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# Observing Finance as a Network of Observations

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# Observing Finance as a Network of Observations

*by* David Stark

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## I. “You can observe a lot just by watching.” Yogi Berra

This quote from one of my favorite Yankee philosophers should be the motto of ethnographers. Watching, being there, in situ, with eyes and ears open, in an attitude of curiosity, not knowing in advance what you are looking for but prepared to recognize it when you find it – this is still one of the very best techniques for data collection. But, of course, ethnographers have no monopoly on observing others. In fact, one of the key premises of observation theory as articulated by Niklas Luhmann and developed by Elena Esposito [2011; 2013a] is that society is constituted by this process of mutual observation. In an earlier, extraordinarily rich paper, Esposito proposed the idea that “the real purpose and function of the market... is to provide an arena for the mutual observation of observers” [Esposito 2013a, 10]. In the paper under discussion here, she elaborates this idea in order to apply observation theory to the field of finance and, in particular, to the study of ratings.

Readers who are not from North America might be under the impression that the “Yankee philosopher” of my opening sentence is some New England gentlemen, perhaps akin to the poet Robert Frost. Although some of Berra’s statements do read poetically, Yogi was no country gentleman. But he was, indeed, a Yankee – a New York Yankee – one of baseball’s most outstanding players, the catcher on a repeat

championship team that fielded some of the sport's greatest athletes.<sup>1</sup> In addition to his baseball talents, Yogi Berra was an accomplished quipster, famous for pithy remarks such as "It's like déjà vu all over again," "Never answer an anonymous letter," and "When you come to a fork in the road, take it." Truisms, true; but sometimes more paradoxical and always, curiously, revelatory. Although his succinct account of inflation – "A nickel ain't worth a dime any more" – might seem to be his most telling contribution to the theory of finance, in fact, I'll be using several of his other observations as a device for restating and discussing Esposito's excellent paper.

We begin with Esposito's argument that notions of the economy as having an inside and outside are mistaken. There is no stance from which one can observe the economy from outside. There are different perspectives, to be sure, but none gazes into the economy from a position outside it. You can observe a lot just by watching, as my Yankee friend says. When you do, you see that observations are a part of the world, they are part of the economy. These include the observations by everyday actors as well as those by economists – and even by sociologists. For these reasons, Esposito argues that the framework of embeddedness – with its notions of economy and society – is not a useful starting point for economic sociology. Sociologists are not outside the economy, observing it from some standpoint in society. For Esposito, the economy is not embedded in observations. Observations are part and constitutive of the economy. I agree. And I have argued elsewhere that it is time for economic sociology to move beyond the notion of markets as embedded in social relations, of value nested in values, of economy resting on some mattress of culture [Stark 2009]. Instead of these nets, and nests, and Russian dolls a better metaphor for the economy would be that of the mobius strip—the topological form without inside and outside.

## II. "That place is so crowded nobody goes there anymore."

In Part II of her essay, Esposito adopts the notion of the "Keynesian beauty contest." In such a contest, all the judges are also, in an important sense, the real contestants since they are competing to see who can anticipate, in Keynes words, "what average opinion expects the average opinion to be." Yogi Berra is no John Maynard Keynes, but he does understand the difference between a value investor

<sup>1</sup> New York Mets fans will demand full disclosure so let's get it all on the table: As a kid, I played behind the plate in Little League baseball. Fellow catcher Yogi Berra and fellow Oklahoman Mickey Mantle were my childhood heroes. So, of course, I was a Yankee fan.

and a chartist, the latter like a fashionista on the restaurant or the clubbing circuit who pays attention to the music or the food only insofar as it necessary for the real game which is paying attention to the crowd. The goal in such a contest: to anticipate the crest and still be (figuratively) the first out of the door when the place gets too crowded just before the “music stops” (the stock plummets, the bubble bursts).

