THE USAGE OF DERIVATIVES IN FINANCIAL RISK MANAGEMENT BY COMPANIES IN BOSNIA AND HERZEGOVINA

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ABSTRACT

The main objective of this paper is to determine the scope of the use of derivatives by companies in BiH for specific purposes of financial risk management. The aim is to provide a comparative analysis with companies from Slovenia and Croatia in order to determine if companies in BiH use the hedging instruments appropriately, and to suggest possible improvements of their practices for managing financial risks. The basic goals of the paper are to explore if companies in BiH use derivatives for risk management purposes to the same extent as Slovenian and Croatian companies and to determine if BiH companies properly hedge their financial risks. The paper also aims to give suggestions to BiH companies for improvements of their risk management practices in order to ensure more efficient and effective financial risk hedging by using derivatives, primarily available through banks on BiH financial markets.

Keywords: use of derivatives, financial risk management, companies, Bosnia and Herzegovina (BiH)

JEL classification: G21, G32

INTRODUCTORY CONSIDERATIONS

There is a growing need among companies which operate in very turbulent business environments to make the use of financial derivative instruments when hedging different types of financial risks. For the past three decades financial instruments have been used with more or less success by companies in developed countries for hedging purposes of their day-to-day business operations. Numerous research related to the use of derivatives by companies in these countries has already been conduced, with general conclusion that most of the companies are dependent on financial derivatives in their risk management strategies.

In emerging markets, such as BiH, financial derivatives are completely new financial instruments and many companies are not equipped with adequate knowledge on how to use them to manage their financial risk exposure.

Taking the above mentioned into the consideration, there is a need to determine the scope of the use of derivatives by companies in BiH for specific purposes of financial risk management. The aim of this paper is to provide a comparative analysis between BiH companies and the organisations from other emerging markets (in this case the neighbouring countries Slovenia and Croatia) in order to determine if companies in BiH are properly using hedging instruments, as well as to recommend possible improvements to their financial risk management practices. The following are the main goals of this paper:

- Explore if companies in BiH use derivatives for risk management purposes to the same extent as Slovenian and Croatian companies.

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- Explore if BiH companies properly hedge their financial risks.

- Provide recommendations for the improvements of the BiH risk management practices in order to ensure more efficient and effective hedging of the financial risks by using derivatives available on BiH financial markets through the financial institutions (primarily the banks).

In order to conduct the relevant research, two scientific hypotheses are formulated, i.e.

- H1: Companies in BiH are not different from Slovenian and Croatian companies in terms of their financial risk management policies.

- H2: Companies in BiH do not use advantages of derivatives usage in the financial risk management to the full extent.

This research will be conducted on the data provided by the Foreign Trade Chamber of BiH, financial statements of the chosen companies, the Banking Agency of the Federation of BiH, the Banking Agency of Republic of Srpska, BiH banks, and other government and non-government organizations.

1. IMPORTANCE OF DERIVATIVES USAGE IN NON-FINANCIAL FIRMS FOR RISK MANAGEMENT PURPOSES

Non-financial firms (i.e. companies), especially those that operate on the global market, as well as financial firms, regularly use derivative instruments to hedge their asset-liability risk exposure and thus reduce the value of their net worth at risk due to adverse events. Derivative contracts, such as futures and forwards, options, swaps, and credit derivatives, allow a company to manage (or hedge) its exposure to interest rate, foreign exchange, credit risk or even catastrophic events such as hurricanes. For instance, a survey of financial institutions, foundations, and university endowments conducted by *New York University Stern School of Business*, *CIBS World Markets*, and *KPMG Investment Consulting Group* found that the most commonly cited reason for using derivatives was risk reduction and hedging. Among large institutions, 41% had a designated risk manager or risk management committee and, among derivatives users (i.e. financial and non-financial firms), 68% had a written policy on risk management (Saunders, Cornett, 2006).

Rapid growth of derivatives usage by both financial and non-financial firms has been controversial. Critics claim that dealing in derivatives opens the door for potential losses that can come to haunt their holders, particularly banks and insurance companies that deal with other people's money. When applied appropriately, derivatives can be used to hedge (or reduce) a firm's risk. However, when misused, derivatives can increase the risk of a firm's insolvency. A number of recent scandals involving financial and non-financial firms (such as *American International Group*, *Goldman Sachs*, *Société Générale*, etc.) have led to a tightening of regulatory requirements for the use of derivative instruments.

