RISK MANAGEMENT WITH FINANCIAL DERIVATIVES: EMPIRICAL EVIDENCE FROM ROMANIAN NON-FINANCIAL FIRMS

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Abstract: *Financial risk management has rapidly evolved over the past two decades and has become an indispensable function in many institutions from different area of activities. In the last two decades, as the financial markets have become more and more mature, an increasing number of firms from emerging economies have chosen to use derivatives to hedge financial risks. As a result, risk management with financial derivatives has attracted much attention recently, becoming an important topic in the financial literature. However, we know little about the use of financial derivatives by firms from emerging economies and about the effect of these instruments on firms' risk and value. The aim of the paper is to provide new insights into the use of financial derivatives for hedging purpose by non-financial firms from emerging markets. We analyzed risk management practices on a sample of 68 non-financial firms listed at Bucharest Stock Exchange (BSE) over a long time frame (2001 to 2011). We found that Romanian non-financial firms from our sample are exposed mainly to commodity price risk, currency risk, interest rate risk, and liquidity risk. More than half of the firms in our sample (55.88%) publish in their annual reports the goal of risk management process. Our results show that 10.29% of non-financial firms in our sample use financial derivatives to hedge their currency, interest rate or commodity price risks. We also found that the volatility caused by the global financial crisis determined many firms to use financial derivatives over the period 2007-2011. Nevertheless, the use of financial derivatives by Romanian non-financial firms is low relative to values registered for other emerging economies. The most important factors that hindered the use of financial derivatives have been the low liquidity of exchange derivatives markets, high hedging costs, and the lack of risk management expertise. The traditional approach of managing risks individually is still predominant among the non-financial Romanian firms.*

Keywords: risk management; financial derivatives; emerging markets; non-financial firms; Romania.

JEL classification: G32; L25.

1. Introduction

In emerging economies from Central, Eastern and South Eastern Europe (CESEE), a key barrier in researching risk management practices, the corporate use of derivatives and their effects on firms' market value has been the limited information about the hedging positions of firms. The lack of available data has been the effect

to the fact that until recently firms in most countries around the world were not obliged to disclose neither the risks they face, nor the policies they adopt to manage these risks. In the last years, the implementation of the International Financial Reporting Standards in many countries worldwide has facilitated the investigation of the relationships between financial derivatives, risk management and firms' market value.
The aim of the paper is to analyze the use of financial derivatives for risk management purposes by non-financial firms listed at Bucharest Stock Exchange (BSE). We collect manually data about hedging activity of public firms from their annual reports. The analysis of these information for a long period of time allows us to identify changes occurred in the financial risk management process under the influence of various factors such as the high volatility caused by the financial crisis of 2008 and the improvement of corporate governance. To the best of our knowledge, there are only a few studies on this topic for emerging economies and none for Romania.
The rest of this paper is organized as follows: section 2 provides the key literature on the use of financial derivatives by firms and banks from developed and emerging economies. Section 3 discusses the data and sample and reports the results of our study. In the last section, we conclude our study and present some further research opportunities.

2. Empirical Evidence on Risk Management with Financial Derivatives

2.1. Empirical Evidence on Risk Management with Financial Derivatives in Developed Economies

The use of financial derivatives in risk management has been the topic of numerous papers in developed countries. The most comprehensive study in this regard was conducted at the University of North Carolina in 2004 (Bartram *et al.*, 2004). The authors examined about 7,300 firms in 48 countries, based on firms' reports from 2000 and 2001. The study shows that over 60% of the analyzed firms were using financial derivatives. On risk areas, 44% of the analyzed firms use currency derivatives to manage currency risk, 33% use interest rate derivatives, while 10% of firms employed commodity derivatives for risk management. Another important finding of this study is that the financial derivative instrument varies on the type of risk that is intended to hedge. Thus, forward contracts are used more than swaps in foreign exchange risk management - 35.3% of firms use forward contracts, while only 11.0% use swaps. Meanwhile, swaps are mostly used in managing interest rate risk in 28.8% of all firms and forward contracts are used only by 0.6% of the firms in our sample.
A similar study conducted by the International Association of Dealers Swaps and Derivatives (ISDA) in 2003 on the use of derivatives by the 500 largest firms in the world shows that 92% of the largest firms in the world use derivatives in order to manage more effectively financial risks (International Swaps and Derivatives Association, 2003). The sample comprises firms from 26 countries and from various industries (from aerospace to the retail electronics and office). The second and, at the same time, the latest study conducted by ISDA, confirm the trend of the use of financial derivatives by the largest firms in the world. Thus, 471 of Top 500 firms (94%) use derivatives to manage financial and business risks

(International Swaps and Derivatives Association, 2009).
As shown in Figure 1, in 2009, most firms (88.2% of 500 firms) use derivatives to manage currency risk, 83.2% of firms use derivatives to hedge against interest rate risk, 48% to manage the commodity price risk, 28.6% to protect against stock price risk, and 20.2% use credit derivatives. In the period 2003-2009 there has been a significant increase in the use of derivatives to hedge the price risk on commodity and equity markets as a direct consequence of the high volatility on these markets.

