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Management of Derivative Financial Products within the Banking Activity

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Abstract. *Current developments in the national financial markets, as well as in the international market, mark a period of great changes. As the process of globalization intensifies, the economic environment is marked by increasing volatility and uncertainty. Financial institutions, as links in the financial intermediation process, play a crucial role in directing capital flows to the areas where they are most productively used. This is also the case of derivative financial products, stock exchange and over the counter, which become elements found in the reports of commercial banks. In this context, this article wanted to identify, on the one hand, the causes that determined commercial banks to focus on activities with financial derivative products, going beyond the traditional sphere of banking operations, and on the other hand to explore ways in which products derivatives can be used in banking. Within the article, complex methods were used, both at the statistical level, materialized through the econometric model exposed, and at the theoretical level, of observation and analysis. An entire point of discussion is intended to x-ray the main derivatives, how they can be used and integrated into banking. Another goal was to deepen, at least theoretically, the consequences of using derivative financial products in banking on systemic risk and monetary policy. Also, the paper aimed to highlight the current conditions and prospects for increasing the use of derivative products in the Romanian banking system.*

Keywords: *banking activities, financial product, globalization, management*

Introduction

The decrease in the profitability of traditional banking activities has created financial stability problems, increased the number of bank bankruptcies and increasing the inclination of banks to assume greater risks, either by engaging in riskier loans or by engaging in "non-traditional" financial activities. which promise higher returns, but also assume the assumption of higher risks (Andreou & Philip, 2016).

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Banks' non-traditional activities, such as their involvement as derivatives dealers, expose banks to risks and moral hazard issues, and these activities must be regulated as well as traditional activities (Haseeb & Hussain, 2019; Calin et al., 2022).

For a long time, the traditional activities of banks were those of granting long-term loans and financing them by attracting short-term deposits (Osayi et al., 2018). In the last 30 years, economic forces have diminished the role of traditional banks in financial intermediation (Bordean, 2007). As a source of funds for financial intermediaries, deposits have decreased in importance. In addition, the profitability of the traditional activities of the banks, such as that of the loans granted, decreased (Burlacu, Profiroiu et al., 2019). As a result, banks turned to non-traditional activities, as a way to maintain their initial position as financial intermediaries.

The aim of the paper is to answer the following question: has the use and management of derivatives triggered or higher market valuation for the banking sector or has the use of derivatives made it more vulnerable to this? Our study contributes to the existing literature on risk and price management by providing a unique sample of analysis over a relevant time, i.e. the past 5 years. Moreover, it contributes to a better understanding of the behavior of investors, who have seen that financial share in one of the most attractive investment opportunities on the European stock exchanges. There are many vulnerabilities in stock markets worldwide, especially when market participants are willing to take large risks. Financial regulators should be interested in understanding the contribution of derivatives to bank value and systemic risk to consider new regulatory initiatives. Financial derivatives can become a crucial instrument used by banks to generate alternative sources of income by hedging their risk exposure.

Literature review

The explosive growth of the financial services industry in the last 20 years was cataloged by Alfred Steinherr as one of the greatest economic developments of the industrial revolution, facilitating the restructuring of industries through mergers and acquisitions, offering innovative solutions to privatization programs, increasing the importance of funds. of investments, expanding the sources and types of financing to support the emergence of new industries and facilitating the consolidation of economic development in emerging and transition economies everywhere in the world.

Also, the expansion of financial instruments and techniques has increased participation in international financial markets, forcing government policies to evolve and thus contribute significantly to the creation of a global financial environment. Perhaps the most important benefit of financial derivatives is the ability to become an effective means of risk management. The increase in the volume of derivative products fundamentally transformed the risk management system of financial institutions, and to request them they were able to reduce the cost of financing and the structure of the assumed risk of their own wishes (Subanidja et al., 2020). Since, as we mentioned in the first part of the papers, financial-banking institutions are involved in the trading of most types of derivative instruments, we will show in the following the advantages that derivative financial instruments bring to these institutions in terms of management of the risks they face (Waswa & Wepukhulu, 2018).

