

3. ACCESS OF FIRMS TO BANK LOANS IN THE EUROPEAN UNION. ARE CENTRAL AND EASTERN EUROPEAN COUNTRIES DIFFERENT?

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Abstract

The recent crises (financial crisis of 2007-2008 and pandemic crisis) put pressure on the access to finance of firms, particularly of SMEs. Using a large microdata database from SAFE (Survey on access to finance of enterprises) survey of European Central Bank/European Commission, we investigated the factors that affect the access to loans of companies in European Union countries. We found that the economic growth is positive in accessing bank loans, the impact being stronger in the case of Central and Eastern European countries and increasing with the size of the firm. Also, an increase in funding cost was found to be negative for the access to banking loans, the effect being stronger in the case of CEE countries. Being a micro or a small firm is decreasing the probability to access a bank loan and credit history has a strong role in accessing funding. We found also that the increase in leverage leads to a deterioration in access to finance, and this effect seems to be stronger for CEE countries. Access to public financial support, including guarantees, has been found to be very important for accessing loans, and even more important if the size of firm was lower.

Keywords: access to finance; SMEs; public support

JEL Classification Numbers: E51, G01, G21, D22

1. Introduction

Access of firms, and particularly of SMEs, to bank loans has always been an important topic in the economic literature. The topic came even more in focus during the financial crisis which started in 2007-2008 and during pandemic crisis which started in 2020, as the two crises came with some restrictions in access to funding (figure 1), especially for SMEs, which have been suffering probably the most. There were also debates at the policy makers level on how to revive the credit to the nonfinancial sector, especially in countries where credit access was more restrained because of the higher stress in their local financial markets.

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According to the SAFE (Survey on access to finance of enterprises) survey conducted by the European Central Bank (ECB) and European Commission (EC) during 2009-2022, a significantly higher percentage of SMEs is ranking “access to finance” as their most pressing problem when compared to large firms (figure 1). Also, by country, there is a large heterogeneity, but in general in CEE countries access to loans seems to be more problematic than in Western European countries. In particular, in Romania the firms are indicating that the access to loans is challenging, in 2021 and 2022 Romania ranking the highest in EU27 in terms of average score assigned by companies for access to loans as a problem (a higher score means access to loan is a bigger problem).

Also, according to SAFE survey, when there is a deterioration in access to loans triggered by different factors, the small companies are hit the hardest.

Using firm level data (microdata) from the SAFE survey, we investigate in this paper what factors are playing a significant role in the access to loans of enterprises. We are focusing our research on borrower balance sheet factors, but also on the bank lending channel, through the cost of funding. We also investigate if the access of firms to public financial support, including guarantees, can alleviate credit constraints. We check in our analysis firm-specific characteristics such as firm size, firm age, and demand for loans.

Our analysis is run first for the EU27 countries aggregate sample. In a second step, we split the sample in CEE countries and Western European countries, and we make the estimations on some individual countries as well, to control for the heterogeneity of countries and to check for robustness of the estimates. Thus, our approach is adding to the existing literature on access to bank funding of firms, which is quite scarce in investigating the heterogeneity of European Union countries. For instance, Öztürk and Mrkaic (2014) investigated the access to bank funding of firms for a relatively smaller sample than our sample (they used only data covering countries from Euro zone) and they isolated just 5 countries from Euro area which were defined as financially stressed (Italy, Spain, Ireland, Portugal and Greece) to see if these countries behave differently.

We use in the estimations the ordered logit model, as we use survey data which are mostly qualitative and ordinal.

The paper is organized as follows. Section 2 provides a brief review of the literature. Sections 3 and 4 discuss the data and the methodology used and section 5 presents the results of the estimations. Section 6 discusses the conclusions and some policy implications.

2. Literature review

There was an extensive effort in the literature since the onset of the financial crisis in 2007-2008 to explain the weak credit growth performance in the banking sector and to investigate the monetary policy transmission mechanism in different countries in European Union and globally. One of the route followed was to explore supply and demand factors and to identify eventually what helps or hampers the access to credit.

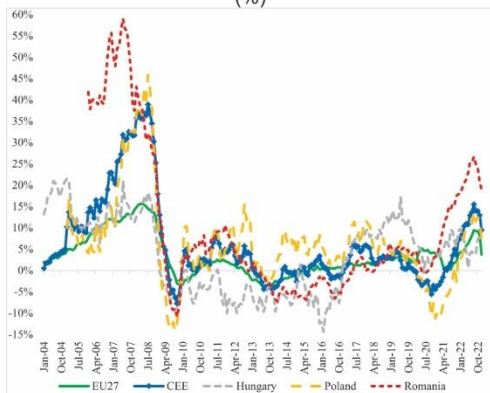
Our focus in this paper is to investigate the traditional bank lending channel and the firm balance sheet channel. We will refer below only to the literature covering the two channels.

In the first channel, the bank lending channel, the supply of credit depends on the financial standing of the banks, on their liquidity and capital position. The increasing risk perception on banks, especially during financial market turmoil, will translate into higher cost of funding which will be passed further to their clients and into a cut in credit supply (Kashyap and Stein, 2000).