The decision by a non-financial firm to actually undertake a transaction in the financial markets to hedge risk is a complex decision-making process that may involve undertaking offsetting transactions in cash, over-the-counter (OTC) or exchange-traded markets. For instance, the early empirical literature on foreign exchange risk management by international firms (Belk and Glaum 1990; Collier et al., 1990; Batten et al., 1993; Ho 1993; Malindretos et al. 1993) suggest extensive use of cash based or "on-balance sheet" products (spot and forward sales or purchases of currency), and occasionally derivative or "off-balance sheet" products (options, futures, and swaps), or combinations of cash and derivative instruments, for hedging risk. However, in recent years there has been an explosion in the use of derivatives, in particular options and swaps, for risk management and speculation purposes by non-financial firms. Only recently have the scale and scope of these transactions been documented or investigated.

2. LITERATURE REVIEW OF RESEARCH CONCLUSIONS ON DERIVATIVES USAGE AROUND THE WORLD

The pioneer research on derivatives usage by non-financial firms was done by the *Weiss Center for International Financial Research of the Wharton School of University in Pennsylvania* in 1995 on the sample of USA non-financial firms (Bodnar et al., 1996). The main conclusion of this research was that derivatives usage among non-financial firms appears to be a fact of modern financial life. Despite the derivatives "train wrecks" of 1994, the evidence suggested that the percentage of firms using derivatives has not dropped off from 1994 levels. According to the survey, less than half of all non-financial firms in the USA use derivatives, although usage is tilted heavily towards larger firms in the commodity and manufacturing sectors.

In 1998, Wharton survey was extended to German firms with comparison to the USA firms (Bodnar and Gebhardt, 1998). Wharton surveys also triggered similar research in other developed countries: New Zealand (Berkman et al., 1997), Sweden (Alkebäck and Hagelin, 1999), Spain (Azofra et al., 2001), and the UK (El-Masry, 2003). All the mentioned research confirmed that there is a similarity between firms in developed countries in terms how and why they use financial derivatives.

In contrast, the research conducted in several emerging economies in Latin America – Peru (Martin, 2009) and Argentina (Tappatá et al., 2000) – and in the Balkans – Slovenia (Berk, 2006; Miloš Sprčić, 2007) and Croatia (Miloš Sprčić, 2007) – revealed different patterns of derivatives usage by the surveyed companies in these countries. For instance, in Latin America large firms do not practice a generalized use of derivatives. In this sense, there is a low percentage of participating firms and a small traded volume. Although the firms are aware of interest rate and foreign exchange risks, they do not carry out formal risk management practices. Furthermore, those risks are not the most influential factor in the use of derivatives.[1] According to Martin et al. (2009), the main issue that influences the most in derivatives use is the degree of market knowledge and the level of training on these financial instruments. This shows the importance of disclosure and training as catalysts that could encourage the development of these instruments.

The comparative analysis conducted to explore differences between risk management practices in Slovenian and Croatian companies has shown statistically significant evidence that Slovenian companies use all types of derivatives, especially structured derivatives, more intensively than Croatian companies. These findings are consistent with the research prediction that Slovenian companies have more advanced risk management practices than Croatian companies.[2] Furthermore, research on Slovenian and Croatian companies showed that forwards and swaps are by far the most important derivative instruments in the analysed countries. Futures, as representatives of standardised derivatives, together with structured derivatives are more important in the Slovenian than in Croatian companies, and in managing commodity price risk than in managing currency and interest rate risks, while exchange-traded and OTC options are not considered important financial risk management instruments in both countries.

As the most important reasons why companies do not use derivatives in financial risk management, Miloš Sprčić (2007) found that the Slovenian and Croatian financial managers indicated high costs of establishing and maintaining risk management programs that exceed the benefits. Slovenian managers are also troubled by the high cost of financial risk management instruments and insufficient exposure to financial risks, while Croatian managers claim that the insufficient and inadequate supply of risk management instruments offered by domestic financial industry is a very important reason why they do not use derivatives.

3. DERIVATIVES USAGE BY COMPANIES IN BIH

This empirical research contains two main parts. The first part involves research among commercial banks operating in BiH, considering them as the only counterparties to companies on the derivative OTC market because of BiH bank-based financial system. The second part refers to companies as real/potential users of derivatives and their view on the use (knowledge, current use for hedging purposes, intentions, etc.).

3.1. From the banks' perspective

In order to evaluate an overall level of derivative instruments demand in BiH, types of derivatives offered by the banking sector, and possibilities and limitations of introducing derivative market as a market segment in BiH stock exchanges, a research was conducted amongst commercial banks operating in BiH at the end of 2010 and the beginning of 2011. For this purpose a specific questionnaire was created and sent to all the banks operating in BiH.[3] The sample included 29 business (commercial) banks, 19 in the Federation of BiH and 10 in Republic of Srpska, according to the data from banking agencies in the Federation of BiH and Republic of Srpska.

