

The Financial Simulacrum

The Consequences of the Symbolic and Technological Virtualization of the Financial Market

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Abstract

In a first step, we present what we call the “symbolic virtualization” that illustrates the “consumer-oriented” dimension of finance where recent marketing methods present the financial market as a “fashion game”. We also emphasize the speculative impacts of this evolution. We introduce then what we call the “technological virtualization” of finance, that derives from the growing computerization of finance mainly characterized by the automatic trading and the e-finance. The third part of the paper show that this double virtualization in finance allows us to consider the financial market as a “hyper-market”. We use this term to emphasize the “consumer-oriented” dimension of finance and to present the financial market as a result of the hyper-reality described by Baudrillard. In the last section, we show that this hyper-reality allows a plurality of theoretical interpretations of the financial reality. That is why the fragmentation of knowledge that we can currently observe in financial economics can be considered as the epistemological consequence of the hyper-reality in finance.

Introduction

Historically, the two main drivers of the financial interaction have been the need for venture capital and the need to share the risks inherent to any trade activity. We find the origins of our contemporary stock exchanges in the commercial fairs organized in Europe during the 14th and 15th centuries. The purposes of these financial marketplaces were to raise capital to finance entrepreneurial projects or to hedge risky commercial positions¹.

In 1617, the creation of a secondary market in some Dutch commercial fairs represents a significant step towards our contemporary vision of the stock markets. The existence of a secondary market² has favored the mobility of savings across markets and the liquidity of the financial assets. According to several authors³, this development of a secondary market combined with the emergence of the financial derivatives has progressively favored the speculation activities. Moreover, the secondary market has increased not only the liquidity of the financial assets but also the liquidity of the underlying goods. Besides, in order to improve the interactions efficiency, material exchanges of goods have been replaced by hand-to-hand exchanges of certificates. Transformed by these evolutions, the commercial fairs were not that far from the stock exchanges that we know today.

Even if the development of financial products and the improvement in the marketplaces organization have been continuous since the 17th century, the last three decades have been

¹ Baskin and Miranti (1997) – p.29-54.

² The secondary market is a public place where trading takes place and where one can buy or sell financial assets that were already issued without waiting for the maturity of the assets. Jacquillat and Solnik (1995) – p. 11.

³ Poitras (2000) – p.255 and Klindenberger (1989)

marked by a sharp and astonishing increase in the complexity of the financial reality. There seem to be two main causes to this evolution : the growing sophistication of financial products and the effects of the technological progress on the financial interaction.

We propose to make a parallel between the current evolution of the financial markets and the revolution that the financial marketplaces faced during the 17th century. Indeed, without going into details, we can observe in both times an increase in immateriality due to the sophistication of the products and to the deep change in the organization of the financial marketplaces.

Our objective in this paper is to show that the contemporary evolution of finance can be considered as a double virtualization of the financial reality : a symbolic virtualization and a technological one. We will see that the new “consumer-oriented” dimension of the financial market tends to favor a “symbolic virtualization” of the financial reality because financial markets are presented as a game that we have to play if we want to be “in”. In this paper, we will also evoke the “technological virtualization” generated by the computerization of finance. The “consumer-oriented” evolution and the computerization in finance have resulted in an increase of the liquidity and the immateriality of the financial assets and have also generated in both cases a multiplication of the speculative behaviors.

Structure of the paper

In the first section, we will see that the sophistication of financial products allows the development of a more and more “consumer-oriented” dimension of the financial market. We will also emphasize the fact that all this symbolic virtualization has led to an increase of the speculative activities. The second section will be dedicated to an analysis of the technological virtualization of the financial market. Some important applications of the new technologies in the financial market will be studied : the automatic trading and the e-finance. In the third section, we will use the term “hyper-market” to characterize the contemporary financial markets. We have chosen this term on the one hand, to recall the “consumer-oriented” dimension of the contemporary financial places and on the other hand, to refer to the concept of hyper-reality developed by Baudrillard (1981). To conclude this paper, we will investigate the epistemological consequences of the virtualization of finance by studying the impact of what we call the new financial hyper-reality on the current evolution of financial economics.

