The impact of the financial crisis on credit constraints and foreign currency borrowing in Eastern Europe

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Abstract

We analyze credit constraints for several types of firms in Central and Eastern Europe and document whether existent sectoral financial asymmetries between sectors have worsened during the financing crisis. Further, using both firm-level data and aggregated bank-level data we investigate the level of foreign-currency denominated debt that might be used to overcome such constraints. The results are discussed in the Boom-Bust-cycle framework and in the policy context of the re-regulation of the financial system.

JEL Classification: F34, F36, G01, G32, G38

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1 Motivation

Prior to the crisis, the EMU aspirant countries in Eastern Europe can be characterized by a rapid, even excessive, credit growth especially to the private sector. This is supported by the catching-up process towards the EMU and huge FDI flows. However, the majority of the credits are issued by foreign banks, and hence, a large part of the credits to the private sector is denominated in foreign currency. Analyzing the degree of currency mismatch, i.e. the level of foreign-currency debt of non-financial corporations that is not supported by income in foreign currency, we argue in a Boom-Bust Cycle framework (see Schneider and Tornell, 2004) that in case of a real appreciation the value of the debt can be reduced substantially which stimulates further borrowing. But in case of a depreciation of the currency, the debt value will rise. This constitutes a serious problem especially for firms operating in the non-tradables sector, and hence, even involves a breakdown of the real economy if the asymmetry between sectors is large.

The aim of the paper is to analyze whether major financing constraints for private non-financial firms operating in the non-tradables sector (proxied additionally by small and non-export firms) have altered and even worsened during the crisis and whether the level of foreign currency debt has cushioned or intensified the financing constraints of the sectors. Hence, the first contribution of this paper is to document the existence of credit market imperfections in Eastern Europe. Firm level data provided by the World Bank will be used to identify the degree to which Eastern European countries are characterized by phenomena that have been observed in other countries that experienced boom bust cycles. Using a binary analysis we find that credit constraints do not alter significantly during the crisis. The second contribution of the paper is the focus on the firms' attempt to overcome these credit constraints by borrowing in foreign currency. World Bank firm-level data and data from the BIS Consolidated Banking Statistics and the IMF are merged, to document the risk for non-financial corporations that emerges from foreign currency debt. We find evidence that large and non-export firms borrow more often in foreign-currency, while the share of foreign-currency loans to total loans do not vary significantly across different type of firms. Finally, we draw conclusions on the impact of the financial crisis on firms' access to financing and foreign borrowing. Inferences are based on a comparison with the findings based on a previous World Bank Survey analysis by Drechsel and Westermann (2010).

While preceding World Bank surveys have been often used in the past to reveal business obstacles in Central and Eastern European enterprises, papers with a particular focus on financing asymmetries and foreign debt at firm-level do not exist.[1] Likewise, the existing literature does not consider the crisis period. Hence, this paper has two main contribution to

[1] Recently, Rancière et al. (2010) provide an analysis of currency mismatch, however the authors make use of the 2005 BEEPS survey and additionally run panel panel estimations including the new survey data.

the literature. First, we analyze the recent Business Environment and Enterprise Performance Survey (BEEPS) provided by the World Bank and EBRD (2009) and the Financial Crisis Survey provided by the World Bank Group (2009) that picture firms' business environment in the crisis period. Second, we focus in particular on the credit constraints and foreign debt that support the Boom-Bust cycle theory. Furthermore, this paper refers briefly to the discussion whether multinational banks has operated as shock absorber or as shock transmitter of the crisis in Eastern Europe.

The paper is structured as follows: Section 2 presents a brief description of the underlying survey data. Section 3 provides a micro data analysis of the effect of the financial crisis investigating firm-level surveys. We focus in particular on financial constraints and the level foreign currency. Furthermore we compare our findings with the results on a previous BEEPS. Finally, section 4 summarizes the results.

2 Survey Data

This section presents the underlying data of our analysis, the recent BEEPS survey provided by the World Bank and EBRD (2009) and the Financial Crisis Survey by the World Bank Group (2009). So far only a few studies have analyzed the former survey, but as far as we know, none of these have particular focus on the financial constraints (see Rancière et al., 2010).[2] Furthermore, the Financial Crisis Survey has not been analyzed so far other than the corresponding Enterprise Survey report by Ramalho et al. (2009) (at least to our knowledge).

Business Environment and Enterprise Performance Survey

Over the last decade the EBRD and the World Bank provided jointly several updates of the Business Environment and Enterprise Performance Survey (BEEPS). While other World Bank surveys, i.e. Enterprise Surveys, focus on a large set of countries, the BEEPS narrows the sample to 29 transition countries (in its fourth round) and aims to examine the business environment of the firms.[3] Compared to the previous versions there are several questions focusing and assessing in particular the financial environment of the firms. However, most of the data refers to the fiscal year 2007.[4]

[2] Rancière et al. (2010) investigate in both, the cross-section of the 2005's survey and a panel using the 2005 and 2009 survey. However, the focus is rather on the link between currency mismatches and growth than on financial constraints.

[3] The first survey was implemented in 1999-2000, followed by the 2002 and 2005 versions. In addition, a comparator survey was carried out in 2004 for 7 non-transition economies. Similar versions with a slightly different focus are conducted as World Business Environment Survey (WBES, 2000).

[4] The Financial Crisis Survey, which is presented below, use the 2009 BEEPS survey as baseline survey, i.e. pre-crisis status, to draw conclusion on the effects of the financial crisis.

