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THE ROLE OF FINANCIAL DOLLARIZATION DURING THE FINANCIAL CRISES

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Abstract

This paper explores the relationship between financial dollarization and financial crises. The unhedged foreign currency borrowing and foreign currency depreciations are often seen as a major threat to financial stability, especially in CEE countries where the credit and deposit dollarization is high. The paper consists of four parts. The first part deals with the determinants of financial dollarization. The second part analyses the dimensions of financial dollarization in Emerging Europe. The third part discusses the role of financial dollarization during several financial crises (Mexico, East Asia, Argentina, recent global financial crisis). The fourth part focuses on potential risks emerging from financial dollarization in Republic of Macedonia, under different scenarios for devaluation of national currency.

Keywords: credit and deposit dollarization, financial crises, exchange rate depreciation, CEE region, Macedonia.

1. Introduction

The standard theory usually recognizes that in a country with fixed exchange rate policy, a major factor for appearance of the crisis is the inconsistent fiscal policy. Another popular explanation in the literature is that the lack of banking supervision and low level of development of the banking sector are two major factors for generating financial instability.

However, some relatively new models of currency crises emphasized private-sector balance sheets as a major cause of the crises. Krugman (2010) coined the term "third-generation models", to describe the models where a currency depreciation set off by speculative attack would sharply worsen balance sheets of firms and banks with foreign-currency debt. The reason is simple: the domestic-currency value of their foreign-currency debt would rise.

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The subject of our research are the risks arising from household and corporate foreign currency indebtedness. Here, we look for the reasons why foreign currency debt use is so prevalent in some countries and regions and whether it is a significant source for macroeconomic and financial risks or not.

The paper describes the episodes of financial crises in different countries, where financial dollarization was the trigger for financial turbulences. Having large amounts of foreign currency debt in their balance sheets, the banks in these countries faced strong financial turbulences when large depreciations of their currencies occurred. As the credit borrowers could not service their liabilities, credit risk started to transform into currency risk. Consequently, bank insolvencies simultaneously generated currency and banking crises.

2. Determinants of financial dollarization

Financial dollarization is defined as holding a substantial part of the assets and liabilities of residents in the form of instruments denominated in foreign currency (Ize and Levy-Yeyati, 2003). Hence, because earlier this phenomenon is analyzed in countries where assets and liabilities are generally denominated in US dollars, the same literature is referred to as "financial dollarization" (Broda and Levy-Yeyati, 2003). Here, we should mention that whenever a country use foreign currency (dollar, euro, etc..) for assets and liabilities denomination, in this paper we will refer as a "dollarized" or "euroized" country. That terminology we will use throughout this paper.

Most of the literature that deals with the causes and experiences of dollarization refer to examples of countries in Latin America. This is because countries like Bolivia, Argentina, Mexico and Peru, in the last thirty years, have experienced currency substitution. However, in the last ten years, because of the emergence of the euro, Europe countries outside the euro-zone were also facing increasing share of Euroization of their economies.

There are many aspects that cause the surplus economic units in these countries to keep their savings in foreign currencies. In this section we will try to summarize the economic phenomena that motivate agents to dollarize their assets and liabilities. If the movement of macroeconomic variables in different economies shows that the "de facto" dollarization is a rational response of economic agents to the loss of trust in the domestic currency, then we should accept that leading reason why dollarization appears is inflation. This is because in economies that have chronically high inflation rates, economic agents use foreign currency to reduce the negative consequences of the inflation. Therefore, the US dollar and the Euro are replacing the local currencies in countries with high inflation rates.

Besides inflation, other important determinants of dollarization are: expected depreciation of the domestic currency, interest rate spreads and the national aversion to risk. Here we can include also: time inconsistency and lack of trust in the monetary policy, market anomalies and the moral hazard arising from deposit insurance (Ize and Powell, 2004); management of assets and liabilities, profitability, concentration and risk management in banks and companies. Further from institutional aspect, dollarization depends on the openness of the economy, the size and depth of the financial system and the legal obstacles and transaction costs associated with the provision of foreign currency.

There are many authors dealing with the issue of dollarization who provide indicators to measure the degree of dollarization in the country in order to better understand the factors that determine it. Extensive literature related to this issue can be divided into three main groups. These three views are not entirely independent of one another, nor are contradictory in their bases, but their conclusions are different.