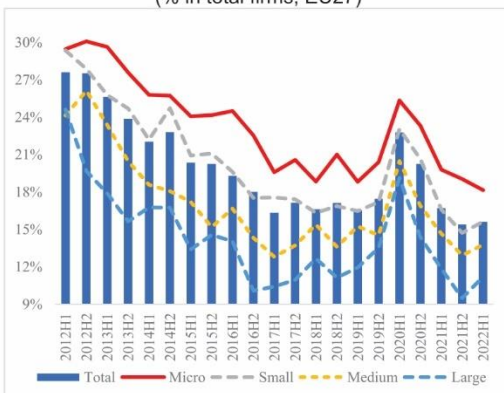
Figure 1. Access to bank loans in EU27 countries

(Source: ECB/EC SAFE survey, own calculation)

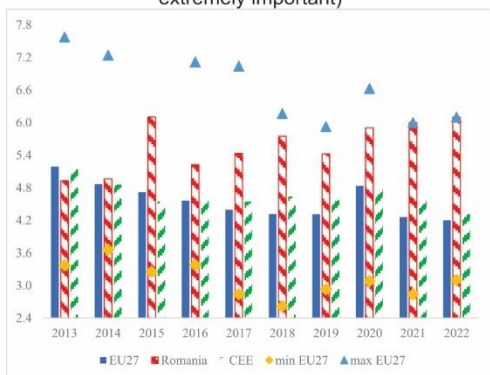
1.1 Annual growth of non-financial companies loans (%)



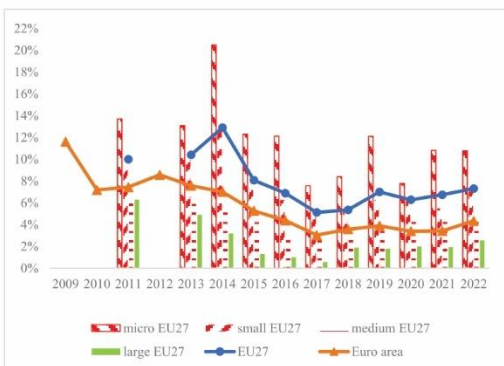
1.2 Firms with access to loans as most pressing problem (% in total firms, EU27)



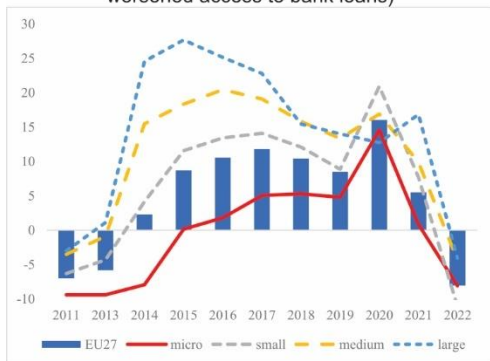
1.3 Average score for access to loans as a problem (1 means it is not at all important and 10 means it is extremely important)



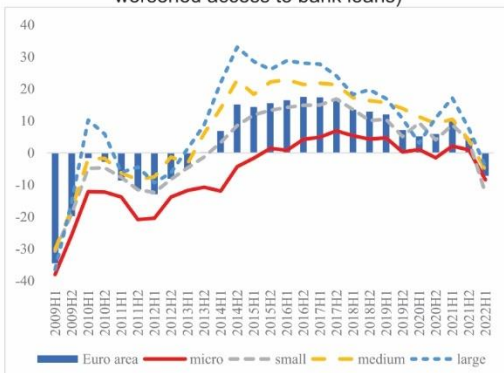
1.4 Share of firm which applied for a bank loan but was rejected (%)



1.5 Changes in access to finance according to SAFE (difference in pp of firms in EU27 with improved and worsened access to bank loans)



1.6 Changes in access to finance according to SAFE (difference in pp of firms in Euro area with improved and worsened access to bank loans)



In the second channel, the firm balance sheet channel, the balance sheet strength of the borrower is key for credit supply.

The monetary policy tightening is in Kishan and Opiela (2000) a significant factor affecting negatively the capacity of banks, especially small and less capitalized banks to sustain loan supply. Also, Gambacorta and Marques-Ibanez (2011) show that banks with weaker core capital positions, greater dependence on market funding and on non-interest sources of income restricted the loan supply more strongly during the financial crisis.

Kapan and Minoiu (2018) found that banks with strong balance sheets were better able to maintain lending during the crisis. In particular, banks that were ex-ante more dependent on market funding and had lower structural liquidity reduced the supply of credit more than other banks.

Ciccarelli et al (2015) found that the credit channel amplifies a monetary policy shock on GDP and prices, through the balance-sheets of households, firms and banks. For corporate loans, their results are showing that the amplification is highest through the bank lending and the borrower's balance sheet channel. In the case of households, they show that the demand is the strongest channel.

Mrkaic and Öztürk (2014) show that changes in bank funding costs and borrower leverage matter for firms' access to finance. According to their results using survey data on thousands of euro area firms, increases in bank funding costs and borrowers' debt-to-asset ratios are significantly and negatively associated with firms' access to finance. Also, the use of subsidies significantly improve access to finance of SMEs and access to finance is found by Mrkaic and Öztürk (2014) to be positively related to firm size and firm age.

