

PRINCIPLES OF MANAGING CURRENCY RISKS BY COMPANIES

PRINCIPI UPRAVLJANJA VALUTNIM RIZIKOM U PREDUZEĆIMA

PhD, Gligor Bishev, professor²⁴⁵
PhD, Tatjana Boshkov, assistant Professor²⁴⁶

Abstract: *Most investors are familiar with the concept of currency exposure, with constantly changing exchange rates affecting the cost of investing in international securities. These same issues also affect companies that operate internationally. So what effect do currency fluctuations have on company profits, and what are they doing to insulate themselves? In this paper we examine this question. Firms can choose to manage their currency exposure through various business practices. Truly international company, theoretically, losses when one currency falls and recovers lost when another rises. Where contracts are concerned business can also set up clauses that reduce this exposure. In many cases this comes in the form of an agreement which protects the client and the company. Some businesses also agree on setting all contracts in their core currency, protecting them from any exposure as they always paying the same relative amount.*

Key words: *hedging, business, currency exposure, exchange rate.*

Sadržaj: *Većina investitora je upoznata sa konceptom izloženosti deviznom kursu, sa njegovim promenljivim vrednostima koji utiču na troškove investiranja u međunarodne akcije. Isti problemi takođe utiču na preduzeća koja posluju na međunarodnom nivou. Postavlja se pitanje, koji efekat fluktuacije valuta imaju na profit preduzeća i šta oni rade da se izoluju? U ovom radu ispitujemo ovo pitanje. Firme mogu da biraju da upravljaju visinom izloženosti ovom riziku na različite načine. Međunarodna kompanija, teoretski, gubi kada jednoj valuti padne vrednost ili dobija kada vrednost druge valute poraste. Međutim, poslovnim ugovorima ovakvi rizici se mogu ublažiti. U mnogim slučajevima ovo podrazumeva sporazum kojim se štiti klijent i kompanija. Neke firme takođe praktikuju da u svim ugovorima koriste jednu (osnovnu) valutu, štiteći se na taj način od bilo kog izlaganja valutnom riziku, obzirom da uvek plaćaju istu relativnu količinu sredstava.*

Ključne reči: *hedžing, biznis, valutna izloženost, devizni kurs.*

²⁴⁵ Executive Director and Chairman of the Board, Sparkasse Bank, Macedonia

²⁴⁶ Assistant Professor at University "Goce Delcev" - Shtip, Macedonia

1. INTRODUCTION

In recent years, investments in international financial securities have grown significantly among individual and institutional investors. Broadening portfolios beyond domestic borders may help investors achieve greater diversification. Although the rapid growth in international investments reflects the benefits of geographic diversification, currency risk can counteract some of these advantages. Since foreign exchange rates can have a significant impact on returns, investors may be interested in hedging this risk where possible and appropriate. Investments in overseas instruments, such as stocks and bonds, can generate substantial returns and provide a greater degree of portfolio diversification, but they introduce an added risk, that of exchange rates. Since foreign exchange rates can have a significant impact on portfolio returns, investors should consider hedging this risk where appropriate. While hedging instruments such as currency futures, forwards and options have always been available, their relative complexity has hindered widespread adoption by the average investor.



Dr. Gligor Bishev, was born on 5 of April, 1958 in Strumica, R. Macedonia. With his 29 years of experience he was appointed as the President of the Board of Sparkasse Bank, Makedonia since 2013. His career began in 1984 at the National Bank of Republic of Macedonia, first as a junior economist, and later in 1993 as General Manager. In 1994 he was appointed to be Vice-governor and in the period from 1997 to 2000 he was also Vice Governor of the National Bank of Macedonia. Since 2000, he was serving as General manager in Stopanska banka AD Skopje.