Reducing the total size of the survey to a set of ten countries, namely Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia the sample includes 3033 firms.[5] For each country less than 300 firms are interviewed, only for Poland and Romania the number of firms ranges between 400 and 500 firms. Country-specific survey details, including implementation, etc. are given in EBRD (2009). Table 1 presents some characteristics of the firms: The majority (70%) of the firms are small and medium-sized, which we refer in the following as "small firms".[6] Furthermore, we can identify firms as exporters, if the share of direct and indirect export is larger than the share of home sales. The share of non-exporters is 87%. However, this classification is arbitrary. Therefore, it might be useful to consider whether non-exporters can be associated with small firms. This is clearly the case, as 74% of the non-export firms are small. Contrary, 56% of the export firms are large.[7]

Table 1: Size Distributions of Firms

	total firms	small	large
no.	3033	2137	896
non-export	2652	74%	26%
export	381	44%	56%
N-sector	1952	72%	28%
T-sector	1081	60%	40%

Note: Small (and middle) firms are characterized by 1 to 99 full-time employees, while large size firms have more than 100 full-time workers. Export firms include both direct and indirect exporters. The T-sector is proxied by manufacturing and the N-sector by services and others.
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009) and own calculations.

Given the classification of the sectors in the survey, we define the tradables sector (T-sector) by manufacturing and the non-tradables sector (N-sector) by services and others.[8] The majority (64%) of the interviewed firms operate in the N-sector, both the small ones and the large ones. Because the number of firms that operate in a specific sector is not the same across the sectors, it is difficult to assess whether the average size of each sector is either small or

[5] The total sample for these 10 countries is larger, including 3158 firms. However, some firms are excluded if they do not assess their financial constraints. The set of countries includes also two EMU member states, and is based on a similar analysis by Drechsel and Westermann (2010), which will be used as a proxy for pre-crisis conditions.

[6] Firms are labeled as small if they have more less than 100 employees, based on the "sample size" figures. Firms with less than five full-time employess are not considered. Note, that due to this classification, a size comparision with the firms in the BEEPS (2005) is difficult, where firms up to 250 employees are summarized as SME. Taken the criteria of the former survey, our number of large firms decreases considerably to 296 firms.

[7] Based on the number of small firms in the survey, we found 92% of the small firms to be non-exporter. Further, given the number of large firms, 71% of these firms indicate to be non-exporters.

[8] "Services" are associated by retail trade and "others" comprises construction, transport, wholesale, real estate, IT and hotels.

large. Furthermore the "traditional" classification in N-sector and T-sector is a precarious matter. We circumvent this allocation as the N-sector firms can be roughly proxied by the non-export firms (78%) and the T-sector firms by the exporters (56%), respectively.[9] While the evidence for the N-sector can be clearly revealed, the findings differ across countries for the T-sector. The Baltic and Slovenian T-sector firms can be clearly associated with export firms with shares well above 70%, while for Bulgaria and Hungary also T-sector firms are non-exporters. However, for robustness issues a cross check at sectoral level is conducted.

Financial Crisis Survey

In the course of the financial crisis the World Bank conducted a complementary poll, the Financial Crisis Survey (FCS). This survey focusing on the effects of the crisis on the firms, was implemented in Summer 2009 in five countries in Eastern Europe, namely in Bulgaria, Hungary, Latvia, Lithuania, Romania.[10] Compared to the BEEPS 2009, this survey covers only 1172 firms, with largest sample for Romania (370 firms) and the smallest for Bulgaria (150 firms). Similar to the BEEPS survey the firms can be classified, according to their size, with 70% being small and medium sized firms; to their non-export characteristic (74%) and their sector affiliation, with 61% operating in the non-tradables sector.

3 Effects of the financial crisis

The Central and Eastern European economies are hit even more severe by the financial crisis, than the Western European countries. GDP, for instance, contracted by around 8% compared to 2008, mainly driven by decreasing demand from abroad.[11] Accordingly, we ask whether the share of constrained firms has increased during the crisis and whether the high proportion of foreign currency debt has boosted the financial obstacles or rather helps to overcome the restrictions.

As a first step, firm-level data are analyzed, to assess the effect of the financial crisis for non-tradables sector (small, non-export) firms in CEECs. In particular the firms are asked in the Financial Crisis Survey about the main effect of the financial crisis on their business, including sales, employment and finance. 90% of the firms in the sample indicate that they are affected by the crisis. Figure 1 shows the main effects of the financial crisis that the firms identify. Compared to the huge drop in demand effect (over 70%), the percentage of firms that identifies "reduced access to credit" as the main effect of the crisis is quite low. Further,

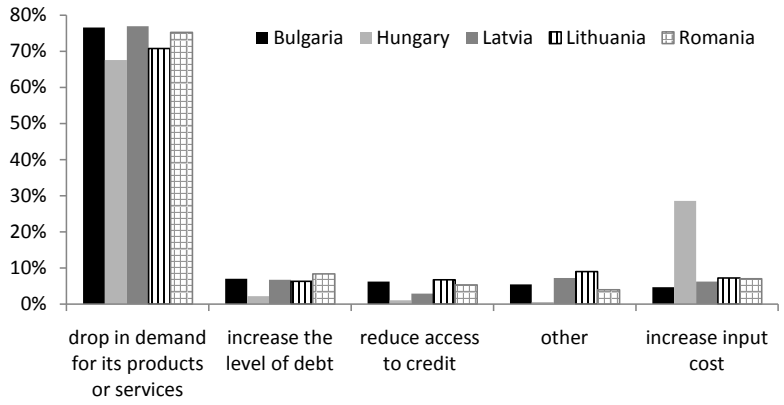
[9] Figures are based on the classification that the export firms have no domestic sales.

[10] Furthermore, the survey was conducted in Turkey.

[11] While the change in GDP growth differs considerably across countries, the Baltics are the most affected countries with an increase by -18% in Latvia, -14.8% in Lithunia and -14.1 in Estonia.

while the main effect is the same in all countries, the share of firms indicating "reduced access to credit" as major effect differs across countries and sectors (see, Ramalho et al., 2009).[12]

Figure 1: Effects of the financial crisis



Note: "What has been the main effect of the financial crisis on this establishment." (question e2). Only firms are included that answer to this question.
Source: Financial Crisis Survey (World Bank Group, 2009) and own calculations.

