

# ACCESS TO FINANCE: INNOVATIVE FIRMS' PERCEPTIONS IN POST-TRANSITION EU MEMBERS

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## Introduction

It is widely documented in the literature that innovators perceive business obstacles differently from non-innovators (Mohnen et al., 2008; Galia & Legros, 2004). Extant findings indicate that firms are able to surmount obstacles (Baldwin & Lin, 2002; Tourigny & Le, 2004) and efforts to understand how firms manage to innovate despite obstacles have been made (Radas & Božić, 2012). It has also been emphasized in the literature that we need to distinguish between obstacles that cause absence of innovation and those that make innovation difficult (D'Este et al., 2012; D'Este, Rentocchini, & Vega-Jurado, 2015). Access to finance has been recognized as important issue not only in the academic literature, but also in public discussions. In terms of policy actions, access to finance has been frequently discussed as one of the obstacles for growth within the European Union, especially in case of SMEs. In 2012 EC adopted an action plan to improve access to finance for SMEs (European Commission, 2011). Programme Competitiveness and Innovation Framework Programme (CIP) and its successor Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) are designed to alleviate financing constraint for important segments of the EU economy. Despite this, Survey on the Access to Finance of Small and Medium-sized Enterprises (SAFE) reveals variations across EU countries in various aspects of access to finance but it is still an issue for many firms in EU countries.

Although problems regarding the access to finance are present across Europe, especially related to SMEs, we focus the analysis on post-transition EU member countries, due to well-known reasons. These countries generally have to catch up with EU most developed economies in many aspects. Problems with access to

finance in these countries are potentially harmful to development of entrepreneurship, innovation performance and overall growth, leading to further lagging behind more advanced market economies. Perceived access to finance can determine business decisions and constrain potential business expansion, including introduction of innovation. In this paper we seek to identify if a gap in perceptions on access to finance between innovating and non-innovating firms in post-transition economies exists. The presence of this gap can help us to understand why firms don't initiate innovation activities. Faced with lack of internal finances, firms that perceive access to external finances as major and unsurmountable problems are expected to give up their ideas without even attempting. Innovation activities in post-transition EU member states are even more financially constrained because insufficient financial support by public institutions (Šipikal, Pisár, & Uramová, 2010). Specifically, previous research has shown that majority of entrepreneurs in Slovakia and the Czech Republic do not receive sufficient help and support from banks as bank criterions for loan approval are too strict (Belás et al., 2015).

In addition to identifying access to finance gap between innovative and non-innovative firms, we explore whether we could identify the characteristics of the firms that contribute to the gap formation. In other words, we explore whether factors such as size of the firm or educational attainment of the employees could explain the differences in access to finance perceptions between innovative and non-innovative firms. Since we are analysing the data pooled over a set of countries, identifying common factors would imply that similar policy recommendations could be provided for a group of countries. Identifying country-specific factors to prevail would call for distinctive solutions.

The remainder of this paper is organized as follows. Section 1 provides basic information on theoretical framework and empirical strategy used in the analytical segment. Section 2 gives overview of the problem analysed. Section 3 presents results of the empirical estimation and provides discussion. Last section summarizes conclusions.

## 1. Theoretical Background and Empirical Strategy

The main focus of the paper is related to the factors influencing the access to finance perceptions. In particular, we want to address the issue whether access to finance is different for innovators than for non-innovators, based on their revealed perceptions. Lack of appropriate financing is important issue from the perspective of innovators but also relevant for all enterprises (Savignac, 2008; Tiwari et al., 2007), regardless of their current innovation effort. The growth of firms, especially small ones, is frequently seriously limited by internal finances (Carpenter & Petersen, 2002). The literature usually finds that small enterprises and in particular micro enterprises have more difficulties in financing their projects (Beck & Demirgüç-Kunt, 2006). Freel (2007) provides evidence that small and innovative firms are less successful in obtaining loans in comparison to large firms, and the background for this is found in bank concentration (Beck, Demirgüç-Kunt, & Maksimovic, 2004). Financing related problems negatively affect profitability of start-ups (Banerjee, 2014). Nevertheless, literature argues that financial constrains to SMEs in developing countries can be alleviated by financial liberalisation (Laeven, 2003). Since financial sector has been underdeveloped at the beginning of transition and recently severely affected by global economic crisis, the legitimate question is how the firms in these economies have weathered these unfavourable conditions.