SECTION 1 : The symbolic virtualization of finance

For the last three decades, financial innovation has become a very important dimension of the financial reality. We will see in the next section that the development of more and more complex products has been made easier by the progress in computer science that has decreased the calculation time. We will show in this section that the financial innovation illustrates the new “consumer-oriented” dimension of our contemporary financial reality.

However, it is useless to provide more sophisticated products if nobody is ready to buy them. We must then not forget that the basic objective of these new products is to satisfy the growing complexity of the investors needs. The evolution of these investors needs may be influenced by a multiplicity of factors such as changes in the financial regulation or changes in the taxation system. Among these factors, one can also underline the increasing volatility of some macro-economic factors (interest rates, exchange rates, ...) which have led investors to ask on the one hand, for complicated hedging solutions and on the other hand, for complex speculative products to take profit from this high volatility.

Jacquillat and Solnik (1995, p.252) list more than twenty-five new financial products that have appeared recently. In consequence of this evolution, a prolific literature has emerged about financial innovation. Some authors try to understand and explain the financial innovation itself. Bettzuges and Hens (2001), for instance, study the evolutionary dimension of the financial innovation by presenting the sophistication of the financial products as a result of the growing complexity of the investors needs. Moreover, one can find interesting surveys about the impact of the financial innovation on the financial markets themselves.

According to Artus (1995, p.44), the sophistication of the products (often combined with changes in the financial regulation as it is the case in France) tends to require a higher professionalization of the assets holders. Artus first explains that this requirement has the effect to reduce the average investment horizon (because the performance of professional asset managers is often measured in the short term) and to favor mimetic behaviors (because asset managers are often evaluated on the basis of some market benchmarks). Moreover, according to Artus, the sophistication has generated a higher volatility on the markets because the professional financial actors have generated an increase in the speculative activities compared to hedging activities. Because the variety and complexity of financial products enlarge the contemporary sphere of speculation, Shiller (2003, p.14) considers also the increase in the speculative activities as a potential problem resulting from financial innovation.

Orléan (1999, p.45) thinks that the emergence of complex products such as the derivatives has increased the liquidity but also the volatility of the financial (stock) markets. Orléan (1999, p.45) recalls, by the way, that the concept of market liquidity is a socially constructed idea created by finance professionals. He also mentions that finance has left aside its initial goal which was to raise capital or to finance entrepreneurial activities. According to Orléan, finance is now almost totally dedicated to speculative activities. That is why he evokes the “virtual character” of finance to express this disconnection with the productive sphere. Over the contemporary legitimacy of speculation, it is interesting to mention Godechot (2001) who underlines the fact that speculation (not well accepted during the previous centuries) has been legitimized thanks to the contemporary belief in a economic equilibrium dictated by the financial markets.

The sophistication of financial products is also said to have allowed a personalization of the financial services (Fain and Roberts, 1997). Indeed, the new financial products are supposed to satisfy the increasing complex needs of investors while at the same time, with the multiplication of the finance products, each kind of investors can find products in accordance with their specific financial needs. How far can the personalization of the financial services go? Shiller (2003, p.4 and 5) explains that, within several years, financial products will protect people against catastrophic risks. Moreover, workers will be able to protect themselves against the risk of losing their jobs or against the risk of being in competition with foreign workers ready to accept lower wages. Institutions will also be able to hedge against changes in the economic conditions of their environment.

According to Shiller (2003, p.10), with the use of new marketing methods, financial products can now be advertised in a fashioned and consumer-friendly way. For instance, some financial products are presented as specifically created for a particular kind of investors as they are said to be optimally adapted to their risk profile. While some professionals try to take advantage of the preferences of investors for stocks of home-country firms (“home effect”), other professionals, on the contrary, praise the advantage of international diversification while advertising for a new international mutual fund⁴. Inspired by Shiller (2003, p.1) who explains that “we need to democratize finance and bring the advantages enjoyed by the clients of Wall Street to the customers of Wal-Mart”, we could say that the contemporary evolution of the financial reality tends to democratize finance and to bring the advantages enjoyed by the clients of Wall-Mart to the customers of Wall Street.

Financial markets often appear to be more and more a matter of advertising. Lunt (2000) proposes a rhetorical analysis of several financial adverts (in England) from the early and mid

⁴ For more information about financial advertizing see also Jordan and Kaas (2002).