Besides the professional engagement, Dr. Bishev is active in the field of economic sciences:

- Professor at the Faculty of Economics - Prilep, State University "St. Kliment Ohridski" – Bitola, Macedonia*
- Professor on Faculty of Economics " St. Cyril and Methodius" – State University in Skopje and*
- Professor on Institute of Economics "St. Cyril and Methodius" - Skopje.*

After completing his doctoral studies in 1991, Dr. Bishev continued with his specialization in the London School of Economics and Political Science in 1995 and as a guest researcher at the Vienna Institute for Comparative Economic Studies in 1997.

During his experience, Dr. Bishev was active in several institutions like:

- Member of the Management Board of the Agency for Restructuring of Banks (1995-1999),*
- Member of the technical committee of the MANU research project "Strategy for Economic Development of Macedonia" (1996-1998),*
- Member of the Managing Board of the Money Market (1997-2000)*
- Co-chairman of the Second desk for economic reconstruction and development of the Stability Pact (January-June 2000),*
- Member of the Securities and Exchange Commission of the Republic of Macedonia Securities (March 1999 - October 2003) and*
- President of the Association of Banks (2006-2010).*

Today is active as a Vice president at the Economic Chamber of Macedonia and he is a

member of the Council of the Faculty of Economics in Ljubljana.

As one of the creators of the new currency and the reforms in Republic of Macedonia, Dr. Bishev also examined reforms in almost all transition economies, and he is participating in many research projects in the areas of banking and monetary theory and policy, applied economics, economic development policies of course, the balance of payments, international financial institutions, capital flows, corporate finance, investment and financial markets. Dr. Bishev has published two books, more than 300 articles and he has taken part in many discussions and research studies in professional and scientific journals in the country and the region.

2. THEORETICAL LITERATURE REVIEW

How does the exchange rate regime affect firms' incentives to hedge their exposure to currency risk? This question has been at the center of the debate over optimal exchange rate regimes in emerging markets since the financial crises of the 1990s exposed the perils of unhedged foreign currency debt. Yet there is no clear consensus among economists on whether the type (or degree of flexibility) of the exchange rate regime affects the corporate sector's incentives to take on foreign currency denominated liabilities or to insure against depreciation risk.

Two basic views exist in this respect. On the one hand, several authors have argued that pegged exchange rate regimes biases corporate borrowing towards foreign currency, due to an implicit exchange rate guarantee given by the government (Mishkin (1996) and Goldstein and Turner (2004)). Under fixed or pegged regimes, the central bank keeps currency volatility within a pre-announced range, effectively underwriting currency risk (Dooley (2000)). Thus, firms borrow in dollars to benefit from the lower ex ante dollar interest rates, and expect the government to insure them from any potential loss in the event of a large devaluation. A second variant of this argument suggests that because of limited exchange rate volatility under fixed or tightly managed exchange rate regimes, borrowers appear to consider a steep devaluation a low-probability event, and therefore neglect or underestimate the exchange rate risk associated with borrowing in foreign currency. The fact that fixed/pegged exchange rates have played a role in every recent financial crisis since 1994, and that firms relied extensively on unhedged foreign currency financing in the years leading up to the crisis, is often used as strong evidence for these views.

On the other hand, Eichengreen and Hausmann (1999) and Eichengreen, Hausmann, and Panizza (2005) dispute this view. The authors suggest that at the root of currency mismatches lies the fundamental inability of emerging markets to borrow abroad in their own currency. Inevitably, this leads to an accumulation of foreign-currency denominated debt which firms are simply unable to hedge, even if they have the foresight or prudence to match the currency structure of their assets and liabilities. In addition, McKinnon and Pill (1999) argue that adopting a floating rate regime will actually exacerbate currency mismatches. Because the domestic interest rate risk premium is a direct function of the stability of the currency, exchange rate volatility associated with floating rates will increase domestic interest rates (and thus the incentives to borrow in foreign currency) and make financial hedging more expensive.