The first theory, is based on the theory of currency substitution, and it is one of the oldest theories of emergence and dynamics of change of dollarization in developing countries. This theory sees inflation as the most important factor for the occurrence of dollarization. The second theory is the one of minimum variance portfolio, which is developed by Levy-Yeyati (2006) and Ize and Levy-Yeyati (2003). According to this theory, the

dollarization is more determined by changes in the rate of inflation and the depreciation of the real exchange rate than expected inflation and depreciation of the nominal exchange rate. The third theory is developed by Rajan and Tokatlidis (2005), and it refers to the impact of institutional quality on the level of dollarization.

In addition, because financial dollarization can take many forms, including credit and deposit dollarization, this part of the paper will give an explanation of the three theories by distinguishing the credit and deposit dollarization.

The degree of dollarization is endogenously determined by optimizing agents between the limits of policy and technology. The study of the theory related to the behavior of different classes of agents that choose among domestic and instruments denominated in foreign currencies, may help explain the relationship between the degree of credit and deposit dollarization and other macroeconomic and financial variables. Thus, if there is a strong connection between the research subject of this paper and independently changing variables of the research model, we could easily give presumption of future violations of economic prosperity through the creation of financial imbalances or failing to take appropriate measures.

There are two types of factors that affect the financial dollarization: factors driven by demand and supply factors driven by the dollarized assets. The domestic banks borrow in foreign currencies, and the factors affecting the increase in the supply of assets denominated in foreign currencies are linked to the specific techniques of managing the assets and liabilities of banks, profitability, and risk management. On the other hand, demand for these assets is a result of liabilities management, aversion to risk and profitability of companies. Additionally, as determinants of dollarization can be also considered: specific indicators relating to general requirements for protection against risks, liberalization and deregulation of the foreign exchange markets, the uncertainty and lack of confidence in domestic policies, and the overall level of financial and economic development.

Table: Factors for increasing financial dollarization:

Factors for increasing financial dollarization	
Deposit dollarization	Credit dollarization
• Changes in inflation rate and real exchange rate;	• Factors specific to banks – assets and liabilities management
• Interest rate spreads,	• Factors specific to companies - opportunities for hedging risks
• Portfolio selection,	• Macroeconomic factors,
• Transmission channel of the effects in the economy,	• The role of the central bank,
• Time inconsistency and lack of confidence in macroeconomic policies,	• Uncertainty and lack of confidence in domestic policies,
• Imperfect markets, and	• The level of financial development, and
• Hysteresis effect.	• Undeveloped markets, warrants and faulty risk assessment.

Source: Authors summarize of different research papers

3. Financial dollarization in the emerging markets

In recent years, an increasing share of private sector credit in the Emerging European markets of Central, Eastern and Southeastern Europe (CESEE) has been denominated in foreign currency. Despite the warnings from academic researchers and central banks governors, the inherent risks associated with foreign currency lending have been underestimated or neglected by banks managers and borrowers. Today we can conclude that the global financial crisis induced a materialization of these risk factors.

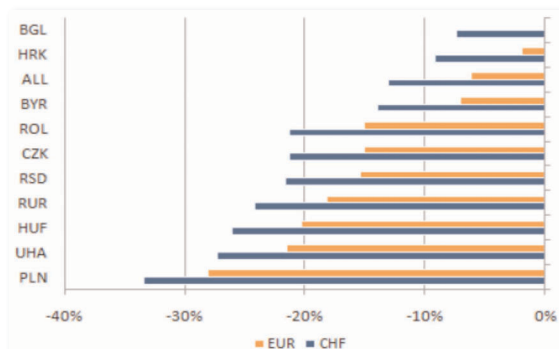
The weakening of Emerging European currencies against the euro and the swiss franc led to a significant increase in the real costs of unhedged FX borrowing and consequently higher expected credit default risks

for banks. As most of the Emerging Europe's currencies depreciated against the euro and the swiss franc, investments in domestic currency become much more risky, and had higher costs for servicing their foreign currency liabilities.

Figure 2:

Exchange rates (CEESE) vs. EUR and CHF
2008-2009

Source: Authors own calculation.



In recent years, the global economy had become increasingly integrated, causing an increase in the number of firms that have some business activity outside their country of origin. Such foreign connection ranges from simple import or export action to more complex decisions including global sourcing, production, and competition. These multinationals face many different product and capital markets, a myriad of legal regimes, political risks, and exchange rate uncertainty.

