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# Embedded, scattered, confused minds: what do hyper-conductive markets impose on investors' social intelligence

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# Embedded, scattered, confused minds

## What do hyper-conductive markets impose on investors' social intelligence

by Flaminio Squazzoni

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### I. Financial markets as “hyper-conductive” systems

Financial markets are complex systems characterised by sophisticated technologies, such as massive data analysis, ubiquitous computing and artificial intelligence. This intense technological development has dramatically modified the market landscape by increasing spatio-temporal interaction effects, real-time, global scale transmission of information and the network density of economic agents. By using an analogy with magnetic fields, we could argue that markets are now “hyper-conductive” systems, where “energy” (i.e., information) does not resist or create barrier and is refracted both in real time and globally.

This structural, dynamic and functional complexity is confirmed by empirical findings on the increased interconnectedness of economic, social and political systems [Helbing 2013]: large-scale, real-time market reactions to announcements by certain regulatory agencies, strong sensitivity to rumours spread in social media, the emergence of cascades and contagion effects between (previously) unrelated markets and systems and the unpredictable relevance of ideally (economic) irrelevant political or social events, are all examples of this growing complexity [Casarin and Squazzoni 2013].

Let us consider markets as an institutional mechanism designed to rationally allocate scarce resources. This mechanism requires consistent predictive capabilities at an individual and aggregate level. Indeed, investors should consider prices as a

means to predict future outcomes, and prices should incorporate the “rationality” of markets by providing non-redundant signals that allow efficient allocation of resources. Regardless of the fact that this may not be a precise idea of markets, we must conclude that the new “augmented”, artificial intelligence, ICT-boosted “reality” of markets, rather than buttressing this important function, dramatically reduces it.

This also has important consequences for observation theory. Indeed, technology development has also drastically increased the “observational” experience of economic agents. Mutual observation is a complex process that implies a significant socio-cognitive interpretative effort by individuals. This effort is social by definition as any individual interpretation requires to predict and refer to, the (inferred or presumed) opinion of other people and is subject to social pressures, as relevant individuals might have a significant influence on individual cognition [Beunza and Stark 2012].

First, we must say that mutual observation has always been a constitutive part of markets, as prices are basically nothing more than an indirect, inference-based ‘mutual observation’ construct for economic agents. When the price of a stock starts to decline, investors presume that some people are selling, expecting that others are doing the same and predicting that others will also sell, and so on. They therefore try to infer their mutual “observational” points of view. So, both before and besides ratings, prices fulfil such a “mutual observation” function [Esposito 2013]. In this sense, recent technological development has only dramatically increased this “reality” by taking it to the next level, i.e., the “hyper-conductive” stage. On the other hand, it seems that economic agents are responding to this increasing complexity by constantly segmenting and re-segmenting their epistemic and social “observation” space, especially through peer-to-peer, e-communication platforms [Saavedra, Duch and Uzzi 2011; Saavedra, Hagerty and Uzzi 2011].

This situation has come about because, like the myth of Janus, the two faced god, financial markets synthesize two aspects, whose relationship has now achieved a paradoxical effect: “intelligence” of instruments and “emotionality” of agents. What we now see is a great deal of “intelligence” embodied in market technology, super-powered computing algorithms and artificial intelligence devices together with the increased influence of emotions, reactions and the social ties of investors’ decision. While the first aspects are socially “de-localized”, the second are dramatically socially “localized”.

While technological development and the institutional self-regulation of markets have ideally induced more “detached” conceptualizations of markets as impersonal, mechanistic, “external” forces, growing interdependence of economic agents has induced even more “involvement” by agents, to quote Norbert Elias [1956].

Therefore, super-computing and a global scale, real-time hyper-conduction, have transformed markets into a global, tightly connected “nervous system”, rather than simplifying the decision domain of investors or properly supporting the rationality of their decision. This has refracted uncertainty in investors’ mind, so demanding a dramatic cognitive effort for anyone involved [Beunza and Stark 2012].

## II. “*Heuristicus*” investors condemned to simplification and embeddedness

“It’s easy to lose sight of what constitutes a good credit risk when you spend all day looking at marginal deals. Fortunately, Ken taught me that the key to evaluating a loan started with asking two fundamental questions. If you can answer ‘yes’ to both of them, he’d tell me, then you’ve got a subprime loan worth pursuing. Question 1 - Can the borrower afford to make the monthly mortgage payment? Question 2 – Will closing the loan put the borrower in a better position than he is in today?. At first I thought he was joking. ‘That’s it?’. I asked him. ‘You’ve spent ten years in subprime and your secret is asking if they can afford the payment and are they better off?’. They were simple questions but I quickly realized their true value” [Bitner 2008, 5].