Special characteristics of firms have also been analysed in the literature with respect to relative access to finance difficulties. Extant literature suggests that gender of firm owner or manager determines relative access to finance. Female led firms experience more problems in obtaining necessary financing (Lee, Sameen, & Cowling, 2015). However, Haines, Orser and Riding (1999) argue that there is no a priori discrimination against female entrepreneurs,

but rather that female entrepreneurs are likely to run smaller businesses in risky industries. Furthermore, low proportion of venture capital investment in female owned enterprises can be explained by the dissimilarity in the industry preferences by female entrepreneurs and venture capitalists (Green et al., 2001). However, although it is still at the low level, these authors identified positive trends regarding venture capital investments of female owned enterprises. Also, over time, access of female entrepreneurs to bank loans has improved (Haynes & Haynes, 1999).

Another factor influencing the relative access to finance is education of the entrepreneurs and/ or employees. It has even been found that education is related to the use of equity capital for financing businesses owned by female entrepreneurs (Carter et al., 2003). Vos et al. (2007) find that younger and less educated entrepreneurs are more likely to get loan approval. According to the same source, fear of loan denial is lower for entrepreneurs with higher levels of education while older and more educated entrepreneurs seek financing from external sources less.

Girma, Gong and Görg (2008) find that access to finance affects firms differently depending on their ownership structure. Their result show that state owned firms experience fewer problems with financing in comparison to other firms. Foreign ownership, frequently associated with foreign direct investment, can provide additional source of financing and consequently alleviate financing constraints (Harrison, Love, & McMillan, 2004). Foreign owned firms have been found to face less financing constraints (Beck et al., 2006), due to ability to raise necessary funding not only domestically, but also from abroad.

Except ownership, other firm characteristics are related to access to finance difficulties. Beck et al. (2006) find relationship between firm age and financial constraints. Namely, older firms are less constrained by financial problems, since they are present on the market for a longer period and had the opportunity to build relationships with investors. Access to finance is significantly more constraining for young innovative firms than it is for older innovative firms (Schneider & Veugelers, 2010), since investors frequently do not have previous experience with young firms and mind find their business (innovative) ideas too radical.

There are two possible reasons why in the literature established relationships might not hold for post-transition economies. The first is that the structure of economy might be under different influences than in the case of advanced market economies. This might be in particular related to the development of the financial system in post-transition economies (Epstein, 2014). Another factor impeding access to finance that we want to emphasize in this paper is related to the effects of global economic crisis. Specifically, credit crunch effect might have been more severe in post-transition than in more advanced economies, partially also as a consequence of cross-border lending (Haas, 2014). Svetličič and Kunčič (2013) emphasize that foreign capital, which has been very important source of financing in transition economies, has severely decreased as a consequence of crisis. Thus, although the factors that have been previously found in the literature to affect access to finance might also be important for post-transition economies, there are some special features which combined with the effects of the latest crisis, might exert unexpected results.

In order to analyse perceptions of access to finance empirically, we rely on the latest available Business Environment Survey (BEEPS V), covering the 2012-2013 period. This survey is conducted by the European Bank for Reconstruction and Development (EBRD) and the World Bank. The data for 15,600 manufacturing and services firms in 30 EBRD countries are gathered employing face-to-face interviews. More information on BEEPS V is available on <http://ebrd-beeps.com/>.

The sample in this study consists of 3,393 firms from eleven central and eastern European countries (CEEC) – EU members. The sample includes countries that joined EU during the eastern enlargement in 2004 (Czech Republic, Estonia, Hungary, Latvia and Lithuania, Poland, Slovak Republic, Slovenia), 2007 (Bulgaria, Romania) and finally in 2013 (Croatia). Since we analyse period 2012-2013, we do not need to provide additional argument that the effects of global economic crisis are still present in the sampled economies. This fact has important consequences for decisions to innovate and ongoing innovation activity of the enterprises. In this analysis we distinguish between innovative and non-innovative firms. Innovative are those that during the last 3 years (1) have

successfully developed new or significantly improved product, production/supply practice, organisational/management practices or structures, marketing methods and logistical or business process, and/or (2) have invested in (intermural or extramural) R&D and and/or gave employees time to develop or try out a new approach or new idea about products or services, business process, firm management or marketing.

Firms without innovation output or any documented attempt to innovate are classified as non-innovative. All cases where the answer to one of the questions related to innovation activity was "I do not know" are excluded from the analysis as their answers are not reliable. In order to analyse factors contributing to the perceptions of access to finance, we rely on the factors previously established in the literature. To that end, we consider following list of variables (the explanation of the variable coding is in the Appendix A1).

Size of the firm. In order to capture this effect, we consider dummy variables for micro, small, medium and large enterprises. The definition of the size boundaries is taken from the Survey itself. The rationale for inclusion of this variable is that it seems that larger enterprises are expected to have easier access to finance than SMEs.