Figure 3:

Share of the private foreign
currency borrowing in select-
ed countries, 2005-2013

Source: National Central
Banks statistics.

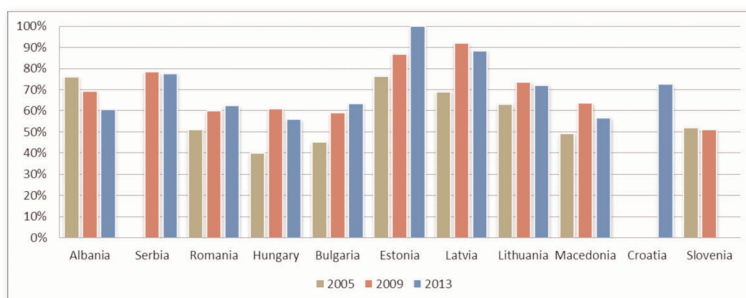
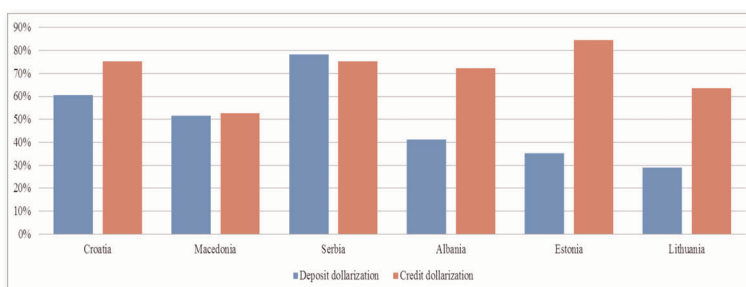


Figure 3 shows that in many of the Emerging European countries the share of foreign exchange loans exceeds the share of the domestic currency loans. Having that in mind and other factors mentioned above, it is no surprise that in some countries, the share of foreign currency borrowing to total credit is more than 60% (Baltic countries, Bulgaria, Croatia and Macedonia), which can be seen as a trend in the recent several years (2005-2009). Although there is evidence of the process of de-dollarization in some countries the scale of the phenomenon of dollarizaion is still big enough for raising concern. This comes to importance even more if we consider that the credit dollarization is greater than the deposit dollarization.

Figure 4:

Average financial
dollarization 2001-2013



This relationship comes from the fact that there is dominant presence of the foreign banks in these countries. As we can suppose the presence of financial institutions that have easy access to foreign funds (credit markets), the balance currency mismatch fears will predominate. They usually not only increase the share of foreign currency denominated credits, but also increase the possibility for contagion in the whole region where some foreign banks are dominant. Our analysis shows that in the countries where FX credits are prevalent, there is a greater probability for credit defaults. Certainly, there are many reasons for appearance of the credit defaults, but the dominant FX lending cannot be neglected.

At the outset of the recent global crisis, the appearance of the exchange rate risks associated with FX lending forced banks to take precautionary measures. For instance, in 2008, Erste Bank stopped granting CHF-denominated credits in Austria and Hungary, and redefined the criteria for approving EUR-denominated foreign currency credits. Such measure reduced retail FX lending to households (Erste Group 2009a, 3). In the similar way, Hypo Group Alpe Adria announced that it stopped all foreign currency lending activities in USD and CHF in the autumn of 2008 (Hypo Group Alpe Adria 2009, 56). Furthermore, in Hungary, which is among the countries with the highest share of FX loans, banks completely stopped granting loans denominated in Swiss Franc (CHF), which until then represented over 90% of new mortgage loans.

Table 1:

Provision for impairment losses (2007-2009)

(€m)	2007	2008	%	Q1 2008	Q1 2009	%
Raiffeisen International	357	780	+119%	93	445	+379%
Erste Bank	455	1,071	+135%	163	370	+127%
Bank Austria/ UniCredit	483	1,012	+109%	103	332	+222%
Volksbank International	43	72	+69%	n/a	n/a	n/a
Hypo Alpe Adria Group	274	533	+95%	n/a	n/a	n/a

Source: Raiffeisen International bank, Erste group, Bank Austria, Volksbank International, Hypo Group Alpe Adria.

EU-based parent banks as part of the European Bank Coordination Initiative ("Vienna Initiative"), also pledged to keep their FX exposures and to recapitalize its CESEE operations (Nitsche, 2010). Central banks and governments also revised their policies towards FX lending (EBRD, 2010; Steiner 2011; UniCredit 2011). Ukrainian policy makers banned FX lending to unhedged borrowers in October 2008, and Turkey for FX lending to individuals in June 2009. Similar policy measures were raised in Poland, Romania, Hungary and Croatia, all aiming to stop or slow the expansion of the foreign currency borrowing.