In my opinion, Elena Esposito’s article underestimates a relevant problem: in order to cope with the complex landscape of markets, economic agents need ways to simplify the infinite regression of the “second-order observation”. It seems to me that this is what empirical evidence shows. Recently, experimental findings showed that investors, and in general economic agents, in typical situations of complexity and uncertainty, tend to radically simplify the decision domain by relying on testable heuristics, which also incorporate (imperfect and subjective) social information [Gigerenzer and Brighton 2009; Boero *et al.* 2010; Monti *et al.* 2012]. Recent empirical studies show that even professional, super-technology-equipped traders respond to complexity by following reactive and emotional behaviour and using large-scale e-communication platforms to creatively segment/re-segment their social network of attention [Saavedra, Duch and Uzzi 2011; Saavedra, Hagerty and Uzzi 2011].

These findings indicate that there is no isomorphism between the complexity of markets and decision making. This is corroborated by insiders’ stories and empirical accounts of the recent financial crisis, where the most striking aspect is the mismatch between the operational, effective complexity of financial instruments and markets and the emotive, social foundations of strategic decisions at all levels, e.g., traders,

big players and regulators [Ishikawa 2009; McDonald and Robinson 2009; Tett 2009; Lewis 2010; Mallaby 2010].

This would indicate that, at the end of the day, in order to overcome market complexity, investors must break the infinite regression typical of “second-order” observation. This has important implications for the “anti-embedded” argument suggested by Elena Esposito, as this rupture is “*local*”, in terms of knowledge, vision, information and “*embedded*”, as social networks, communication and sharing of opinions among relevant others are fundamental for investors’ decision. This means that, on the one hand, investors cannot ontologically avoid the constitutive process of “second-order observation”, as correctly argued by Elena Esposito. They are therefore induced to “dis-embed” their view by reflecting on the consequences of their mutual relationships. On the other hand, in order to deal with uncertainty and complexity, they must epistemologically escape from this same level by “re-embedding” their own views.

In my opinion, this challenges Elena Esposito’s argument about the “pre-economic”, “over-socialised” power of “second-order” observation. It also requires us to consider the continuous tension between “involvement” and “detachment”, subjectivity and objectivity (here meant in terms of assigning objective properties to perceived features of reality - including other’s perceptions - and treating these as an objective, external “reality”) and individual creativity and social reflexivity.

### **III. Involvement and detachment: the irreducible dis/re-embeddedness of economic action**

“The growth of men’s comprehension of natural forces and of the use made of them for human ends is associated with specific changes in human relationships; it goes hand in hand with the growing interdependence of growing numbers of people. The gradual acceleration in the increment of knowledge and use of non-human forces, bound up with specific changes in human relations as it is, has helped, in turn, to accelerate the process of change in the latter, The network of human activities tends to become increasingly complex, far-flung and closely knit. More and more groups, and with them more and more individuals, tend to become dependent on each other for their security and the satisfaction of their needs in ways which, for the greater part, surpass the comprehension of those involved. [...]. No one is in charge. No one stands outside. Some want to go this, others that way. They fall upon each other and, vanquishing or defeated, still remain chained to each other. No one can regulate the movements of the whole unless a great part of them are able to understand, to see, as it were, from outside, the whole patterns they form together [...]. They can

only look at whatever happens to them from the narrow location within the system. They are too deeply involved to look at themselves from without” [Elias 1956, 232].

Re-conceptualising certain intuitions made by Norbert Elias in his analysis of the relationship between the individual and the society could be helpful to provide less tautological foundations to observational theory. Following Georg Simmel, Elias developed a sociological theory of knowledge emphasizing the continuous tension between the development of “impersonal”, objectified concepts of reality, which reflects reality as a relatively autonomous order. This is external and is not influenced by human behaviour and the increasing social interdependence and subjective interpretation brought about by individuals. These are often paradoxically condemned as ‘re-subjectifying’ this same impersonal order in an attempt to control it [Elias 1987].

Not far from the focus of observation theory, e.g., the complex relationship between observers and observed systems, he showed that individuals (e.g., scientists and artists) could ideally even detach themselves from the social system they are embedded in, especially by developing institutionalized forms of self-control. Furthermore, he suggested that individuals mostly behave “as if” they were detached and that the relation between detachment and involvement was a continuous tension to be understood, rather than an ontological, taken-for-granted starting point.