According to the data collected from the official web sites and questionnaires, out of 29 commercial banks 10 of them offer derivatives products (6 in the Federation of BiH and 4 in Republic of Srpska). The remaining 19 do not offer derivative instruments and have no intention to offer these instruments in the near future. Therefore, these 19 banks were excluded from further research. Out of 10 banks that offer derivative instruments, 8 banks returned the questionnaire, which was 80% of all responses (all 6 banks from the Federation of BiH and 2 from Republic of Srpska returned the questionnaire).

Based on the answers provided by the banks, it was concluded that, besides a low supply of derivatives in the banking sector (34.48%), OTC derivative market in BiH is relatively "young" and it has only existed for the last six years. There is no formally organized derivative market as derivative exchange. Also, demand for derivatives in BiH is extremely low. The data shows that one bank, that is the biggest supplier of derivatives, closed only 10 contracts for derivatives with an average value of BAM 750,000.00 (approx. EUR 383,600.00) from August 2008. Other banks all together closed only 4 contracts for derivatives.[4] Concisely, the research results imply that derivative market in BiH is in the early phase of development, which is an indicator of low derivative market potential in BiH.

The research also shows that the offer of derivative instruments in BiH is very poor. Commercial banks offer just three types of derivatives, which are commonly used for foreign exchange risk and credit risk hedging: currency forwards, currency swaps, and interest rate swaps. The research shows that all three types of derivatives are offered by 12.5% of the surveyed banks, currency forward and currency swaps are offered by 50% of the surveyed banks, and 37.5% of the surveyed banks offers only currency forwards.

The structure of derivatives offered at OTC market in BiH is shown in Chart 3.1.

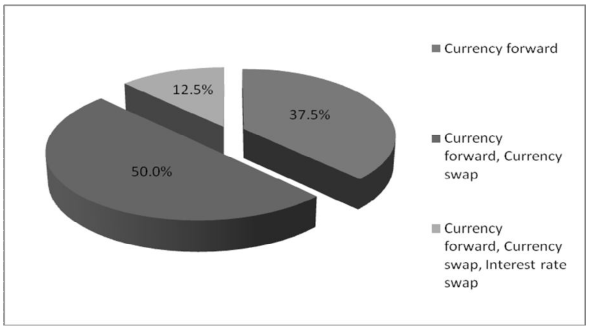

Chart 3.1. Types of derivatives at OTC market in BiH
Source: The authors' research

The demand for derivative instruments is also very low. According to the surveyed results, the biggest interest amongst bank clients is for currency forwards, with the average grade 2.33, then for currency swaps (2.20) and the smallest for the interest rate swaps (2.00).[5] Further, information provided by the users of derivatives (via informal communication) revealed that the major reasons for low usage of derivative instruments are lack of information about the procedure of derivatives use and lack of knowledge about potential benefits of these instruments in the domain of risk management. Also, the major limiting factor of larger derivatives use can be attributed to a relatively low number of business operations of BiH companies on the global market.

Companies have the major role in the structure of users that closed contracts for derivatives with the surveyed banks. According to the survey, dominant users of derivatives are companies involved in production and distribution of oil and oil derivatives, furniture production companies, trading companies (especially trading companies with imports from China), gas trading and supplying companies, and IT companies. Other users of contracts for derivatives are banks, but in lower percentage. The structure of derivatives users in BiH by client segments is shown in Chart 3.2.

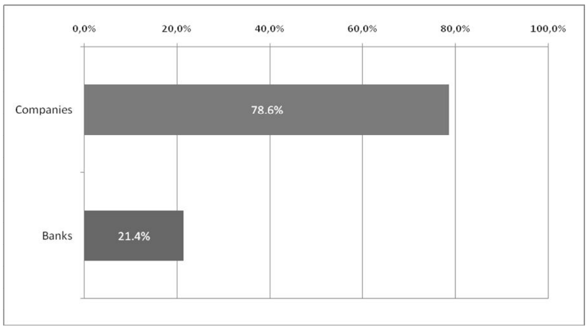

Chart 3.2. The structure of derivatives users in BiH (client segments)
Source: The authors' research

The survey also shows that the most important conditions and/or limitations for derivatives purchase by companies are as follows:

- Necessity of having a deposit on a special bank account for covering forward transaction (usually 10% of transaction value),
- Value of client turnover with the bank,
- Considerable need for buying different currencies, and
- Collateral level (depending on clients' credit worthiness).