4. Episodes of financial crises related to foreign currency borrowing

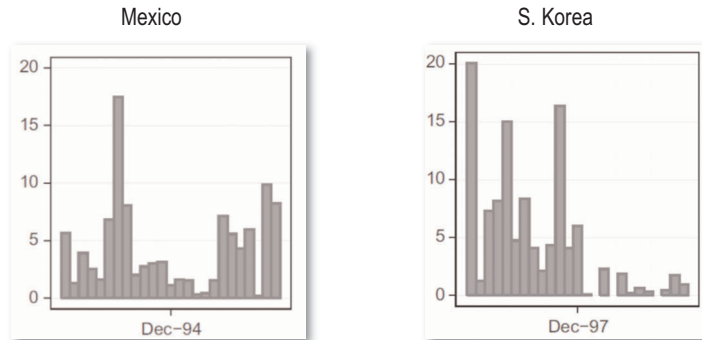
The Great Russian writer has once said something that can be used as an introduction to what this part wants to elaborate: "All rich families are the same. But, all unhappy families are miserable in their own way". We can compare the financial crises in similar way: every financial crisis is different from another and has its own characteristics, but also they have rudiments that can be seen as similar form different crises.

With little differences, today we can identify certain pattern for development of the past financial crises. First, after every period of large capital inflows, the investors (domestic and foreign), expecting the worsening of the economic fundamentals try to export their capital from the affected country. Second, this leads to completely changed pattern of the investors' behavior, which can easily put the country in a situation of episodes of bank run. Third, large outflows of capital, accompanied with great currency depreciations, foster the vulnerability of the financial institutions in the country. Such situations, at the end usually result with decreasing credit activity, deleveraging and worsening the economic fundamentals of the country.

Close analysis of the Asian and Latin Americas crisis; lead the economists to the conclusion that the foreign currency borrowing is an important factor for the appearance of the financial imbalances (Eichgreen and Hausmann 2005). In addition, in countries like Mexico (1994), several countries from Eastern Asia (1997), and Argentina (2001), prior to the crises, the regime of fixed exchange rates was considered as the factor for stability. But exactly the fixed exchange rate was the reason for prevalence of the foreign currency use and consequently, for the eruption of financial crises.

The figure 4 shows us that the similar pattern followed the crises in Mexico and South Korea. At the beginning, there were major increases in the foreign currency lending, and after the large financial imbalances were developed, the investors perceived the FX landing as toxic.

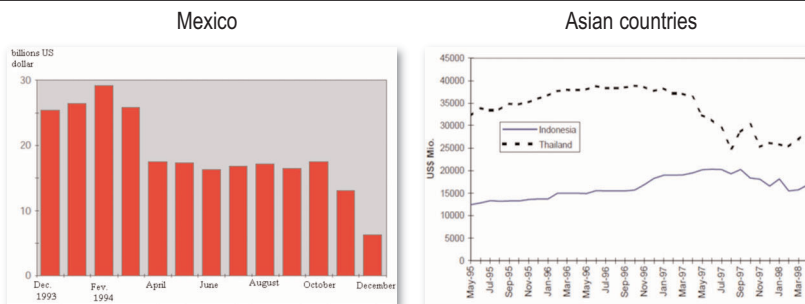
Figure 5:
Foreign borrowing of the private sector in Mexico and S. Korea (% of GDP)



Source: Hale, Arteta, 2009.

The period leading to the rapid increase of the foreign currency borrowing was characterized with large foreign capital inflows from foreign investors. Banks were approving credits with little awareness of the long term risks, and what is more important; most of the credits were denominated in foreign currency. Everybody forgot the FX risks, since the countries had great amount of FX reserves, as they were the investors' paradise for the period.

Figure 6:
Foreign currency reserves (Mexico and Asian countries)



Source: IMF - International Financial Statistics.

Suddenly, several political and economic shocks, made the investors to lose their trust in the countries strong fundamentals, and begin to withdraw their capital. With many foreign and domestic investors pulling out large amounts of capital, the countries were left with almost no funds to defend their nominal exchange rates, and eventually to devalue their currencies.