Type of the enterprise. Since our main focus is on the countries in various stages of post-transition, one of the hypotheses is that origin of establishment itself might be important for difficulties in obtaining finance. For example, we could foresee that firms that start as originally private might perceive larger difficulties in access to finance than joint ventures with foreign partners who could provide financing from their home countries. Dummy variables that reflect whether the firm was established by privatization of a state-firm; as originally private; as private subsidiary of a formerly state-owned firm; joint venture with foreign partners or state-owned firms are considered. Additionally, we include dummy variable if the establishment is part of a larger enterprise. Since we generally assume that larger firms can more easily gain access to finance, we believe that this additionally captures the network effect, in particular if this case is related to domestic subsidiary of a multinational enterprise.

Type of activity. In this paper we cover the period during which effects of the global crisis

have affected most of the analysed countries. Since the crisis can have different impacts on different segments of the economy, we include dummy variables for the most general type of activities – manufacturing, retail and services. This effect could be probably more important for transition economies, which had gone through a deindustrialisation period (see Kudina and Pitelis (2014) for a wider explanation related to FDI and overall economic performance) and consequently we assume that firms in manufacturing perceive larger difficulties in financing their projects. Additional factor is that projects in manufacturing might be financially more demanding than projects in services. Since we cannot control for the amount of financing required for each project, this approach seems plausible.

**Gender of employees.** Two aspects are considered here. First relates to the dummy variable if the manager is female and the second relates to the share of female employees in the firm. The gender issues have been previously found significant in relation to the access to finance and we also believe that this might be important for post-transition economies.

**Age of the firm and education of employees.** Including age of the firm relates to the knowledge accumulation through time. Young firms frequently have difficulties in getting finance, both due to the fact that they are relatively unfamiliar to financing agents and their lack of experience in preparing project documentation. Along the same lines, we assume that firms with highly educated employees are more likely to prepare the financing documentation according to the requirements and consequently do not perceive the financing constraints as important as firms with less educated employees.

**Growth of the firm.** We assume that firms that have experienced growth (measured by the increase of employment during the last three years) and firms that expect growth of their sales in the forthcoming period at the same time less likely to identify access to finance as a major obstacle for development. Thus, we also include these variables in our specification.

The contribution of these factors to the access to finance perception gap are empirically assessed in Section 3. However, prior to that, we devote some space to the presentation of the sample characteristics and illustration of the analysed issue.

## **2. Preliminary Findings and Empirical Strategy**

Table 1 shows the structure of the sample by country, innovation activity and applications for credits or bank loans in the three-year period. Total sample is dominated by innovators (i.e. 55 percent), which is fortunate for the analysis since the countries in the sample are not belonging to the innovation leaders in the European Union. Analysed by country, Estonia, Hungary, Latvia, Lithuania and Slovak Republic have less than 50 percent of innovative firms in the sample. Our analysis focuses on all types of innovative activity. However, it might be interesting to reveal that among the innovative enterprises, large share of them revealed that they had introduced new product or service over the reference period (from 48 percent in Bulgaria to 78 percent in Czech Republic). New production methods has been relatively less frequent (from 22 percent in Slovenia to 56 percent in Hungary), as well as new organisational/management practices (from 35 percent in Latvia to 58 percent in Bulgaria) and new marketing methods (from 35 percent in Latvia to 65 percent in Romania). Since respondents could have reported multiple innovative activities, we classify them as innovators if they had reported any of the possibility during the reference period.

26 percent of firm in the overall sample have had applied for bank loans, showing that there is a large percentage of firms that had direct experience with the access to finance. Countries with highest rate of firms that have applied for credits and loans are Romania (37.5 percent), Slovenia (36 percent) and Estonia (29.6 percent). Data reveal that innovators apply more for bank loans and credits (30.5 percent of innovators vs. 25.5 non-innovators). However, data vary significantly by country. In Bulgaria, Croatia, Czech Republic, Estonia and Slovenia non-innovative firms apply more for loans and credits.

