking on uncertain enterprises. While some tongue in cheek attempts at formulating a program have been made at some point (e.g., Preda 2000), these have remained individual statements rather than being embraced at community level.



Many of those who embarked on this enterprise were trained as STS practitioners, coming either from a tradition of historical studies or from an ethnographic one - and indeed, many of the first studies were ethnographic or historical (including here contemporary history), as they continue to be today. SSF scholars had to spruce up their knowledge of finance by a combination of individual study and ethnographic work - witness here the many internships providing the institutional format for participant observations.

What were then and still are now the stakes in this enterprise? Why leave the safe STS home for an adventure into the unexplored finance? The latter has proven to be a turbulent domain; during its relatively short existence, SSF has witnessed several major crises, and in all probability this will not be the end of it.

If we were to apply here the old STS dictum about opening black boxes, what is at stake in attempting to open the black box of finance? And, to recycle the metaphor a little, what if this black box is Pandora's Box? Since SSF have attracted enough criticism for not being critical and combative enough, this jump across metaphors may be less far fetched than some may think.



As we are seeing more and more claims that the black box of finance has finally been opened, the curiosity is legitimate. What is inside? A code? A formula? What else? And if we know what is inside, will we be able to concoct an antidote?

True, in good academic fashion there have been debates as well (mostly at academic conferences). Some have said that the true black box hasn't been discovered. Some others have said that it is all about storytelling, about culture, or about ethics, or about politics… might it be that everybody is looking for a different black box? Nevertheless, we need to ask, what does SSF think that is hidden in the black box of finance, and what do they think is the key to opening the box?

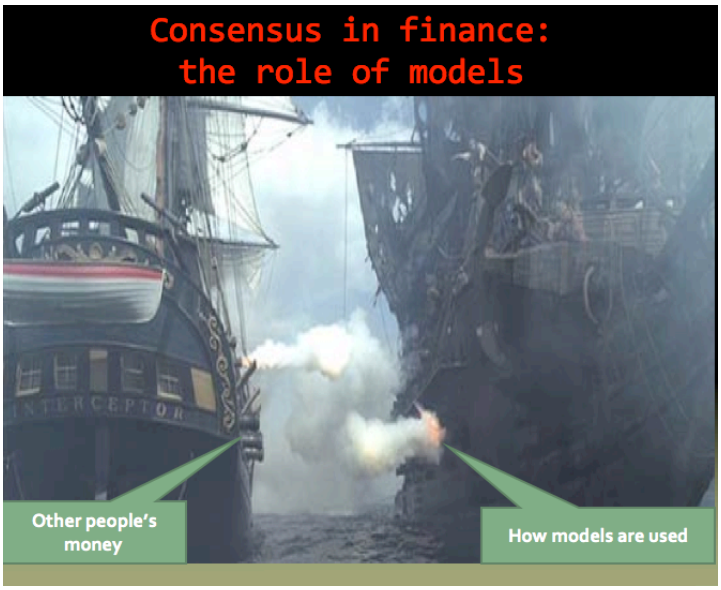
We have then to do with two distinct questions, but which are linked to each other. What SSF think that it is in the box is not independent of what SSF think is the key to the box.

What is the key to the box? Until now, the key has been mainly seen as social histories of communication technologies and of mathematical models of prices. Why mathematical models? Because the starting point has been provided by the empire of financial economics itself, namely by the quest to forecast prices of financial securities (e.g., Mehrling 2005; Bernstein 1998). In practice, these forecasts are nothing else but trading in financial derivatives—the prices of derivative instruments are public forecasts of the underlying instruments. (Public in the sense

of the market public). Forecasts are made with the help of forecasting models, which in their turn are formulae for calculating the prices of derivative instruments.

What SSF did in this respect was to take over the key provided by financial economics and tweak it. While financial economics sees such pricing models as a benchmark mirroring the rational behavior of market participants, SSF did mostly historical studies of pricing models, seeing them as social instruments by means of which participants reach some form of consensus (e.g., MacKenzie and Millo 2003; MacKenzie 2006). If everybody thinks this is the key to the box, then they will also think they have opened it. This works well provided that nobody takes a closer look and then it's too late. Consensus, however, does not mean mere superficial agreement or "pretending to agree". Consensus is reached in a long and complex process involving procedural and communicational hurdles, a process which is not devoid of struggles and controversies, as we know only too well from the history of science.