3. EFFECTIVE RISK MANAGEMENT TOOLS FOR UPSTREAM COMPANIES

3.1. Serbia

In a modern business environment, there are high oscillations and threats from unforeseeable external shocks. It is of primary importance to choose an adequate method of payment that will provide, to the largest possible extent, security and/ or minimize occurrence of a risk event. To that end, financial derivatives which ensure security of receivables are becoming more important today. From the aspect of banking operations, development of modern financial products, including operations with financial derivatives, is of utmost importance.

Country data sheet - Serbia

Population:		7.120.666			
		2011	2012	2013	2014
GDP (real, in mn eur)		25.008	24.754	25.391	24.931
GDP (nominal, in mn eur)		33.424	31.683	34.263	33.059
GDP per capita in eur		3.457	3.439	3.544	3.497
GDP per capita PPP		10.355	10.300	10.616	10.474
GDP growth		1,4%	-1,0%	2,6%	-1,8%
Remittances (in mn eur)		1.751	2.154	2.234	3.660
Remittances as % of GDP		7,0%	8,7%	8,8%	14,7%
Total investments (in mn eur)		5.027	5.198	4.481	3.882
Investments as % of GDP		20,1%	21,0%	17,7%	15,6%
Foreign direct investments		3.320	753	1.298	1.236
Foreign direct investments as % of GDP		13,3%	3,0%	5,1%	5,0%
Total import (in mn eur)		16.487	16.992	17.782	18.096
Total import as % of GDP		65,9%	68,6%	70,0%	72,6%
Import from EU (in mn eur)		9.016	9.659	9.927	10.373
Import from EU as % of total import		54,7%	56,8%	55,8%	57,3%
Total export (in mn eur)		11.145	11.469	13.937	14.451
Total export as % of GDP		44,6%	46,3%	54,9%	58,0%
Export to EU (in mn eur)		5.111	5.053	6.588	7.110
Export to EU as % of total export		45,9%	44,1%	47,3%	49,2%

Top 10 companies	
1.	NIS
2.	JP EPS
3.	Fiat Automobili Srbija
4.	Telekom Srbija
5.	Delhaize Serbia
6.	EFT Investments
7.	JP Srbijagas
8.	Tarkett Backa Palanka
9.	Mercator
10.	Idea Beograd

Figure 1. Author's estimation.

More intensive use of these instruments would contribute to long-term and more stable sources of funding for the optimization of matching the maturities of assets and liabilities. The results obtained in this research undeniably show that although currency forward contracts represent an instrument for hedging against FX risk, their use does not increase with higher volatility of foreign exchange rates. The main reason for such situation lies in the fact that forward contracts are conducted by large companies, that is, companies with developed risk management awareness. These companies use forward contracts on an ongoing basis, irrespective of the movements of the foreign exchange rate. Actually, they use these contracts subject to their own foreign currency ins and outs (i.e. liabilities). Consequently, for larger firms a business cycle is the most important determinant for the use of financial derivatives. Other firms still complain about the foreign exchange flexibility and expect the National Bank of Serbia to eliminate the risk of foreign Importance of forward contracts in the financial

crisis, exchange rate changes, instead to hedge it through forward contracts. Therefore, the higher foreign exchange rate volatility does not represent an important determinant of the demand for forward contracts for most companies in Serbia. The main reasons for the lack of use of forward contracts and other financial derivatives in Serbia are, first of all, the unclear regulatory framework and the consequent limitations only to hedging transactions due to the limited legal regulations, as well as inadequately developed companies' awareness of the necessity to hedge against risks. Other possible reasons that may explain why the economy insufficiently uses currency forwards as instruments for hedging against FX risks are neglecting the foreign exchange rate volatility, while ignoring risks and leaving it to the

