Financial Innovation and Its Effects on Financial Stability and Efficiency

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Abstract

In the last decades, financial innovation has been in the forefront of all the major changes which have affected the financial system, both at national and international level. Thus, the research of this subject has become a major field of research, its importance growing since the start of the current financial and economic crisis. In this context, the aim of this paper is to underline the impact of financial innovation on the stability and efficiency of the financial system while also taking into account the implications over the systemic stability of an economy. The results of our study highlight the need for a cautionary approach regarding the usage of financial innovations, as new financial instruments used excessively or in an inappropriate manner, without proper regulations and supervision, can lead to financial instability and the accumulation of major systemic risks.

Key words: financial innovation, financial stability, efficiency, crisis, systemic risk

J.E.L. classification: G01, G14, G32.

1. Introduction

Taking into consideration that, over the last decades, financial innovation has been considered to be one of the major causes of the radical changes that took place in the financial systems, both at the national and international level, its analysis represents an actual and interesting problem for both policy makers and participants from various financial markets, whether we are talking about investors, financial intermediaries or end-users of financial services. Within this framework, it becomes clear that a better understanding of the impact of financial innovation on the two key components of the financial sector, namely: stability and efficiency is crucial in order to ensure that episodes such as the current financial crisis does not happen again.

In this context, the purpose of this paper is represented by the study of the financial innovation and of its implications on the financial systems development, highlighting both the positive and negative effects that the financial innovation has on its efficiency and stability. Thus, taking into consideration that all financial innovations encompass advantages as well as risks, the core question that arises refers to under what circumstances financial innovations enhance the efficiency and the stability of financial systems, and, under what circumstances do they threaten their stability?

In order to achieve this purpose the research is structured in five parts: the first part contains introduction remarks regarding the field of research and the importance of the approached theme; the second part is dedicated to a literature review which identifies the main researches undertaken so far on this subject; the third part highlights the key role played by financial innovation in increasing the efficiency and the stability of the financial systems, and the fourth part of the paper reflects, mainly, the negative impact that the financial innovation may have, in certain circumstances, on the stability of the financial systems; while part five provides the concluding remarks of the research.
The methodological approach used starts with a literature review, which is useful because, on one side, it helped us to familiarise with the main studies from this field and, on the other hand, we were able to underline the way in which our research will cover the least approached areas of this field, especially the problems regarding the trade-off which often exists between the efficiency and stability characteristics of the financial system. As a method of data analysis we have used systematisation techniques and also a series of comparative tables and graphics. In order to obtain our data, we have used mediate techniques for data gathering, like official statistics of the Bank for International Settlements (BIS), different reports, studies and researches.

2. Financial innovation – a literature review

In general, most scientific papers undertaken on the subject represented by financial innovation have focused on three main research areas: the concept of financial innovation, the drivers of financial innovation and the effects of financial innovation.

Regarding the concept of “financial innovation”, taking into consideration its’ dynamic and complexity, even after a quarter of century, the academic literature has not reached a consensus. Anyway, one of the most widely and frequently used definition is that offered by Frame and White (2004, p. 118), which after having analyzed the basic functions of the financial system, considered financial innovation as “something new that reduces costs, reduces risks, or provides an improved product/service/instrument that better satisfies participants’ demands”.

Concerning the drivers of financial innovation there are four main theories: the circumvention innovation theory (Kane, 1981), the transaction regulation innovation theory (Sylla, 1982), the cost innovation theory (Niehans, 1983) and the constraint-induced financial innovation theory (Silber, 1983), each of these theories explaining in a comprehensive manner the reasons why the pace of financial innovation have accelerated in recent decades.

In respect to the effects of this process, it is considered that financial innovation has a direct effect on reducing the negative elements (such as costs and risks) as well as on increasing the positive ones (through development of products, services or instruments that would better meet market’s needs). Hence, Van Horne (1985) highlights in his paper that a real financial innovation helps to increase market efficiency and completes the range of products and services. Also, Llewellyn (1992) argues that financial innovation refers to the creation of new financial instruments, techniques and markets as well as to the separation of different characteristics and risks of individual financial instruments, followed by their combination in various new ways. The author emphasizes also that the financial innovation helps to increase the overall efficiency of the financial system. However, in the aftermath of the 2007 crisis, a series of studies have underlined also that, in certain conditions, the impact of financial innovation for stability is ambiguous and that techniques and instruments, used to shift credit risk in a stable environment, may become problematic when the market environment becomes more volatile and uncertain, and when there are systemic shocks (Anderloni et al, 2009).