In order to assess whether the innovative firms or non-innovative firms perceive access to finance more, we have contrasted the responses of each sub-populations regarding their answers. Results presented in Figure 1 reveal that access to finance is perceived as major obstacles more in innovative firms. Share of firms perceiving access to finance as major issue is generally higher in the group of innovative firms than among non-innovative

Tab. 1: Innovative and non-innovative firms and their applications for credits or loans

Countries	Innovators			Non-innovators		
	Applied	Not applied	Total	Applied	Not applied	Total
Bulgaria	29	124	153	23	105	128
Croatia	56	161	217	35	72	107
Czech Republic	46	119	165	16	50	66
Estonia	37	72	109	35	99	134
Hungary	38	72	110	32	150	182
Latvia	16	96	112	17	185	202
Lithuania	34	71	105	24	120	144
Poland	79	202	281	38	181	219
Romania	157	227	384	34	92	126
Slovak Republic	27	65	92	26	103	129
Slovenia	52	87	139	30	59	89
Total	571	1,296	1,867	310	1,216	1,526

Source: own based on BEEPS

firms. This is not the case in Latvia, Poland and Slovak Republic where there is higher share of non-innovative firms struggling with this obstacle. In order to emphasize the cross-country differences, we present the perceptions of each subgroup (innovator or non-innovator) in specific country to the overall sample. This reveals that the access to finance is considered to be more important in Romania, Slovenia, Croatia and Bulgaria. In Poland and Latvia, non-innovators seem to express larger concern regarding access to finance than non-innovators in other countries.

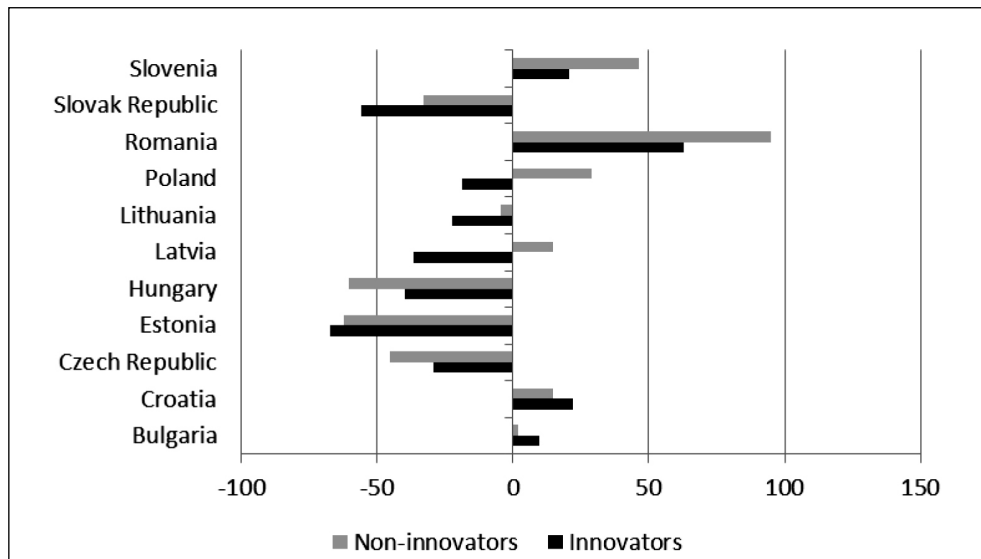
As indicated, innovative firms perceive access to finance to be major obstacle more frequently than non-innovative firms. The overall sample data indicates that the share of innovators who perceive access to finance to be major or very severe obstacle is 19.6 percent. In case of non-innovators this percentage is 13.8. Furthermore, preliminary probit estimates (results available upon request) have revealed that when access to finance is regressed to possible predictors including dummy variable for innovative firms in a pooled sample, the innovative dummy is positive and statistically significant. This additionally confirms the fact that innovative firms perceive access to finance more problematic than other firms.

Amongst other variables, only two more were found significant, both with negative coefficient – a dummy variable for a firm being a part of a larger enterprise and a dummy for an enterprise which has been established as joint venture. Both seem highly logical, since in both cases we can assume that partners are responsible for providing additional financing.

Preliminary analysis points to the existence of perception gap between innovative and non-innovative firms in sampled countries. The question that we want to analyse is whether we can identify the firm characteristics that contribute to the gap in perceptions. Since part of the explanation behind the gap might be related to the differences in firms' characteristics (as previously established in the literature), we restrict the analysis to the matched sample.

Our variable of interest is whether firms consider access to finance to be major or very severe obstacle to their business. To identify the gap in the outcome variables we have used Fairlie (1999) decomposition, which is an extension of the widely used Blinder-Oaxaca decompositions for the cases when the outcome variable is binary. Fairlie (1999) describes the method to identify and decompose the overall gap between the two subgroups into the contribution of each specific factor considered

**Fig. 1:** Share of firms perceiving access to finance as major obstacle, innovative vs. non-innovative sub-sample



Source: own based on BEEPS

to be relevant for the existing gap. The methodology relies on defining characteristics which are important for the specific outcome. The significance of specific factors for the outcome can be estimated by the logit or probit model. Theoretically, decomposition method proposed by Fairlie holds exactly in case of logit model, but empirically very closely also for the probit model (Fairlie, 2005). In the specifications presented below, we follow the logit approach, which has initially considered all previously discussed variables. The final choice of variable, however, ensured favourable statistical properties of the estimation output.