The concept of derivatives is not a new one. Contracts, which have in themselves a component that can also be found in current financial derivatives, have appeared since ancient times, necessary to provide security for transactions to be carried out in various territories include a certain period from the moment of initiation to the moment respectively carrying out the transaction.

During the development of financial derivatives, their concept also changed. Thus, the term derivatives, in its modern meaning, according to several economists, appeared in 1970, as a response to the changes made following the change in the financial architecture.

Methodology

Mix research technique has been used. While qualitative research entails in-depth literature readings and reports, quantitative analysis entails presenting data via graphs and tables. The statistical methods used in the studies of economic and financial problems are complemented by the design of models for the analysis of derivative banking products. The approach varies from conceptual to methodological dimensioning for exploring the experimental field, which includes information, comparative analysis, interpretations, deductive and inductive testing of ideas. Some aspects related to banking contracts are highlighted, seen through the prism of derivative products, based on some mathematical examples, as well as an analysis model for the use of derivative products in banking activity.

To quantify the effect of the use of derivatives on financial sector market values, we estimated a regression model using a panel setting. First, we used a pooled OLS (POLS), ignored the panel structure, and assumed that individual unobserved effects were insignificant. This hypothesis was rejected in the Breusch-Pagan and LM test (BP LM). To model the impact of unobserved personal effects, we then used random effects and fixed effects models. The main difference is that the random effects estimator assumes that individual unobserved effects are uncorrelated with the included regressors. Therefore, we can treat it as random. Whereas with the fixed-effects estimator, we relaxed this assumption and allowed for possible correlation.

While the accumulation of derivatives was found to decrease market valuation over the entire period of analysis, it is also possible that external shocks may have influenced this impact.

According to the brief discussion above, the modeling scheme of this study adopted DEA Approach as an efficiency measure for financial risk management efficiency. found efficiency measures, an example of the need for its application. In addition, in relation to financial risk management, the literature shows that the derivative instrument has received less attention in investigating the impact of its use in analyzing the risk management of efficient banks. Indeed, this research may help reduce the long-standing controversy regarding the impact of the use of derivatives on firm performance.

Based on the literature review, there are two widely used approaches in evaluating bank efficiency, namely, parametric approaches (stochastic frontier approach, SFA) and non-parametric approaches (DEA). In measuring the risk management efficiency of commercial banks, this study uses the DE approach of its strength against the parameter SFA.

A DEA is based on linear programming, which makes it more powerful compared to other productivity management tools. DEA can be measured so that no explicit functional form needs to be specified beforehand. The production frontier will be generated by a mathematical programming algorithm that also calculates the optimal efficiency score for each of the decision-making units (DMUs).

Results and discussions

An important controversy arose in relation to the banks' tendencies to diversify their activities, moving towards off-balance sheet operations, increasing their role on the derivatives market (Bendob, et al., 2015). The big banks have become dealers in the OTC derivatives markets. The

motivation was to replace part of the loss of the traditional "banking" income, with attractive returns that come from transactions with derivative products (Bunea & Bucşa, 2004).