government and the National Bank of Serbia to stabilize the foreign exchange rate. It is true that the government and the National Bank of Serbia are responsible for establishing the macroeconomic environment that will allow stable conditions for doing business and, accordingly, they are responsible for systemic risk factors, including currency risk. Nevertheless, according to the present monetary policy, the main objective of the National Bank of Serbia is price stability (low and foreseeable inflation), not foreign exchange rate targeting. Therefore, the reliance of local firms on the central bank and the state, in terms of the foreign exchange rate and risk elimination, is completely unjustified. Furthermore, underdeveloped entrepreneurial spirit and the lack of understanding of business risks, as well as inadequate education, are just some of the reasons why local companies do not use forward contracts. Besides, it is a fact that many entrepreneurs have already hedged themselves, admittedly not by means of sophisticated instruments, but simply by building their selling prices on the exchange rate of RSD 115 to 120 for 1 euro. Moreover, an objective reason also lies in the fact that it is not possible to agree forward contracts with long maturities that would

serve as hedging of long-term liabilities denominated in foreign currency in a company's balance sheet liabilities. The fact is that there are numerous advantages of financial derivatives as modern financial instruments. However, taking into consideration the risks that financial derivatives potentially entail due to the undefined legal norms and at the time of the global



Tatjana Boshkov, PhD

2015-present

Assistant Professor

Faculty of Tourism and Business Logistics,

Address: "Krstev Misirkov" nb.10-A, Stip, 2000,

Macedonia; www.ugd.edu.mk

2011 – 2014

Doctoral degree (PhD)

Faculty of Economics, Prilep,

University St. Kliment Ohridski, Bitola, Macedonia

2008 – 28.06.2010

Master of Science

Faculty of Economics, Prilep,

University St. Kliment Ohridski, Bitola, Macedonia,

2004-2008

Bachelor degree

Faculty of Economics, Prilep,

University St. Kliment Ohridski, Bitola, Macedonia

3.2. Croatia

Regarding the intensity of influence of financial risks on the performance of the Croatian companies, the results have shown that the price risk has the highest influence among the Croatian companies.

Country data sheet - Croatia

Population:		4.238.400			
		2011	2012	2013	2014
GDP (real, in mn eur)		38.186	37.351	37.000	36.852
GDP (nominal, in mn eur)		48.100	42.811	41.961	47.132
GDP per capita in eur		8.921	8.752	8.694	8.699
GDP per capita PPP		16.944	16.624	16.513	16.523
GDP growth		-0,3%	-2,2%	-0,9%	-0,4%
Remittances (in mn eur)		1.042	1.050	1.085	1.255
Remittances as % of GDP		2,7%	2,8%	2,9%	3,4%
Total investments (in mn eur)		7.878	7.197	6.978	6.585
Investments as % of GDP		20,6%	19,3%	18,9%	17,9%
Foreign direct investments		1.147	1.070	735	2.876
Foreign direct investments as % of GDP		3,0%	2,9%	2,0%	7,8%
Total import (in mn eur)		19.657	17.596	17.825	20.564
Total import as % of GDP		51,5%	47,1%	48,2%	55,8%
Import from EU (in mn eur)		10.065	11.770	12.220	13.082
Import from EU as % of total import		51,2%	66,9%	68,6%	63,6%
Total export (in mn eur)		19.435	17.799	18.020	21.555
Total export as % of GDP		50,9%	47,7%	48,7%	58,5%
Export to EU (in mn eur)		5.735	5.601	5.927	6.622
Export to EU as % of total export		29,5%	31,5%	32,9%	30,7%

Top 10 companies	
1.	INA
2.	KONZUM
3.	HRVATSKA ELEKTROPRIVREDA
4.	ZAGREBACKA BANKA
5.	HEP
6.	HRVATSKI TELEKOM
7.	PETROL
8.	PRIVREDNA BANKA ZAGREB
9.	HEP - PRODUCTION
10.	PLIVA HRVATSKA

Figure 2. Author's estimation.

These findings could be explained by the fact that Croatia is small and open economy, which results in a high dependence on international trade. Croatian companies are more affected by currency risk. Finally, the interest-rate risk has been ranged as less important in comparison with commodity price and currency risks. The explanation of this result could be found in the fact that Croatian companies do not use debt capital heavily; therefore they are not highly exposed to the fluctuations of interest rates.