Demary et al (2022) used in their empirical analysis data from the Survey of Access to Finance of Small and Medium-sized Enterprises (SAFE) from the EC/ECB. They found evidence for a transmission mechanism from yields on sovereign bonds to the vulnerability of companies. They show that business cycle conditions worsen access to finance and the financing gap which both increase the vulnerability of firms.

McQuinn (2019) investigates the factors linked to the variation in SME credit access across euro area countries. After controlling for the fundamental performance and characteristics of firms and bank funding costs, McQuinn (2019) investigated the financial and macroeconomic channels that explain variation in credit constraints across countries and time and found out that the soft information channel and firm indebtedness are the most important channels associated with SME access to finance. Bank competition and the condition of bank balance sheets are also found to have important relationships with SME access to finance.

Jiménez et al (2017) analyzed the impact of balance-sheet strength on credit availability using an administrative dataset of loan applications matched with bank and firm variables covering Spain from 2002 to 2010. Their findings are suggesting that the bank balance-sheet strength determines the granting of loan applications only in crisis times, while firm balance-sheet strength – notably leverage – determines strongly this granting in both good and crisis times.

Ferrando and Mulier (2015) uses the SAFE survey on access to finance for a sample of firms in the euro area which were matched with their "nearest neighbor" in the AMADEUS balance sheet dataset. Their results show that low-profit firms are more likely to face real financing constraints and low working capital and high leverage ratios explain actual financing constraints to a lesser extent. At the same time, firms are more likely to perceive access to finance as being difficult when they have more short-term debt. Firm age is found to be an important factor in explaining both the perceived and the actual financial constraints. Ferrando and Mulier (2015) examined also the perceived vs actual financing constraints nexus faced by firms, and found that there was a consistent difference between perceived and actual financing constraint.

3. Data

The main source of our data is the European Commission/European Central Bank access to finance of SMEs (SAFE) survey (ECB, 2022) which is conducted twice a year: once by the ECB covering euro area countries and once in cooperation with the European Commission covering all EU countries plus some neighboring countries. We used in our estimations all available data since 2009 to date (from the first round of survey, 17 June 2009-23 July 2009, to the 27th round, 7 September - 14 October 2022), having more than 334,000 of data observations. This survey is a very comprehensive database for the access to funding of companies, not only bank funding but also other types of funding (trade credit, grants or subsidized loans, leasing, debt securities, equity, other funding). The survey covers characteristics of the firm, information on the type and situation of the firm, on the financing of the firm, availability of finance and market conditions, and future, growth and obstacles to growth.

We use in our estimations two sets of variables. The first set is related to the firm level variables. Our dependent variable, `BANK_ACCESS`, is a qualitative and ordinal variable, capturing the perception of the firm on its access to bank loans. We also include variables to capture the size of the firm (`MICRO`, `SMALL`, `MEDIUM`, `LARGE`) and the age of the firm (`AGE2_5` and `AGE10`). Also, we introduced in the estimations two variables on credit history (`CH_DECREASED` and `CH_IMPROVED`).

In order to capture the borrower balance sheet channel, we use in our estimation the leverage (`DEBT_ASSETS_INCREASED`) from the balance sheet.

Firms are asked in the SAFE survey if their need for bank loans has changed over the past six months, and we included two variables in our estimate on this topic (`DEMAND_UP` and `DEMAND_DECREASED`) in order to control for the demand for bank loans, and differentiate the demand from supply effects. There could be a different perception on access to banking loans if the firm is in need of it (demand increased) or not (demand decreased or unchanged).

The last firm level variable we use is related to access to public financial support, including guarantees, to see if this has an influence on access to funding.

Bellow we describe the construction of the firm level variables we are using.

Firm level variables

- Our dependent variable is bank access to banking loans, `BANK_ACCESS`- Coded 3 if the firm reported access to bank loans improved, coded 2 if it remained unchanged, coded 1 if it deteriorated, and 0 otherwise (the answers from the survey were re-coded by us in order to make our dependent variable more intuitive). We excluded Don't know OR Not Applicable responses.
- `MICRO` – Coded 1 if the number of employees of the firm is 1-9 employees, and 0 otherwise. We excluded Don't know OR Not Applicable responses.
- `SMALL` – Coded 1 if the number of employees of the firm is 11-50 employees, and 0 otherwise. We excluded Don't know OR Not Applicable responses.
- `MEDIUM` – Coded 1 if the number of employees of the firm is 51-250 employees, and 0 otherwise. We excluded Don't know OR Not Applicable responses.
- `LARGE` – Coded 1 if the number of employees of the firm is higher than 250 employees, and 0 otherwise. We excluded Don't know OR Not Applicable responses.
- `AGE2_5` - Coded 1 if the age of the firm is between 2-5 years, and 0 otherwise. We excluded Don't know OR Not Applicable responses.