Summarizing, the researches undertaken so far regarding the subject of financial innovation are still in an early stage, when compared with the abundance of researches undertaken on the innovation from other sectors of the economy (like the industrial innovation), and we can observe also a lack of systematic empirical researches with unique and unanimously accepted results. Thus, we consider that this research can represent a relevant response to this very important subject, that should be studied continuously in order to improve its comprehension for the benefit of those who produce it, use it and eventually who regulate it.

3. Financial innovation – key factor for the development of financial systems

The process of financial innovation is one of the key factors for the development of financial systems because it contributes to the achievement of five basic functions of a
financial system: (1) it increases the variety of the financial spectrum by combining the characteristics of various financial instruments in order for the advantages of one instrument to alleviate the disadvantages of another; (2) it enables various types of risk to be more efficiently managed and shifted to those who have a greater ability and willingness to absorb risk; (3) it increases the liquidity of assets and markets; (4) it allocates funds to their most efficient use and (5) it may give investors access to new markets from which they were previously excluded. Based on these functions we consider that the various forms of financial innovation can be grouped as in Table no. 1.

<table>
<thead>
<tr>
<th>Types of financial innovation</th>
<th>Examples</th>
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<tbody>
<tr>
<td>• Instruments/processes that ensure the transfer of price risk</td>
<td>Swaps, forward, futures and options contracts</td>
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<tr>
<td>• Instruments/processes that ensure the transfer of credit risk</td>
<td>Securitisation, collateralized debt obligations - CDOs, credit default swaps - CDSs</td>
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<tr>
<td>• Instruments/processes that allow the growth and development of firms and corporations</td>
<td>Bonds</td>
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<tr>
<td>• Instruments/processes that contribute to the liquidity enhancement</td>
<td>Securitisation, Direct access trading (DAT)</td>
</tr>
<tr>
<td>• Instruments/processes that ensure the financial services modernisation</td>
<td>ATMs, internet banking, Target 2 Securities</td>
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<tr>
<td>• Instruments/processes that ensure the substitutability between different financial instruments</td>
<td>Debt equity swaps</td>
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Source: realised by the author

The scientific studies from the academic literature regarding the effects, both positive and negative, generated by the different types of financial innovation on the stability and efficiency of the financial systems are varied. Thus, on the one hand, there are a series of studies that highlight how financial innovation help to increase the efficiency and stability of financial systems. In this respect, Greenspan (2004, p. 4) argued that: “credit derivatives and other complex financial instruments have contributed to the development of a far more flexible, efficient and hence resilient financial system”.

In general, the main benefits of the financial innovation (although not the only ones) regarding the increase of the financial sectors efficiency are related to the possibility of innovative instruments to reduce the financial intermediation costs (basically this can be achieved in two ways, either by facilitating borrowers the access to a wider range of financial markets which are providing additional lending facilities, or, in some cases, by creating the necessary conditions so that the financial institutions would be able to obtain scale economies which will reduce the costs of the services that they provide), to enhance the liquidity (e.g. CDOs enable banks to create liquidity based on their loans, which traditionally represent an illiquid component of their portfolio) and, most important, to enable risks to be dispersed optimally throughout the financial system (for instance, a bank could maintain a relationship with a client over an extended period of time without incurring an excessive credit-risk exposure). However, we must take into account that one of the financial systems characteristics is represented by the trade-off which often exists between its efficiency and stability (more precisely, the impossibility to obtain them both at the same time). Extrapolating this situation, some analysts considered that this is true also in the case of financial innovation, particularly with respect to credit derivatives. In this context, the impact of financial innovation on the financial system stability represents a controversial issue.

Thus, on the one side, because the financial innovation enables risks to be dispersed optimally throughout the financial system, it increases its stability, but, on the other side, because, in certain conditions, it allows the accumulation and proliferation of risks, it can have a deleterious impact on the financial system stability.

Hence, there are a number of ways through which financial innovation can enhance financial system stability, giving it a higher resistance to shocks:
innovative instruments spread risks more widely within the financial system, in this way the risks being absorbed by those who are more willing and more able to deal with them, thus emphasizing the stabilizing role of financial innovation.

in many respects, this type of instruments enable banks to respond more easily to certain types of shocks. Greenspan suggested that “[the stability that has characterized the financial systems until 2007] suggest a marked increase over the two or three decades in the ability of modern economies to absorb unanticipated shocks...this has doubtless been materially assisted by the recent financial innovations that have afforded lenders the opportunity to become considerably more diversified and borrowers to become far less dependent on specific institutions or markets for funds” (Greenspan, 2002, p. 6).

another dimension to these issues is provided by the Bank for International Settlements, which considers that “The ability to switch smoothly between balance sheet financing and market-based financing contributes to the robustness of a financial system and improves its ability to deal with strain” (Knight, 2004, p. 6).