The survey's results have clearly indicated that Croatian non-financial companies manage financial risks primarily with simple risk management instruments such as natural hedging. In the case of derivatives use, forwards and swaps are by far the most important instruments. The Croatian companies use simple risk management instruments like managing assets and liabilities to a greater extent when managing price risk. Amongst the most important reasons why companies do not use derivatives, the Croatian financial managers have addressed the high costs of establishing and maintaining risk management programmes that exceed the benefits of it as the most important reason why they do not manage financial risks. 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.

Croatian non-financial companies manage financial risks primarily with simple risk management instruments such as natural hedging, while in the case of derivatives usage, 'plain-vanilla' instruments like forwards and swaps are by far the most important instruments. However, exchange-traded derivatives and structured derivatives are more important in countries that have entered the Euro Zone as European financial market, together with derivative market as one of its segments, has developed significantly in recent years. Market for derivative instruments has introduced a broader assortment of new risk management products designed to help corporate managers handle financial risks. In addition to the development of exchange traded derivatives there has also been an increase in the volume of OTC derivatives introduced by commercial and investment banks (Foreign Exchange and Derivatives Market in 2004, BIS, 2005; Monetary and Economic Development, OTC derivatives Market Activity, BIS, 2000; 2002; 2005). A further growth and development of derivative markets will have an impact to the decrease of the transaction costs related to the use of derivative instruments what should make these instruments more available and feasible to a broader class of companies in different industries.

Regarding the risk management instruments that companies use in managing currency risk, it could be concluded that natural hedge like matching currency structure of assets and liabilities (e.g. debt in foreign currency) is the most important instrument in managing currency risk in both countries. In respect to the use of derivatives, the currency forward is the most important and frequently used instrument, followed by currency swap as the second most important derivative instrument. Other derivatives such as stock-exchange and OTC (over-the-counter) options are not important currency risk management instruments among the Croatian and Serbian companies. Interest rate risk in the Serbia as well as in the Croatian companies is hedged most frequently by natural hedge (e.g. matching maturity of assets and liabilities or combining debt with fixed and fluctuating interest-rates). Again, forward contract and swap are the most important derivative instruments in the risk management strategy, but in contrast to currency risk management, interest rate swap is more important than interest rate forward.

3.3. MACEDONIA

Refinancing risk is significant for Macedonia. It will need to repay large Eurobonds maturing in 2013 and 2015, as well as the PLL purchase (in 2014–16) and the bank loan guaranteed by the World Bank PBG (in 2016). Market volatility has been high since the onset of the global crisis, due to external rather than domestic factors. This was evident in 2009, when the government issued a 3½-year Eurobond at a yield of 9½ percent, more than double the 4½ percent yield of the 10- year issuance in 2005, and in 2010 when it canceled a planned Eurobond issuance after market rates spiked in the run-up to the Greek program. In addition, domestic debt features a very short average maturity of just 6 months, and hence the need to roll over existing debt on average 2 times per year.

Macedonia's exposure to currency risk could gradually be reduced by increasing domestic non FX-indexed denar issuance. Currency exposure is considerable: all external debt is in FX, and almost half of outstanding domestic government debt is FX-linked (Table 1). Taken together, almost 90 percent of general government debt is hence denominated in or linked to foreign currency. Currency risk—defined as the (high) exposure multiplied by the (low) probability of a shock—may not appear to be high in light of the stability of the peg over the past 15 years. However, reducing it would add to policy flexibility in the event of unforeseen shocks in the future. Gradually increasing the share of domestic denar-denominated, non FX-

linked debt would be a prudent strategy in this context, together with increasing the share of domestic debt in fiscal financing. These actions would also bring other benefits, including developing the domestic currency yield curve, improving the monetary policy transmission mechanism, and in general promoting greater use of denars in financial transactions.

