

*Ontology of finance: an introduction*

Gloria Sansò and Barry Smith

In his introduction to *The Ant Trap* (2015), Brian Epstein claims that philosophers (more precisely, *ontologists*) have a delicate task, which is to identify the building blocks of the social world. This is not in itself surprising. Identifying the components of reality is exactly what philosophers (and more precisely, *ontologists*) have always done. What is different now is that, according to Epstein, performing this task is not a theoretical exercise for its own sake. Indeed, identifying the building blocks of the social world would allow social scientists to gain a deeper understanding of this world and, as a consequence, to improve their models and predictions. Consider, for example, the 2007-2008 financial crisis: the fact that economists had serious difficulties in seeing it coming is, Epstein says, evidence that their models were flawed. On one hand, this flaw was more than likely due to questionable methodological choices, such as creating models that poorly reflect the real world. On the other hand, it seems equally obvious that, in order to design realistic and effective models, one needs sound metaphysical assumptions relating to the domain of interest.

Epstein’s arguments are convincing. But they provide only part of the story. In addition to being well-designed, a model, in order to work effectively, needs reliable data which, unfortunately, may be difficult to get. In the financial sector, for example, the existing information systems have been shown to lack the capacity to enable the institutions involved – for example each bank – to produce an accurate accounting of its own state of financial health (Basel Committee 2013: 1). If one cannot have a realistic picture of individual financial institutions, however, then one certainly cannot have a realistic picture of the state of the financial market as a whole. In addition, information systems used in the financial sector have also shown that they are unable to facilitate what is technically called “data interoperability”, which is the capacity systems may have to exchange information from one to another in such a way that the recipient can understand and use the information he receives in the same way that he can use his own information. Lack of data interoperability greatly compromises, for example, the ability to track the securities that have been issued and to find out who owns them, who has used them as collateral, and so forth (this problem emerged in dramatical form during the Lehman crisis; see for example Helleiner 2011: 71). Being unable to *find* securities is a serious problem not only when one needs to identify *who* is holding a given toxic asset, but also when one needs to estimate *how many* toxic assets in total are out there. This second piece of information, too, becomes vitally relevant if one aims to assess the state of the market as a whole. Interestingly, the solid social metaphysics wished for by Epstein, in addition to helping improve our financial models, could also have a role in improving our information technology and, therefore, the quality of the data to feed into the models. Indeed, such a metaphysics could be used as a foundation (or at least, as point of reference) for building an applied ontology of finance. By “ontology” we mean, with information and computer scientists, an artifact representing a portion of reality by providing terms that refer to the entities and relations specific to a given domain (Arp et al. 2015: 1; Guarino et al. 2009: 2).

In the case of an ontology of finance, for example, some of the terms to be included would be: “transaction”, “debt”, “currency”, “stockholder”, but also “buying”, “selling”, and “investing”. All of these terms would need to be defined unambiguously within the framework of a single, logically well-constructed ontology, in order to clarify the nature of the things they refer to and of the relations between them.<sup>1</sup> Such a detailed representation has a practical aim, which is helping to manage data and to do this in a way that promotes interoperability between information systems. In particular, an artifact representing financial entities would be a valuable tool for banks and other financial institutions because it would assist them in better organizing their data and in producing more accurate and more easily understandable reports on their own financial state. Moreover, such an artifact would also allow the computer systems of these institutions to more easily exchange information and this, in turn, would help tracking transactions and securities.

This special issue of *Rivista di Estetica* collects original research papers exploring the financial world from a metaphysical point of view. Although these papers certainly do not exhaust the philosophical issues associated with finance, they are a step toward a better ontological understanding of this specific portion of the social reality. This is valuable for both theoretical and practical purposes. Indeed, if the analysis proposed above is correct, then this special issue can contribute to improving financial models, on the one hand, and to the information technology used by financial institutions, on the other.

