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Positivism in finance and its implication for the diversification finance research

Diversifying finance research: From financialization to sustainability

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ABSTRACT

This paper is a complementary comment to the article recently published in IRFA by Thomas Lagoarde-Segot on the necessity of diversification of modelling in finance. In his claim, the author explained that financial concepts used by the mainstream are not neutral because they refer to a particular ethical judgement mainly focused on the shareholders' interest. In this comment, I explain that this ethical judgement historically results from the role playing by the Gaussian distribution in finance: while this statistical framework gave the first scientific foundations to finance in the 1960s, its symmetrical configuration implies that negative changes occur with the same probability than positive ones. In this context, all potential intervention (regulation) could only interfere (disturb) this "ethically fair situation" within the only perturbing element is the shareholder whose behaviours are likely to influence the market. After having explained that this reasoning is based on an a priori statement about observational facts (in opposition with positivism), I present this situation as an opportunity for current researchers in finance to clarify their implicit assumptions; which would open the door to a diversification of modelling in finance as Lagoarde-Segot promoted it in his IRFA article.

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1. Introduction

In a recent article entitled "Diversifying finance research: from financialization to sustainability", Lagoarde-Segot (forthcoming) offered an interesting epistemological analysis of the financial mainstream. After having mentioned "that academic finance research belongs almost exclusively to the positivist functionalist paradigm" governed by an "objectivist ontology", Lagoarde-Segot (forthcoming, p.2) promoted a diversification of finance research. The author's argument is clear and well explained: the financial mainstream is founded on a positivist epistemology implying a dichotomy between values and facts (data) within theoreticians usually associate statistical analysis of data with "facts". As Lagoarde-Segot (forthcoming) explained it, that way of doing research is epistemologically naïve since it wrongly assumed a possible

distinction between facts and values suggesting that the first can describe financial reality in a neutral way. I agree with the Putnamian argument proposed by the author when he wrote that the financial concepts are not neutral since they "reflect certain categories of thought which could perhaps be summarized in one ethical judgement: shareholders have priority over all other stakeholders of the firm" (Lagoarde-Segot, forthcoming, p.6). In this short paper, I would like to discuss this claim by presenting it as the result of a specific a priori (in opposition with positivism). In this context, I will explain that, although the financial mainstream seems to be founded on a positivist rhetoric, the methodology really used in scientific practices is rather based on a priori assumptions which is actually in opposition with the so-called positivist roots of finance. In the third section, I will present this gap between the positivist rhetoric and the not-so-positivist practices as an opportunity to promote a diversification of financial modelling in line with Lagoarde-Segot (forthcoming) promoted in his article.

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2. Positivism and the reject of synthetic a priori statement

According to positivist rhetoric, the purpose of science is seen as being to describe what can be observed and measured (Uebel, 2006). Positivists believe in a logical empiricism and the idea that observations are the core of all scientific research. Given this empiricism, the positivist framework calls into question the separation of the natural and human sciences: whatever the field of research, scientific knowledge should be empirically founded and logically true. The link between logic and empiricism was developed by Carnap (1937, 1966) who introduced two kinds of statements: analytic and synthetic. Analytic statements are propositions whose predicate concept is contained in their subject concept. They are true or false by virtue of their logical forms. These a priori statements are true by definition, and they do not express factual truths. Synthetic propositions are not axiomatic since predicate concepts are not contained in their subject concepts. The truth or falsehood of these statements can only be determined by means of experiments. Synthetic a priori statements (a priori proposition referring to observational facts) are therefore rejected by positivists because they lead to the creation of knowledge without an empirical base. In this perspective, synthetic propositions must be based on empirical laws that are “laws containing terms either directly observable by the senses or measurable by relatively simple techniques” (Quine, 1951, p.337). In other words, factual truths (empirical statement about the world) cannot refer to an a priori argument.

Although mainstream economics and finance is said to be based on his empiricist methodology, this claim is often vague. Some authors showed that the positivist dimension of economics is exaggerated. By exposing the ambiguity of economic propositions, Mongin (2003, 2005) has shown that positivism is not really the most appropriate framework to describe the economic mainstream methodology. Block (2003) and Boland (1989, 1997) have argued that the positivist stance in economics is mainly a matter of rhetoric. The following section will extend these critiques to finance where the “objectivist ontology” enhanced by the mainstream implicitly favours the development of an econometrics-based research.