Croatia	53
Macedonia	51
Bulgaria	33
Romania	26
Serbia	13
Ukraine	4
Hungary	0
Moldova	0

Table 1. Percentage of foreign currency debt in domestic debt
Note: Domestic debt denominated in or linked to foreign exchange.
Data for Macedonia includes structural bonds.

By developing and following a medium-term debt strategy along these lines, Macedonia can achieve the goal of minimizing medium-term costs subject to keeping risks within appropriate pre-set bounds. As described above, the government has taken the first initial steps toward renewed market development. Further gradual moves in this direction, guided by a comprehensive debt strategy, would bring the goal within reach. Achieving this goal would benefit the budget through lower interest expense and lower risks over the medium term. At the same time, developing a domestic yield curve would yield positive externalities for the real economy, as it would clearly establish a denar yield curve that can be used in pricing private sector loans and bonds.

Traditionally, Macedonia has had low fiscal deficits, ranging from -1% to +1%, but during the crisis in 2009 this grew initially to 2.5% then to 2.8% with our highest in 2012 at 3.8%. In 2013, due to the financial stimulus were at 3.5%. NBRM was able to mitigate successfully because Macedonian public debt was low at around 20% of GDP which afforded us room for expansion which we used during this crisis period.

Country data sheet - Macedonia

Population:		2.075.625			
		2011	2012	2013	2014
GDP (real, in mn eur)		6.415	6.386	6.556	6.803
GDP (nominal, in mn eur)		7.544	7.585	8.112	8.533
GDP per capita in eur		3.105	3.086	3.163	3.277
GDP per capita PPP		9.588	9.529	9.768	10.120
GDP growth		2,3%	-0,5%	2,7%	3,8%
Remittances (in mn eur)		195	198	191	204
Remittances as % of GDP		3,0%	3,1%	2,9%	3,0%
Total investments (in mn eur)		1.668	1.845	1.868	2.082
Investments as % of GDP		26,0%	28,9%	28,5%	30,6%
Foreign direct investments		344	111	252	262
Foreign direct investments as % of GDP		5,4%	1,7%	3,8%	3,9%
Total import (in mn eur)		5.053	5.071	4.983	5.485
Total import as % of GDP		78,8%	79,4%	76,0%	80,6%
Import from EU (in mn eur)		3.038	3.372	3.397	3.821
Import from EU as % of total import		60,1%	66,5%	68,2%	69,7%
Total export (in mn eur)		3.215	3.124	3.235	3.723
Total export as % of GDP		50,1%	48,9%	49,3%	54,7%
Export to EU (in mn eur)		2.281	2.110	2.386	3.025
Export to EU as % of total export		70,9%	67,5%	73,8%	81,3%

Top 10 companies	
1.	<i>Johnson Matthey</i>
2.	<i>Okta AD</i>
3.	<i>EVN Elektrostopanstvo na Makedonija AD</i>
4.	<i>Makpetrol AD</i>
5.	<i>Elektrani na Makedonija AD</i>
6.	<i>Feni Industry AD</i>
7.	<i>Makedonski Telekom AD</i>
8.	<i>T-Mobile Makedonija AD</i>
9.	<i>Lukoil Makedonija DOOEL</i>
10.	<i>Arcelormittal Skopje AD</i>

Figure 3. Author's estimation.

Apart from the macro-economy concerns, the crisis with the Euro as a currency helped boost confidence in Macedonian domestic currency [MKD denar]. This is because people naturally began to wonder what would happen with Europe; therefore, its primary currency. As a result, some people began to orient more towards the MKD. Macedonia, like most former Yugoslavian countries are highly Euro-rized, which means people save and use credits in Euros, with a 65% Euro to 35% MKD ratio. During the crisis and continuing today, the ratio of households and their propensity to save in MKD has elevated to 50%.