- AGE10 - Coded 1 if the age of the firm is above 10 years, and 0 otherwise. We excluded Don't know OR Not Applicable responses.
- CH_DECREASED - Coded 1 if the firm reported credit history deteriorated, and 0 otherwise. We excluded Don't know OR Not Applicable responses
- CH_IMPROVED - Coded 1 if the firm reported credit history improved, and 0 otherwise. We excluded Don't know OR Not Applicable responses
- DEBT_ASSETS_INCREASED - Coded 1 if the firm reported debt to assets increased, and 0 otherwise. We excluded Don't know OR Not Applicable responses
- DEMAND_DECREASED - Coded 1 if the firm reported demand for bank loans decreased, and 0 otherwise. We excluded Don't know OR Not Applicable responses
- DEMAND_UP - Coded 1 if the firm reported demand for bank loans increased, and 0 otherwise. We excluded Don't know OR Not Applicable responses
- PUBLIC_SUPPORT_IMPROVED - Coded 1 if the firm reported Access to public financial support, including guarantees improved, and 0 otherwise. We excluded Don't know OR Not Applicable responses.

The second set of variables we use in estimations are country level variables. As there is no possibility to link the firm level data from SAFE to bank level data, we will use in the estimations a proxy for the bank funding cost, namely the 10Y T-bond yields at the country level. Also, we add the GDP growth to account for the general macroeconomic conditions.

Country level variables

- GDP growth - GROWTH - cumulative real GDP growth on previous 6 months vs previous period. Source of data is Eurostat.
- Bond yield – BOND_YIELD - 10Y Treasury bond yield average in the previous six months. Source of data is Eurostat.

In table 1 we present the expected sign for the explanatory variables. Higher economic growth is expected to result in better access to bank funding. Higher cost of funds is expected through the bank lending channel to result in lower access to funding. Micro and small companies are expected to face difficulties in accessing funding, while large companies to have better access to funding. Age of the firm is expected to have a mixed impact on access to bank loans, older companies being probably more likely to access funding. An improved credit history is also expected to result in better access to funding. According to the borrower balance sheet channel, we expect increasing leverage to be negative for funding access.

Table 1. Expected sign of the explanatory variables

Variables	Expected sign
GROWTH	+
BOND_YIELD	-
MICRO	-
SMALL	-
LARGE	+
AGE2_5	ambiguous
AGE10	+
CH_DECREASED	-

Variables	Expected sign
CH_IMPROVED	+
DEBT_ASSETS_INCREASED	-
DEMAND_DECREASED	ambiguous
DEMAND_UP	ambiguous
PUBLIC_SUPPORT_IMPROVED	+

We expect the sign of demand of loans to be ambiguous. If the firms are doing well, they will be willing to expand business and therefore they have bigger need for loans. As they are doing well, their access to loans can be improved. A negative sign can be explainable as well. If the firms are not doing well and they are struggling to cover their financial needs, they will increase their demand for loans, but their access will be restricted (because their financial standing is bad).

Last, but not least, we expect the access to public financial support, including guarantees to have a “grease” effect on accessing loans, as it can decrease the risk of the loan, with favorable impact on cost of loans and lending standards.

4. Methodology

As pointed out in section 3, most of our variables are qualitative and ordinal. Consequently, we will use in the estimations ordered logit models.

In ordered dependent variable models, the observed y denotes outcomes representing ordered or ranked categories (Aitchison and Silvey, 1957). In our case, we have firms indicating their access to loans improved, remained the same or deteriorated, which were codified by us with 3, 2, and respectively 1. The labeling is strictly ordinal and any monotonic transformation of the labels is a valid labeling.

We model the observed response by considering a latent variable y_i^* that depends linearly on the explanatory variables x_i :

$$y_i^* = x_i' \beta + e_i$$

where e_i are independent and identically distributed random variables. In the expression above, the vector of observed firm specific characteristics is given by x . Structural parameters are denoted by β .

The observed y_i is determined from y_i^* using the rule:

$$y_i = \begin{cases} 0 & \text{if } y_i^* \leq \gamma_1 \\ 1 & \text{if } \gamma_1 < y_i^* \leq \gamma_2 \\ 2 & \text{if } \gamma_2 < y_i^* \leq \gamma_3 \\ \dots & \\ M & \text{if } \gamma_M < y_i^* \end{cases}$$

The actual values chosen to represent the categories in y are completely arbitrary. All the ordered specification requires is for ordering to be preserved so that $y_i^* < y_j^*$ implies that $y_i < y_j$.

The probabilities that firm n reports at time t that its “bank access” was in the j th “bank access” class (j from 1 to M), is given by:

$$\Pr(y_i = 0 | x_i, \beta, \gamma) = F(\gamma_1 - x_i' \beta)$$

$$\Pr(y_i = 1 | x_i, \beta, \gamma) = F(\gamma_2 - x_i' \beta) - F(\gamma_1 - x_i' \beta)$$

$$\Pr(y_i = 2|x_i, \beta, \gamma) = F(\gamma_3 - x_i'\beta) - F(\gamma_2 - x_i'\beta)$$

....

$$\Pr(y_M = M|x_i, \beta, \gamma) = 1 - F(\gamma_M - x_i'\beta)$$

Where F is the cumulative distribution function of e . We use logistic distribution in our estimations.