In all presented cases, prior to estimation, variables were checked for multicollinearity. This is particularly important in case of dummy variables capturing the whole population. Since we do not assume a priori that the correlations are the same across analysed countries, data properties dictate omission of the specific category covered by reference dummy variable. The results of the estimation are presented in following section.

### 3. Empirical Results and Discussion

We have estimated the gap in perceptions on relative difficulties in access to finance

between innovators and non-innovators with two separate definitions of innovative firms, in order to provide some robustness check. In „output innovation“ the innovative firms are only those that were successful in innovation activity during the analysed period. In „R&D innovation“ innovative firms are defined as those that were successful in innovation output but also as those that had innovation input during the analysed period but were not yet successful in output innovation.

The gap has been estimated by following the Fairlie procedure. The procedure has been applied with standard 100 replications, randomising the ordering of independent variables. The sample has been restricted to the firms in the countries analysed in the paper. The reference group has been set to innovators. The results of the gap estimation are presented in Table 2.

The data in previous table reveals that the innovative firms perceive access to finance as generally more important problem than non-innovative firms. The fact that the gap slightly differs from the one based on sample averages is due to matching procedure. Without matching, the sample gap amounted

Tab. 2: Estimated gap results in two alternative specifications

	Output innovation	R&D innovation
Innovators (percent)	19.66	19.25
Non-innovators (percent)	14.28	13.72
Gap	-5.38	-5.52
Total explained	-3.09	-2.52
- Percentage of gap	57.43	45.65

Source: own

to -5.8. This shows that matching reduced the gap to a certain extent, although the effect seems small. Both estimations have yielded similar results, showing that the definition of the innovative firm (the one with innovation output, or just innovation input in the analysed period) does not affect the final results. When overall sample is considered, innovative firms perceive greater difficulties in access to finance than non-innovative firms.

The variables used in the decomposition seem to contribute to the explanation of the overall gap. The results imply that, if the non-innovative firms were more similar to innovative firms, this would actually reduce the estimated gap in perceptions. So, part of the explanation of the perceptions gap could be attributed to the different characteristics of the innovative in comparison to non-innovative firms.

When exploring the perceptions on the access to finance, the benefits of utilizing the Fairlie procedure can be found in the fact that it uses logit model to perform one to one matching. The estimated logit model has the dummy dependent variable related to the access to finance. Thus, from the data presented in Appendix A2, we can see that country dummy variables are important predictors for the access to finance difficulty perceived by innovative firms. Additionally, we can only find female top management to be important predictor, and from the estimation results it seems that female managers are less likely to perceive this issue as the problem. If we include the firms that had innovation input but were not successful in the sample, than we can also see that micro enterprises dummy variable becomes significant. This finding might be related to the most current period, since micro firms might be having adverse experienced on the financial markets due to

the crisis. This specification precisely includes micro firms that have attempted innovation, but were not yet successful and it seems that for them the financing constraint is relatively more important than if we count as innovators only those that already had innovation output.

Decomposition of gap reveals that relatively few variables can be accounted for its existence, due to the fact that most of the contributions seem to be insignificant. In case when we have defined innovators as those that actually had innovation, dummy variable covering female top management was the only one (besides country dummies) that was significant contributor to the explanation of the gap. It explained approximately 3.9 percent of the gap. In case of definition of firms that have both attempted innovation and succeeded, 3.9 percent of the gap and 8.6 percent of the total explanation of the gap can be attributed to the firms with female top management. This means that female top management perceives that the access to finance is more important for innovative firms.

The fact that we have found country variables to be important contributors to the gap reflects different financing conditions in the countries.

The important finding of empirical exercise performed in this paper is that, although differences in perceptions of the access to finance difficulties between innovative and non-innovative firms exists in most post-transitional economies, they are in general not related to the characteristics of the firms, but actually immanent to the countries themselves. Thus, although general claim persists that smaller firms, or relatively younger firms or even the firms in manufacturing sector experience greater difficulties in finding adequate financial resources for their projects, our results point to