4. DISCUSSION AND CONCLUSION

Companies in Croatia, Serbia and Macedonia reported that are not using (and are not going to use) financial derivatives for risk hedging indicated following reasons to explain the limited practice in the derivatives market:

- Costs of risk management are greater than benefits;
- Financial reporting requirements for risk management activities;
- Lack of knowledge on financial derivatives by the firm's management;
- Difficulties in monitoring/measuring contract effectiveness;
- Risk exposures are managed more efficiently by other means;
- Exposures to currency, interest rate, or commodity price risk are not significant.

Figure 4 illustrates the most important factors for not using derivatives by the fraction of the surveyed firms reported that they are not using derivative financial instruments.

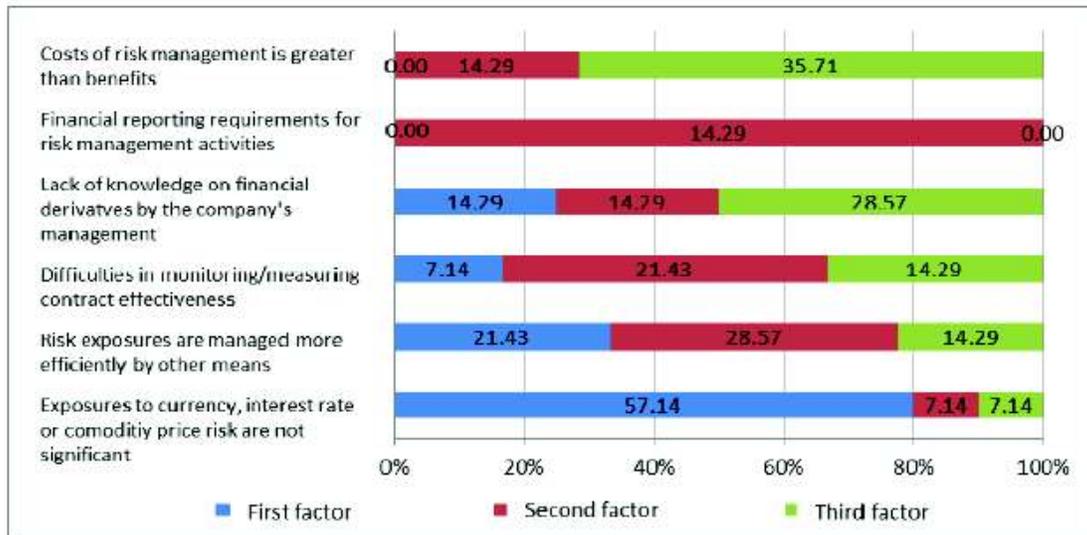


Figure 4: The most important factors for not using derivatives

From the figure above could be concluded that the biggest reason why companies not use derivatives is the non significant exposure to currency, interest rate or commodity price risk.

In general, developing countries - the Balkan countries have a shortage of savings and they imported foreign savings. Companies tend to borrow in foreign currency-Euro which is particularly popular in Serbia and Croatia, due to the lower interest rates compared to interest rates on credits in national currency. Differences in interest rates are an indicator of expected future depreciation / appreciation currency in terms of fluctuating exchange rates. The currency risk can be hedged in two ways: if the company is a net exporter and lend in currency of the net exports, or in short-term loans, if agreed today a term exchange rate to repay the loan at the time of the mature. But, in the Western Balkans as we have seen from the above researches there is no developed market of term rates to use this tool.

Namely, as an instrument to mitigate foreign exchange risk can serve the following rule - if the company does not generate income in the same currency as the loan is, repayment capacity of the loan should not exceed 50-60 EBIT of the company. In the case of depreciation, the company has the capacity to back the loan. So, those countries which are small and open (as Croatia, Serbia and Macedonia) have high indicator on protection of the EUR currency risk through their exports in Euros. These sectors can avoid currency risk by borrowing in Euros.