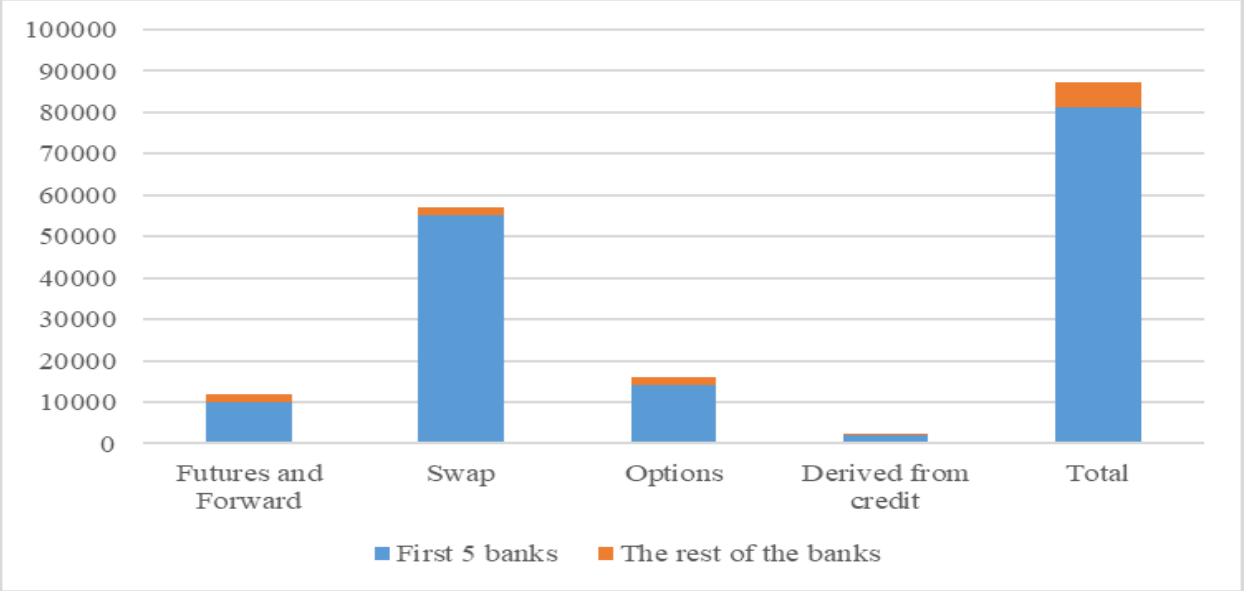

Figure 1. The derivatives market (billion USD)

Source: BMI data, 2021.

The increasing participation of banks in derivatives markets raises problems for regulatory authorities, as there is a fear that derivatives may cause banks to take on greater risks, to the detriment of banking prudence (Cyree et al., 2012). In recent years, many banks have suffered substantial losses from interest rate derivatives (MacCarthy, 2017). Due to the indebtedness that is possible, derivatives lead banks to invest to speculate on the evolution of the interest rate or the stock market, an evolution that, if not favorable, can generate impressive losses (Kantar & Duzer, 2022).

In the case of many market innovations, regulations were absent or appeared late, when the crisis had manifested itself (Bodislav et al., 2020). National and international banking regulatory and supervisory authorities have established common principles, standards regarding capital, accounting and auditing for financial institutions that use derivative products (Bodislav et al., 2021).

The use of OPTIONAL contracts in banking

Optional contracts are used by banks to cover market risks, namely interest rate and exchange rate risks. The optional contracts that have the interest rate and the exchange rate as the supporting asset, assume the use of a notional value (amount of currency or bonds) (Guo, 2022).

The flexibility of exercising options allows you to cover the risk of exchange rate fluctuations, while also benefiting from its favorable evolution (Rădulescu et al., 2020). Exchange rate risk coverage is differentiated, according to whether the currency position is long or short, respectively according to the type of options used, stock or over the counter (Harb et al, 2022).

Hedging currency risk for a long currency position using OTC options

Assume that a US bank buys £1,000,000 worth of CDs issued at a six-month discount at an interest rate of 5% per annum from a UK bank at the exchange rate of US$1.83/ GBP.

Assuming the bank does not record other balance sheet items in foreign currency, it will be in a long sterling currency position (assets denominated in pounds greater than liabilities denominated in pounds).

The long currency position translates into the risk of depreciation of the pound in relation to the dollar (the national currency). Hedging this risk of the pound falling below 1.83 GBP/USD can be achieved by buying 1,000,000 GBP options at a strike price of 1.83 GBP/USD. These options will allow the bank to sell pounds at 1.83 GBP/USD at maturity. At maturity, the exchange rate situation could be:

Assuming that the premium paid by the investor to buy the put option is 0.1 USD/GBP, the hedging strategy is summarized in the following figure. From the graph it can be seen that the value of the portfolio consisting of certificates of deposit and put options never falls below USD 1,730,000. USD 1,730,000 = (USD 1.83/GBP - USD 0.1/GBP) x GBP 1,000,000 = (E - P) x Amount invested