**Tab. 3: Contributions to the gap: estimated coefficients and percentage of total gap**

	Estimated coefficients*100 (standard errors*100)	
	Output innovation	R&D innovation
<b>Type of activity</b>		
-Manufacture	-0.103 (0.202)	-0.068 (0.199)
-Services	0.002 (0.036)	0.003 (0.059)
<b>Size of enterprise</b>		
-Micro	0.234 (0.224)	0.394 (0.254)
-Small	0.022 (0.159)	0.109 (0.229)
-Large	-0.149 (0.349)	-0.499 (0.449)
Segment	0.050 (0.059)	0.052 (0.081)
<b>Establishment origin</b>		
-Privatization	0.029 (0.080)	-0.015 (0.089)
-Subsidiary	-0.008 (0.021)	-0.006 (0.042)
-Joint	0.029 (0.049)	0.58 (0.081)
-State	0.030 (0.036)	0.010 (0.030)
Age of firm	-0.030 (0.105)	0.077 (0.124)
<b>Employees</b>		
-Female management	-0.212* (0.115)	-0.217* (0.120)
-Employment delta	-0.053 (0.077)	-0.017 (0.047)
-University share	-0.007 (0.045)	0.002 (0.039)
Positive expectations	-0.255 (0.288)	-0.087 (0.318)
<b>Country dummies</b>		
-Bulgaria	0.065 (0.171)	0.161 (0.240)
-Croatia	-0.310 (0.304)	-0.410 (0.379)
-Czech Republic	-0.172 (0.200)	-0.042 (0.171)
-Estonia	-0.083 (0.092)	-0.060 (0.105)
-Hungary	-0.084 (0.155)	-0.119 (0.171)
-Latvia	0.763* (0.450)	0.899 (0.585)
-Lithuania	0.393 (0.278)	0.334 (0.308)
-Poland	0.149 (0.357)	0.288 (0.493)
-Romania	-3.340*** (0.795)	-2.854*** (0.812)
-Slovenia	0.003 (0.259)	-0.498 (0.390)

Source: own

Notes: \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%. The percentages of total contribution of all covariates to the gap calculated based on unrounded data.



the fact that most important factor relates to the country the firms actually stage their business activity in. Thus, in countries with generally better business environment, innovative firms might form different expectations regarding the financing difficulties.

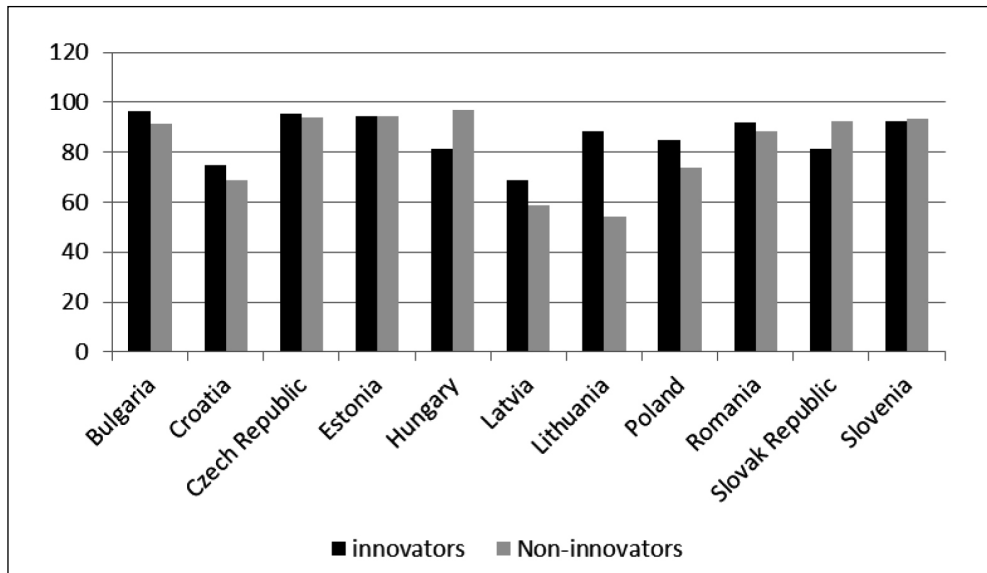
The expectations are frequently formed based on previous experience, as adaptive expectations. If the firms expect that their project will not be funded, they might not even decide to apply for credit. Thus we explore whether there are differences when it comes to approval rate of prior loan requesting attempts in innovative and non-innovative firms across country. In most of the countries (with the exception of Hungary, Slovak Republic and Slovenia), innovative firms have higher approval rate. Thus, previous experience of those that have asked for a credit or a loan does not indicate that based on their negative experience they would restrain from continuing their projects (Fig. 2).

Previous analysis refers only to the firms that have applied for finance and their experience, which seems to be in general positive. However, it might be the case that across the countries there are differences in factors influencing

decisions not to seek finance. Consequently, we explore the main reasons innovative firms decide not to apply for finance and the answers are presented in Table 4.