To cover the obstacles in the business environment, the firms specify in the BEEPS (2009) their major obstacle (see Figure 2). For 13.1% of the firms access to finance is the biggest obstacle in running their business. Interestingly taxes (21.9%) and unqualified workers (13.6%) might be a more problematic, but the shares vary across countries.[13] Notwithstanding that the other difficulties are highly relevant, they are out of the scope of our analysis. Further, distinguishing between small and large firms, there is evidence that for small firms the second most severe obstacle after tax issues (22.5%) is the access to finance (12.9%). Therefore, in what follows, we mainly focus on the financing structure and financial constraints.

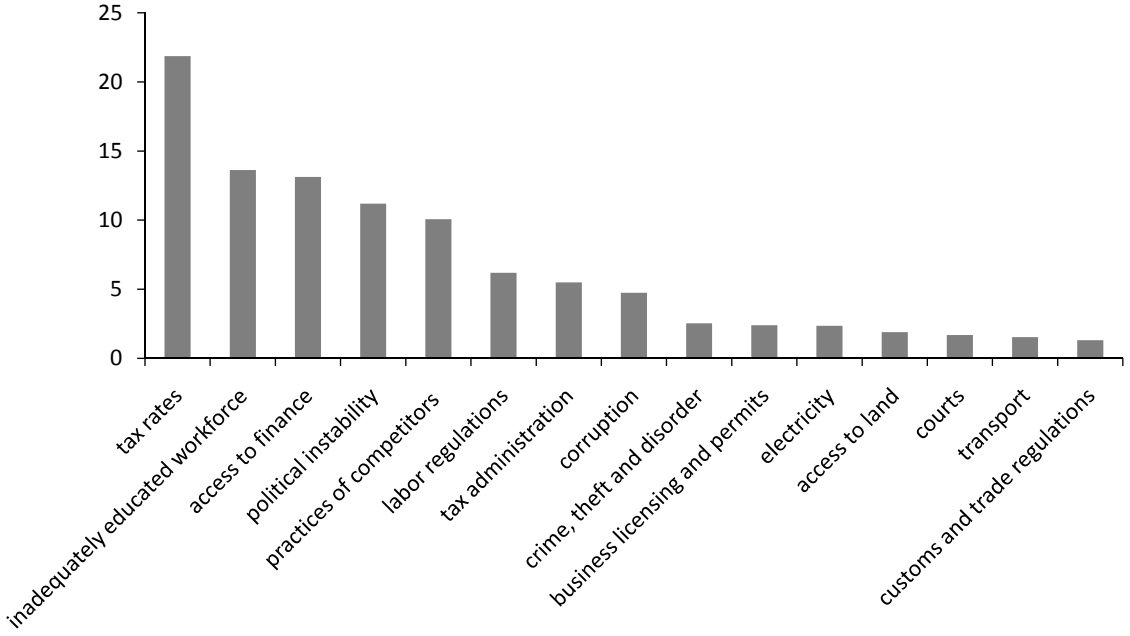
Financial constraints

First, based on the BEEPS (2009) and the FCS (2009) we analyze the financing sources that are used for fixed assets by the firms. While in 2009 over 80% of the financing originates from internal funds, the surveys give evidence that the largest external financing source of the firms are banks, both private and state-owned banks.Table 2 indicates that in average only 30%

[12] Based on 1040 firms answering this question, the share of firms identifying decreased access to credit as major effect of the crisis is in Bulgaria (6.3%), Hungary (1.1%), Latvia (2.9%), Lithuania (6.8%), and Romania (5.4%).

[13] In most countries a flat tax system applies, i.e. a uniform tax rate is effective for all firms whatever their profit is. Further, recent changes in tax rates have been used for aid to recovery from the economic crisis. Besides private taxes, corporate income tax has been an important instrument. For instance Lithuania has increased the corporate income tax rate from 18% to 20% in 2009 (Word Bank Group and PWC, 2010). Further tax reforms are implemented in Czech Republic and Poland.

Figure 2: Biggest Obstacles for Business



Note: The firm's biggest obstacles for running their business are shown for 2680 firms in our sample that answer this question (question M1).
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009) and own calculations.

of the surveyed firms indicate that they use bank loans to finance their working capital.[14] In contrast, small and non-export firms are even more pronounced to use internal finance in the crisis. Nevertheless, the share of working capital that is financed from banks is in avergage 31%, for large firms and export firms the share is marginally lower.

Table 2: Financing from banks

	Total sample	small firms	large firms	non-export firms	export firms
Total	30.4%	27.1%	38.4%	28.9%	34.0%
Bulgaria	33.3%	31.4%	43.5%	32.4%	36.1%
Hungary	48.0%	43.6%	55.7%	48.7%	46.6%
Latvia	24.4%	22.5%	28.0%	19.1%	33.3%
Lithuania	21.4%	18.1%	32.1%	18.0%	30.2%
Romania	30.0%	26.7%	38.0%	30.7%	27.5%

Note: The share of firms that finance the establishments working capital from banks is given. Calculations are based on the number of firms answering to question d5.
Source: Financial Crisis Survey (World Bank Group, 2009) and own calculations.

[14] However, this question does not allow to draw conclusions on the currency of the loan. Further the share given for bank loans and internal funds not necessarily sum to 100, as they were addressed in different questions in the survey and

However, referring to their most recent loan (see Table 3), 1680 firms indicate that their main external financing source are private banks, being almost 80%.[15]

Table 3: External financing sources

	total	large	small
private commercial bank	78.3	76.7	81.1
state-owned bank or government agency	18.5	19.5	16.6
non-bank financial institutions	2.0	2.4	1.3
other	1.3	1.4	1.0

Note: Average share of non-internal funds financing is given in percent. Non-bank financial institutions include microfinance institutions, credit cooperatives, credit unions, or finance companies.
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009) and own calculations.