The aftermath is well known in the history of financial crises. Private sector couldn't serve its obligations in foreign currencies; The governments didn't manage to collect enough money to pay its debt liabilities; Large currency mismatches led to big bank crises and great deterioration of the economics of the countries.

Recent turbulence in the global financial markets has triggered a major review of the conventional wisdom about Emerging Market countries' macroeconomic policies. The result is a wide debate on the set of policies and institutional arrangements for macroeconomic stability to these countries. One important aspect of all debates has been the choice of proper exchange rate system. The 1997 Asia crisis raised serious questions about conventional crises explanations (e.g., current account and fiscal deficits, low saving rates) and led to a noticeable shift of financial analysts' opinion towards favoring floating exchange rates.

5. Foreign currency borrowing and the exchange rate regime – The case of Macedonia

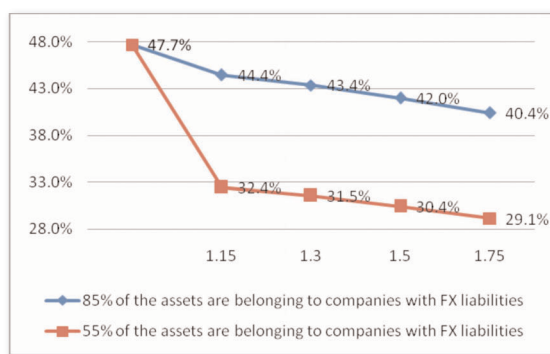
The analysis so far, has shown that, a country with fixed exchange rate regime has the potential to accumulate higher share of FX loans in their banking systems than countries with floating rates. Macedonia has fixed exchange rate and high level of FX loans (more than 80% of the total loans to corporate sector). In those terms we test the impact of denar devaluation on the credit portfolio and banks performance in Macedonia.

In the analysis we put two general assumptions: (1) The denar value of the euro is supposed to devalue by 15%, 30%, 50% and 75%; (2) the depreciation is not followed by changes in the aggregate commodity demand (the aggregate revenues of the companies do not change).

The effects of the projected devaluation will be analyzed both on the corporate and banking sector. The company performances will be measured by two indicators; financial stability (an index of the total liabilities to capital), and profit margin, as a buffer to the rising costs due to exchange rate devaluation. Here, we made several adjustments to exclude the net exporters, and the total liabilities that the companies have to foreign companies.

Figure 7:
Financial stability ratio of the companies
in a case of devaluation of (15%-75%)

Source: Authors own calculations, according to assumptions and data from official statistics of the NBRM.



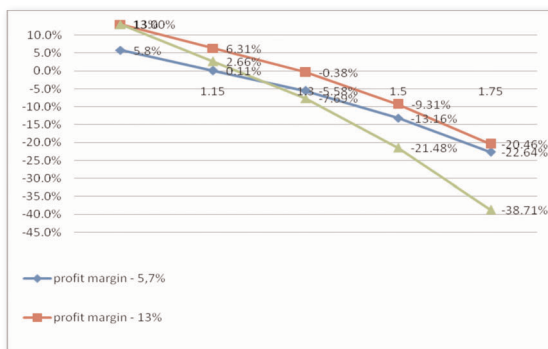
Under assumption that around 15% of the total company assets in the country belong to the companies that do not have liabilities in FX we find a decrease in the financial stability ratio⁴ of 40% (from 47% to 29% with devaluation of 75%). Under assumption that 45% of the total company assets belong to the companies that do not have liabilities in FX, the decline of the ratio is 29% (from 47 to 40% with devaluation of 75%). Knowing that Macedonia is small and open economy, the realistic share of the FX liabilities is supposed to be greater, leading us to the concerns about the potential vulnerabilities of the economy. In our analysis we took that 64% of total imported goods were used as a repro-materials, which means that all that goods will have higher price in case of devaluation.

4) Measuring the total capital to total liabilities of the company.

Figure 8:

Changes in the profit margin in a case of devaluation of (15% - 75%)

Source: Authors own calculations, according to assumptions and data from official statistics of the NBRM.



The analysis shows that even the devaluation of only 15% will make all companies to lose their profits. Like in the previous test we take that 85% (55%) of the total revenues are generated from companies with FX liabilities. Then we first make the calculation under the assumption that these companies have profit margin of around 13%. Then we make calculation with the profit margin of 5,7%, which is the actual nonfinancial companies margin. Analysis shows that the companies enter the negative profit margin territory with devaluation slightly over 15% in both cases, showing great sensitivity to the changes in the exchange rate.