A positive fact is that the surveyed banks give great attention to the available basic financial instruments, and, therefore, have organized special departments (such as trading and asset departments) in their corporate structure with trained personnel for this type of transactions. The negative side related to operations on OTC derivative market is that only 25% of the surveyed banks hired specialized persons with adequate knowledge and international certificates for trading with financial instruments (e.g. ACI Dealing Certificate), while other banks only satisfy legal obligations and hire personnel with adequate brokerage certificate and investment advisors certificate issued by the

Securities Commissions in the Federation BiH and Republic of Srpska.

At the time of data collection, none of the surveyed bank was planning to form departments for derivatives trading in the near future, which is logical due to the lack of substantial demand for derivatives. This fact will, *ceteris paribus*, slow down further development of financial market and derivative market, respectively, in BiH. As for derivative types offer enlargement, 75% of the surveyed banks are planning to offer new derivative instruments, 12.5% is not planning to offer new derivative products, while 12.5% did not have clear answer to this question (see Chart 3.3).

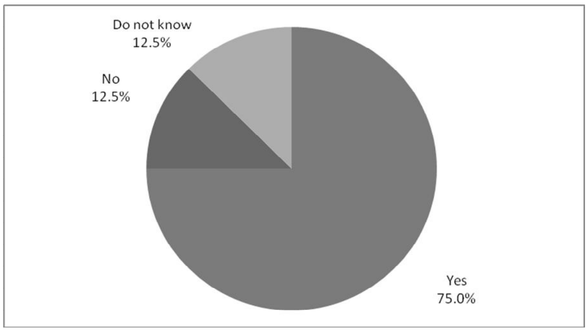

Chart 3.3. The derivative offer expansion in BiH
Source: The authors' research

The banks that answered positively to the questions regarding expanding their derivatives offer, will offer interest rate swaps, currency swaps, and credit options. A detailed structure of derivative offer development in BiH is shown in Chart 3.4.

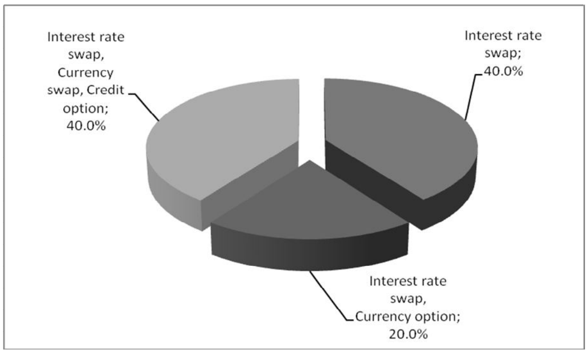

Chart 3.4. The (intended) structure of derivative offer development in BiH
Source: The authors' research

As for the need to establish organized derivative market as a market segment within Sarajevo Stock Exchange (SASE) or Banja Luka Stock Exchange (BLSE), the surveyed banks are divided: 50% of them think that establishing derivative market will contribute to development of financial market in BiH in general, while other 50% think that there is no need for its establishment yet.

The most interesting conclusion of the part of the research is that all the banks express the need for further education of their staff in the field of derivatives trading and derivatives use as the tool for managing (i.e. hedging) risks. This fact led us to the general conclusion that the main reason for the low level of derivatives supply and demand is the lack of information and education of banking personnel in derivatives contracting, but also banks' caution in the aftermath of the global financial crisis.

When asked what particular type of education is needed, most of the surveyed subjects mentioned the ACI Dealing Certificate exam, as well as the need for basic education and trainings in all aspects of business operations with derivatives. Education is necessary for staff not only employed in a front desk, but also for those working in other departments and dealing with derivative transactions, such as financial department, trading department, credit department, etc.

3.2. The companies' view on derivatives usage

The second part of the research was conducted in the period from the middle of 2011 until the middle of 2012. At first, a sample of 30 companies was created using a generator of pseudo-random numbers and the Foreign Trade Chamber of BiH database of 600 exporting/importing companies. Unfortunately, the rate of responses to the questionnaire was only 10%. After that, it was decided to form another sort of random sample using data from the Foreign Trade Chamber of BiH as well as the information from lists of derivatives users-clients provided by some banks (i.e. the lists of 36 companies). In the end, using all available resources, 76 companies were examined (classified as real/possible users of derivatives).[6]

Data was collected by using a questionnaire ("the technique of written structured investigation") consisting of 26 questions which, besides the basic company information, were divided into five sections (I Financial Derivatives Usage, II Currency Derivatives, III Interest Rate Derivatives, IV Control and Reporting Procedures on Financial Derivatives, and V The Need for Additional Education on Financial Derivatives Usage). The questionnaire was e-mailed or personally delivered to the sample companies.[7]

The response rate was 36.84% or, in absolute terms, 28 of the surveyed companies responded to the questionnaire. Out of that number, 7 companies declared they were using or still use financial derivatives.