As the BEEPS data relates to the fiscal year 2007, i.e. prior to the crisis, we can observe that the share of internal funds financing has been increasing by nearly 20 percent during the crisis.[16] However, a major drawback of the new BEEPS survey is that the firms no longer state the currency-denomination of their loans. At least for a few countries this gap can be filled by an additional survey provided by the World Bank, which we present below. Before we turn to the credit supply, we further make use of the survey to assess the credit demand at all. Interestingly, 57% of the firms indicate that they did not apply for a credit.[17] This share is slightly larger for small firms and non-export firms (both around 62%). The firms indicate that missing demand for credit results with roughly 72% from no need for a loan and thus the fact that their internal funds are sufficient to run their business. This results from decreased sales due to a huge drop in demand (see also Figure 1). High interest rates, collateral requirements or application procedure are comparativly minor reasons.

Second, the BEEPS asks the firms more detailed about their financing restrictions, where we focus on the access to finance condition, being the key variable for the following analysis.[18] The firms assess the level of their constraint, where we analyze at the one hand the extreme case considering only very severe obstacles and at the other hand in line with a previous BEEPS survey using a broader definition comprising major and very severe obstacles. Table A.1 in the Appendix gives an descriptive overview. In general, the share of firms indicating severe

[15] Please note that this figures refer only to firms that assess their financial constraint.

[16] The average of internal financing in 2007 is 56%, in 2008, 78%, and in 2009, 82%. The last two figures refer to the FCS and include only the assessment the firms in 5 countries.

[17] This figure refers to the fiscal year 2007. A drawback of the new survey compared to the 2005 version is that the firms can not assess whether the granting of credit is pending.

[18] Question K30 is used for this purpose: "Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements, no obstacle [0], a minor obstacle [1], a moderate obstacle [2], a major obstacle [3], or a very severe obstacle [4] to the current operations of this establishment?" Firms which answer "do not know" or "does not apply" are excluded from our analysis. In this survey the category "very severe obstacle" is new, hence to allow comparability with previous BEEPS analysis we additionally pool firms that answer [4] or [5].

obstacles in the access to finance are less than 7%, and are slightly larger for non-export firms and firms operating in the N-sector. According to this descriptive analysis, there is no significant difference between small and large firms. Furthermore, the findings vary across countries, being more seriously in Romania (with almost 13%) and humbly in Estonia with less than 2%. Based on a broader definition of the constraint (panel (b)), the share of constrained firms increases considerably, being in average 21%. The small and non-export firms are more constrained, while firms operating in the T-sector indicate more obstacles than firms in the N-sector. Again, the results for individual countries are mixed.

Based on a simple binary regression, we analyze whether the financing constraint is more severe for small, non-export and non-tradables sector firms. Using a probit approach, we estimate

$$\text{constraint}_i = c + \beta \cdot F_i + \sum_{n=1}^{9} D_n + \varepsilon_t \qquad \text{with} \quad i = 1, ..., 3033, \tag{1}$$

where the constraint$_i$ is a dummy variable, which indicates, whether firm i considers the access to finance to be a (major and) severe obstacle for running its business. F_i is a dummy variable that indicates the sector classification, i.e. being either a small, a non-export or a N-sector firm. Besides the constant c and the error term ε_t, we include country dummies as recommended by Schiffer and Weder (2001).[19]

The results summarized in Table 4 Panel (a) indicates that the firm characteristic has a positive impact on the constraint, i.e. the non-exporters, small firms and the N-sector firms are more constrained, although the effect is not statistically significant (see columns 1,3,5, respectively). Panel (b) indicates that in particular small firms are faced to major and severe obstacles. This effect is even statistically significant. Interestingly, the sign of effect has altered for the N-sector, being negative, although not statistically significant.

For robustness, equation (1) is extended by two control variables. A dummy indicating whether the firm is private (1) or state-owned (0), and the firm's age. In general, we find that less than 2% of the firms are owned (at least partly) by the government. Only for large firms the share that is owned by the government is somewhat larger (3.5%). Furthermore, the survey differs between private domestic and private foreign ownership, where the latter share of firms is even 11%.[20] The average firms' age is 15 years (based on the year the operation starts), for export firms, large firms and government owned firms the age is older, being 17, 20 and

[19] Country dummies capture country-specific effects that determine the level of the constraint within each country and affect all firms in the country similarly.

[20] Firms are labeled as private if they are not (partly) owned by the government. In addition 196 firms can not clearly be identified, as they answer "other" (140) or "don't know"(56).

Table 4: Financial asymmetries

	(a) severe constraint					
	(1)	(2)	(3)	(4)	(5)	(6)
non-export	0.186	0.167				
	[0.121]	[0.122]				
small			0.003	0.021		
			[0.079]	[0.086]		
N-sector					0.049	0.035
					[0.075]	[0.079]
non gov		0.169		0.166		0.174
		[0.331]		[0.331]		[0.330]
age		0.001		0.001		0.001
		[0.003]		[0.003]		[0.003]
McFadden R^2	0.035	0.032	0.033	0.031	0.033	0.031
p-value (LR-stat)	0.000	0.000	0.000	0.000	0.000	0.000
obs	3033	2784	3033	2784	3033	2784
	(b) major and severe constraint					
	(7)	(8)	(9)	(10)	(11)	(12)
non-export	0.074	0.077				
	[0.082]	[0.087]				
small			0.113 **	0.140 *		
			[0.059]	[0.064]		
N-sector					-0.027	-0.038
					[0.055]	[0.058]
non gov		-0.080		-0.114		-0.084
		[0.216]		[0.216]		[0.216]
age		-0.001		0.000		-0.001
		[0.002]		[0.002]		[0.002]
McFadden R^2	0.042	0.043	0.043	0.045	0.041	0.043
p-value (LR-stat)	0.000	0.000	0.000	0.000	0.000	0.000
obs	3033	2784	3033	2784	3033	2784

Note: Probit regression results are shown, both excluding and including control variables. *,** ,*** indicate significance at the 10%, 5% or 1% level. Standard errors are given in parenthesis.

Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009), and own calculations.

23 years, respectively.[21] Including these control variables does not alter our results. Hence, the analyzed firm characteristics have a positive impact on the severe constraint, although not significant. Small firms have a positive and significant impact on the broader constraint. Similarly we can consider whether the interaction of firm characteristics will affect our results. While the marginal effect of a change in both variables is different to the marginal effect of a change in the interaction term (see Ai and Norton, 2003; EC Norton, 2004), we find that the coefficient is positive for small, non-export firms indicating that the constraint is more severe, although the difference is not statistically significant (see Table A.2 in the Appendix).[22]

The same exercise is conducted for the ordered binary constraint variable as given in the survey. Table A.3 in the Appendix indicates that the latent constraint variable is increasing if the firms are either non-export or small firms, and decreasing for N-sector firms. For the N-sector, the coefficient is statistically significant.

Foreign currency debt

The high share of foreign banks prior to the crisis (Fig. 3) as well as the amount for foreign-currency liabilities to total liabilities (Fig. 4) gives evidence that the foreign currency risk is passed directly to the borrowers, and hence exchange rate risks emerges at firm-level.[23] Hence, in case that the firms, typically the small and non-export firms, do not have income in foreign-currency to hedge this risk, a depreciation of the currency is a major problem. Referring to the real effective exchange rate, this was the case in most of the countries during the crisis (see Fig. A.1 in the Appendix), except for the countries with a currency board vis--vis the euro.

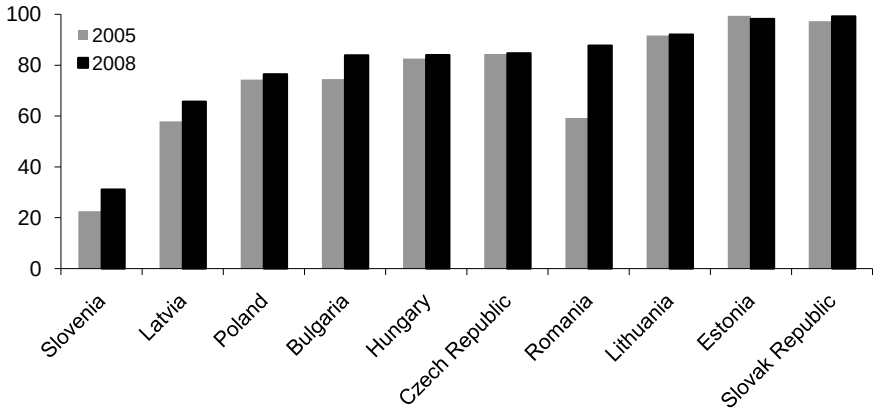
Firm-level data on foreign currency debt is extremely scarce. However, based on a recent enterprise survey by the World Bank (Financial Crisis Survey, World Bank Group, 2009), which has been already presented above, the share of debt denominated in foreign currency (FC, hereafter) can be roughly determined and the degree of currency mismatch can be measured. The firms are asked to state the share of foreign-currency liabilities and the results, given in Table 5, indicate that half of the firms in the sample borrow abroad, i.e. in FC. Latvian firms are more likely to borrow in other currencies than the Latvian Lats (63%). This in line with the finding on the banks-level above. The share of firms in Hungary that borrow in FC is 57%. Also for Romania, along with Lithuania, the share of firms with FC loans is well above 40% and reaches almost 30% in Bulgaria as well. However, for all firms, the share of liabilities that

[21] Taken into account that the survey is conducted between 2008 – 2009, the age is calculated with respect to the interview date. Further, there is a minor discrepance between the year in which the firms begins its operation and the registration year for some firms.

[22] Applying the correction procedure for interaction effects by Ai and Norton (2003); EC Norton (2004), we found that the sign of the interaction dummy is robust, and significance is neglected.

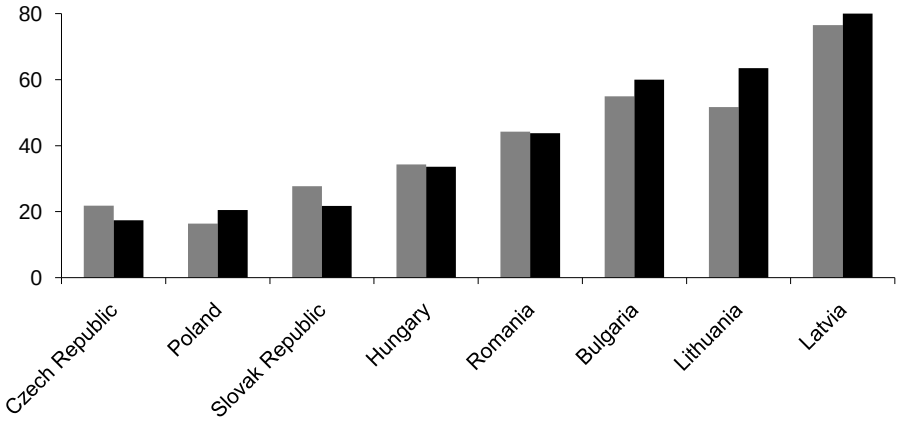
[23] This can be confirmed when comparing the data foreign-currency liabilities to foreign-currency loans.

Figure 3: Foreign Banks



Note: The market share of foreign banks is shown, measured by the asset share of foreign-owned banks to total banking sector assets (in percent).
Source: EBRD (2009) and own calculations.