Such dynamics related to the performance of the companies would normally have its impact on the total loan portfolio of the banks, and in the end on their capital adequacy ratio. Rising production costs of the domestic companies will cause them liquidity problems and eventually problems in servicing their loans. With lowered expectations for on time debt repayments, the banks will start to reclassify the companies' loans and calculate provisions for the appropriate risk category.

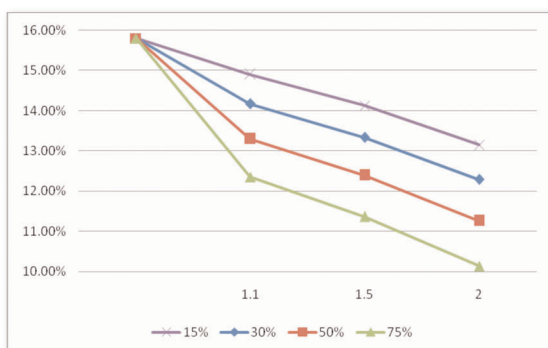
Our test includes 3 scenarios, representing an increase of the risk categories of the loans from 10%, 50% and 100%. Under assumption of 10% increase of the certain risk category loans, 10% of the risk category with lower provision ratio will be added to the higher provision ratio loan portfolio. This implies that, if some loans enter into a riskier loan category, the total non risk bank portfolio will get smaller.

Another assumption is that there are no new loans disbursed and the worsening of the loan risk classification means that the amount of the free risk loans is decreasing. The bank's capital is corrected only for the additional provisions and not for the open FX position, since it is hard to guess its path (although the results will be even worse if we have data for its assumption).

Figure 9:

Bank Capital Adequacy in a case of devaluation of (15% - 75%)

Source: Authors own calculations, according to assumptions and data from official statistics of the NBRM.



The results suggest that the banks will face capital adequacy ratio decrease of 19% (36%) if the denar devaluates at 15% (75%). As the simulation shows, the banks will still have enough capital to cover the losses (slightly over 12% with devaluation of 15% and over 10% with 75% of devaluation). However, these are the expected changes in the bank liquidity that would occur only as a result of the changes in the solvency of the corporate borrowers. Here we should expect that the retail sector would be also infected by the devaluation, resulting in decline of the aggregate demand and negative changes in the corporate, banking and government sector. Such assumption leads to a greater decline in the bank capital adequacy ratio, even in cases of smaller percentage of devaluations.

Having that in mind, and the fact that Macedonian banking system is still relatively underdeveloped, in terms of loan to GDP ratio (18,7% for retail loans and 27% for corporate loans), the risks arising from FX borrowing are great and ask for precautionary measures on a regular (systemic) basis.

6. Conclusion

Foreign currency borrowing is probably the most visible symptom of financial dollarization. It is prevalent in emerging markets, where firms often borrow in a foreign, rather than the domestic currency. Foreign currency use is also dominant in most countries in Eastern Europe, with the exception of the advanced transition economies (Poland, Slovenia, Czech Republic, etc.). Our analysis points out that the main determinants for the expansion of FX loans are both macroeconomic environment (relative inflation rates, interest rate differential, and exchange rate volatility) and a currency composition of banks deposits.

The paper's short overview of the recent episodes of financial crises shows that in some cases (East Asia in 1990's, Argentina in 2002) unhedged FX borrowing was a major cause of a financial crises. There are also reasons to believe that a surge in FX lending, chiefly in euros and Swiss francs, in some Central and Eastern European countries exacerbated the effects of the recent Global financial crisis. All these examples reveal that FX borrowing was and continues to be a significant source of macroeconomic, financial and personal risks (EBRD, 2010).

Finally, given the very high level of FX borrowing and the fixed exchange rate regime, we tried to test the vulnerability of the Macedonian banking sector under three different scenarios for a devaluation of the denar (15%, 35%, 75%). We find that even with our rather stylized assumptions, the test shows a significant deterioration of the banking sector credit portfolio as a result of currency devaluations.

All these arguments suggest that action for reducing the unhedged FX borrowing is critical for making the Macedonian economy (and other transition economies) less vulnerable to potential currency devaluations/depreciations. Unfortunately, at least for now, this topic is "non-issue" both for policymakers and academic economists in Macedonia. We will be happy if this paper would be a start of a fruitful debate about an interesting and important issue.

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