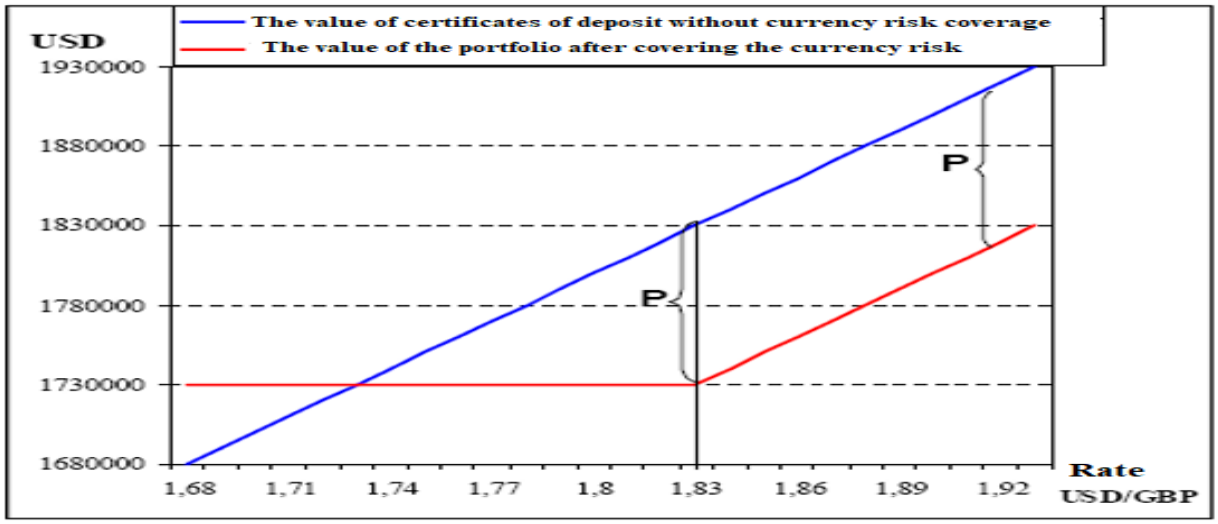

Figure 2. Currency risk coverage for an active position

Source: own processing.

Hedging currency risk for a short currency position

In the case of partial coverage of an exchange rate appreciation risk (short currency position), we assume, again, that the American bank that issued certificates of deposit can only purchase 14, respectively 8, call options out of the 16 required on the stock exchange. As a result, the debt will no longer have a "locked" maximum level as it happens in the case of full hedging of the risk. The situation at maturity of the put options is shown in figure 4. Partial hedging causes the potential debt to increase above its maximum value of 1.950 .000 USD from the fully hedging position of the currency risk. The more hedging is done for a higher value of the exposure, the slower the potential liability will grow.