Figure 4: Foreign Currency Liabilities



Note: The share of foreign-currency-denominated liabilities to total liabilities are given (in percent).
Source: Financial Soundness Indicators (FSI) by IMF (2009) and Bank Regulation and Supervision Database 2007 provided by Barth et al. (2008).

is not denominated in domestic currency ranges between 17% for Bulgaria and 41% for Latvia (see Table 6).[24]

The findings are similar for small firms that represent over 70% of the firms in our sample. However, for large firms the share of firms with FC-loans is extremely huge, amounting up to 98% in Lithuania. The share of firm's FC-debt to total liabilities ranges in a narrow band between 30-40%, both for small and large firms. Only for Bulgarian firms the share of non-Lev denominated liabilities is lower (17%).

[24] Considering only firms that indicate a share of FC-liabilities greater than zero, we find that the average share of FC-liabilities to total liabilities for the five countries is around 62%.

As noted above, firms are faced to foreign-currency risk if they can not hedge the exchange rate fluctuation by income in domestic currency. Therefore, we consider furthermore the share of non-export, and export firms that borrow in FC. Our findings indicate that export firms are more likely to feature FC-loans. At the country level, we identify that the share of Hungarian exporters that borrow in FC is the largest with 84% followed by the Latvian exporters (75%). The latter even denominate almost half of their liabilities in FC.

While the analysis has shown that the share of firms that borrow in FC is higher for large and export firms, there is clear evidence that also the small or non-export firms have a comparatively high share of loans in FC (with more than 40%).

Table 5: Firms with foreign-currency liabilities

	Total sample	small firms	large firms	non-export firms	export firms
Total	48.8%	41.7%	76.6%	40.6%	67.4%
Bulgaria	28.6%	24.1%	47.4%	27.0%	33.3%
Hungary	56.8%	50.0%	66.7%	36.0%	84.2%
Latvia	63.0%	57.1%	73.7%	55.8%	75.9%
Lithuania	44.7%	38.5%	97.7%	34.3%	70.5%
Romania	48.3%	40.7%	76.5%	43.3%	63.3%

Note: The share of firms that indicates that they have loans in foreign-currency is given.
Source: Financial Crisis Survey (World Bank Group, 2009) and own calculations.

Table 6: Share of foreign-currency liabilities

	Total sample	small firms	large firms	non-export firms	export firms
Total	30.3%	28.5%	34.2%	27.2%	37.3%
Bulgaria	17.2%	17.2%	17.2%	15.5%	22.5%
Hungary	34.6%	33.1%	36.7%	32.8%	36.9%
Latvia	40.7%	39.8%	42.4%	36.5%	48.3%
Lithuania	26.1%	23.9%	31.7%	20.2%	40.6%
Romania	32.7%	28.7%	42.7%	30.9%	38.0%

Note: The share of foreign-currency liabilities to total liabilities is given (question d8).
Source: Financial Crisis Survey (World Bank Group, 2009) and own calculations.

Comparison with the BEEPS Survey (2005)

While the BEEPS (2005) survey has comprehensively been analyzed in the literature (Drechsel and Westermann, 2010; Brown et al., 2010; Volz, 2008; Rancière et al., 2010), in particular focusing on financial constraints and currency mismatch as well as other severe obstacles, like corruption (see, Knack, 2006), for a multitude of countries and groups of countries, we aim to compare tentatively the findings by Drechsel and Westermann (2010) with our results

above. This is not an easy task as the classification, e.g. regarding the size criteria, has changed and questions are dilated or modified. However, Table 7 indicates that the changes regarding the financial constraints are minor.[25] Probit regression results indicate significantly major obstacles in access to financing for small firms. Although the coefficient for non-export firms is not statistically significant, we find that the obstacles are more severe compared to export firms. Further, we find that the N-sector is less constraint, although not significant. However, Drechsel and Westermann (2010) have shown that the results are different across sectors.

Table 7: Comparison of BEEPS 2005 and 2009

	BEEPS 2005		BEEPS 2009	
no. of countries	10		10	
no. of firm that assess their financial constraints	3722		3033	
share of constrained firms (in %)	20.8		20.7	
	small	*large*	*small*	*large*
	21.6	12.1	21.6	18.5
	non-export	*export*	*non-export*	*export*
	21.6	18.8	21.0	18.1
	N-sector	*T-sector*	*N-sector*	*T-sector*
	16.3	27.6	20.4	21.1
firms with major (and severe) obstacles	*small*	$+^{***}$	*small*	$+^{**}$
	non export	$+$	*non export*	$+$
	N-sector	$-^{***}$	*N-sector*	$-$

Note: For the BEEPS (2009) the constraint is based on major and severe obstacles in access to finance.
Source: Business Environment and Enterprise Performance Surveys (World Bank and EBRD, 2005, 2009) and own calculations.

Finally, using the Financial Crisis Survey, we can roughly assess the share of firms with foreign-currency liabilities. In contrast, in the BEEPS (2005), 29.8% of the firms indicate that their last loan was in foreign-currency. A comparision with the FCS is difficult, as the new survey comprises only 5 instead of 10 countries. Further, the question is modified from whether the most recent loan was denominated in foreign currency to the share of foreign debt to total liabilities.

[....]

[25] We additionally analyze the 2009 BEEPS survey data defining the firm characteristics according to the previous version, i.e. where small and medium sized firms have up to 250 employees. The results differ not significantly.

Financial Constraints: Evidence from a panel analysis

The EBRD-World Bank also provides an unbalanced panel dataset including the years 2002, 2005, 2007 and 2009.[26] In addition to the cross-section analysis in the previous section, we further study the long panel, i.e. including only 4 available years but 10,061 firms. The dataset has already been used by Rancière et al. (2010) to analyze the link between currency mismatch and the Boom-Bust cycle. The authors find clear evidence that increasing currency mismatch in the firm's balance sheet involves faster growth subsequently (unless there is a crisis).

Our analysis is different as we use the panel information to document whether the credit constraints and the foreign currency liabilities has altered during the crisis.