Esposito’s use of the Keynesian beauty contest is more sophisticated than a simple chartism. She wants us to see contemporary finance as almost entirely disconnected from materiality. The dominance of derivatives and the prevalence of circularity (note that Keynesians use “specularity” [Dupuy 1989]) results in a situation “abandoning any reference to “objective” criteria (to the outside world) and adventure in the field of opinions and social structures...” [Esposito 2013b, 4]. For Esposito, the metaphor of the Keynesian beauty contest “indicates that financial world is guided by precise, and not random, criteria, which have nothing to do with the actual quality of goods or with the soundness of companies – or with other alleged ‘fundamentals’ of the economy” [Ibidem, 4]. One need not to have adopted some financial theory equivalent of the correspondence theory of truth to note that it is hyperbolic to insist that the financial world has nothing to do with the soundness of companies. I want to focus instead on the notion of second-order observations.

At this point the reader must be reminded that I am operating with the philosophical depth of an American baseball player and so might be forgiven for being confused with all this talk about the differences between Luhmannian first- and second-order observations, leading to Keynesian “third, fourth, and fifth degrees” of circularity.

Esposito labels this section “Beauty contest as second-order observation.” The object of study of sociologists, we learn, should not be first-order observations because “They do not lead the dynamics of operations, which focus instead on second-order observation, the mutual observation of the observation of others, and this up to very high and seemingly inextricable levels of abstraction and circularity.” [Ibidem, 4].

Not frivolously: I am confused about the concept of a “second-order” observation. In the passage just quoted above, a second-order observation is “the mutual observation of the observation of others.” Can I observe your observation? Can you observe mine? If we mutually observe each others’ observations, are these then “second-order observations”? If so, how? What would it mean that I have observed your observation? Of course, I cannot be in your head; I cannot observe your perception. I can, however, observe your stated views or inscribed communications about your observations.

Imagine, for example, that you are a securities analyst. I can read your reports, your estimates about the earnings of a given security. But this is no different – as an order of observation, which is the question at issue – from looking at a stock ticker, or listening to a CEO on a conference call, or reading a company report. Since I cannot read your mind, my reading of your inscribed communication (your “observation”) is necessarily a first-order observation. Perhaps I am (stubbornly) misunderstanding, but I do not see how the “mutual observation of the observations of others” is a “second-order observation,” when it seems, instead, a straightforward case of multi-sided first order observations.

What about watching you observing? Could this be a “second order observation”? Observing how you pay attention – your posture, for example, or your degree of attentiveness – seems to me trivial. In any case, it would still be a first-order observation. Perhaps then a second order observation refers to your observation about my observation, or mine about yours. This very commentary could be seen as a meta-observation, for example, my observations about the observations of Esposito. But meta or not, from a first-order versus second-order problematic this is no different from the securities analyst’s observations (in effect, a report about reports) which we had already established is a first-order observation.

What is important here is that I do agree with Esposito that something is going on, and especially so in the field of finance, that cannot be captured with the notion of a first-order observation. It is precisely because this process is important that I think the language of “observation” might not be the most appropriate analytic tool for investigating the problem. I can observe your observations in the sense of making first order observations of your communications about your observations. But, as valuable, (in many cases, more valuable) than your stated communication would be if I could have access to the interpretive schema that gave rise to your communicated observations. In other words, I would like access to your *model*. In some cases you might wish to reveal your model. But in the more interesting cases, your model (the schema through which you interpret the world and make decisions, including how you interpret your observations about my communications) is proprietary. If you choose not to reveal it, it cannot be observed. But it might be inferred. We will return to this question of the veil of hidden models.

The question is whether Yogi Berra gets the last word or not, and if so, how. Perhaps you can observe a lot just by watching. Perhaps, as well, there is much that you cannot observe by watching. And perhaps there are some things that you can observe but not by watching. That is, it could be that, if I had just been observant enough, I might have noticed that Yogi was trying to alert me all along to the possibility that there could be a difference between observing and watching.

### **III. “The future ain’t what it used to be.”**

In Part III, Esposito amplifies the concept of “moral hazard” in a fascinating way, going beyond the notion that insurance produces new risks. For her, the most interesting aspect of the circularity of observations pertains to uncertainty about the future. And the most troubling aspect is that models that predict the future can and will, by being used, bring about a different world than the one predicted. This is a diabolical circularity: The more a prediction is followed, the more it will modify the conditions on which it was based, and thereby change the world. Now we can understand just how apt is this statement by our Yankee philosopher: “The future ain’t what it used to be.” Observations about the future bring about different futures.