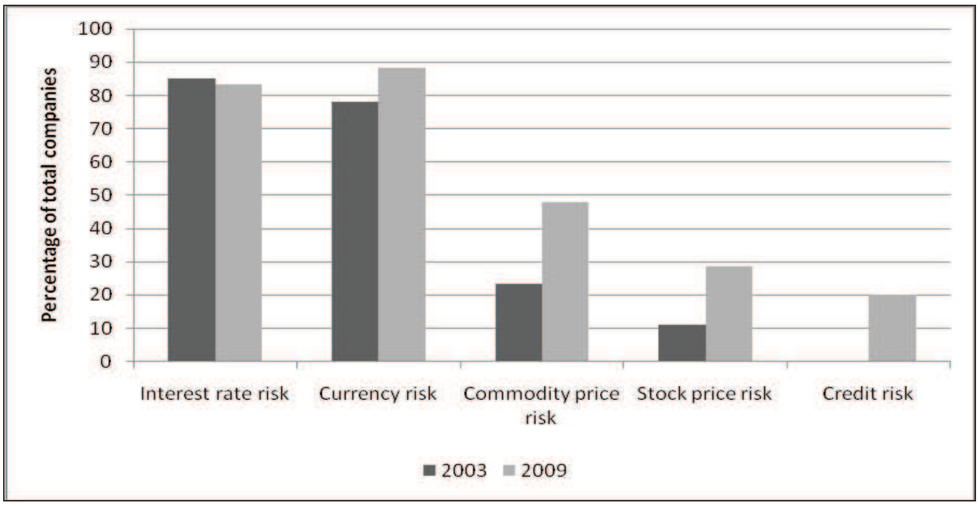

Figure 1. The use of financial derivatives by corporations in Top 500 by type of risk (2003 and 2009)
Sources: International Swaps and Derivatives Association, 2003; International Swaps and Derivatives Association, 2009.

From studies carried out in the last 10 years it is observed that the use of derivatives has grown from year to year. The use of financial derivatives by firms is widespread in many developed economies, as shown in studies for the United States, France, Finland, Sweden, Germany, Great Britain, and Belgium.

2.2. Empirical Evidence on Risk Management with Financial Derivatives in Emerging Economies from Central, Eastern, and South-Eastern Europe
In the extant literature there are only a few studies (Berk, 2006; Sprčić, 2007; Anton, 2013; Huian and Apostol, 2014; Kozarević *et al.*, 2014; Ayturk *et al.*, 2016) on the use of financial derivatives by firms or banks from CESEE countries. Using a sample of the largest firms and the largest foreign exchange exposure in Slovenia in 2004, Berk (2006) showed that 37% of the respondents in the survey used derivatives. According to this study, Slovenian non-financial firms are more likely to use internal hedging techniques (asset liability management, leads and lags, or netting). Kozarević *et al*. (2014) reported a low level of derivatives usage both by commercial banks and non-financial firms in Bosnia and Hertegovina. Using a sample of non-financial Turkish firms for period of 2007-2013, Ayturk *et al*. (2016) reported that 36.41% of them used financial derivatives in order to hedge

financial risks.
Anton (2013) analyzed the evolution of risk management practices and risk perception in metallurgical firms from Romania in the light of the latest global financial crisis. The paper showed that Romanian non-financial firms were facing two important financial risks (increased prices of raw materials and energy, currency risk) during the financial crisis and they started to use more and more financial derivatives in order to hedge some financial risks and also they improved the organization of risk management. Huian and Apostol (2014) reported that 73% of the Romanian banks used financial derivatives over the period 2007-2012. According to this study, financial derivatives are employed for hedging purposes and the most used contracts are currency swap. Previous studies on risk management practices (Horobet *et al.*, 2009; Păun *et al.*, 2010) used surveys in order to assess the risk management practices among non-financial Romanian firms. None of them analyzed the instruments used by public Romanian firms to hedge financial risks.