More than half of the surveyed companies using financial derivatives for risk management purposes (71.43%) employ less than 50 workers. Although most of the surveyed companies employ a relatively small number of workers, their annual turnover is very high. Most of them (42.86) achieve BAM 30 million or more in their annual turnover. In terms of core business, the structure of the surveyed companies implies more than half of the derivatives users (57.14%) which are in trading business (predominantly importing companies), followed by the derivatives users which are in production business (28.57%) and service sector (14.29%).

The importance level of different types of OTC financial derivatives in managing risks used by the surveyed companies is shown in Chart 3.5.

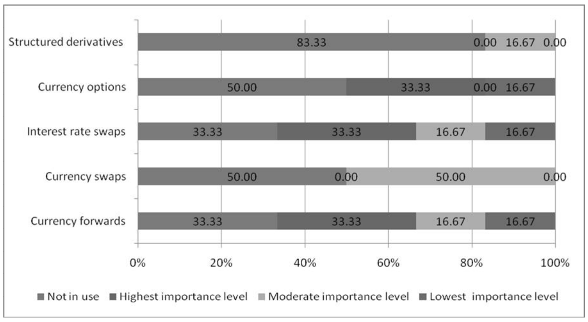

Chart 3.5. The importance structure of different types of OTC financial derivatives assessed by the surveyed companies

Source: The authors' research

One third of the surveyed companies stated that currency forwards are the most commonly used financial instrument in the financial risk management process, while for 16.67% of the surveyed companies this instrument has a moderate or lowest level of importance. It is important to mention that one third of the surveyed companies stated that they are not using currency forwards in financial risk management process. The same results were obtained for currency swaps. Interest rate options and currency swaps (if we exclude structured derivatives) are the least used instruments in financial risk management amongst the surveyed companies. Cash flow variability is the risk factor which has the highest level of importance and priority in risk management process for more than 57.14% of the surveyed companies (Chart 3.6). The second important risk factors hedged by the financial derivatives are revenue variability and balance sheet positions (or in particular financial ratios) protection.

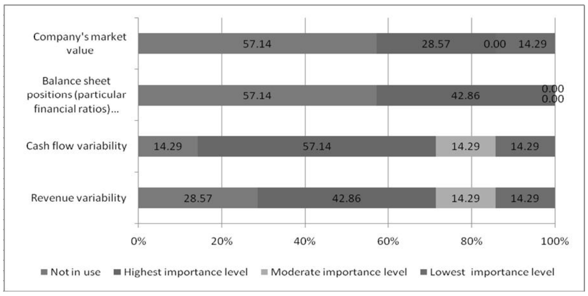

Chart 3.6. The structure of risk types hedged by using financial derivatives

Source: The authors' research

Slightly more than 42% of the surveyed companies have a high level of concern regarding liquidity risk related to financial derivatives transactions and financial derivatives pricing. A detailed structure of concern levels regarding particular questions about the use of derivatives is shown in Table 3.1.

Table 3.1. The concern levels regarding particular questions about financial derivatives usage

No	Concerns about derivatives usage	Structure (%)				Total
		No concerns	Low concern level	Moderate concern level	High concern level	
1	Credit risk related to transaction with financial derivatives	42.86	28.57	28.57	0.00	100.00
2	Uncertainty about qualifying for hedge accounting treatment	14.29	28.57	28.57	28.57	100.00
3	Taxes and legal questions	14.29	14.29	42.86	28.57	100.00
4	Transaction costs (fees to dealers)	28.57	14.29	28.57	28.57	100.00
5	Liquidity risk related to transactions with financial derivatives	28.57	28.57	0.00	42.86	100.00
6	Lack of knowledge about derivatives within the company	42.86	14.29	42.86	0.00	100.00
7	Difficulty quantifying the companies underlying exposures	14.29	14.29	57.14	14.29	100.00
8	Pricing and valuing derivatives	14.29	0.00	42.86	42.86	100.00
9	Monitoring and evaluating hedge results of derivatives usage	42.86	0.00	57.14	0.00	100.00
10	Evaluating the risk of proposed derivatives transactions	14.29	14.29	57.14	14.29	100.00

Source: The authors' research

Chart 3.7 shows the opinion of the surveyed companies regarding accounting treatment of hedging activities by financial derivatives. The data obtained shows a high level of contradiction in the opinion. Therefore, the analysis of this question would need additional investigation in order to determine consistency of the surveyed companies regarding their knowledge on rules governing accounting for hedging.