Of course, the notion of consensus makes more sense if one associates it with the notion of dissent. That is, there will always be some market participants who do not buy into the mainstream models of financial economics, who either ignore them or develop their own approaches. This is best illustrated by some hedge funds making a killing in the present crisis by betting against the consensus.



SSF, with its main emphasis on how social consensus around pricing models developed historically, has not looked at dissent with the same intensity—and maybe the time has arrived to do it. But of course, we can recognize in the emphasis on how consensus is achieved a classic theme from the Kuhnian sociology of

science which has been translated first into STS and then applied to financial markets. At the same time, STS has a rich history of investigating scientific controversies (e.g., Latour 1988; Collins 2004), a history which can be productively used in investigating outliers, non-conformists, or contrarians in finance. We should not forget that in finance, for every party there is a counterparty as well.

Oftentimes social studies of finance have been fascinated by the "big guys"—be they big investment banks, big stock exchanges, big firms—in short, big money. Big money has been seen as where the action is, echoing one more time the standard view of financial economics. The advantage of this approach is that it potentially opens a portal onto the technologically multi-layered world of electronic finance where, perhaps more than in other domains, the dictum "time is money" becomes true. The drawbacks consist in difficulty of access to the field, of penetrating the field in depth, but also sometimes in ignoring the technological complexity, diversity and dynamism of the field we call finance.

It will boost SSF to move from historical studies of mathematical model development—extremely valuable, but not enough—to ethnographic studies of their production and use (e.g., Yonay and Breslau 2006; Lepinay 2011; Lepinay and Callon 2011). If you want, social studies of finance should follow here the historical lead of laboratory studies from thirty years ago and go into the laboratories where models are produced.

True, we have a number of ethnographic studies of trading rooms. Yet, many of them, including ones recently published, have been actually conducted ten or twelve years ago, more often than not as PhD work, which then—understandably—had to wait a while to be processed in book form.

Having said that, I shall move into the second domain of investigation, namely studies of communication technologies. This branch of SSF has taken a different

direction from the historical studies of financial price models, in a double sense, both theoretical and methodological. Theoretically, studies of communication technologies in finance—be they trading screens, telephones, or tickers—have not sought to replicate themes from financial economics, but have been concerned with observation as a fundamental cognitive process, and with how observation is socially produced (e.g., Muniesa 2008; Knorr Cetina and Bruegger 2002; Wansleben 2011; Zaloom 2006). If you want, this is another way of questioning rationality assumptions in financial markets (Knorr Cetina and Preda 2007), which take observation as an individualized and atomized, unproblematic activity.

Questioning price observation as a basic cognitive activity in finance has also opened the door onto investigations of the specific formats of social behavior in markets. In STS, observation has been long associated with laboratory- or big engine-specific cooperations (e.g., Collins 2004). In finance, we have to do not only with cooperation, but with combinations of cooperation and competition, and with forms of strategic behavior where presentation is dissociated from intention. At the very least, SSF can investigate deeper in this direction and pay more attention to the complexity of cognitive processes related to strategic behavior, which can include, but is not reduced to cooperation.

It is not very difficult to recognize the anthropological and phenomenological roots of this approach, going back to the work of Alfred Schutz (Schutz and Luckmann 1972) and Erving Goffman (1970) among others. Methodologically speaking, investigations of communication technologies in finance have been more balanced between historical and ethnographic approaches, and we know a deal more about the uses of contemporary technologies than we do about the uses of models.

Yet, even this branch of SSF could have paid more attention to the complexity, dynamism and diversity of contemporary finance, where changes take place now a greater speed than that of writing academic articles.

Going back to the introductory metaphor, we can see that various groups involved in this enterprise have actually taken different approaches about how to open the box and about what is inside.

Have they opened it? Do we know what makes finance so agitated? Can SSF offer solutions for calming it?

More recently, SSF research has suggested that the origins of the financial crisis are to be found in models, which are used not for their accuracy, but in order to establish valuation consensus among market actors, leading to the creation and trading of deficient financial instruments, with disastrous consequences (MacKenzie 2011).