In his *What is a financial crash?*, Emiliano Ippoliti proposes a review of the main theoretical positions concerning what financial systems are, and he describes how each theory would account for the phenomenon of financial crashes. Ippoliti argues that, even though these theories differ considerably, it is still possible to identify certain ontological and epistemic preconditions that are assumed by all them. The role of these preconditions is then well-illustrated in the case study of a rapid price drop. This case study makes it clear what effect these preconditions have in terms of a scenario involving two artificial agents which illustrates the behaviors each may adopt in the trading process.

In *Economic performativity: beyond binaries?* Jack Mosse deals with the problem of performativity in economics. In economic sociology, some scholars raise doubts concerning the idea that economics merely describes reality: it seems evident, they say, that economic models, by influencing people’s behavior, *create* the reality. After unpacking in detail this performativity thesis, Mosse shows that, in its attempt to go beyond the modern ontological binaries such as the object/subject dichotomy, this thesis ultimately fails.

Simon Derpmann, in *The walking debt*, presents an original ontological characterization of debts. Nowadays, debts are sold and bought as if they were commodities. However, Derpmann argues that debts are far from being commodities. The buyer of a debt is not acquiring a thing, but a social relation connected to the debt. His account works instead with a theory of social relations. By buying a debt, a person becomes a successor to the original holder of a position in a pre-existing social relation. It is in virtue of this that there arise the deontic powers associated with debts.

---

<sup>1</sup> We hope in due course to publish a complementary study on the status of the Financial Industry Business Ontology (FIBO) in this respect.

In *Ownership, preferences, and offers*, Gloria Sansò presents some remarks on the *Action Theory of Exchanges* (ATE) according to which, in an exchange involving goods, an agent transfers the ownership of those goods to another agent. The expression “transferring ownership” is, however, ontologically problematic since it is not clear what is denoted by the term “ownership”. The ATE claims that an exchange is motivated by the agents having convergent preference. Sansò claims that, while this condition is necessary for an exchange to occur, it is not sufficient to motivate the decision to enter into an exchange. Finally, Sansò also provides a characterization of “buying” and “selling” that, in addition to being compatible with the ATE, has the merit of accounting for both monetary and non-monetary exchanges.

Noriaki Okamoto in *Hierarchy and heterarchy in (impact) finance* proposes an interesting reflection on different organization systems. Okamoto argues that, in finance, the process of quantification inevitably leads to the creation of hierarchies. However, when one of these hierarchies becomes outdated, a heterarchy can be created. A heterarchy is a system whose elements are unranked from the power perspective. Impact finance can be seen as an example of heterarchy insofar as it includes investments that have not only a monetary return, but also a social impact. Since the social impact cannot be easily expressed in monetary terms, the investments (and the investors) cannot be ordered hierarchically. However, as Okamoto points out, the tendency to monetize leads, in the end, to strategies for quantifying the social impact, and this converts the heterarchy into a hierarchy.

Finally, in *From Babylon to Bitcoin*, Dean Rickles proposes a characterization of money that is compatible with the interdisciplinary field of econophysics, a field in which the theories and methods developed by physicists are used to address problems in economics. Rickles starts with a discussion of the constructivist approach which focuses almost exclusively on the creation of the single tokens of money, and describes the shortfalls that result from the perspective of obtaining a bigger picture of economic reality. He then draws comparisons between money and the ontological status of what, in physics, is called “gauge freedom”.

## *Bibliography*

Arp, R., Smith, B., Spear, A.

— 2015, *Building Ontologies with Basic Formal Ontology*, Cambridge (MA), MIT Press.

Basel Committee

— 2013, *Principles for Effective Risk Data Aggregation and Risk Reporting*.

<https://www.bis.org/publ/bcbs239.pdf>

Epstein, B.

— 2015, *The Ant Trap: Rebuilding the Foundations of the Social Sciences*, Oxford, Oxford University Press.

Guarino, N., Oberle, D., Staab, S.

— 2009, *What is an ontology?*, in S. Staab, R. Studer (Eds.), *Handbook on Ontologies*, Berlin, Springer: 1-17.

Helleiner, E.

— 2011, *Understanding the 2007-2008 global financial crisis: lessons for scholars of international political economy*, “Annual Review of Political Science”, 14: 67-87.