The threshold values γ are estimated along with the β coefficients by maximizing the log likelihood function:

$$l(\beta, \gamma) = \sum_{i=1}^N \sum_{j=0}^M \log(\Pr(y_i = j|x_i, \beta, \gamma)) \cdot 1(y_i = j)$$

where $1(\cdot)$ is an indicator function which takes the value 1 if the argument is true, and 0 if the argument is false.

In our estimations, γ is a vector of limits that split into categories corresponding to different levels of "bank access".

5. Results

As a first step, we run a baseline analysis for the EU27 countries vs Central and Eastern European Countries³.

The estimated coefficients of the ordered model must be interpreted with care (see Greene (2008) or Johnston and DiNardo (1997)). In order to interpret properly the results of the estimations, we need to keep in mind that we are using mainly qualitative data series and we cannot draw the standard conclusions used in literature (such as 1% in one exogenous variable lead to x% increase/decrease in dependent variable). We can only discuss the signs and the statistical significance of the estimated coefficients, but also, we can compare the coefficients with each other.

As shown in table 2, the effect of the previous 6 months economic growth is positive and statistically significant on bank access to banking loans, the impact being stronger in the case of CEE countries vs Western EU countries⁴. Also, an increase in funding cost (proxied by the T-securities bond yield) is negative for the access to banking loans, the effect being again a bit stronger in the case of CEE countries vs Western EU countries.

At the firm level variables, the firm size is significantly influencing the probability to access finance by companies. Micro and small companies seem to face difficulties in accessing banking loans, being a micro or a small firm decreasing the probability to access a bank loan. If the company is a large one, there is an increasing chance to access a bank loan. Also, in the case of EU27 companies, if the age of the firm is higher than 10 years, the chance of accessing a loan is higher and if the age is between 2-5 years the chance of accessing a loan is lower. The age of the firm is not a significant factor for accessing a loan in the case of CEE companies (table 2).

³ Bulgaria, Czechia, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia

⁴ Western EU countries are the other 16 EU27 countries except CEE countries from above.

Table 2. Baseline model results

	EU	EU SMEs	CEE	CEE SMEs	WE	WE SMEs
GROWTH	0.06 ***	0.05 ***	0.16 ***	0.16 ***	0.04 ***	0.03 ***
BOND_YIELD	-0.09 ***	-0.09 ***	-0.11 ***	-0.11 ***	-0.10 ***	-0.10 ***
MICRO	-0.34 ***	-0.35 ***	-0.14 ***	-0.15 ***	-0.34 ***	-0.35 ***
SMALL	-0.14 ***	-0.15 ***	-0.09 *	-0.09 *	-0.14 ***	-0.14 ***
LARGE	0.14 ***		0.18 ***		0.13 ***	
AGE2_5	-0.05 *	-0.06 *	0.17 *	0.18 *	-0.09 ***	-0.10 ***
AGE10	0.05 ***	0.05 **	-0.02	-0.03	0.08 ***	0.07 ***
CH_DECREASED	-1.07 ***	-1.06 ***	-0.99 ***	-0.97 ***	-1.06 ***	-1.05 ***
CH_IMPROVED	0.86 ***	0.82 ***	1.00 ***	0.96 ***	0.84 ***	0.81 ***
DEBT_ASSETS_INCREASED	-0.20 ***	-0.21 ***	-0.25 ***	-0.26 ***	-0.19 ***	-0.20 ***
DEMAND_DECREASED	0.11 ***	0.10 ***	0.01	0.02	0.12 ***	0.12 ***
DEMAND_UP	-0.02	-0.06 ***	0.16 ***	0.11 **	-0.05 ***	-0.07 ***
PUBLIC_SUPPORT_IMPROVED	0.96 ***	1.00 ***	0.94 ***	0.94 ***	0.97 ***	1.01 ***
gamma1	-1.82 ***	-1.84 ***	-2.10 ***	-2.12 ***	-1.77 ***	-1.79 ***
gamma2	1.45 ***	1.43 ***	1.53 ***	1.48 ***	1.46 ***	1.44 ***
Included observations:	103375	93524	12475	11002	90900	82522

Note: *** p value <1%, ** p value<5%, * p value<10%

Credit history seems to have a strong and statistically significant role in accessing banking loans, both for CEE and Western countries. If credit history is improving, that is positive, increasing the probability to access loan, and if credit history is deteriorating, that is negative, decreasing the chance to access loans. The impact seems to be symmetric in the case of CEE countries (the deterioration/improvement in credit history has a negative/positive impact on access to loans which is relatively similar in terms of magnitude). In the case of Western EU countries, the impact is rather asymmetric, the deterioration in credit history being stronger in terms of negative impact on access to loans than the positive impact on access to loans from an improvement in credit history.

As expected, the companies reporting an increase in leverage (debt to assets ratio) in the last six months are more probably reporting a deterioration in the access to finance, and this effect seems to be a bit stronger for CEE countries than in the case of Western EU countries.