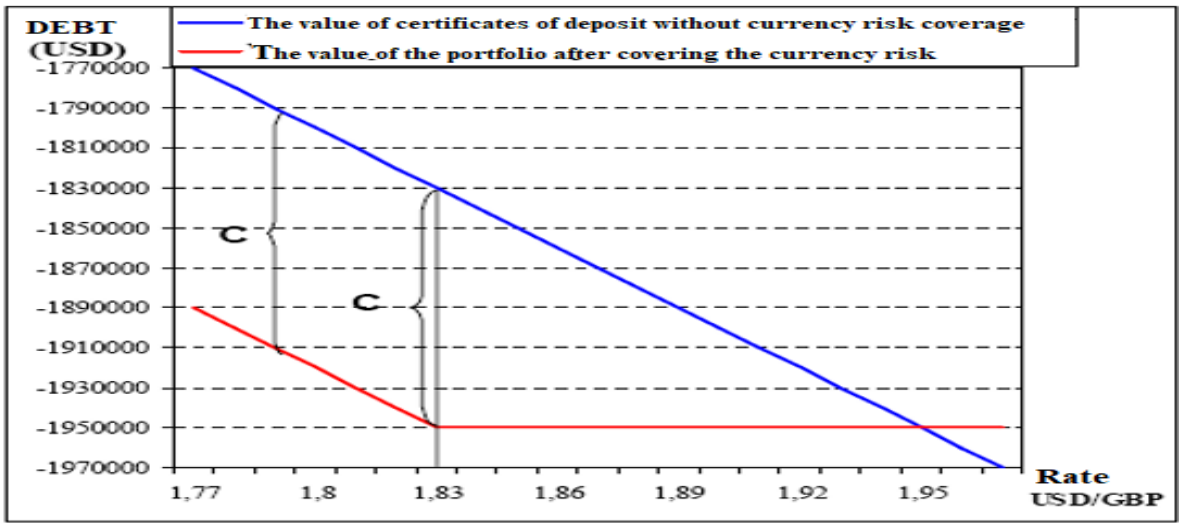

Figure 3. Currency risk coverage for a liability item

Source: own processing.

As income from OTC derivative products on the interest rate, it can be observed that the most important were the swap and FRA contracts, which together held a majority share, reaching 94.18% in April (Figure 4). It is observed that the options recorded the most pronounced dynamics, increasing 4.88 times in 2015-2021 compared to 2005-2010. Among the swap contracts, those expressed in EURO stood out as a weight (46.4% in 2007). Regarding FRA contracts, it can be observed that the largest share was held in April 2007 by FRA in EURO.

As far as derivative products on currencies (swaps and options) are concerned, the majority share was held by derivatives on the exchange rate of the dollar against other currencies (78.64% of total income reported in April 2021).

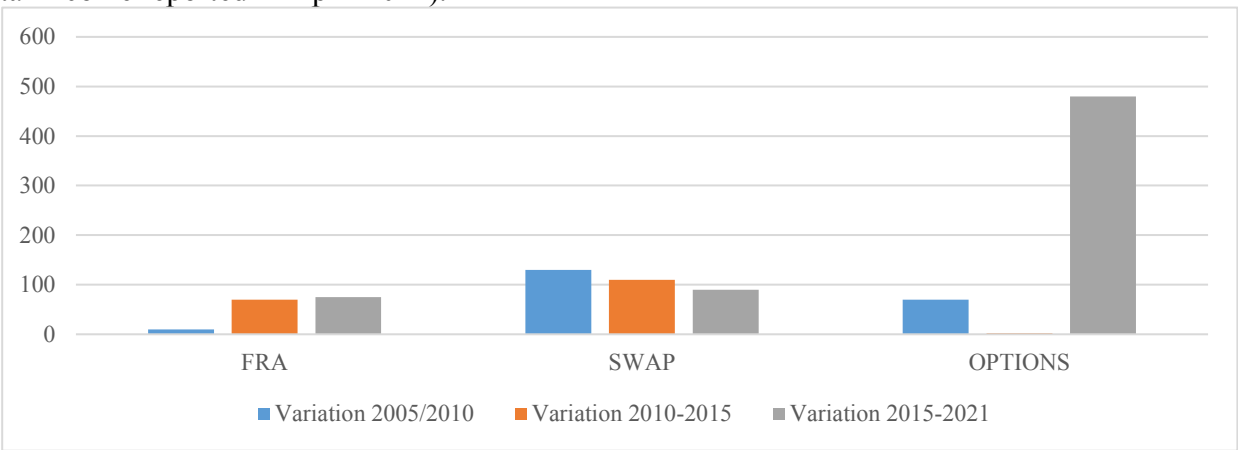

Figure 4. The percentage variation of the income from OTC derivatives

Source: BMI data, 2021.

Perspectives regarding the development of the derivative products market at the level of credit institutions in Romania

The aspects analyzed in the paper led us to the conclusion that the use of derivative products in the activity of banks in developed countries took place against the background of the decrease in profitability related to traditional banking operations and against the background of the increase in the degree of exposure to risks from these operations.