1990's. This analysis of the financial adverts clearly shows the new “consumer-oriented” dimension of the financial services. Lunt explains that financial companies, by using adverts such as “if you want to be like a princess or like a famous footballer or if you want to be secure (for old people), you have to buy the financial services proposed by the company”, present financial products as a necessary condition to be “in”. Shiller (2000, p.101-129) emphasizes that the mass media have an impact on the investors' behaviors. The financial markets are often presented as a casino where it is possible to become an important person exactly as some famous investors (whose life is presented as a fairy tale) did.

According to us, the evolution of financial adverts and the influence of the mass media tend to favor the “virtual dimension” of the financial reality. All these elements that influence the investors' behaviors are related to our specific culture and tend to emphasize the “consumer-oriented” reality by enhancing the symbolic aspect of investment. If we consider, following Shiller (1999), that investors pay much more attention to conversations, rituals and symbols, we can conclude that financial adverts and mass media are culturally dedicated to the symbolic (and hence material) perpetuation of the contemporary financial markets. We can then observe a “symbolic virtualization” of the financial market which now appears as a game that we have to play if we want to be “in”⁵.

The financial innovation is often considered to be related to the emergence of e-finance which is claimed to also favor the speculative behaviors (Barber and Odean, 2001). In the next section, we will study the influence of electronic trading and e-finance on the financial reality. It seems obvious that these technological evolutions have the effect to intensify the virtual dimension of finance.

SECTION 2 : The technological virtualization of finance

The technological mutations, mainly characterized by the emergence of the automatic trading and the creation of electronic financial products, have profoundly modified the organization of the markets but also, we will see, the financial exchanges themselves. We will show how these evolutions have generated what we call the “technological virtualization” of the financial reality.

Since the eighties, the greatest stock exchanges have been automated and auctions have been replaced by quotations determination algorithms⁶. Each financial marketplace has since then

⁵ Lunt (2000).

⁶ « An algorithm is a set of finite and recurrent rules or instructions which can be executed by a machine. A quotation algorithm executes the orders according to an auction process and in accordance with a set of priorities » in Muniesa (2000).

been equipped with an electronic trading platform. Technically, such an electronic trading platform is an automated market which exercises some of all of the following functions : an “electronic order routine (the delivery of orders from users to the execution system), an automated trade execution (the transformation of orders into trades), an electronic dissemination of pre-trade (bid/offer quotes and depth) and post-trade information (transaction prices and volume data)”⁷.

First, the electronic trading has profoundly revolutionized the functioning of the financial markets. For a few years, the organizational consequences of this technological evolution have been studied by several authors. Jiang, Tang and Law (2002) explain that the electronic trading has increased the operational and informational efficiency of the markets. Moreover, in the literature, the automatic trading is said to have reduced the transaction costs⁸ and to have increased liquidity⁹. Tsang (1999) proposes a comparison between the traditional open outcry trading system and the automated trading system. He confirms the impacts evoked above and also underlines the better transparency generated. This transparency is also discussed by Jiang, Tang and Law (2002) who specify that the automated system “offers a greater transparency of the order book on prices and volumes way from the best bid and ask, which can reduce information asymmetry and provide more information for market-maker to manage their inventory exposure more effectively” (Jiang, Tang and Law, 2002). Apparently, the only main drawback of the automated trading system is the fact that, despite its lower operating costs, it generates high development costs. Moreover, the order cancellation procedure may cause delays and discourage other orders. Finally, let us mention the eventual bug problems inherent to every computer-based system.

Even if it is true that the automatic trading has considerably reduced the negotiation dimension of the financial exchange, it has not (yet) “dis-humanized” the financial exchange which is still based on human interactions. However, the oral negotiation has been replaced by a more abstract sociability because traders only interact via their computer screens (Godechot, 2001). According to Lepinay and Rousseau (2001), there is a true “screen sociability” where traders tend to personify their screen by giving them a hypothetical personality. In a recent paper, Knorr Cetina and Bruegger (2002) explain how the financial interaction has evolved since the emergence of the automatic trading. According to them, financial interaction can be reduced to the way the traders interpret the signals that appear on their computer screens. As regards this technological virtualization of finance, we can also mention the researches of Nesbitt and Orenstein (1999) who have worked on the possibility and the potential impact of a multi-sensory human-computer interface.