If the firms reported that their demand of loans increased/decreased in the last 6 months, in the case of the full sample their access to loans decreased/increased. The companies doing bad are probably in demand of loans to meet their daily financial needs and their access to loans is constrained. That seems to be even more stringent in case of EU SMEs. The same relationship applies for the Western EU countries sample. However, for the CEE countries sample the sign of decreasing demand becomes statistically insignificant and the sign of increasing demand is positive and significant. That is, in the case of CEE countries the firms doing well are increasing their demand for loans and they have a better access to loans because their financials are in a good shape.

The improvement in access to public financial support, including guarantees, has a strong and positive effect on access to loans. Also, the coefficient is highly statistically significant in all model specifications. The public financial support, including guarantees improves the firms access to finance.

To check the robustness of our estimates, but also to expand the analysis, we will estimate some more specifications of the model.

In a second step, we estimate the model by size of the firm, using initially the full sample for the all-EU27 countries and afterwards we will make the estimations only for the Central and Eastern European (CEE) countries and for some individual CEE countries.

As we can see in table 3, the impact of economic growth on access to finance is positive and significant in each subsample and increasing in magnitude with the size of the firm. So, in the case of large companies, the positive impact of economic growth on access to financing is the strongest, the coefficient from the regression being the highest. Also, the cost of funding (proxied by bond yields) is having the right sign and is significant in all regressions, having relatively the same impact on access to financing in the case of micro, small and medium companies, but significantly higher impact in the case of large companies. The age of the company is statistically significant only in the case of medium and large companies, and if the company age is higher than 10 years then the company has a higher probability to access financing and that probability is a bit higher in the case of large companies than in the case of medium companies.

Table 3. Model results on the full sample by size of the firms

	EU micro	EU small	EU medium	EU large
GROWTH	0.046***	0.043***	0.065***	0.094***
BOND_YIELD	-0.09***	-0.09***	-0.09***	-0.113***
AGE2_5	-0.061	-0.091	-0.025	0.052
AGE10	-0.001	0.049	0.119***	0.141**
CH_DECREASED	-1.02***	-1.05***	-1.082***	-1.241***
CH_IMPROVED	0.754***	0.829***	0.875***	1.118***
DEBT_ASSETS_INCREASED	-0.24***	-0.20***	-0.186***	-0.172***
DEMAND_DECREASED	0.039	0.073**	0.209***	0.168***
DEMAND_UP	-0.30***	-0.032	0.162***	0.243***
PUBLIC_SUPPORT_IMPROVED	1.174***	1.027***	0.820***	0.675***
gama1	-1.60***	-1.66***	-1.715***	-1.795***
gama2	1.704***	1.562***	1.574***	1.504***
Included observations:	31824	32356	29164	9851

*** p value <1%, ** p value<5%, * p value<10%

As in the case of the baseline estimate, credit history seems to have a strong and statistically significant role in accessing banking loans, irrespective of the size of the company, being stronger as an influencing factor if the company is larger. If credit history is improving, that is positive for accessing a loan, and more positive if the company is larger in size. The asymmetry of the impact is valid irrespective of the size of the firm, the deterioration in credit history being stronger in terms of negative impact on access to loans than the positive impact on access to loans from an improvement in credit history.

As shown also in the baseline estimates, the companies reporting an increase in leverage are more probably reporting a deterioration in the access to finance, but this effect seems to be

stronger for smaller companies, the coefficient of this variable being less negative with the increase in the size of the company.

An interesting relation can be reported between the demand for loans and access to financing by size of the firm (table 3). If demand of loans increased in the last 6 months, in the case of the micro and small firms the access to loans decreases and if the demand increased in the case of medium and large companies then the access of loans increases. Probably, in the case of small and micro companies they are increasing the demand for loans to meet their daily financial needs in case their financial situation is bad and their access to loans is constrained. In the case of medium and large companies probably the firms doing well are increasing their demand for loans and they have a better access to loans because their financials are good.

As in the baseline estimates, the improvement in access to public financial support, including guarantees, has a strong, positive and statistically significant effect on access to loans of companies in EU. The impact of this factor is higher if the size of firm is lower. So, micro and small companies are the most helped in their efforts to access loans if the state is intervening with public support. In the case of large companies, the impact of this factor is just half vs the impact on micro companies.

We estimate now the models by size of the firm only for the CEE countries. The results are shown in table 4. The results are relatively similar to the results obtained for the full EU sample, but there are some particularities to be pointed out in the case of CEE countries.

Table 4. Model results on the CEE sample by size of the firms

	CEE micro	CEE small	CEE medium	CEE large
GROWTH	0.168***	0.131***	0.163***	0.225***
BOND_YIELD	-0.11***	-0.13***	-0.08***	-0.10***
AGE2_5	0.339***	0.104	-0.152	0.022
AGE10	-0.020	0.025	-0.110	0.066
CH_DECREASED	-1.16***	-0.80***	-0.99***	-1.16***
CH_IMPROVED	0.968***	0.967***	0.963***	1.255***
DEBT_ASSETS_INCREASED	-0.118	-0.30***	-0.31***	-0.173
DEMAND_DECREASED	-0.155	0.081	0.078	0.017
DEMAND_UP	-0.104	0.191**	0.166**	0.518***
PUBLIC_SUPPORT_IMPROVED	1.205***	0.973***	0.771***	0.867***
gama1	-1.96***	-2.02***	-2.18***	-2.19***
gama2	1.670***	1.495***	1.486***	1.785***
Included observations:	3138	3424	4440	1473