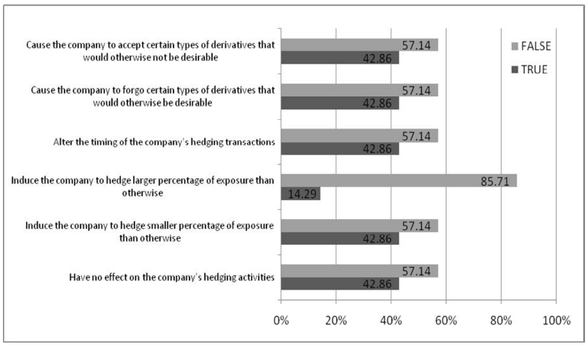

Chart 3.7. The surveyed companies' opinion regarding accounting treatment of hedging activities by financial derivatives
Source: The authors' research

The most common reason for using currency derivatives is exposure to currency risks in anticipated transactions within one year or shorter time, which was reported by 40% of the surveyed companies. The second rationale for currency derivatives use, as reported by 20% of the surveyed companies, is protection from the risk caused by contractual obligations (repatriations). More detailed information on structure of currency derivatives use against particular types of exposures to currency risk is shown in Chart 3.8.

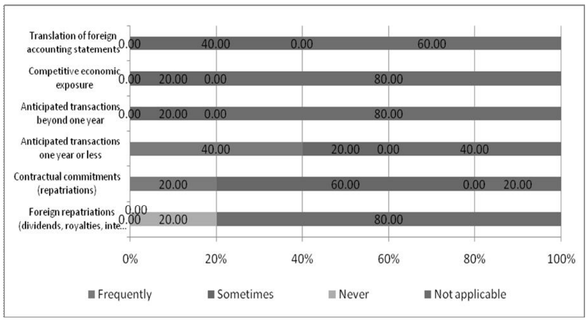

Chart 3.8. The structure of currency derivatives use frequency against particular types of exposures to currency risk

Source: The authors' research

For 20% of the surveyed companies, movements on the currency market in BiH are the main factor that motivates them to take an active (open) position in financial derivatives. The same cause less often affects decisions to alter the timing of the hedging (i.e. alter the delivery date of the derivative contract), which was registered for 60% of the surveyed companies, while 20% of the surveyed companies alter the timing of the hedging due to the movements on the currency market (see Chart 3.9).

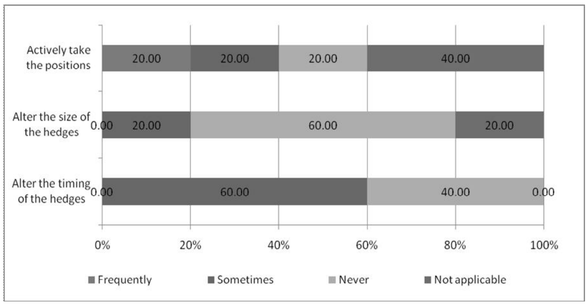

Chart 3.9. The structure of BiH currency market influence on particular decisions regarding financial derivatives

Source: The authors' research

The largest volume of currency derivatives, in nominal terms 89%, have maturity date within the period shorter than 90 days, while remaining 11% use the period of up to 180 days.

Furthermore, Chart 3.10 shows the structure of interest rate derivatives usage frequency in hedging interest rate risk exposures. Only 16.67% of the surveyed companies use interest rate derivatives for the hedging of all types of interest rate risk exposure. On the other hand, one third of the surveyed companies never used interest rate derivatives for swapping from floating rate debt to fixed, and vice versa. The surveyed companies sometimes use interest rate derivatives for reducing costs or lock-in rates based upon a market view. It is interesting to observe that half of the surveyed companies believe that interest rate derivatives are not applicable for managing credit risk through swapping floating rate debt to fixed, and vice versa, and also fixing in advance the debt rate (spread) on the new debt.

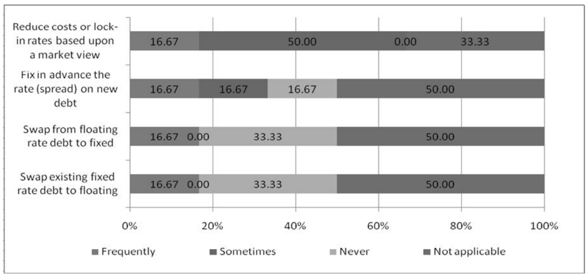

Chart 3.10. The structure of interest rate derivatives use frequency in hedging of interest rate risk exposure

Source: The authors' research

For one third of the surveyed companies, the perception of interest rate market movements is frequently a factor in making decision to alter the timing of hedging. In contrast, one half of the surveyed companies consider this perception, among others, as a lesser reason for making decision to take active positions in the financial derivatives, or to alter the size of the hedging action (see Chart 3.11).