In conclusion, we can state that the benefits driven from the development and use of financial innovations are manifold. Hence, the cost of financial intermediation may be reduced due to the use of financial innovations, offering the entities which seek financing the possibility to enter different markets and allowing different actors from these markets to effectively exploit their competitive advantages. Also, new instruments enable arbitrage between markets in different countries, which lead to the decrease of pricing anomalies, and implicitly to the reduction of market imperfections. Moreover, a number of financial instruments allows the use of diverse hedging options enabling the increase of protection vis-à-vis risk, while another series of innovative financial instruments facilitate the risk assessment, transferring it to those entities that are more capable to manage it efficiently. Nevertheless, these instruments enable different risks to be divided and then separately priced and “sold”. Thus, we can assert that if these processes are carried out in a correct and professional way, then these innovative financial instruments will have a direct effect of increasing the efficiency of resources’ allocation in the economy.

4. Controversies regarding the effects of financial innovation on the stability of financial systems

The manifestation of the financial crisis which started in 2007 highlighted the existence of a high number of opaque financial products in the international markets, such as: credit default swaps, mortgage-backed securities or collateralized debt obligations. The role that these financial products have had within the financial crisis has triggered a heated debate regarding the value that they bring to the international financial system as well as regarding which would be the correct response from the authorities in charge with the regulation and supervision of these innovative instruments. It is already obvious that from the debate around this subject have emerged two streams of opinion, on the one hand, are those who believe that financial innovation is largely unnecessary (e.g. Krugman (2008): „It's hard to think of any major recent financial innovations that actually aided society, as opposed to being new, improved ways to blow bubbles, evade regulations and implement de facto Ponzi schemes”) and on the other hand are those who believe that financial innovation is crucial, indeed indispensable, for sustained economic growth and prosperity”.

Thus, there is the possibility that the financial instruments that should increase efficiency, instead, in certain circumstances, may threaten the financial stability. These instruments can as well increase or reduce financial stability, enabling these fluctuations to put into question the overall financial innovation capacity to generate financial stability. For instance, the credit derivatives (one of the most invoked examples of financial innovation over de last years), allow
the banks to improve their image, similar to the process of "window dressing", but this arrangement could hide the reality (Stoica, 2010).

These considerations lead to a preliminary conclusion related to the implications of financial innovation on the stability of a modern financial system. It would seem that the financial instruments that allow better dispersion of risk and that emphasize the role of markets in financial systems are also reducing the vulnerability of the financial systems to small shocks, allowing a more effective management of these events. Hence, the capacity of financial systems to stabilize is enhanced by the financial innovation. On the other hand, the financial innovation can lead to the exposure of financial systems to major and systemic shocks, enabling the management of this type of shocks to be more difficult. An example in this respect may be represented by the systemic liquidity shock, generated by the decrease of the liquidity from the global financial markets, experienced in 2007. Thus, Rajan (2005, p. 16), for instance, concludes that: “[while] the financial system is more stable most of the time, we may also have the possibility of excessive instability in really bad times (as well as higher probability of such tail events)”.

Thus, despite the fact that the derivative products have been created to help dissipate the credit risk of the issuers, they hide a number of risks that have facilitated the emergence and expansion of the financial crisis. This was due to, on the one hand, the lack of transparency and the extremely high complexity of these financial instruments, and, on the other hand, the fact that many of the financial entities involved in the transactions with such type of financial instruments didn’t fully understand the risks associated with these transactions.

Basically, we can state that there was a tendency of proliferation of derivative instruments with a high degree of complexity and opacity, as well as of trading such instruments through certain financial entities equally opaque, such as the so-called Structured Investment Vehicles (SIV) (see Figure no 1). Thus, in a typical securitisation transaction where banks transfer the legal rights of the assets to an SPV, CDOs involve the transfer of a portfolio of loans (collateralised loan obligation: CLO) or bonds (collateralised bond obligation: CBO) or a mixture of the two (CDO), and the tranching of the risk to attract investors. The use of tranching techniques enables the creation of highly structured types of credit risk profiles (Anderloni et al, 2009, p. 254).