This is the shortest section of the paper under discussion, partly because Esposito has written elsewhere [Esposito 2009, 2013a] and at greater length about this topic. Esposito notes that any model would need to make assumptions about the actions of others. Things get really interesting, she argues, when models become more sophisticated and begin to take into account that others are not simply acting but are acting on the basis of models (which themselves take into account that others are using models, each of which is probability based). As models become more sophisticated, more powerful, and better able to take into account model risk, prices become more volatile and the system as a whole less predictable. That is, the reliability of models contributes to the unpredictability of the system: “Under these conditions, every reliable forecast is destined to falsify itself, because the future reacts to the expectations imposed on it – where every additional reliable forecast contributes to an increased unpredictability of the future” [Esposito 2009, 370]. I am far from conversant in matters of probability theory so you should not rely on my summary. But in the spirit of a Yogi Berra quip, it would read: It’s probably improbable that improbability will last.

### **IV. “If the world were perfect, it wouldn’t be.”**

How then does one calculate in the Keynesian third degree (attempting to ascertain what the average opinion considers as the average opinion) under conditions of diabolical circularity (when uncertainty about the future is generated by attempts to predict the future)? With everything in an uncertain motion, to what can I tether my algorithm? Esposito answers that ratings provide such a fixed point of reference. To fulfill this function, ratings do not need to be perfect. In fact, their function as a point of reference, Esposito argues, can be detached from their predictive function. What matters is that they provide a common standard, “a shared and visible refer-

ence, an opinion that is available to everyone and that everyone knows to be known (even if one doesn't know what they will think of it)" [Esposito 2013b, 11]. In a situation of the generalized invisibility of others' observations, it is not the correctness of ratings but their high visibility that gives them value.

**V. "If you don't know where you're going, you'll wind up somewhere else."**

Esposito's paper prompted me to think again about my own research on finance. I didn't know exactly where I was going in that work, but I now see that I am ending up quite close to observation theory even though I had not previously understood the explicit connection. For example, in a recent paper, "From Dissonance to Resonance: Cognitive Interdependence in Quantitative Finance" [Beunza and Stark 2012], Daniel Beunza and I ask the question: How do traders deal with the fallibility of their models? In particular, how do they deal with the fact that, in identifying patterns in the markets, these same instruments can also blind the trader from seeing some things. As instruments of perception – and indeed, like the optic nerve itself which allows us to see but must also produce a blind spot – models that reveal also conceal.

How does the trader avoid such cognitive lock in? The answer is that traders leverage the fact that other traders are observing from a different vantage point. The traders at the merger arbitrage desk we studied could not observe what is on their rivals' screens. That is, as a trader I cannot observe your observations directly, and I don't have access to your model. What I would like to do is make reasonable inferences about your model. Beunza and I show that, in the case of merger arbitrage, traders place on their screen an image of the "spread plot" which they skillfully use as a representation of the aggregate views of their rivals.

When the spread plot moves in a direction different from one's own estimates, traders can ask, "What am I missing?" and make corrections in their models. In itself, watching the spread plot is a first order observation. But when the spread moves in a different direction than the estimates derived from my proprietary model, the resulting triangulation is a second order observation that allows me to make inferences about how you are interpreting the world which can cause me to reflect on (to think again about) my own model. Such "reflexive modeling" can help an individual trader to avoid disaster. But it should come with a warning label: when the system lacks requisite diversity, the cognitive interdependence can create positive feedback that yields an arbitrage disaster – such as the \$2.8 billion in losses to merger

arbitrageurs (including the team we studied) in the GE-Honeywell deal. When the system lacks diversity of viewpoints, the same practices that do prove effective in mitigating individual cognitive lock in can lead to a collective lock in of enormous proportions.

Beunza and I base our argument on extended ethnographic observations of merger arbitrageurs in the derivatives operation of a major international investment bank on Wall Street. This paper was drawn from observations of one merger arbitrage desk in one trading room (in fact, further limiting our account to what transpired on a single morning). In a subsequent paper, Matteo Prato and I use a very different method – a statistical analysis of 10,933,662 pairs of securities analysts' estimates on US publicly listed firms' earning per shares – to study the effects of social structures of observation on valuation.