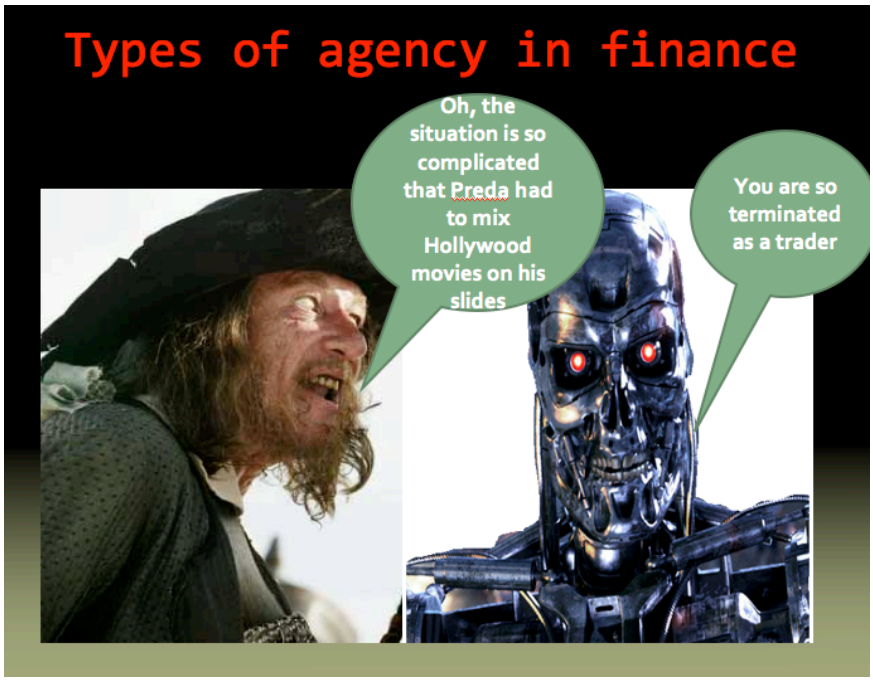
Critics of SSF have countered that ethical issues are ignored here, that the key to understanding the crisis lies not in pricing models but in deviant subcultures which foster greed and risk taking, and which should be curtailed by tougher regulations. All we need here is more patrol boats, and the hurricanes will recede. What these critics curiously do not see is the argument formulated by the other branch of SSF, namely that communication devices bring about global observation and coordination mechanisms which are very difficult, if not impossible to regulate

at local or national level. What critics have also failed to grasp is the extent to which dedicated communication technologies continue to spread and evolve globally, establishing new centers of finance partly in response to local regulatory measures. Finance is indeed about to become a mechanism of global coordination, with significant consequences—among others, that apparently minor events in one part of the system can trigger system-wide snowballing reactions. This was not the case ten to fifteen years ago, when the various Asian, Mexican, Argentinian, or Russian crises were more or less contained at a regional level.

It is precisely the fact that global finance is grafted upon global, dedicated technological systems (which are still very little understood), together with the widespread use of analytical technologies of varying complexity which should make us push the investigation more and more into these systems rather than resort to calls for more patrol boats.

Coming back one more time to our main topic: what else should we expect from Pandora's Box? Well, the really interesting things are still to come…

Here are just three issues where STS investigations of finance promise good yields: (1) agency and robots; (2) epistemic cultures; (3) expertise. I shall touch very briefly upon each of them.



Agency has figured prominently on the STS agenda during the past twenty five years, and a great deal of papers have dealt with how technologies force human agents to take unforeseen paths of action, or with postsocial sociality (e.g., Knorr Cetina 1997). What we have witnessed in finance during the past five years or so has been the rise of algorithms, robots replacing humans in trading. In some mar-

kets, more than half of the overall trading is now done by algorithms, and this proportion is bound to increase. What is more, regulators have begun using robots for market surveillance. The flash crash of May 2010 has been linked to algorithm trading, and it is worth remembering here that previous crashes (October 1987) have been linked to program trading as well. The trend towards increased market automation goes hand in hand with an increased technologization, as illustrated not only by the increased speed of transaction, by deepening technological linkages among exchanges, but also by the increased presence of science professionals in finance. We should keep in mind here that finance firms recruit heavily among science and engineering graduates.