[Results are still at a very preliminary stage....]

4 Policy implications and conclusions

In this paper we investigated two recent surveys by the World Bank and EBRD (2009), and the World Bank Group (2009). With a particular focus on financial constraints, we have analyzed the firms' assessment of their financing situation and the excess of foreign-currency borrowing in the crisis time.

The results of our firm-level analysis show, that the financial constraints for small firms are significantly different from the large firms. Also major constraints are found for non-exporters. While the N-sector aggregate reveals significantly less constraints than the T-sector, the evidence differs across individual N-sectors. A comparison with previous survey data does not show that the obstacles in access to credit are more severe during the crisis. This confirms the findings by Brown et al. (2010) that small firms, with stable internal financing, are less affected in the crisis, compared to exporters, which a higher credit demand. Further, the level of foreign-currency lending is still high, despite that a huge share of foreign claims is withdrawn from the international operating banks (BIS,2010). Brzoza-Brzezina et al. (2010) shows that foreign-currency loans in the CEECs are favorable in case of a restrictive monetary policy.

[...]

[26] Firms do not participate in each year, some firms are dropped and others are added. In 2007 the survey was conducted only in Bulgaria.

References

Ai, C. and Norton, E. C. (2003). "Interaction terms in logit and probit models". *Economics Letters*, *80*(1), 123–129.

Barth, J. R., Gerard Caprio, J. and Levine, R. (2008). "Bank Regulation and Supervision (2007 database)". Bank Regulations Are Changing: For Better or Worse?

Brown, M., Ongena, S., Popov, A. et al. (2010). "Who Needs Credit and Who Gets Credit in Eastern Europe?" 2nd draft manuscript for economic policy, Swiss National Bank.

Brzoza-Brzezina, M., Chmielewski, T. and Niedźwiedzńska, J. (2010). "Substitution between domestic and foreign currency loans in Central Europe - Do central banks matter?" Working Paper No 1187, ECB.

Drechsel, K. and Westermann, F. (2010). "Credit Market Imperfections, Boom-Bust Cycles and Financial Regulation in Eastern Europe". Working Paper mimeo, University Osnabrück.

EBRD (2009). *The Business Environment and Enterprise Performance Survey (BEEPS) 2008-2009 : A Report on methodology and observations*. EBRD.

EC Norton, C. A., H Wang (2004). "Computing interaction effects and standard errors in logit and probit models". *The Stata Journal*, *4*(2), 154–167.

IMF (2009). "Financial Soundness Indicators (FSI)".

Knack, S. (2006). "Measuring Corruption in Eastern Europe and Central Asia: A Critique of the Cross-Country Indicators". Policy Research Working Paper No. 3968, The World Bank - Development Research Group (DECRG).

Ramalho, R., Rodrguez-Meza, J. and Yang, J. (2009). "How Are Firms in Eastern and Central Europe Reacting to the Financial Crisis?" Enterprise Surveys- Enterprise Note Series No 8, The World Bank Group.

Rancière, R., Tornell, A. and Vamvakidis, A. (2010). "Currency Mismatch and Systemic Risk in Emerging Europe". Draft prepared for the 51^{st} Panel Meeting of Economic Policy in Madrid, IMF, UCLA.

Schiffer, M. and Weder, B. (2001). "Firm Size and the Business Environment: Worldwide Survey Results". Discussion Paper No 43, International Finance Corporation.

Schneider, M. and Tornell, A. (2004). "Balance Sheet Effects, Bailout Guarantees and Financial Crises". *Review of Economic Studies*, *71*(3), 883–913.

Volz, U. (2008). "An Empirical Examination of Firms Financing Conditions in Transition Countries". Paper presented at the international conference "Monetary and financial transformations in CEECs " at 20th november 2008 in Paris, German Development Institute.

WBES (2000). "The World Business Environment Survey (WBES) 2000, The World Bank Group". `http://info.worldbank.org/governance/wbes/index2.html`. last checked: March 2010.

Word Bank Group and PWC (2010). "Paying Taxes 2010 - The global picture". Doing business report, Word Bank Group.

World Bank and EBRD (2005). "EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS) 2005, Dataset for researchers". http://www.ebrd.com/country/sector/econo/surveys/beeps.htm. last checked: March 2010.

World Bank and EBRD (2009). "EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS) 2009, Dataset for researchers". http://www.ebrd.com/country/sector/econo/surveys/beeps.htm. last checked: March 2010.

World Bank Group (2009). "Financial Crisis Survey". http://www.enterprisesurveys.org/FinancialCrisis/. last checked: May 2010.