“Attention Networks: A Two-Mode Network View on Valuation” [Prato and Stark 2013] builds on the observational theory principle that valuation depends on the contingent viewpoint of the observer and on the views expressed by the observed. The observer's viewpoints and observed views are for us embedded in the evolving two-mode (agents-assets) network structures of attention that characterize financial markets. Our argument starts with a simple question: What does it mean to focus on a financial asset?

One way to think about this is as a singular relationship of an actor to the asset. Another, quite popular way among sociologists, is to think about an actor examining an asset in relationship to an abstract category. We take a different view: Instead of positing that it is the “structure of classification that guides valuation” [Zuckerman 2004, 411], we argue that it is the structure of attention that guides valuation. In place of arguing that valuation is embedded in socially constructed categories, we argue that it is shaped by networks of attention.

We define an attention network as an evolving network created by multiple agents allocating their attention and expressing their judgments across multiple situations. Valuation, we argue, is shaped by an actor's location (or viewpoint) within such an attention network. That is, as a first step, we propose to study the relationship between paying attention and allocating attention. Focusing attention and allocating attention are not so very different. The objects across which one allocates attention are the ground against which the figure can be seen. If we as researchers can know the other objects that an actor has in her field of view, then we know the viewpoint from which she makes an assessment.

In assessing a focal situation, actors can make associations, analogies, and comparisons with the other situations that are present in their portfolio of attention. Specifically, a feature viewed as salient for evaluating one issue might be recognized as



relevant for another. That is, the issues across which an actor allocates her attention will shape the properties that are selected as salient and worthy of consideration when assessing the focal situation.

We refer to this as the viewpoints effect. Our first proposition is that valuation is perspectival: One's assessment of an issue is shaped by one's viewpoint, given by one's contingent portfolio of attention. We hypothesize, specifically, that two actors who assess a given situation vis-à-vis a similarly (differently) composed portfolio of other situations are more likely to autonomously converge (diverge) in their interpretations of the given situation.

Viewpoints are the first but not the only step in developing an observational network approach to valuation. Building on the second relational property of attention in a two-mode observational network (i.e., links among the competitors who pay attention to the same market issues), we expect that market actors are more likely to come across the assessments of the competitors who focus their attention on the same issues. When two competitors allocate their attention across more similar portfolios of problems, their views become prominently visible to each other. Associations made by one actor become noticeable to the other and vice-versa. Conversely, mutual exposure would be limited when two competitors are not in their respective fields of vision because they are allocating their attention to different market aspects.

Thus, our second proposition, referring to the views effect, is that valuation is doubly perspectival: actors' valuations are not only shaped by their contingent viewpoints, given by their fleeting portfolios of attention, but also by the views of others, which themselves are shaped by their changing viewpoints. We, therefore, further hypothesize that, the more (less) two actors have encountered the same third actors' views on the other situations to which they have not been attentive jointly, the more their interpretations of a given situation will converge (diverge).

We test these propositions in the context of securities analysts, whom we might think about as professional observers. In particular, we study the end of year earnings estimates that securities analysts make about the firms in their portfolio of coverage. Our findings support the idea that an actor's position in an observational network – via viewpoint and selective exposure to others' views – shapes valuation.

Our analysis shows, in the first instance, that an analyst's estimate of the end-of-year earnings per share of a given security is shaped by the other securities in her field of view. In terms of Podolny and Hill-Popper's [2004, 91] insight that valuation takes place from the "particular orientation of an individual to an object of exchange," we found that, when evaluating a given security, an analyst is not facing that security alone. In place of a singular relationship – a given analyst to a given security – we

found a more multi-sided set of relations. The security is not alone. As our findings indicate, it is evaluated in terms of the other securities that are in the analyst's field of view.