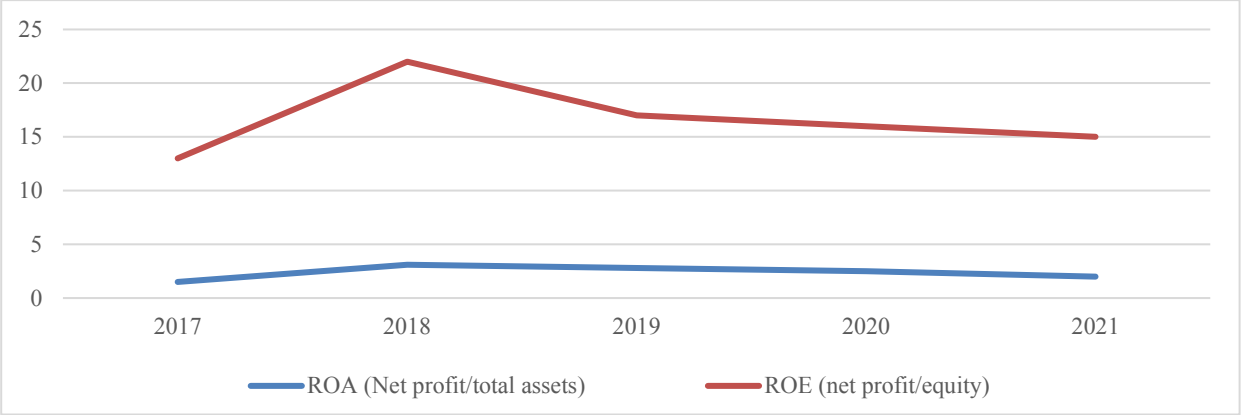

Figure 5. Bank profitability indicators

Source: BMI data, 2017-2021.

Aggregate net profit at the end of 2021 increased by 4.485.7 billion RON compared to the previous year, representing an increase of 33.8% in nominal terms and 22.4% in real terms. This increase occurred exclusively on the basis of the 47.3% increase in net interest income. This increase in net interest income was due, in large part, to the contribution of net income related to lending to non-bank clients. Rapid increases in profitability were recorded by the banks that increased their share on the credit market (Jalal-Eddeen &Saleh, 2022).

The conclusion we draw from this evolution is that credit institutions in Romania (as the majority financial intermediaries, with 37.8% of GDP) obtain and consolidate their profitability indicators by virtue of the traditional operations that they carry out predominantly.

Regarding another factor that boosted the use of financial innovations in banks from developed countries, the increase in the degree of risk of traditional banking operations (because of the orientation towards real estate lending), the evolution of risk indicators at the level of the Romanian banking system does not yet confirm the existence a similar situation, as the graph below illustrates.

The share of "overdue and doubtful loans in total loans" was between 0.6% and 0.3% in 2021, and the ratio "overdue and doubtful debts" / total assets" was between 0.2% and 0.4%. The decreasing values of these indicators reflect the existence of loan portfolios with a low degree of risk. In addition, the evaluations carried out by the specialists of the World Bank, the International Monetary Fund, respectively the European Commission, in the reports drawn up on the occasion of the collective evaluation missions of the financial system, the banking system was considered resistant to potential market risks and of credit. The expansion of lending activity did not affect the solvency of the banking system, indicating a considerable resistance to shocks.