3. The ambiguity of financial positivism

Econometrics is often considered as the spreadhead of the empirical dimension of economics and finance. Although econometrics is often presented as an empirical field with deep roots in the logical positivist tradition (Spanos, 1986), this belief in a neutral observation of economic phenomena also shows contradictions with positivist approach. Indeed, there exists a literature (Caldwell, 1982; Mirowski, 1989; Lawson, 1989; Morgan, 1990; Dharmapala and al., 1996) emphasising that econometric methodology is often used as a measurement of theoretical relationships. Actually Dharmapala and al (1996) explained in details how the parameterization of exogenous variables in econometrics requires a priori restrictions derived from economic assumption\theory that econometricians want to test. The authors added that “the treatment of theories as a priori true violates the spirit of the logical positivist approach to science” (Dharmapala and al. 1996, p.14). By using economic theory to set up the initial conditions of the formalized systems, the “model becomes an a priori hypothesis about real phenomena” (Haavelmo, 1944, p.8). More precisely, econometric methodology implies a synthetic a priori statement axiomatically defined but referring to economic facts. However, as explained in the previous section, this kind of synthetic a priori statements are explicitly rejected by positivism. A data-based methodology is not a sufficient condition to be associated with a positivist framework, the way of implementing this methodology must also be net of any a priori statement.

We can illustrate the existence of this a priori statement in finance by analysing the methodology usually implemented by neoclassical finance to deal with stylized facts such as fat tails or financial crashes.

Financial economists usually consider that price changes obey a lognormal probability distribution with a kurtosis around zero (a mesokurtic distribution). In this context, the Gaussian framework became very important in finance for historical and methodological reasons related to the emergence of finance as a scientific field. More precisely, this statistical framework contributed to the “scientification” of finance by allowing the pioneers (Markowitz, 1952 and Sharpe, 1964) to give empirical and logical foundations to this emerging field.¹ At that time, the Gaussian framework and its Normal distribution was a popular statistical approach well-known for its convenience (i.e. only variance and mean are required to describe the whole distribution). Although Markowitz (1952) acknowledged that other distribution could better suit for describing financial prices, he chose the Gaussian frame for its simplicity explaining why the Gaussian framework became the statistical environment in which the key financial models (Portfolio Theory, CAPM, Black and Scholes Model) have been developed.

The importance of this Gaussian perspective has also an ethical justification since the statistical normality can justify that markets are fair (Jovanovic, 2001). Indeed, the Normal law is a symmetrical distribution around its average implying that negative changes occur with the same probability than positive ones. In other words, all investors face with the same trading conditions and no intervention\regulation² is therefore required since, in average, the market gives ethically the same chance to all investors. Of course, theoreticians know that financial data do not follow a “perfect Normal law” but they often describe the evolution of financial returns through a Gaussian distribution (unconditional distribution) whose variations are associated with another (conditional) distribution (which is not necessary Gaussian).³ There exist a lot of theoretical discussions about the measurement of errors which can be seen as the statistical consequences of the impossibility to deal with the ceteris paribus assumption in practices (Bierens and Swanson, 1998). Indeed, according to this clause, the effect of some causes can be studied in isolation of other influences. However, because financial econometricians work on the dynamics of financial returns, all influences contribute to the dynamics of prices modifications. This impossibility to isolate some influences from others led economists to define an error parameter paving the way to measure of errors through statistical treatments of the disturbances.⁴ IN accordance with I wrote above, all key econometric models dealing with disturbances are based on an “improved Gaussian framework” within the major trend is assumed to be Gaussian (unconditional distribution) while the large variability observed in the empirical data are associated with a no-Gaussian distribution (conditional distribution) describing the disturbances. This statistical treatment of errors usually assumes that massive fluctuations are very unlikely implying that a financial crisis has a very small probability of occurrence. From a positivist point of view, the importance of the Gaussian framework appears to be an a priori statement. Mandelbrot (2004 p.4) argued that economists' a-priori-ism leads them to under-estimate the likelihood of a financial crash: “The standard theory, as taught in business schools around the world, would estimate the odds of that final, August 31 [1998] collapse at one in 20 million” – However, as Kahana (2005) pointed out, there were several financial crises during the twentieth century. This situation generated a lot of debates (McCauley, 2006) and some authors (Keen, 2003, p.108) even claimed that “pivotal concepts from modern economic theory are empirically and logical flawed”. In this context, the positivist dimension of the economic mainstream seems to be, above all, a rhetoric justifying the scientific approach of finance\economics.

¹ See Jovanovic (2008) for further details on the debates between proponents of statistical approach and chartists in the 1960s.

² This free-market approach is often called neoclassical finance (Stiglitz, 2010).

³ I refer here to ARCH-type models. Of course, one can find no-conditional modelling (see Mantegna & Stanley, 1999 or Broda, Haas, Krause, Paoletta, & Steude, 2013) but I am dealing here with the financial mainstream.

⁴ See Broda et al. (2013) for a literature review on the econometric models dealing with the disturbances.

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