Our analysis further demonstrates that analysts' estimates are influenced by the views of other analysts with whom they shared stock coverage and that these effects are amplified when individuals shared attention patterns with the same third parties. How does a given analyst search when she knows that she has limited cognitive abilities? Our answer began with a simple proposition: The analyst is not alone. Again, the relationship between analyst and security is not a singular one – there are multiple analysts evaluating that security, each of whom is simultaneously evaluating other securities. Given limited individual cognitive abilities, analysts leverage this multi-sided relationship. Just as the view of the focal stock is not only shaped by the information on that security but also by the other securities that form the background, so we argue that the view of the focal stock it is not shaped only by the views of others about that security but also by their views of other securities that are not shared.

If my views are shaped by my peripheral vision and yours are shaped by your peripheral vision, then to the extent that we mutually influence each other, we can say that my views are shaped, in part, by your peripheral vision.

Our sociological account of valuation exploits two-mode networks as a method of analysis. Objects are located within a network structure of attention given by the actors who observe and evaluate them. Meanwhile, actors are also located within a structure of attention given by the ties that connect them through the objects they observe and evaluate. Note the peculiar feature of this network. There are no direct ties among the agents. They are not proximate because of some personal connection. Their location in the social space of attention – their proximity to or distance from each other – is a function of ties formed through objects. In mapping these networks, we chart socio-cognitive networks.

Whereas problems like the Keynesian beauty contest are stimulating economists to think about intersubjectivity [Fullbrook 2001], we think about our adoption of two-mode network analysis as a method for studying interobjectivity.

## **VI. Conclusion: “It ain’t over ‘til it’s over.”**

Heinz von Foerster's “We don't see what we don't see” might well have been a Yogi Berra aphorism – for both men appreciated that a good tautology can be informative. Does observation theory have a blind spot? Of course, it must. To the extent that it provides a lens to see, it must also conceal some element or moment

or instance from observation. Every theory has a blind spot. In place of the singular “I am a Luhmannian” (or the equally singular, “I am an ethnographer,” or “I am a network analyst”), the corrective is binocular theoretical vision. To the plea, “Oh, but surely you, just like I, need an identity,” one can reply that a real identity is one that is with the discrepancy, at the difference, within the dissonance. Dante expressed it slightly differently in this passage from the Purgatorio of *The Divine Comedy*: “Fix not thy mind on one place only.”

Dante’s injunction is good advice to address the problem of getting trapped in your own successes. A sociological double vision can help to avoid such cognitive lock-in. Of course, double vision is a kind of malady, things are out of focus. But “focus” can be overrated, especially if it’s the single-minded variety.

We so often hear advice, whether it is to organizations or, for example, to our students: “Get focused!” But, continuing with this visual metaphor, there is also something to be said about the importance of peripheral vision. It’s critical for athletes. It’s a useful and necessary skill for moving very quickly together with many other people, going in different directions, as I’ve been aware when navigating from one subway line to another during rush hour in the Times Square subway station. And it’s vital for organizations. In highly uncertain settings, you should not be locked-in looking ahead (in the doubly mistaken view that the future can be foreseen and that it must necessarily be ahead) but must also be attentive to the movement that is happening around you. Peripheral vision achieves awareness of that movement.

In science, as for organizations, the binocular has benefits. We are blind to our blind spots, von Foerster tells us. We cannot find a point from purely outside, as if in some kind of aerial sociology, objectivity and/or reflexivity were a function of distance. We are always inside. There is no mobius strip social theory. In place of no inside/no outside we can operate in another topological form – the structural fold – inside more than one community [Vedres and Stark 2010; De Vaan, Vedres, and Stark 2012]. In this way, we can strive for reflexivity as a property not of an individual but of a collectivity. What’s better than an observation? A conversation.

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## Observing Finance as a Network of Observations

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**Abstract:** This essay contributes to observation theory by commenting on Esposito's paper, "Economic circularities and second-order observation: the reality of ratings." The key question of that paper is summarized as: How does one calculate in the Keynesian third degree (attempting to ascertain what the average opinion considers as the average opinion) under conditions of diabolical circularity (when uncertainty about the future is generated by attempts to predict the future)? Esposito answers that ratings provide a fixed point of reference not because they are accurate but because they are highly visible. The second half of the paper is itself a second-order observation. It uses another viewpoint (that of observation theory) to reinterpret my earlier ethnographic and network analytic research on finance.

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*Keywords:* Observation theory, attention networks, financial models, reflexivity, valuation

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