REFERENCES

- [1] Aguiar, Mark A., 2005, Investment, devaluation, and foreign currency exposure: The case of Mexico, *Journal of Development Economics* 78, 95–113.
- [2] Berkmen, Pelin, and E. Cavallo, 2010, Exchange rate policy and liability dollarization: What do the data reveal about causality?, *Review of International Economics* 18(5), 781–795.
- [3] Berrospide, Jose, A. Purnanandam, and U. Rajan, 2008, Corporate hedging, investment and value, *Finance and Economics Discussion Series* 2008–16 (Board of Governors of the Federal Reserve System, Washington).

- [4] Bordo, Michael, C. M. Meissner, and D. Stuckler, 2009. *Foreign Currency Debt, Financial Crisis and Economic Growth: A Long Run View?*, NBER Working Paper No. 15534 (National Bureau of Economic Research, Cambridge, Massachusetts).
- [5] Brown, Martin, S. Ongena, and P. Yesin, 2011, Foreign currency borrowing by small firms in the transition economies, *Journal of Financial Intermediation*, 20, pp. 285–302.
- [6] Burnside, Craig, M. Eichenbaum, and S. T. Rebelo, 2001, Hedging and financial fragility in fixed exchange rate regimes, *European Economic Review* 45, 1151–1193.
- [7] Caballero, Ricardo, and A. Krishnamurthy, 2003, Excessive dollar debt: Financial development and underinsurance, *The Journal of Finance* 58, 867–893.
- [8] Calomiris, Charles, 2007, Devaluation with contract redenomination in Argentina, *Annals of Finance* 3(1), 155–192.
- [9] Corden, W. Max, 2002. *Too Sensational: On the Choice of Exchange Rate Regimes* (MIT Press, Cambridge).
- [10] Dooley, Michael, 2000, A model of crises in emerging markets, *Economic Journal* 110, 256–272.
- [11] Eichengreen, Barry, and R. Hausmann, 1999, Exchange rates and financial fragility, in *New Challenges for Monetary Policy* (Kansas City: Federal Reserve Bank of Kansas City).
- [12] Eichengreen, Barry, R. Hausmann, and Ugo Panizza, 2005, The pain of original sin, in Barry Eichengreen and Ricardo Hausmann, eds.: *Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economics* (The University of Chicago Press).
- [13] Eichengreen, Barry, and R. Razo-Garcia, 2006, The international monetary system in the last and next 20 years, *Economic Policy* 21(47), 393–442.
- [14] Frankel, Jeffrey A., 2005, Contractionary currency crashes in developing countries, *IMF Staff Papers* 52(2), 149–192.
- [15] Goldstein, Morris, 1998. *The Asian Financial Crisis: Causes, Cures, and Systemic Implications*, Policy Analyses in International Economics No. 55 (Institute for International Economics, Washington).
- [16] Goldstein, Morris, and P. Turner, 2004. *Controlling Currency Mismatches in Emerging Markets* (Institute for International Economics, Washington).
- [17] Kamil, Herman, 2007, A new database on currency and maturity composition of firms' balance sheets in Latin America: 1992–2005, Unpublished manuscript. (Washington: International Monetary Fund).
- [18] Magud, Nicolas, 2010, Currency mismatch, openness and exchange rate regime choice, *Journal of Macroeconomics* 32, 68–89.
- [19] McKinnon, Roland, and H. Pill, 1999, Exchange-rate regimes for emerging markets: Moral hazard and international over-borrowing, *Oxford Review of Economic Policy* 15, 19–38.
- [20] Mishkin, Frederic S., 1996, Understanding financial crises: A developing country perspective, in Bruno Michael and Boris Pleskovic, eds.: *Annual World Bank Conference on Development Economics* (World Bank, Washington).
- [21] Zettelmeyer, Jeromin, P. Nagy, and S. Jeffrey, 2010, Addressing private sector currency mismatches in emerging Europe, European Bank for Reconstruction and Development Working Paper, London.