Financing of the firm under the impact of the financial crisis. Evidence from CEE countries

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Abstract: This paper explores the problems experienced by the firms from the analyzed CEE countries regarding the access to finance under the impact of the financial crisis. The easy access to finance is a vital problem for the firms because it affects their development but also their survival. Also, the existence and activity of the firms appears in an interdependent relationship with the economic situation of the country in which they operate. So, if the economy of the country is affected by the financial crisis then this interdependent relationship leads to problems related to firms financing.
Through this paper we analyze 245 firms from seven countries in Central and Eastern Europe member of the European Union (Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania and Hungary). Using an econometric model we observe the changes that appear in the financing decision of these firms under the impact of the financial crisis.
The results show that the current financial crisis had a significant influence on the financing decision of the analyzed firms causing significant changes of their level of indebtedness, especially a decrease.

Keywords: Financing decision, sources of financing, Central and Eastern European countries.

JEL Classification: G01, G32, O11

1 Introduction

The main objective of this paper is to identify how it is affected the access to finance of the analyzed firms by the financial crisis. The access to finance for the firms it is a stringent issue even in normal conditions. But, with this research we want to see if under the impact of financial crisis the situation gets worse. The impact of a financial crisis in a country it is observed by its impact on the macroeconomic indicators. When these indicators have a negative evolution, as a result of a crisis, we observe deterioration in the country's economy, in general, which directly affects firms operating in that country.

We consider this as a serious problem, because the firms are the engine of an economy and especially, in the current period, when financial crises are becoming increasingly common in all countries, the firms are really serious affected.

In the last decades increasingly more studies (Rajan & Zingales, 1995; Demirgüç-Kunt & Maksimovic, 1999; Graham & Harvey, 2001) have examined which are the sources of finance used by the firms and its determinants. Most of these studies show that the dominant sources of firms financing are the internal resources, for example the reinvested profit. Regarding other sources of financing (eg, issuance of shares, bonds or bank loans), there are important differences between countries according to their economic and financial characteristics.

Talking about the impact of financial crisis on firms the internationally studies realized by the World Bank (Correa & Iootty, 2009; Correa *et al*., 2010a; Correa *et al*., 2010b) showed that the firms from Central and Eastern European countries were significantly affected by the current financial crisis, registering reductions in net revenue from the activity.

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To identify the changes registered in the financing decision of the firms because of the changes in the macroeconomic environment determined by the financial crisis we have chosen to use an econometric analysis based on panel data.

The main source for the microeconomic data is AMADEUS database managed by Bureau van Dijk, which provides comparable financial information for about 14 million public and private companies throughout Europe. For the macroeconomic data we have used the information offered by Eurostat and the World Bank.

2. Empirical analysis

For the econometric analysis the sample consists of the top 35 private non-financial enterprises (by their turnover recorded in 2009) from seven developing countries in Central and Eastern Europe, members of the European Union (Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania and Hungary). Based on this selection has resulted a sample of 245 large enterprises. The period for which we collected the data is 2004-2009; we chose this period to be able to make a comparison between the situation before the outbreak of the current financial crisis and the crisis situation.

When choosing the explanatory variables we have considered macroeconomic indicators whose development show the evolution of the economy in the analyzed period. Thus, given that the evolution of the economy significantly influences the access to finance of the firms (Correa *et al*., 2010a; Correa *et al*., 2010b) we considered that the evolution of this indicators (*the real economic growth rate, the interest rate on loans and the foreign investments)* in the context of the current financial crisis had a significant influence on the financing decision of the analyzed firms.

When the *real economic growth rate* is positive the firms are prosperous and are developing, having more opportunities for their financing due to the expansion of the economy. Also, the values of the *interest rate on loans* is exercising influence over firms financing decision because, if the interest rate is low, loans are granted in more favourable conditions for entrepreneurs, increasing their preference for lending. And when the interest rate is high, the firms that use loans become more vulnerable. High interest rate results in a high cost of borrowed capital and the orientation of the firms to their own sources of financing or by issuing new shares. *The foreign investments* as a percentage of GDP are of particular importance in terms of firms financing, especially in Central and Eastern European countries, where firms require large amounts of capital to organize and streamline their activity. The firms in developing countries call credit constraints as one of the main obstacles to investment. Thus, foreign investments have an important role in these countries because it eases credit constraints felt by firms, by introducing capital, supplementing the limited resources on those markets (Harrison & McMillan, 2003).

Self-financing is the main source of finance used by the firms (Rajan & Zingales, 1995; Demirgüç-Kunt & Maksimovic, 1999; Graham & Harvey, 2001; European Commission, 2009), but when they want to develop or their revenue is low they are forced to seek external sources of financing. So, through this research we want to see if the external indebtedness level of the 245 analyzed firms has suffered significant changes under the impact of the financial crisis. Based on this, we have chosen as dependent variable *the indebtedness level* of the firms.