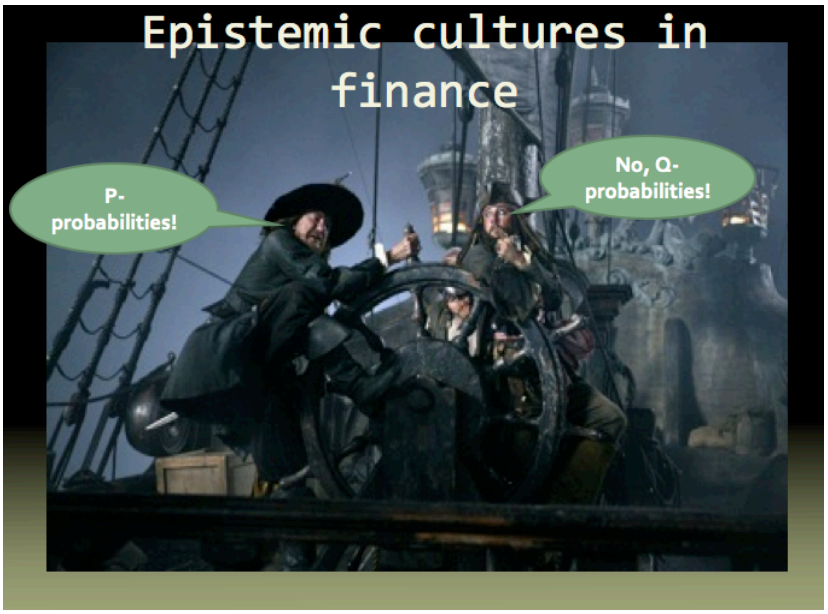
Are we looking now at a world where trading will be done exclusively by robots? And what place do humans have in this world? First, there is the issue of human-robot interaction on trading screens. In electronic markets, human traders and robots can be indeed pitched against each other. We have to do with a world where human agency is confronted on the trading screen with active non-human agencies, agencies which are different from the more or less passive resistance of the scallops from twenty five years ago (e.g., Callon 1986). This raises a whole series of interesting issues for STS research: how do I recognize non-human agency in action? Can human agency be recognized as such by non-humans, and to what consequences? What are the consequences for the notion of strategic action?

Imagine here football teams combining human and non-human players, and confronting each other. But they do not know from the start who is human and who is non-human on the other team, and they can find this out only during the game. The challenge for STS research is to investigate how various types of agencies are configured as accountable and recognizable as such in action. Another challenge is to investigate how robotic agencies are produced and put to use collaboratively by various groups in finance.

Thirteen years ago, the notion of epistemic cultures was introduced to denote the variety of ways in which scientific disciplines produce knowledge (e.g., Knorr Cetina 1999). Recently, SSF studies have begun turning away from the concept of performativity (e.g., Callon 1998; MacKenzie *et al.* 2006) to that of epistemic culture, in an effort to capture the diversity of the ways in which knowledge is produced and put to use. And by knowledge, I do not mean here any kind of financial knowledge, but most and foremost theoretically grounded knowledge claiming predictive power with respect to the prices of financial instruments. It appears that in this respect finance is way more diverse and rich than the initial criticism of a dominant model of rationality would have us believe. It also appears that at least for some types of transactions such a model was never dominant, and that a rich variety of academically sanctioned theories, and well as non-sanctioned ones, coexist side by side, and very often encounter each other in action.

We need to map therefore the variety of knowledge forms encountered in finance, in relationship to each other, together with the variety of groups producing and reproducing them. We need to map their boundaries, as well as their clashes. In the initial setting where the concept of epistemic cultures was introduced, they were kept apart by disciplinary boundaries, namely by the fact that these cultures

had developed and evolved within distinct scientific disciplines. In finance, things are more complicated. While in part epistemic cultures have evolved within different markets—and we could talk here about a foreign exchange culture as different from a derivatives culture, they can also overlap organizationally, or develop more tense relationships.



Epistemic cultures can stretch over a wide variety of settings, from the academic settings of mathematical finance down to practitioners' elaboration of mundane theories, tools and models of finance. Not all of them have pricing models of the core. Some center on tools with the help of which price movements can be monitored and explained. This would also explain why we do not encounter the same intensity of use of the same pricing models everywhere. The notion of performativity, launched about fifteen years ago, implied (without stating it as such) that some model becomes dominant if not the standard. (And performativity can be seen as an extension of the notion of standardization). Meanwhile, the picture has become more complicated. We know that competing models can be developed, or that models can be ignored by practitioners.