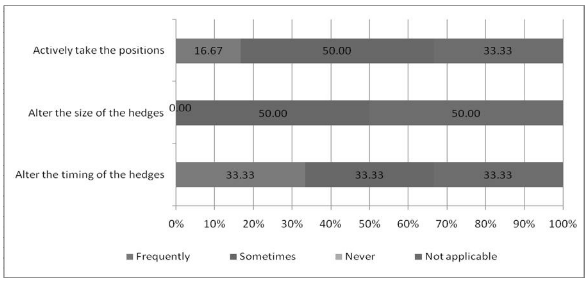

Chart 3.11. The structure of the perception of interest rate market movement influence on decision making in hedging of interest rate risk

Source: The authors' research

In terms of preference for different types of derivatives in hedging interest rate risk, 80% of the surveyed companies prefer the use of interest rate options, while 20% of the companies prefer interest rate swaps.

A large number of the surveyed companies (85.71%) have documented the strategy defining conditions for using financial derivatives in the financial risk management process. This is an encouraging indicator, having in mind the fact confirmed by the previous research that the formalized process of planning is at a very low level in most of the small and midsized companies in BiH. Reporting to board of directors on financial derivatives usage is in most cases (i.e. for 42.86% of the surveyed companies), done on a monthly and quarterly basis. In 14.29% of cases, this reporting is done in other intervals, depending on needs and requirements of a particular business situation.

Commercial banks are the primary “source” of financial derivatives for 85.71% of the surveyed companies, while 14.29% of the companies do not use commercial banks for generating instruments for financial risk management. In lower extent, insurance companies are reported by BiH users as “the source” of financial derivatives.

Financial derivatives users in large extent (in 85.71% of cases) have positive experiences in transactions with financial derivatives in terms of the counterparty risk. In some way, this fact may encourage the use of these instruments in a company financial risk management process.

The surveyed companies are quite divided when it comes to risk assessment associated with financial derivative transactions. In fact, 42.86% of the companies do not make any assessment, which indicates that they are confident when using financial derivatives, even though this can be treated as inadequate dedication and systematization in the process of financial risk management.

In a large number of cases (83.33%), the surveyed companies use financial derivatives in financial risk management associated with corporate exposure. Only one sixth of the surveyed companies use financial derivatives for hedging risks in specific cases.

Three quarters of the surveyed companies have employees with university degree in economics, which is considered a solid base for development of the financial risk management process as well as the risk management process as a whole.

Only slightly more than half of the surveyed companies (57.14%) have created a separate business unit charged with responsibility over financial risk management. Even though activities of the financial risk management process can be allocated to other business units, successful business practices show that this question has to be the subject of some sort of due diligence, which will probably result in a specific organization unit being formed, focusing on overall business risk management within a problematic company.

An encouraging fact is that management of 85.71% of the surveyed companies understands the importance of financial derivatives usage for risk management in general. This data is even more important when it links to the data on the above mentioned positive experiences in transactions with financial derivatives reported by the surveyed companies.

Need for education is constant since these processes are fairly dynamic and strong knowledge is a key in continuously ensuring a competitive position on the market. Investment into education is an essential element for these processes. For that reason, once more, an encouraging fact is that 85.71% of the surveyed companies think that their employees have the need for additional education in the area of financial derivatives.

A large number of the surveyed companies (85.71%) believe that they will have the need for using financial derivatives for financial risk hedging in their future business. On the other hand, 14.29% of the surveyed companies believe that in the near future, they will not have the need for the use of financial derivatives. Certainly it would be interesting to further analyze the reasons for negative opinions regarding the use of derivatives.

More than half of the surveyed companies, more precisely 57.14% of those that expect to use financial derivatives in their future business, expect to use interest rate swaps and interest rate options. The surveyed companies believe that the lowest interest would be in currency options (14.29% of them). A detailed structure of the intended use of financial derivatives in future business operations of the surveyed companies is shown in Chart 3.12.