⁷ Committee on the Global Financial System (2001).

⁸ Classens, Glaessner and Klingebiel (2002).

⁹ Jiang, Tang and Law (2002).

The second dimension of the impact of the technological progress in finance is the more recent electronic finance often abbreviated e-finance. There exists no broadly agreed definition of e-finance. Generally speaking, e-finance refers to financial services offered electronically i.e. via Internet or via any other public networks. For several years, the number of products offered in this way has significantly increased. The online technology even allows for the creation of fully virtual markets. The “Iowa Electronic Market”¹⁰ (IEM), created in 1988, was the first virtual market. According to Varian (1998), the EIM was indeed the first market where all kind of interactions took place online. Through the years, this evolution towards virtual markets has extended to other regions of the world. The virtual financial infrastructure called “FinNet”¹¹ developed in Hong Kong in 2002 is a good example of this evolution. Governed by a public-private partnership, “FinNet” is a network interconnecting investors with all institutions established in Hong Kong. It means that investors have simultaneously access to all types of financial services that are available in Hong Kong. According to Classens, Glaessner and Klingebiel (2002), even if there exists a variety of factors (the telecommunication infrastructure for example) determining the development speed of the electronic technologies in each country, more than 90 percents of the financial products should be available online in 2010 in the industrialized countries. The authors also explain that the trend towards e-finance is observed all over the world even in countries where the financial infrastructure is poorly developed.

E-finance is profoundly impacting the functioning of the financial markets. Classens, Glaessner and Klingebiel (2002) explain that e-finance generates a decrease in the transaction costs and in the costs related to marketing and intermediation and increases the competition as it becomes much easier for investors to compare the advantages of all types of financial products and to compare the fees charged by all financial institutions. By reducing the transaction costs and the financial intermediation, e-finance will allow more customers to have access to various financial products and services. Varian (1998) explains that, parallel to the automatic trading, e-markets improve the transparency of the transactions.

Moreover, the investors’ behavior has been influenced by the emergence of e-finance. For Barber and Odean (2001), Internet provides an “illusion of knowledge” to online investors who become excessively self-confident and tend to underestimate the risk. In an other paper, Odean (1998) had showed that overconfident investors used to invest more and in a more speculative way than they would otherwise do. Barber and Odean (2001) conclude that, in this way, online trading contributes to increase the speculation and the market volatility.

¹⁰ The Iowa Electronic Market is currently dedicated to derivative securities. For more information about this market, see <http://www.biz.uiowa.edu/iem/index.html>

¹¹ For more information see www.aboutfinnet-hk.net/about_finnet/what.html

E-finance and the virtual financial markets can be interpreted as the continuity of the automatic trading. This technological evolution represents means to move closer to our idealized conception of the efficient markets (no transaction cost, availability of information,...) on which all theoretical models are built. In this vision, the technological progress seems to be used to create a virtual market close to the idea of “perfect market” that we have in our theoretical textbooks. Through the “technological virtualization” discussed in this section, the finance reality has become a “hyper-reality” i.e. the image of the theoretical reality that we have in mind.

SECTION 3 : The financial hyper-reality

In this section, we will first show the similarities that exist between the contemporary financial market and the market of consumer goods. It will then allow us to apply to the financial market the analysis of Baudrillard (1981, p.116) who considered the hypermarkets as an example of the hyper-reality. In our analysis, the symbolic virtualization of finance developed in the first section can be seen as a related to the consumer society and the technological virtualization of finance developed in the last section can be considered as a consequence of our “perfect market” conception.

The “financial hypermarket”

As we have seen in the previous sections, the evolution of the marketing methods in finance proves that the financial reality has become more and more “consumer-oriented”. Indeed, financial products are more and more complex and adapted to the variety of the investors’ needs while the consumers’ behavior in the financial market are attracted by more and more creative marketing methods. All what matters now in the financial market is the purchase. It has become the only morality of the financial market as it is already the morality of the consumer goods market. However, while the finality of the purchase in the goods market is the consumption, the finality of the purchase in the financial market is the exchange. Indeed, as speculation activities have supplanted the investing activities, investors buy products to exchange them later¹².