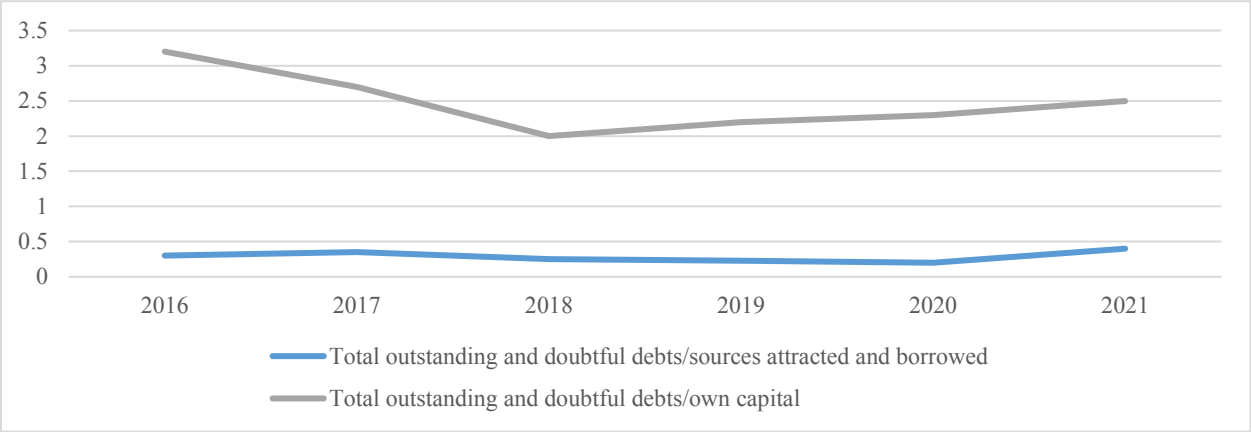

Figure 6. Outstanding and doubtful debts in the banking system

Source: BMI data, 2016-2021.

Conclusion

The analysis carried out at the level of American banks aimed to identify the main factors that determined their orientation towards new activities, beyond the traditional sphere, namely attracting deposits and granting loans. Among the important factors that we highlighted in the analysis are the role of banks in financial intermediation has diminished; deposits, as a source of financing for banks, have decreased in importance, in the context of financial disintermediation and the emergence of new types of investments on the financial markets; the profitability of loans decreased compared to the degree of risk, which registered significant increases. Regarding the risks induced using these products in the activity of banks, there are specific ways of measuring them, the nominal value not being a relevant indicator.

Optional currency contracts can be used by banks to cover the currency risk, measured by the bank's long or short currency position. The examples illustrate the effectiveness and flexibility of using these instruments in hedging exchange risk.

The use of derivative products allows banks to react more quickly to monetary policy measures, while offering them the means to protect themselves against these measures. The result is that the transmission of monetary policy impulses to the economy is less easy, but the principle remains unchanged.

Derivatives contribute to the creation of much more complete financial systems, because the risk properties of credits and financial assets can be compounded and decomposed into new synthetic assets. This re-creation of risk properties provides a way to perfectly match investors' risk preferences with the actual risks of their portfolios or cash-flow profiles. In addition, derivatives allow the risk elements of an asset to be individually valued and traded. This generates a more efficient system for assessing asset prices, because the prices of derivative products can signal variations in the prices of the underlying assets.

A simple summation of derivative positions at the level of the economy overestimates the total risk. Derivatives can provide means of hedging against adverse shocks, reallocating them to those market participants who are able to manage them.

Derivatives markets offer an efficient mechanism for disseminating new information on financial markets, facilitating early risk management actions in the perspective of systemic turbulence.

The possibility of an expansion of the risk at the level of the financial market, starting from the use of derivatives, seems to be somewhat overestimated. Certainly, the traditional size of the exposure - the face value- overestimates the risk.

The increase in the liquidity of bank loans due to derivative products increases the degree of substitution between them and other forms of credit and reduces their role as a monetary policy mechanism. The use of derivative products reduces the effect of the variation of the central bank's interest rate, and the elasticity of investment demand with respect to the interest rate decreases.

In a more complete financial market, it is more difficult for the central bank to predict the effect of a certain monetary policy impulse on the real economy and on the level of employment.

Our study had some limitations that could be further considered when approaching future research.

First, due to data availability, we did not consider the purpose of the banks when using derivatives: speculation or hedging. This differentiation might lead to different results, when considering the impact of derivatives holdings on the market value. Second, we could extend the analysis period, considering both pre-crisis and post-crisis data, and observe whether there is a difference in the relationship between derivatives and firm valuation. Finally, more recent advances can be used, concerning econometric estimation, to refine the results and correct the potential estimation problems.

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