*** *p* value <1%, ** *p* value<5%, * *p* value<10%

First of all, in case of CEE countries the impact of economic growth on access to finance is also positive and significant in each subsample and increasing in magnitude with the size of the firm, but the magnitude of the coefficients is higher than in the case of the full EU sample. So, in the case of CEE countries, the economic growth plays a stronger role in access to finance than in the other EU countries. An increase in cost of funding has also a significant effect in all regressions

for CEE countries, having relatively higher negative impact on access to financing in the case of micro and small companies than in the case of the other EU countries, and lower than in the other EU countries for medium and large companies. The age of the company is not statistically significant for most of the specifications of the model.

Credit history seems to have also a strong and statistically significant role in accessing banking loans for CEE countries, irrespective of the size of the company. However, when credit history is improving, the positive impact on access to loans in case of CEE countries is stronger vs other EU countries irrespective of the size of the firm. Also, when credit history is deteriorating, the negative impact on access to loans in case of CEE countries is weaker vs other EU countries in case of all companies except micro firms. In the case of micro companies, the impact of credit history on access to loans is stronger in CEE countries vs other EU countries.

The companies from CEE countries reporting an increase in leverage are also more probably reporting a deterioration in the access to finance, the relationship being stronger in CEE countries vs other EU countries in case of small and medium companies.

In case of a decrease in demand for loans the relationship with access to finance in case of CEE countries is not statistically significant. In case of an increase in demand for loans, the relationship with the access to finance is positive for small, medium and large companies and stronger than in the case of other EU countries, being probably a reflection of the improved financials of the companies which are leading to an improved access to loans.

The improvement in access to public financial support, including guarantees, has a strong, positive and statistically significant effect on access to loans in CEE countries also. The impact of this factor in case of CEE countries is higher than in other EU countries in case of micro and large companies and a bit lower in case of small and medium companies.

As a last step, we made the estimations of the model by some individual countries from CEE region. We estimated the baseline model for Romania, Poland, Hungary, and Bulgaria and we also estimated the model by firm size for Romania (see table 5 and table 6). As we can see in the table 6, the impact of the economic growth on access to loans seems to be stronger in Romania (in particular in the case of micro companies) than in EU27, but a bit lower than in the CEE countries average. The impact of growth is even higher in countries like Poland and Bulgaria.

In case of cost of funding, this factor seems to be a stronger factor in access to loans in Romania than in the case of EU, but also higher than in CEE countries. The impact of cost of funding seems to be even higher in Poland and Hungary.

The micro and small companies seem to be much more restricted in Romania from the access of finance point of view. The age of the company is statistically insignificant in all individual countries.

An improvement in credit history in Romania (particularly in the case of micro and small companies) in Poland seems to be a stronger factor than in the other countries in accessing loans. An increase in the leverage of the companies seems to be a stronger constraining factor also. Finally, public support seems to be a stronger stimulating factor in accessing loans in Romania (particularly for small and micro firms) vs other CEE countries.

Table 5. Model results for some CEE individual countries

	RO	RO SMES	PL	PL SMES	BG	BG SMES	HU	HU SMES
GROWTH	0.13***	0.11***	0.30***	0.29***	0.27***	0.30***	0.11***	0.10**
BOND_YIELD	-0.17***	-0.16***	-0.20***	-0.18***	-0.15***	-0.16***	-0.27***	-0.27***
MICRO	-0.44**	-0.44**	0.02	0.00	-0.24*	-0.22	-0.10	-0.12
SMALL	-0.34**	-0.33**	-0.05	-0.07	-0.02	-0.02	-0.21	-0.22
LARGE	-0.21		0.33**		0.17		0.08	
AGE2_5	-0.46	-0.48	0.34*	0.39**	0.34	0.29	-0.17	-0.18
AGE10	-0.03	-0.05	0.03	0.00	0.12	0.16	0.18	0.11
CH_DECREASED	-0.14	-0.18	-1.85***	-1.88***	-1.36***	-1.35***	-1.14***	-1.26***
CH_IMPROVED	1.19***	1.19***	1.36***	1.33***	0.97***	0.97***	0.75***	0.67***
DEBT_ASSETS_INCREASED	-0.40**	-0.29*	-0.22**	-0.29***	0.09	0.05	-0.25	-0.27
DEMAND_DECREASED	-0.53***	-0.53***	0.12	0.15	0.24	0.23	-0.10	-0.14
DEMAND_UP	0.09	-0.01	0.02	-0.03	0.13	0.08	-0.12	-0.16
PUBLIC_SUPPORT_IMPROVED	1.32***	1.27***	0.55***	0.55***	0.89***	0.86***	1.12***	1.16***
gamma1	-2.81***	-2.77***	-2.15***	-2.17***	-2.37***	-2.37***	-2.91***	-3.00***
gamma2	0.74***	0.72**	1.88***	1.86***	1.33***	1.35***	0.70**	0.53*
Included observations:	995	855	3,283	2,938	1,691	1,510	1,028	913