3. Risk Management Practices among Romanian Non-Financial Firms

In Romania, according to the Regulation no. 1/2006 on issuers and securities operations (approved by the National Securities Commission Order no. 23/2006), firms listed on a stock exchange are required to disclose in their annual report information on the risks they are facing, the objectives of risk management policies, and the instruments used in this purpose (Comisia Naţională a Valorilor Mobiliare, 2006).
Our sample comprises the non-financial firms that are listed on the BSE and have their annual report published according to the Romanian Accounting Standards for the period 2001-2011. The initial research sample consisted of 81 Romanian firms that were listed on the BSE over the period 2001-2011. Next, for the purpose of this paper, we excluded financial firms, which may use financial derivatives for trading purposes. Also, we excluded from the sample any firm that indicates the use of derivatives for speculation. The size of the sample varies from year to year due to the fluctuations of the number of firms quoted (new listings or delisting), but after eliminating financial firms, we obtained an average sample of 68 firms listed at the three categories of Bucharest Stock Exchange.
In the last years the Romanian firms started to disclose in their annual reports more and more information on corporate hedging activities. We collected from annual reports the following set of information: the existence and aim of risk management committee; goals of risk management process; management involvement in financial risk management process; the main financial risks that firms faced and the main instruments and policies employed to mitigate these risks (financial derivatives, insurance contracts, operational hedging and so on).
The main risks faced by the Romanian public firms over the period between 2001 and 2011 are commodity price risk, currency risk, interest risk, and liquidity risk. The impact of these risks on the financial performance varies from one industry to another. For example, the Romanian metallurgical firms were particularly exposed to the following risks: commodity price risk (price of raw materials and electricity), foreign currency risk, economic risk, and interest rate risk (Anton, 2013). For firms in the drug manufacturers, regulatory risk related to their export activities is the most important risk in their business.

In the last decade Romanian firms have understood the importance of financial risk management and have begun to implement techniques and financial instruments to reduce the volatility of their cash-flows. In our sample, an increasing number of firms present in their annual report their risk management objectives (55.88%). Also, since 2005, it appears that some Romanian firms began to use derivatives to hedge against financial risks. However, only 7 out of 68 firms (approximately 10.29% of the total firms) reported the use of derivatives over the period between 2001 and 2011.

The major users of derivatives according to information published in their annual reports are S.C. Alro S.A. Slatina (swaps and options on aluminium), S.C. Antibiotice S.A. Iaşi, C.N.T.E.E. Transelectrica S.A. Bucureşti, S.C. OMV Petrom S.A. (swaps and options on Brent oil or currency forward), S.C. Șantierul Naval Orșova S.A. (currency forward), S.C. Artrom S.A. (currency forward) and S.C. VES S.A. - Sighisoara (currency futures). We found that large firms, which were very exposed to commodity price risk (such S.C. OMV Petrom S.A. and S.C. Alro S.A. Slatina), used almost constantly derivatives over the period 2005-2011. On the other hand, smaller firms, with activities oriented predominantly towards export (e.g., S.C. Șantierul Naval Orșova S.A and S.C. VES S.A. - Sighişoara) used only during certain periods currency derivatives to protect against the volatility of exchange rate (Anton, 2015). The financial statements show that the hedging strategy used by some firms allowed them to maintain profitability in the context of the high volatility on the commodity markets.

Over the analyzed period, the Romanian firms had the opportunity to use OTC derivatives or exchange traded derivatives. The low liquidity recorded by the Romanian derivatives exchanges (Sibiu Stock Exchange and Bucharest Stock Exchange) determined the Romanian public firms to use mainly OTC derivatives to hedge against financial derivatives. We also found difference in the kind of financial derivatives uses. Thus, big corporations used complex instruments, such as swaps and options on commodities, while smaller firms used less complex instruments, such as futures or forward contracts. Our findings confirm other studies (Allayannis and Weston, 2001; Bartram *et al.*, 2011), which show that the size of a firm influences the use of financial derivatives for risk management, given the high fixed costs of hedging activities.

Our results will be of particular value to academics, managers, and financial supervisory authorities. Managers can improve their knowledge about the role of financial derivatives in risk management and learn from the best practices in their industry. From the financial supervisory authorities' perspective, empirical evidence on derivative use is particularly useful when the costs and benefits of additional regulations on these markets are being considered.

4. Conclusions and Further Research

We contribute to the extant literature by providing new insights on the use of financial derivatives by non-financial firms before and during the latest global financial crisis. So far financial risk management practices attracted considerable research in developed economies and only a few papers analyzed firms from CESEE countries. To the best of our knowledge, this is the first paper on the use of financial derivatives by non-financial Romanian firms.

On this particular sample, we found that the main financial risks that non-financial

firms faced were commodity price risk, currency risk, interest rate risk, and liquidity risk. Also, 55.88% of firms from our sample disclose in their annual reports the goals of risk management process. Our results show that an increasing number of public firms from Romania are using financial derivatives, but the number is still low compared to developed markets. On average, 10.29% of non-financial firms from our sample reported the use of financial derivatives for risk management purpose. The volatility caused by the latest global financial crisis influenced significantly the use of financial risk management tools. Romanian firms use derivatives primarily to manage currency risk and commodity price risk.
Although data on derivatives use become more and more available in developed economies, the results of empirical research on the effects of derivatives usage on firms' risk and value are still unclear and mixed. Most of the previous research has focused on the U.S. firms, since the improvement of disclosure requirement in U.S. allows the researchers to obtain more information about firm's derivatives position and to investigate whether the use of derivative for hedging purpose is a value creative strategy for firms. In our opinion, further research should focus on the effects of derivatives use on the value of firms from emerging economies.

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