This evolution of the financial reality allows us to consider the financial market as a hypermarket where the investors (consumers), attracted by various adverts, can do “financial shopping”. The “financial hypermarket” appears to be a social arena where the financial

¹² The finality of financial interaction (exchange) explains why there is only an exchange value and no use value in finance. For more information, see McGoun (1997).

products and the financial needs are driven by the logic of the “consumer society” evoked by Baudrillard (1970, p.57).

We will use the term “financial hypermarket” in a twofold meaning : on the one hand, this word allows us to emphasize the increasingly “consumer-oriented” dimension of the financial market and on the other hand, this word also allows us to present the financial market as a result of the hyper-reality defined by Baudrillard (1981, p.10).

According to Baudrillard (1981, p.116) who studied the development of the traditional hypermarkets, the emergence of these supermarkets as a new distribution network is an evidence of the hyper-reality. He explains that the roles of a hypermarket are to centralize, to rationalize and to distribute all goods whatever their destination. It is a controlled socialization in a homogeneous (and virtual when the hypermarket is online) public place dedicated to consumption. According to us, this analysis of the hypermarket phenomenon can be used to better understand the contemporary evolution of the financial market. Indeed, parallel to the consumer goods hypermarkets, the “financial hypermarket” tends to become more and more impersonal, standardized and territory-neutral (Economides, 2001).

Good road transport is required to bring both goods and consumers to the public place of consumption and thus to ensure the good functioning of the distribution hypermarkets (Baudrillard, 1981, p.117). With the virtual “financial hypermarket”, it is exactly the same, the electronic market need a good technological and communicational infrastructure to lead easily the investors (consumers) to the virtual public place dedicated to the online exchange (Jiang, Tang and Law 2002).

Another similarity between the traditional and the virtual “financial hypermarkets” is their pre-existence before the real infrastructures. Baudrillard (1981, p.115) underlines the fact the towns are often constructed around pre-existing modern hypermarkets. He also recalls that it seems contradictory with the fact that the traditional public markets usually resulted from the growing commercial activities within a given existing town. As regards the virtual “financial hypermarkets”, Classens, Glaessner and Klingebiel (2002) mention that in some emerging countries, the virtual financial markets exist before the real financial structures, which are often very poor or even non-existing. Once more, we can see that Baudrillard analysis about the hypermarkets phenomenon helps us to better understand the current evolution towards the virtual “financial hypermarkets”.

The financial market as a financial simulacrum

The “financial hypermarket” appears to be what Baudrillard (1981, p.16) calls a simulacrum i.e. an exchange field which does not propose a real exchange but rather an internal (virtual) exchange (without any link with the economic reality) in a continuous logic where there is no more referent. Paradoxically, all these virtual exchanges have some real impacts on the economic reality. It is not a matter of false representation of the world, it is just a matter of hiding the fact that the apparent reality is not real anymore but rather hyper-real. The development of the new media and communication technologies in the financial sphere can be seen as an evolution towards Baudrillard’s simulation : these technologies have the effect of disconnecting us from the reality by creating for us, instead, a virtual reality that we can call “hyper-reality” (Baudrillard, 1981, p.10).

The “symbolic virtualization” presented in the first section of this paper and the “technological virtualization” evoked in the second section allow us to consider the financial market as a cultural simulacrum, a hyper-real simulation of the reality, driven by a self-referent logic. This hyper-real finance has apparently become more real than the economic reality. Let us illustrate this point with the paper of McGoun (1997) who, by studying the impact of the “hyper-reality” on the concept of “intrinsic value”, presents finance as a cultural post-modern game. He recalls that “decisions affecting production and employment are made on the basis of stock prices, and not on the basis of production and employment” (McGoun 1997, p.16). In doing so, McGoun (1997, p.16) explains that : “it is not the real economy that shapes reality but activity in the financial economy. The financial economy is thereby more real than the real economy itself ; it is a hyper-real economy”. We can also observe this impact of the hyper-reality in finance as a consequence of on the one hand, the virtual financial markets and on the other hand, the fact that they exist even before the traditional financial structure in some emerging countries. The result of this evolution is that the virtual market seems more real than the economic reality.