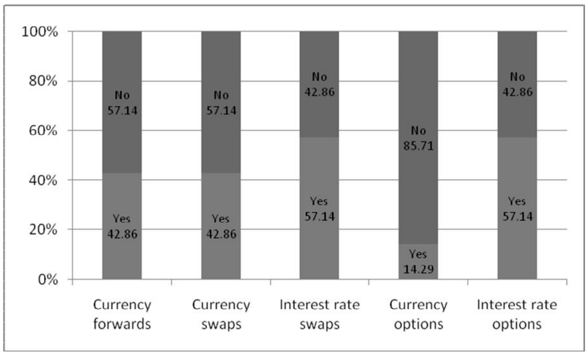

Chart 3.12. The structure of intended use of financial derivatives
Source: The authors' research

Considering the first part of the research, which was referring to banks as main counterparts in the OTC derivative market in BiH, it can be concluded that development of derivatives offered by the banks is consistent, in principle, with expected derivatives usage by the surveyed companies.

CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

In general and based on the information provided by the banks, the users of financial derivatives and the exporting/importing companies, it can be concluded that major rationales for a low use of derivative instruments are due to lack of information about procedures of derivatives use and lack of knowledge about potential benefits of these instruments in the domain of risk management. This applies not only to company employees, but to bank employees too. Also, the major limiting factor of larger derivatives usage can be a relatively low number of business operations conducted by BiH companies on the global market as well as an absence of significant movements on BiH currency market due to currency board arrangement of the Central Bank of BiH (i.e. fixed course BAM against EUR and, consequently, a relatively low level of currency risk which the companies are exposed to, excluding BAM/USD).[8] Amongst the risk factors hedged by the companies through their use of financial derivatives are cash flow volatility, revenue volatility, and protection of balance sheet positions.

In scrutiny and comparison with Slovenian and Croatian companies, we can conclude that they use derivatives in bigger extent than BiH companies. As for the types of derivatives being used, companies from those countries predominantly use OTC derivatives, which are more expensive than exchanged-traded derivatives, due to the fact that there is no regional market for derivatives available for exchange-traded derivatives.

In terms of the rationales why companies do not use derivatives for hedging purposes, the companies in BiH are similar to those in Slovenia and Croatia. In other words, it depends on the size of a company (measured by its annual turnover) as well as its intention to limit either cash flow/revenue volatility or to protect particular financial ratios.

BiH companies are more likely to decide not to use derivatives due to lack of knowledge and due to higher costs of maintaining derivatives portfolio, rather than the costs related to financial risks. Nevertheless, the offer of derivative products in BiH is respectable with perspective to include additional products such as interest rate swaps, in contrast to the derivative offer in Croatia. Besides that, a number of the companies expect to use current and new financial derivatives instruments in their future business operations. But for now, if they want to improve their financial risk management practices, due to higher costs (resulted mainly from the banks' provisions and their targeted profit rates) and despite their positive experience, BiH companies should, unfortunately, rather use exchange-traded derivatives of more developed countries markets than derivatives on domestic OTC market.

As we can summarize, both formulated scientific hypotheses can be confirmed. Further research suggests a need for more in depth analysis of derivatives usage by non-financial firms in other countries of the region (e.g. Serbia, Montenegro, Macedonia, possibly Albania). Also, we recommend the research which would include a simulation of a regional derivative exchange-traded market establishment. Such simulation would help demonstrate possible benefits and costs, probable regulation, connections and support from other similar markets (or their segments), etc.

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[1] For more details, see: Martin, M. A., Rojas, W., Erausquin, J. L., Yupanqui y Edgar Vera, D. and Bauer, W. (2009) "Derivative Usage by Non-Financial Firms in Emerging Markets: The Peruvian Case", *Journal of Economics, Finance and Administrative Science*, Vol. 14, No. 28, pp. 73-86, Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1549864

[2] See: Miloš Sprčić, D. (2007) "The Derivatives as Financial Risk Management Instruments: The Case of Croatian and Slovenian Non-financial Companies", *Financial Theory and Practice*, Vol. 31 (4), pp. 395-420

[3] Questionnaire included 13 questions, often divided in few sections. The survey was conduced according to *ICC/ESOMAR International Code on Market and Social Research*.

[4] This data should be considered with a qualified acceptance, because not all the surveyed banks answered this question.

[5] The surveyed banks were asked to assess demand for derivative instruments through the grading system, where 1 meant "there is no demand", 2 "low demand", 3 "moderate demand", 4 "high demand", and 5 "very high demand".

[6] If we assume that the total population contains 600 companies (they are mainly the clients from the bank lists), then the sample fraction is 12.67%.

[7] A questionnaire was sent on-line or the interviewers went on-site. In several cases, interviewers had direct communication with the chief financial managers. The survey includes a few of their free but important observations and rationales.

[8] Because of the global financial crisis as well as current debt crisis in the European Union, the last thesis is suspect. For instance, the recent appreciation CHF against EUR has directly influenced BAM/CHF. A consequence, among others, is well known for all BiH banks' debtors, citizens and companies, with the currency clause in CHF.