By analogy, this approach can be applied to Elena Esposito’s analysis of mutual observations in financial markets. This indicates that, independent of the ontological impossibility of a “true” detachment of investors from reality - as supporters of observation theory would claim – the “reality” of markets is built upon an “as-if” detachment experiment continuously made by individuals. Ultimately, it does not matter if “standing outside” is ontologically impossible, what matters sociologically is that individuals believe “as if” they were “standing outside”. In some cases, this creates unintended social consequences, e.g., financial bubbles and racist ideologies, in other cases, it could even be beneficial, e.g., scientific progress. In my opinion, the implications of the “as-if” experiment and the important role of individuals are not sufficiently considered in observation theory.

In this respect, the case of John Paulson, quoted by Elena Esposito, is interesting. With a group of investors well outside the Wall Street establishment, John Paulson made 15 billion dollars in one single year, more than the GDP of many South America nations with millions of residents. He did it by massively buying mortgage protection and betting against the whole sub-prime mortgage market, which – to his own surprise – generally (with some exceptions) continued to buy sub-prime mortgage-backed securities until the very end. This case reveals that the success of certain

investors depends on their capability to correctly interpret (or “observe”) the interpretation (or the “observation”) of other competitors and in general the market as a whole. At the same time they “detached” themselves from their ‘object’ of interpretation, to counter-act any collective patterns.

This is not an exceptional case of a pure outsider, though John Paulson immediately became a legend. In a fascinating account of the failure of Lehman Brothers, Larry McDonald, a former vice-president of the company, reported many cases of experts, even inside Lehman, who came to the same conclusion as John Paulson and used the same observation point not to make money, but to try to convince the company to step back from excessively risky investments [McDonald and Robinson 2009].

For example, Larry McDonald reported the case of Michael Gelband, an “inside man”, Lehman veteran, head of the fixed income division during the company’s last year. In a meeting on June 6, 2005, so years before the meltdown, he flatly discussed the U.S. real estate market bubble and the excessive amount of leverage in the system, accused certain shadow banks of having created trillions of economic activity around false money, zeroed in on certain reckless government agencies and so on. Accused of being excessively conservative by some colleagues, he envisaged the market suddenly caving in with Lehman getting caught with billion securities without any chance of selling them as all the other competitors were trying to do the same. He tried to persuade the company to step back [McDonald and Robinson 2009, 131-138]. He provided a “different reflexive model” on which he tried to persuade people in his company to change their business models to change the predictable market outcomes, i.e., a global meltdown. It is worth noting that the same happened to other “insiders” in various financial companies, such as Greg Lippman, a Deutsche Bank trader who also influenced Paulson’s view. Another example is Charlie Ledley, who applied a very simple business model: “the best way to make money on Wall Street was to seek out whatever it was that Wall Street believed was the least likely to happen, and bet on it happening” [Lewis 2009, 79ss, 107-08].

As summarised by Gillian Tett, influential markets and finance columnist of the Financial Times, looking at J. P. Morgan and the inter-linkage between big players (and regulators) in the recent financial crisis, “quite apart from whether they were “too big to fail”, they were too interconnected to ignore” [Tett 2009, 225]. This was also confirmed by a recent empirical analysis on the network structure of financial markets and its effects on systemic risk [Battiston *et al.* 2012]. The same was illustrated in the brilliant and informative reconstruction of inter-linkage between governments, market regulators and financial institutions that characterised the tragic

events of 2008, provided by the New York Times columnist, Andrew Ross Sorkin [2009].

To sum up, rather than being purely determined by a vicious cycle of mutual observation, which would have driven the market towards unrealistic evaluations and unpredictable outcomes, the recent crisis was more determined by certain structural aspects of financial markets, which seem to be neglected in Elena Esposito's approach.

### **Concluding Remarks**

“Paulson invited mortgage experts from Bear Stearns to challenge his team to make sure they weren't missing anything [...]. The Bear Stearns team, among the most bullish on Wall Street, began by saying that subprime mortgage losses of more than 3 percent were highly unlikely and that BBB slices of mortgage deals wouldn't fall much. ‘You guys are good customers and we're concerned about you’, one Bear pro said. ‘You guys need to do more research on historical price appreciation’. ‘What are your models based on?’ Paulson responded. ‘The market has changed – now you can get a loan without any documentation. Are you including that in your models?’ ‘Our models are fine,’ the Bear Stearns expert responded, polite but self-assured. ‘We've been doing this for twenty years’ [...]. Scott Eichel, a senior Bear Stearns trader, [...] was struck by the thesis of Paulson team. It sounded too simple for a firm that he suspected had placed billions of dollars of trades. Didn't they understand the complexities of the mortgage market?” [Zuckerman 2009, 155].