Another evidence of the hyper-reality is the existence of speculative bubbles. Speculative bubbles are events where the mimetic process can be considered as a set of self-referential signs (since some investors buy securities because others investors do). Speculative bubbles are hyper-real events¹³ without real finality but rather with undefined reflexive logic.

¹³ We often consider some historical financial events (for example the “Tulipmania”) as speculative bubbles but as Garber (1989 and 1990) emphasizes it rightly, we must pay attention to our interpretation of the historical financial events because we often tend to explain these events in the light of the current dominant theory while there is nothing which could ensure us that these events were really what we now call a speculative bubble. For more information about this epistemological analysis, see Garber (1989 and 1990). We do not have to consider every speculative event as an example of the (current) theoretical concept. It is the same with our historical analysis of the impact of the financial crashes. McGoun (1997) recalls, for example, that the stock market crash of 1929 was accompanied by a serious and real depression while the stock market crash of 1987 had no

Baudrillard (1997, p. 139) explains that the speculation is only an exaggeration of the conception of an exchange value without link with the productive sphere. It is important to mention, following McGoun (1997), that “the hyper-real economy is not a consequence of speculation”. In this context, the distinction between the investor and the speculator loses its meaning. Hyper-real finance is just a matter of virtual exchanges and advertising. The speculative activities that result from this hyper-real finance is just a “modern”¹⁴ way of characterizing the investors’ behaviours.

The automation of the financial trading as a result of hyper-modernity

The automation of the financial trading illustrates a new specific way of thinking the market. According Baudrillard (1968, p. 153), the automation is the myth of modernity in our western societies. Currently, the perfection degree of a system is often related to its automation degree. The automation process allows to situate ourselves in this technical world. Baudrillard (1968, p.215) uses the term “technème”¹⁵ to characterize the automated objects that tend to be more and more independent of the human intervention. In this vision, we can consider the automated financial market as a “technème”. The author adds that each analysis of these “technèmes” is directly related to the analysis of the dominant ideology because when we choose some “technèmes”, we have to deny other ways of structuring the world (Baudrillard, 1968, p.155).

Dupuis (1992, p.50) emphasizes also the ideological dimension since, according to him, we have to keep in mind that the automatic trading results from a certain ideological image of the market presented in the famous Black’s article (1971). As underlined rightly by Muniesa (2000), this automated conception of the market corresponds to the neo-classical idea of a perfect market in which the prices adjust quickly to information in order to prevent arbitrage. This way of integrating the technological progress in the financial markets is thus not a fatality, it is just a virtual mirror of the theoretical concept of “perfect market” (better liquidity, better operational and informational efficiency, better transparency and lower transaction costs).

Exactly as Godechot (2000, p. 52) underlines it, the sophistication of the financial markets tends to reduce the degree of materiality of the financial reality. The author evokes this increase in immateriality when he explains the evolution from commercial fairs to financial

discernible causes in the real economy and did not trigger a depression. Once more, there is no universal meta-analysis that could explain every similar historical events.

¹⁴ The result of the hyper-reality in finance appears to be what neo-classical financial economics calls speculative activities but this way of characterizing the financial markets is so well integrated in people’s mind that we can consider the term “speculation” as a new common way of thinking the financial reality.

¹⁵ In french in the original text of Baudrillard (1968).

markets : the goods were not exposed anymore and the transactions (on paper) became symbols. We can apply this analysis of Godechot to the current evolution of the financial market but it is now the market itself that tends to become a symbol. There is no market anymore... just a virtual public place, symbol of the hyper-reality.

As we have already mentioned, the sociability of the traders has now become more abstract with the emergence of the electronic trading. The traders' screens have become the contemporary windows of finance and, by determining the "outside" world, these "windows" are more real than everything in the "outside" world. The automatic trading has then allowed a technological virtualization of finance.

SECTION 4 : Epistemological consequences of the hyper-real finance

The new evolutions that we have depicted in the first three sections also represent challenges for theoreticians. We can thus wonder what impact the new hyper-real finance has on the way that the financial knowledge is constructed. In this section, we will try to present the epistemological consequences of the hyper-real finance.