**Figure 1 – The process of cash securitisation**

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<tr>
<th>Originating bank</th>
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<tr>
<td>Sale of loans</td>
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<tr>
<td>Par Value</td>
</tr>
<tr>
<td>Equity ('first loss')</td>
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<tr>
<td>Par minus net loss</td>
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<tr>
<td>Special Purpose Vehicle (SPV)</td>
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<tr>
<td>Trenched Notes</td>
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<tr>
<td>Par Value</td>
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<tr>
<td>Investors</td>
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**Source:** Mengle (2007)

Chart no. 1 highlights the proliferation of financial derivatives at the global level, the total value of the swap contracts on the interest rate and of the other types of derivatives reaching in 2008 the amount of 672 trillion dollars, equivalent to 11 times the global GDP, according to the estimations made by the Bank for International Settlements (2010). Just ten years previous, in 1998, the value of these financial derivatives was only 75 trillion dollars, equivalent to 2 ½ times the global GDP. Thus, the global derivatives market has simply exploded in the period 2007-2008, registering an annual increase of about 50%.

**Chart 1 – The evolution of the total value of various types of financial derivatives issued in the period 1998 - 2010 at the global level (biannual values, trillion U.S.A. dollars)**

**Source:** realised by the author based on the data provided by BIS

The British Financial Services Authority argued that the manner in which financial intermediaries have used the associated
financial entities, such as the SIVs, represented the main cause of the financial markets negative developments from the end of 2007. During that period, the liquidity of the securities market has mostly disappeared, after a period of several years during which there were significant increases in this market. The lack of liquidity has created major problems especially to certain types of financial derivatives, such as: collateralized debt obligations - CDOs or collateralized loan obligations – CLOs. In general, all the financial markets that have allowed the trading of such financial instruments have been hit hard by the financial crisis.

Despite the issues presented and the fact that the current financial crisis has seriously affected the international financial system, the opinion of the economists and government representatives present at the G20 meetings in 2009 and 2010 was that the financial markets will continue to be interconnected and with a strong tendency of globalization, while the financial innovation will continue to play a key role in the process of economic development (G20, 2009, p. 5). This vision is not only declarative, because the majority of the legislative changes made during this period within the G20 economies in order re-regulate the financial sector were taking into account these considerations. In this context, the president of the Financial Stability Council, Mario Draghi, stressed that regulations should not inhibit financial innovation, because it represents on the one hand the element that its needed in order to provide to consumers diversified solutions of financing and on the other hand it’s the element through which the lending process can be extended (Tonveronachi, 2010, p. 131).

Thus, we consider that the objectives of the re-regulation process should be represented by the strengthening of the financial system, without affecting the process of markets self-regulation and the process of financial innovation, because they represent some of the main advantages offered by this sector.

Also, we can say that the fragility of the financial systems is not given by the widespread use of innovative financial products, but rather by the excesses of the financial markets, excesses that the regulations in force and the existing supervisory systems were not able or did not wanted to inhibit at the right time. Thus, we can consider that the current international financial system is based on correct and solid principles, which make unnecessary its entire redesigning and rather requires a readjustment of the supervision and regulatory framework in order for it to be able to cover the issues highlighted by the financial crisis, thereby increasing the stability of the entire international financial system.

5. Conclusions

The process of financial innovation is influencing directly two key components of the financial sector, namely: its stability and efficiency. If regarding the positive impact that the financial innovation has on the financial system efficiency there is a general consensus, regarding the financial innovation implications on the stability of the financial system, two visions have been crystallized. One of them argues that because the financial innovation enables risks to be dispersed optimally throughout the financial system, it increases the financial system stability. In contrast with this vision, the other view highlights that, because, in certain conditions, it also allows the accumulation and proliferation of risks, the financial innovation can have a deleterious impact on the financial system stability. A possible theory concerning the dual effect of financial innovation takes into account the nature of shocks, starting from the idea that on the one hand, in the case when minor shocks are manifesting, that are less correlated, the use of for example derivative instruments (with particular reference to those who spread risk) may increase the stability of the financial system and on the other hand, in the case when large systemic shocks are manifesting, accompanied by a reduction of the liquidity at the international level (as was the case in the summer of 2007), their use may increase the vulnerability of the financial system.

Under these conditions, there is a need for caution, because the use of some new financial instruments on a larger scale or on a different background compared with the original one, without proper regulation and supervision, could generate instability. Thus, the ideal policy approach is in our opinion to
find an appropriate balance between preserving safety and soundness of the system and allowing financial authorities and markets to perform their intended functions, by ensuring, firstly, that the necessary market-framing is in place and, secondly, by establishing a proper method for reviewing financial innovations.

6. References