*** p value <1%, ** p value<5%, * p value<10%

Table 6. Model results by firm size in case of Romania

	RO micro	RO small	RO medium
GROWTH	0.376***	0.071	0.007
BOND_YIELD	-0.098	-0.155*	-0.094
AGE2_5	-0.508	-0.712	-0.277
AGE10	-0.417	0.582*	-0.584*
CH_DECREASED	-0.482	-0.022	-0.564*
CH_IMPROVED	1.449***	1.609***	0.853***
DEBT_ASSETS_INCREASED	-0.750*	-0.213	-0.286
DEMAND_DECREASED	-0.945**	-0.957***	0.021
DEMAND_UP	-0.922*	-0.352	0.464*
PUBLIC_SUPPORT_IMPROVED	1.515***	1.926***	0.808***
gamma1	-2.525***	-1.991***	-2.935***
gamma2	1.815**	1.615***	0.333
Included observations:	199	291	365

*** *p* value <1%, ** *p* value<5%, * *p* value<10%

6. Conclusions

We investigated in this paper the factors that affect the access to loans of companies in European Union countries and we were interested in particular to see if the Central and Eastern European Countries are different in this respect.

Using ordered logit model, we estimated initially a baseline model using panel data for the EU countries and then we split the sample in 2 sub-samples – one for Western EU countries and one for CEE countries. We found that the economic growth is positive and statistically significant in accessing bank loans, the impact being stronger in the case of CEE countries vs Western EU countries. Also, an increase in funding cost was found by us to be negative for the access to banking loans, the effect being again a bit stronger in the case of CEE countries vs Western EU countries.

Micro and small companies seem to face difficulties in accessing banking loans. If the company is a large one, there is an increasing chance to access a bank loan. Also, in the case of EU27 companies, if the age of the firm is higher, the chance of accessing a loan is higher. The age of the firm is not a significant factor in our estimations for CEE countries.

Credit history seems to have a strong and statistically significant role in accessing banking loans, both for CEE and Western countries and its impact seems to be relatively symmetric in the case of CEE countries. We found also that the increase in leverage triggers a deterioration in the access to finance, and this effect seems to be a bit stronger for CEE countries.

We investigated also the impact of demand of loans to the access to loans. We found that for Western EU countries the impact of increasing demand of loans is decreasing the chance to access a loan, as probably the week companies are in this situation. However, for the CEE countries the opposite seems to apply, the increasing demand of loans (probably from good companies which are in higher need for loans to increase their business) being found to be positive for the access to loans.

Another interesting result of our analysis is that the public financial support, including guarantees, seems to have a strong and positive effect on access to loans.

The economic growth positive impact in accessing loans seems to increase with the firm size for the full sample, this effect being even stronger in the case of CEE countries. For the CEE sample, cost of funding has a relatively higher negative impact on access to financing in the case of micro and small companies than in the case of the other EU countries.

Credit history seems to have also an increasing role if the company is larger in the case of full EU sample. When credit history is improving, the positive impact on access to loans in case of CEE countries is stronger vs other EU countries irrespective of the size of the firm.

The negative impact of increasing leverage is found to be stronger for smaller companies, the relationship being even stronger in CEE countries vs other EU countries in case of small and medium companies.

In the estimations for individual countries, we found the impact of the economic growth on access to loans seems to be stronger in Romania (in particular in the case of micro companies) than in EU27, but a bit weaker than in the CEE countries average. The impact of growth is even higher in countries like Poland and Bulgaria. In case of cost of funding, this factor seems to be a stronger factor in access to loans in Romania than in the case of EU27, but also higher than in CEE countries. The micro and small companies seem to be much more restricted in Romania from the access of finance point of view. The age of the company is statistically insignificant in all individual countries. An improvement in credit history (particularly in the case of micro and small companies) and an increase in the leverage of the companies in Romania seems to be a stronger factor than in the other countries in accessing loans.

Not in the last, public support seems to be a stronger stimulating factor in accessing loans in Romania (particularly for small and micro firms) vs other CEE countries. Actually, this is a conclusion valid also for CEE countries vs other EU countries. So, targeted public support can help alleviate credit constraints of firms, especially in the case of smaller companies, and that is even more valid for CEE countries.

Our results are in general in line with the results from some other papers in terms of the estimated sign of coefficients of variables reflecting firm-level fundamentals (Holton et al. 2013, McQuinn 2019, and Öztürk & Mrkaic 2014). However, the methodology we used (ordered logit models) is more appropriate than in some other papers (for instance McQuinn 2019 is using ordinary least squares – OLS; using the OLS model when the dependent variable is ordered will result in violations of the assumptions of OLS - see for instance Winship and Mare, 1984) and our estimated coefficients are, in principle, higher in terms of size.

Also, our results are adding to the existing literature as we are using a more comprehensive data sample and our results seems to be more robust and more statistically significant. Moreover, we were able to identify a significantly different behavior of CEE countries from EU in terms of access of firms to bank loans, which is quite unique in the existing literature.

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