Before studying the impact of hyper-reality in financial economics, we would like to recall the cultural dimension of the computerization phenomenon. According to Lyotard (1979, p.13), the current hegemony about computerization refers to a new way of thinking the knowledge.

First, the scientific justification of the computerization can not be reduced to its operational character. Lyotard (1979, p.18) explains that this operational criterion that we can call, in this context, the technological criterion is not relevant to evaluate the truth and the fairness of a social reality. Lyotard adds that this technological criterion should not be considered as a new "meta-justification". Moreover, we tend nowadays to focus only on the computerization as a universal concept and not on the different ways of interpreting this computerization. We can not ignore that the importance dedicated to the technological and operational criterion is related to our specific culture. Even if the trend towards computerization (of the financial marketplaces) is almost universal, the way of thinking this evolution is different from a country to the other. Computerization does not imply universalism¹⁶. It is the same for the growing development of more complex financial products. Even if it seems to be a general trend, the nature of the development in each country is related to the trading culture of this country.

From an epistemological point of view, we must also remember that the computerization of the financial marketplaces does not imply that financial economics has become a "hard

¹⁶ For more information about this, see Baudrillard (1997)- p.27.

science". Sometimes, when one read some recent financial theoretical developments¹⁷, one has the feeling that for some theoreticians, the computerization of the financial reality combined with all its impacts (better liquidity, more available information, less transaction costs, higher exchange speed, ...) have generated a kind of "neutralization" of the human factors. The quotations appear then to be less human as there are fully determined via computers. This attempt to bring the social sciences closer to the physical sciences by neutralizing the social facts is the object of an old debate.

With what we have called the technological virtualization of finance, the existing distinction in finance between theoretical facts and reality has disappeared. Indeed, following Granger (1993, p.77), we can say that every theory is virtual because it refers to theoretical facts which depend on the network of basis concepts and assumptions specific to this theory. To justify his/her theory by proving its explanatory power, the theorist then try to confront the virtual theoretical facts with the observed reality. With the virtualization of the financial reality, the social facts are no more observable. Indeed, in the virtual society, the social facts become exactly what the theoretical facts are in a theory : the result of a complex network of representations. The reality does not exist anymore ... the quotations are just a simulation or a simulacrum of the underlying social facts.

Having to cope with this peculiar situation, the theorists can develop two kinds of knowledge. On the one hand, one can completely play the game of the virtualization by considering that the financial facts are no more of a social nature. In this case, we reduce our vision of the facts to the technological tools. On the other hand, one can try to give a social meaning again to the virtual facts by associating them some "signs". We will now try to discuss this two theoretical directions.

The researches that are based on the assumption that the financial quotations are totally independent from the social behavior of the investors can be said to represent a "meaningless knowledge". Indeed, some searchers consider that the quotations refer to nothing else than themselves, that there is nothing behind the quotations. In other words, the social behaviors and the human interactions appear to be neutralized because totally included in the quotations. We can find this vision in the well-known efficient market hypothesis (which stated that all information is captured in the market prices). The chartism, whose origin goes back to the Middle Age¹⁸, also fits perfectly within this kind of perception. For the chartists, everything is a matter of regularities and periodicities. They voluntary ignore the social dimension of the market to focus on the empirical values.

¹⁷ See Econophysics applied in finance, for example.

¹⁸ For an enlightening history of the chartism (with a direct link with the astrology), see Poitras (2000), p.252.

It seems obvious that this trend of “neutralization” of the social dimension of the financial reality has been supported and encouraged by the technological virtualization of finance. Currently, a lot of physicists, statisticians and computer specialists try to develop “hard models” in finance. The econophysics¹⁹, which consists in applying in finance models developed in physics, is a nice illustration of this trend. In those models, the quotations are studied as if they behaved, for example, like gas molecules. We can also mention the growing applications of the “neural networks”²⁰ in finance. In this case, the computer specialists develop computational algorithms to price or hedge financial securities by considering that their returns behave like electric inputs and outputs.