A Appendix

Table A.1: Financial constraints

	total firms	small and middle firms	large firms	non-export firms	export firms	N-sector firms	T-sector firms
no. of firms	3033	2137	896	2652	381	1952	1081
(a) extreme classification: severe obstacles							
share of constrained firms	6.7%	6.7%	6.7%	7.0%	4.5%	7.0%	6.2%
share of constrained firms in:							
Bulgaria	5.1%	4.9%	6.0%	5.4%	3.1%	5.5%	4.3%
Czech Republic	6.6%	6.3%	7.1%	5.4%	12.2%	6.6%	6.5%
Estonia	1.9%	1.1%	3.8%	2.3%	0.0%	2.3%	1.2%
Hungary	3.2%	3.6%	2.2%	3.1%	3.4%	2.9%	3.5%
Latvia	7.5%	8.4%	5.1%	8.5%	2.3%	9.5%	3.0%
Lithuania	8.3%	9.6%	6.3%	9.2%	2.9%	6.9%	12.7%
Poland	6.5%	6.0%	8.2%	6.5%	6.5%	5.1%	9.1%
Romania	12.9%	13.0%	12.7%	13.8%	2.4%	15.1%	8.7%
Slovak Republic	4.8%	4.9%	4.5%	5.2%	2.6%	5.2%	4.1%
Slovenia	5.4%	5.2%	5.9%	4.9%	8.0%	4.7%	6.6%
(b) broad classification: major and severe obstacles							
share of constrained firms	20.7%	21.6%	18.5%	21.0%	18.1%	20.4%	21.1%
share of constrained firms in:							
Bulgaria	17.2%	18.3%	12.0%	18.2%	9.4%	15.5%	20.4%
Czech Republic	23.0%	24.7%	18.6%	22.7%	24.4%	25.7%	18.5%
Estonia	6.6%	6.7%	6.3%	6.9%	4.9%	5.7%	8.4%
Hungary	9.8%	11.9%	5.5%	10.5%	3.4%	11.1%	7.9%
Latvia	25.7%	27.9%	20.5%	25.0%	29.5%	23.7%	12.1%
Lithuania	22.6%	25.2%	18.9%	21.9%	26.5%	26.4%	38.0%
Poland	23.5%	21.3%	30.0%	23.9%	19.4%	20.0%	29.9%
Romania	33.8%	36.6%	27.3%	34.6%	24.4%	33.5%	34.3%
Slovak Republic	14.8%	15.8%	12.5%	15.5%	10.5%	14.4%	15.5%
Slovenia	17.8%	16.2%	21.2%	16.8%	22.0%	18.8%	16.0%

Note: The share of firms that assess access to finance as severe obstacle (panel (a)) and major or severe obstacle (panel (b)) is given. This corresponds to question K30: "Is access to finance, which includes availability and cost, interest rates, fees and collateral requirements, No Obstacle, a Minor Obstacle, a Moderate Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment?"
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009).

Table A.2: Financial asymmetries II

	(a) severe constraint			(b) major and severe constraint		
	(1)	(2)	(3)	(4)	(5)	(6)
non-export	0.103	0.085	0.169	0.056	0.128	0.113
	[0.163]	[0.173]	[0.173]	[0.120]	[0.130]	[0.125]
small	-0.204	-0.137	0.021	0.128	0.28 *	0.254 *
	[0.236]	[0.244]	[0.226]	[0.154]	[0.164]	[0.153]
non-export × small	0.204	0.154		-0.026	-0.172	
	[0.251]	[0.261]		[0.167]	[0.178]	
non-export × small			-0.028			-0.145
× non-gov			[0.243]			[0.167]
non gov		-0.166	0.184		-0.109	-0.05
		[0.331]	[0.354]		[0.217]	[0.229]
age		0.001	0.001		0.000	0.000
		[0.003]	[0.003]		[0.002]	[0.002]
McFadden R^2	0.035	0.032	0.032	0.043	0.045	0.0449
p-value (LR-stat)	0.000	0.000	0.000			
obs	3033	2784	2784	3033	2784	2784

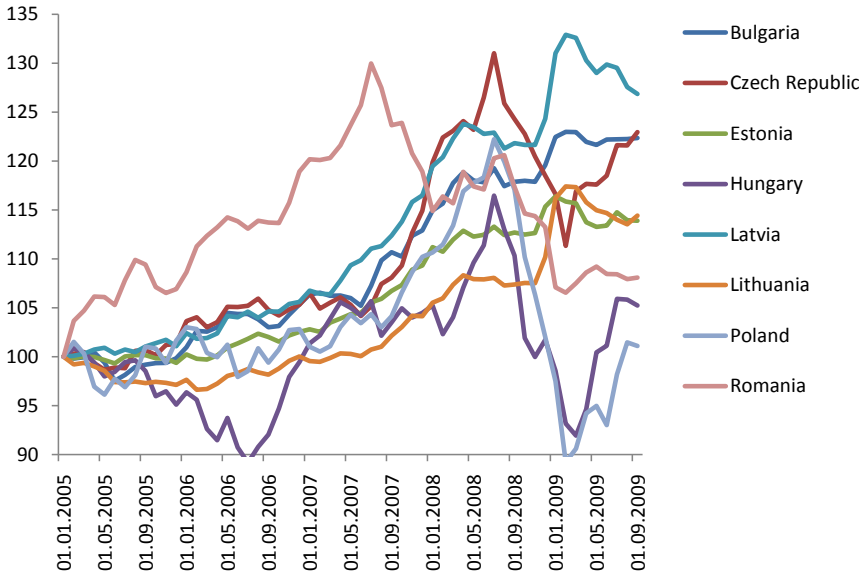
Note: Probit regression results are shown. *,** ,*** indicate significance at the 10%, 5% or 1% level. Standard errors are given in parenthesis.
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009), and own calculations.

Table A.3: Financial asymmetries III

	(1)	(2)	(3)	(4)	(5)	(6)
non-export	0.060	0.062				
	[0.060]	[0.063]				
small			0.067	0.074		
			[0.044]	[0.047]		
N-sector					-0.072 *	-0.085 **
					[0.041]	[0.043]
non gov		-0.181		-0.199		-0.189
		[0.164]		[0.165]		[0.164]
age		0.000		0.000		-0.001
		[0.002]		[0.002]		[0.002]
McFadden R^2	0.034	0.036	0.034	0.036	0.034	0.036
p-value (LR-stat)	0.000	0.000	0.000	0.000	0.000	0.000
obs	3033	2784	3033	2784	3033	2784

Note: Ordered probit regression results are shown, both excluding and including control variables. *,** ,*** indicate significance at the 10%, 5% or 1% level. Standard errors are given in parenthesis.
Source: Business Environment and Enterprise Performance Survey (World Bank and EBRD, 2009), and own calculations.

Figure A.1: Real effective exchange rates



Note: Real effective exchanges rates are monthly average trade-weighted effective rates against 41 trading partners (1999=100). Consumer prices are used as deflator for real values. An increase of the index indicates an appreciation of national currency (i.e. the inverse of the conventional definition.)
Source: Eurostat (2009).