If we look at the recent financial crisis, apart from irrational behaviour, the greediness of big financial institutions, bounded rationality of regulators and so on, the most interesting lesson is the incapability of economic agents, including regulators, to view financial markets as complex systems and anticipate the potential implications of collective outcomes on their own business [Fligstein and Goldstein 2010]. During the recent financial crisis, structural aspects played a more important role than observational issues, e.g., the complex forms of inter-connectedness between financial institutions and the systemic structure of markets were paramount. A further development for observation theory could be to investigate how mutual observation is influenced, constrained or amplified by these structural features. I believe these are essential.

Secondly, my impression is that the basic problem is neither the disconnection between financial markets and reality, nor the “objectification” of the reflexive modelling, which dominates the world of investors and the validation of their knowledge.



Although these aspects have attracted great interest in sociology [Callon 2007], I believe there are other important points to focus on. On the one hand, the history of markets includes periods where, after years or decades of social folly, hard facts dramatically knock at the door and markets are reset. This also includes a selection between varying, competitive “performative” models. Surely, models are always “performative”, but market selection implies that some turned out to be wrong, while others were useful. On the other hand, the “objectification” of models is also typical of human life and scientific investigation, to mention only a couple of examples. This is not an epistemic distortion, as it does not postulate *per se* a lack of connection between knowledge and reality.

For example, let us compare financial markets with other social systems, such as science. Also in the latter, “second-order” observation and the “performativity” of models play similar roles (even stronger, probably) but do not have the same consequences, at least in terms of the mismatch between “models” and reality. It is worth noting that scientific citations and scientometrics indicators in science can be viewed as similar scaffolds as prices and ratings in finance. Ideally scientists are competitive agents in a selective environment like investors, but they do not produce unpredictable collective outcomes, e.g., bubbles or collective irrationality, such as in finance. There must be something else characterising the specificity of markets, which is not simply competition and power.

Finally, I would like to conclude by addressing another problem that has important implications to sociologically understand financial markets: the imperialism of econometrics at financial institutions, mostly concerned with extrapolating future expectations from complex, large-scale time series of data. The predominance of econometrics equips neither the regulators nor the investors to understand systemic behaviour or consider extreme events [Helbing 2013]. Interestingly, from an “observational” point of view, by extrapolating predictions from past data, investors objectify reality and elaborate “detachment” concepts where the reference with their “reflexive” construction is lost. Then, everyone realizes that the only way to fix market failures is to rely on “narratives” (e.g., “The New Narratives for Europe”, the project recently launched by José Manuel Barroso) and induce “trust” (“whatever it takes”, said Mario Draghi, the President of the European Central Bank” in his famous speech in London on 26<sup>th</sup> July 2012, to protect the eurozone from collapse). This indicates the crucial role of emotive, “involved” concepts at the heart of the (supposed) “impersonal”, objective market mechanism and would confirm the complex mix of detachment and involvement, mutual observation and operational knowledge on which markets are based.

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## Embedded, scattered, confused minds

### What do hyper-conductive markets impose on investors' social intelligence

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**Abstract:** This article discusses the observation theory developed by Elena Esposito, especially emphasising her critique of embeddedness. My understanding is that observation theory, if pushed to its limits, implies a never ending, infinite regression of meaning, cannot help to fully understand market behaviour. This is true for 'scientific observers' but also for 'field observers', e.g., economic agents. Recent empirical findings indicate that the latter deal with (semantic, ontological and strategic) uncertainty, which is amplified by hyper-conductive, ICT-boosted, global markets, by drastically simplifying their strategies, adaptively segmenting and re-segmenting their epistemic, social "observation" space and creatively exploiting heuristics, emotions and social information. These findings seem to be more compatible with the idea of a continuous process of dis/re-embedding economic action. I argue that the involvement vs. detachment analogy formulated by Norbert Elias in his sociology of science studies could help us to develop an observation theory that does not merge individual and social dimensions and is more compatible with empirical evidence.

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*Keywords:* Financial markets, observation theory, embeddedness, hyper-conductivity, Norbert Elias

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