At the opposite of that vision, some searchers focus on the underlying social and human behaviors related to the quotations. Examples of such theoretical frameworks are the social studies in finance or the behavioral finance. This kind of researches tries to understand what is hidden behind the complex financial reality. On the one hand, the social studies in finance try to explain the evolution of the financial reality by situating it in a more global social reality. On the other hand, the behavioral finance tries to explain the evolution of the quotations by studying the psychological biases of the investors. These two theoretical frameworks emphasize the social and psychological dimensions of the financial reality : while sociologists try to underline the existence of a trading culture²¹ or to show how traders use the theoretical tools developed by the academics²², psychologists try to explain the evolution of quotations thanks to psychological concepts such as “overconfidence”²³, “conformity effect”²⁴ or “aversion to ambiguity”²⁵. Even if these two fields can not propose a “global explanation” (universally true) of the financial market, they explore dimensions that should not be considered as useless. Within this vision, we can also include the classical fundamental analysis. By considering the evolution of quotations as a walk around the intrinsic values, the fundamental analysis gives a meaning to the quotations. That is why we can consider this approach as a “meaningful knowledge” of finance.

Even if different theoretical frameworks have always co-existed in finance, it is obvious that we are now facing a real new fragmentation of the financial knowledge. We think that this current fragmentation has been encouraged by the technological virtualization in finance.

¹⁹ For an introduction to econophysics, see Farmer (1999).

²⁰ For an introduction to the application of neural networks in finance, see Baestens, Van den Bergh and Wood (1994).

²¹ Abolafia M.Y., « Markets as Cultures : an ethnographic approach in Callon M. (ed), *The law of Markets*, Oxford, Blackwell Publisher, 1998.

²² Godechot (2000).

²³ Odean (1998).

²⁴ Bond and Smith, 1996, Culture and conformity : A meta-analysis of studies using “Aschs line judgement task”, *Psychological Bulletin*, 119, 111-137.

²⁵ Peter and Slovic, 1996, The role of affect and worldviews as orienting disposition in the perception and acceptance of nuclear power, *Journal of Applied Social Psychology*, 26, 1427-1453.

Indeed, the current hyper-reality in finance is now becoming a simulacrum of the traditional financial reality and the current evolutions (symbolic and technological virtualization) are giving the simulacrum a real and true character. The simulacrum does not hide the reality but has become the reality and thus hide that there is no underlying reality anymore. This situation allows a plurality of interpretations where no particular interpretation is better than the others. That is why we propose to consider each of these approaches as a specific “language game” that tries to grasp one specific dimension of the complex financial hyper-reality. Due to the increasing virtualization of the financial reality which leads to a simulacrum situation, the commensurability between the different theoretical approaches is impossible. In conclusion, the financial reality is now becoming a hyper-reality with a (fragmented) knowledge (characterized by a high pluralism) directly in line with Lyotard (1979) analysis.

Conclusion

The beginning of the paper is dedicated to an analysis of the current evolution of finance. In a first step, we have presented what we call the “symbolic virtualization” of the financial reality. Inspired by several authors (Shiller, Lunt), we argue that this “symbolic virtualization” illustrates the “consumer-oriented” dimension of finance where recent marketing methods present the financial market as a “fashion game”. We have also emphasized the speculative impacts of this evolution.

In the second section, we have introduced what we call the “technological virtualization” of the financial reality. This “technological virtualization” derives from the growing computerization of finance mainly characterized by the automatic trading and the e-finance.

The third part of the paper has showed that this double virtualization in finance allows us to consider the financial market as a “hyper-market” i.e. a supermarket where the investors can do “financial shopping”. We used the term “hyper-market” to emphasize the “consumer-oriented” dimension of finance and to present the financial market as a result of the hyper-reality described by Baudrillard.

The double virtualization (symbolic and technological) observed in the financial world transforms the financial market in a cultural simulacrum, a hyper-reality which has no referent anymore (but which still have some impacts on the economic reality).

In the last section, we have showed that this absence of referent allows a plurality of theoretical interpretations of the financial reality. The fragmentation of knowledge that we can

currently observe in financial economics can be considered as the epistemological consequence of the hyper-reality in finance.

In conclusion, we have proposed in this paper a baudrillan reading of the contemporary evolution of the financial reality. We wanted to show that the contemporary finance evolves towards a postmodern phase. The financial reality has been constructed in accordance to the main principles of the modernity : consumer rationality and technological development. With the exacerbation of these principles, the financial reality is entering a hyper-modern phase...

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