The main reason why innovative firms don't apply for bank loans in all analysed countries is because they have enough capital to finance their operations and thus there was no need for additional external financing. The second most important reason why innovative firms in CEEC don't apply for loans is attributed to unfavourable interest rates. In countries such as Bulgaria, Croatia and Romania this is rather pronounced reason for not applying for bank loans. In several countries (namely in Latvia and Slovak Republic) there is equal percentage of innovative firms discouraged from applying for loans due to complicated procedure as it is due to unfavourable interest rates. Other reasons include too high collateral requirement that appears the most present among innovative firms in Bulgaria, Croatia, Hungary, Lithuania and Romania. Certain percentages of innovative firms, mainly from Hungary, indicate the size and maturity of offered loans were insufficient as one of the reasons for not applying. Interestingly, there are innovators

Fig. 2: Approval of finance rate to innovators vs non-innovators (in percent)



Source: own based on BEEPS

**Tab. 4: Main reasons for not applying for finance, innovative firms (in %)**

Country	Reasons					
	No need	Procedure	Interest	Collateral	Size	Pessimist
Bulgaria	55.64	5.64	25.00	6.45		
Croatia	67.70	6.21	13.04	7.45	1.24	0.62
Czech Republic	83.19		3.36		0.84	0.84
Estonia	76.38	2.77	5.55			2.77
Hungary	56.94	2.77	8.33	6.94	4.16	1.38
Latvia	77.08	3.12	3.12	2.08		5.21
Lithuania	61.97	5.63	8.45	7.04	1.41	2.82
Poland	78.22	1.48	3.46	1.48		1.98
Romania	56.82	9.69	17.18	7.92	0.44	0.88
Slovak Republic	75.38	7.69	7.69	3.07		
Slovenia	79.31	2.29	3.44	2.29		

Source: own based on BEEPS

Notes: No need: No need for a loan - establishment had sufficient capital; Procedure: Application procedures were complex; Interest: Interest rates were not favourable; Collateral: Collateral requirements were too high; Size: Size of loan and maturity were insufficient; Pessimist: Did not think it would be approved

that anticipate their approval would be rejected and hence don't apply. These pessimistic expectations are especially pronounced in Latvia.

The fact that the firms have declared that they have sufficient funding available is rather puzzling. If we were analysing economies and periods with abundant capital and pronounced economic growth, the large proportion of answers implying that there are enough internal funding available could be associated with encouraging business prospects for these firms. However, in circumstances this paper is referring to, a large proportion of "no need for financing" answers could be translated in "not enough viable business ideas", which is a notion frequently emphasized in public debates related to financing conditions in post-transition economies.

### Conclusions

The main focus in this paper was exploring the gap in perceptions on access to finance difficulties in post-transition economies. The main findings is that, in general, innovative

firms perceive access to finance (regardless whether they have already been successful in innovation or have just devoted some resources to innovative activity) to be a larger problem than non-innovative firms. However, this problem is not evenly distributed among the countries and there are even countries in which non-innovators have expressed greater concern regarding the financing constraint.

In exploring the factors contributing to the gap we have identified that precisely country differences play important role. Only one additional factor can be found to be significant contributor to explaining the gap – female top management. It seems that when innovative firms are considered, female top managements are more likely to express their worries regarding the difficulties in obtaining required financing. However, when gap in perceptions between innovators and non-innovators are considered, having female top management actually acts in reducing the existing gap.

The fact that other factors considered – size and age of the firm, type of establishment, growth prospects, structure of employees –

were not found to be significant contributors implies that firms with these characteristics perceive access to finance equally important impediment to their business, whether they are innovative or not. It seems that the major factor behind the gap in access to finance perceptions is related to the successfulness of the national policy in promoting available financing sources. This fact points to the need to redesign national policies where the gap seems to be most articulated in a way that it supports financing of innovation projects more vigorously than the previous experiences show to be the case.