It would be mistaken to reduce the epistemic cultures of finance to large organizations, based solely on the grounds that they have the most money and therefore the most influence. In order to get a better picture—one which should help understand why finance is so dominant in contemporary life—we need to pay attention to cultures of finance at various levels of professionalization and expertise, and see how they correlate with each other. We need to include here institutional formats addressing the public, such as brokerage houses, but also regulatory agencies and central banking.

Expertise has been another major STS topic over the past ten years or so (Collins and Evans 2002). In relationship to finance, expertise can be understood at least as being about how a specific domain of knowledge is locked in by specific groups which set up mechanisms for controlling access but also instituting a specific form of knowledge about finance as the legitimate one, while other formats retain a marginal position. This would also mean examining the social mechanisms through which this form of expertise is reproduced in institutional settings, and disseminated at various levels. It would also mean looking at how variations are produced within this form itself—that is, how different groups produce alternative and competing theories, models, and explanations, all within the dominant format of expertise. I am thinking here for instance of how different quant groups produce competing theories and explanations, publish in journals, meet at conferences etc., while remaining all within the same domain of expertise.

Lock ins of this kind usually go hand in hand with reproducing a domain of expertise like finance at different levels and across various institutions, so that we now have for instance TV experts on finance, but also government experts, academic experts, bank analysts, and so on. The ongoing crisis has brought afore a great deal of experts and expertise, and there goes not a single day without various experts and analysts commenting the ongoing events in the media. This raises at least a few questions in need of closer examination: first, is the public understanding of finance enhanced by this permanent display of expertise in the media? Second, and this is perhaps the question to begin with, what is the public understanding of finance? To what extent and how do publics understand financial theories and finance? Third, what is the link between this permanent display of exper-

tise and the legitimacy of finance? Do we encounter here contestations or alternative forms of expertise?

Where is the expertise on finance situated by rapport with the social sciences, but also with the natural sciences? We have to keep in mind here that for quite a while finance was not seen as part of economics and the topic was not dealt with very much within economics departments (e.g., Jovanovic 2012). Even today, the situation is not very clear. While financial economics is now a firmly entrenched feature of business schools, institutionally it is often associated with accounting rather than with economics. Its disciplinary status is not necessarily very clear, especially if we think of the complexity of the discipline itself. We also need to keep in mind that disciplinary status can shift according to the background of practitioners, and more and more of the latter have a background in the natural sciences. Is finance then a form of social science expertise, or of natural science expertise, or are we looking here at a hybrid form, which is not very easy to classify?

At this point, after having tried to identify a few ways in which finance can be made into the object of STS investigations, some may object that all this still does not take into account morality, and that it is all about profit making. To which the answer should be: haven't we learned from so many STS studies, and from the classics of sociology as well (and I am thinking Durkheim and Weber here), that morality cannot be separated from how forms of social knowledge are produced and from the specific interaction formats corresponding to this production? And doesn't profit making require the ability to extract rent from specific forms of expertise? Investigating the morality of markets cannot be logically seen as a project alternative to that of investigating financial knowledge and technology, but as something intrinsically related to it.

Some might say that this approach does not answer the general question, "what is finance?" Since this very finance seems to bring about crisis after crisis, since it seems to be of such importance for the welfare of entire societies, this question may seem legitimate, in the hope that an ultimate answer to it will help us find a cure for all the economic and social malaise of our times. So, it might be here that some will call for SSF to reach deeper into Pandora's Box, in the hope that somewhere, at the very bottom, we'll find the ultimate answer and with it the ultimate cure.

Shall then SSF try and answer such metaphysical questions? Do answers to metaphysical questions provide cures? This is doubtful. This is not to say that SSF investigations cannot contribute to shaping policy toward finance—they certainly can. SSF investigations definitely can contribute to public debates, and to raising public awareness as well. But they cannot offer any cure to the general social malaise caused by a state of crisis which seems to become semi-permanent. It is tempting to try and see SSF as a form of cultural therapy, but in the end this would hollow out the very enterprise, which has built its name upon rigorous investigations.

Coming back to the above question, what lies then at the very bottom of Pandora's Box, underneath all the questions about agency, expertise, and epistemic cultures? This reminds me of the question in the title of Niklas Luhmann's farewell

lecture at the University of Bielefeld twenty years ago, "What Is the Case? What Lies Behind?" (Luhmann and Fuchs 1994). As a curious and newly arrived PhD student, I went to the packed auditorium to hear this lecture. Luhmann's answer was, "nothing at all!".

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