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## Appendix A1: Data description

Variable	Definition
Finance obstacle	= 1, if a firm perceives access to finance as major or severe obstacle
Manufacture	= 1, if a firm's main activity is within manufacturing sector
Services	= 1, if a firm is operating within wholesale; Hotel and restaurants; Services of motor vehicles; Construction Section; Transport ; Supporting transport activities or Post and telecommunications
Retail	= 1, if a firm's main activity is retail
Micro	= 1, if this is a micro firm (less than 5 employees)
Small	= 1, if this is a small firm (more than 5, less than 19 employees)
Medium	= 1, if this is a medium firm (more than 20, less than 99 employees)
Large	= 1, if this is a large firm (more than 100 employees)
Segment	= 1, if establishment is part of a larger firm
Privatization	= 1, if the firm was established by privatization
Subsidiary	= 1, if the firm was established as subsidiary of formerly state-owned firm
Joint	= 1, if firm was established as a joint venture with foreign partners
State	= 1, if firm was established as state-owned
Private	= 1, if firm was established from time of start-up as private
Age of firm	= years since establishment (until the time of interview)
Female share	= number of female employees/total employees
Female management	= 1, if top manager is female
Employment delta	= number of workers last fiscal year/number of workers 3 years ago
University share	= share of employees with university degree in total
Positive expectations	= 1, if a firm expects its sales to increase next fiscal year
Country dummies	= 1, if a firm is located in specific country

Source: own

**Appendix A2: Logit estimates for Fairlie procedure, innovative firms sample**

	Estimated coefficients (standard errors)	
	Output innovation	R&D innovation
Constant	-2.575*** (0.368)	-2.556*** (0.432)
<b>Type of activity</b>		
Manufacture	0.091 (0.175)	0.069 (0.198)
Services	0.012 (0.173)	-0.009 (0.193)
<b>Size of enterprise</b>		
Micro	0.371 (0.328)	0.675* (0.362)
Small	0.023 (0.166)	0.095 (0.192)
Large	0.127 (0.290)	0.400 (0.329)
Segment	-0.414 (0.340)	-0.258 (0.381)
<b>Establishment origin</b>		
Privatization	-0.103 (0.278)	0.054 (0.307)
Subsidiary	-0.471 (0.770)	0.145 (0.803)
Joint	-0.593 (0.758)	-0.734 (1.059)
State	0.681 (0.719)	0.661 (0.854)
Age of firm	0.002 (0.006)	-0.005 (0.008)
<b>Employees</b>		
– Female management	-0.419** (0.178)	-0.440** (0.196)
– Employment delta	0.023 (0.029)	0.140 (0.024)
– University share	-0.002 (0.012)	0.002 (0.014)
Positive expectations	0.132 (0.146)	0.046 (0.167)
<b>Country dummies</b>		
– Bulgaria	0.673* (0.394)	0.734* (0.441)
– Croatia	0.900** (0.384)	0.924** (0.449)
– Czech Republic	0.519 (0.459)	0.154 (0.594)
– Estonia	-0.424 (0.473)	-0.315 (0.528)
– Hungary	-0.234 (0.436)	-0.344 (0.497)
– Latvia	0.783** (0.363)	0.846** (0.420)
– Lithuania	0.792** (0.381)	0.714 (0.438)
– Poland	0.881** (0.351)	0.999** (0.402)
– Romania	1.620*** (0.354)	1.601*** (0.414)
– Slovenia	1.415*** (0.372)	1.245*** (0.451)
<b>Diagnostics</b>		
N	1,821	1,501
logL	-706.79	-569.48
LR Chi <sup>2</sup>	79.55***	61.61***
Pseudo R <sup>2</sup>	0.05	0.05

Source: authors' estimates

Notes: \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%.

## Abstract

**ACCESS TO FINANCE: INNOVATIVE FIRMS' PERCEPTIONS  
IN POST-TRANSITION EU MEMBERS****Valerija Botrić, Ljiljana Božić**

*The post-transition EU member countries generally have to catch up with EU most developed economies in many aspects. Access to finance problems in these countries are potentially harmful to development of entrepreneurship, innovation performance and overall growth, leading to further lagging behind more advanced market economies.*

*In this paper we analyse perceptions on access to finance in post-transition EU member countries. Special focus in the paper has been put on the differences between innovative and non-innovative firms. Furthermore, we seek to identify the characteristics of the firms that contribute to the gap formation. Empirical analysis in this paper relies on the latest available Business Environment Survey (BEEPS V), covering the 2012-2013 period. The sample in this study consists of 3,393 firms from eleven central and eastern European countries – EU members (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic and Slovenia).*

*The analysis expectedly revealed that innovative firms perceive financing constraints to be more important for their business, but somewhat unexpectedly the differences across countries are present. Although access to finance is more likely to be perceived as a problem by innovative firms, the firms that are either a segment of larger enterprise or established as joint venture, in general have less problems in financing their activities. When exploring the contributors to the perceptions in access to finance gap, only one variable proved to be important – female top management. It seems that if female top managers were more equally distributed between innovative and non-innovative firms, the perceptions on access to finance gap would be smaller.*

**Key Words:** Access to finance, innovation, post-transition.

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