In order to realize the empirical analysis we proposed one model by which we wanted to test the impact of the current financial crisis on the indebtedness level of the firms in the analyzed countries.

$$G\_IND_{zt} = c + \beta_1 \cdot PIB\_R_{zt} + \beta_2 \cdot DOB\_CR_{zt} + \beta_3 \cdot INV_{zt} + \varepsilon_{izt}$$

Where: i = 1, 2,..., 245; z = BG, EE, LT, LV, PL, RO, HU; t = 2004, 2005,..., 2009.

In the analyzed multiple linear regression model we have included the residual variable (ε_i) because, in these model we have considered a limited number of explanatory variables and inevitably a number of variables are omitted, moreover, both at economic agents level and at the level of the macroeconomic phenomena there is a certain component that is not predictable, and this component is measured by the residual component.

In analyzing this model we have started from the following hypothesis:

Hypothesis: The current financial crisis (quantified by the modification of the three macroeconomic variables) has a significant impact on the indebtedness level of the analyzed firms.

3. Results and discussions

The results of testing the model are shown in Table 1. Thus, in table 1 we present the impact of the current financial crisis (determined by the evolution of the three macroeconomic analyzed variables) on the indebtedness level of the enterprise in the period 2004-2009.

From the results presented in this table we observe that the real economic growth rate of the seven analyzed countries (PIB_R) and the interest rate on loans from these countries (LDOB_CR) have a positive and significant effect on the level of indebtedness of the 245 firms. Also, the foreign investments as a share of GDP (LINV_M) have not a statistically significant effect on the level of indebtedness of the firms. So, only two variables, from those considered for analysis, are both economically and statistically highly significant while the third variable, the foreign investments as a share of GDP has not a statistically significant effect on the level of indebtedness of the analyzed firms.

The coefficient estimates indicate that, when the average economic growth rate from the seven countries is reduced by 1% (in our case as an effect of the financial crisis) the level of indebtedness registered by the firms from this countries decreases with 0.615%, which represents a minor influence. Also, a modification of interest rate on loans (effect of the financial crisis) determines a modification in the same direction of the level of indebtedness of the firms with 16%. Of course, we maybe had expected that a modification of the interest rate on loans to have the effect of a modification in an opposite direction of the level of indebtedness of firms, but the effects of changes in interest rates do not feel immediately on the market, and also, looking at the interest rate on loans at country level we observe that the changes under the impact of the financial crisis was not uniform, thus we explain the result.

Table 1. The impact of the financial crisis on indebtedness level of the enterprises from the seven analyzed countries. The statistical significance of the regression coefficients of the econometric model

Variable	Constant	PIB_R[1]	LDOB_CR[2]	LINV_M[3]
Coefficients	31.140***	0.615**	16.523***	-0.124
	(7.275)	(0.294)	(3.078)	(1.453)
R-squared	0.52			

Time fixed effect	2004	2005	2006	2007	2008	2009
Coefficients	2.012	0.847	-0.055	-2.031	-1.959	-1.384

*, ** and *** denote that coefficients are significantly different from zero at the 90%, 95% and 99% level, respectively.

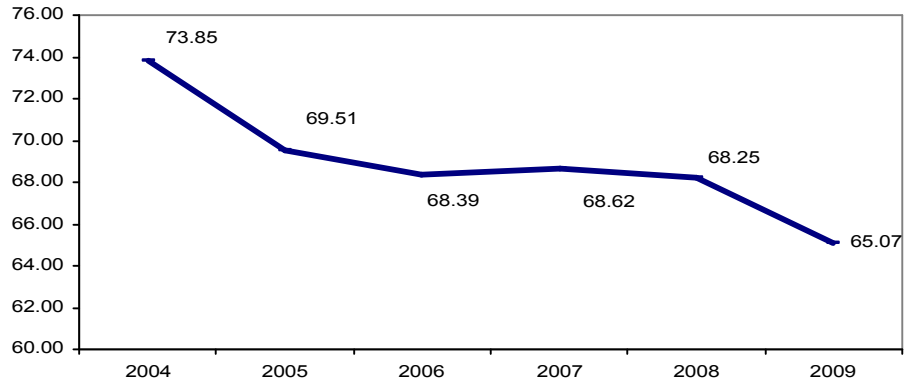
[1]the real GDP growth rate, [3]logarithm of interest rate on loans, [3]logarithm of foreign investment as percent of GDP

(Source: data processed by out—put from E-views 7)

At the same time we observe that only 53% (R-squared) of the variation in the indebtedness level of the firms is explained by the two observed macroeconomic variables that are considered significant, which shows that the remaining 47% of the variation is explained by other external or internal factors. The reduction in level of indebtedness of the firms from the seven countries analyzed in 2004-2009, is due by 53% to the economic growth rate reduction and the slightly increase of the interest rate on loans in these countries, under the impact of the financial crisis.

Because the probability associated with the test F-statistic is less than 5% we accept with a very small error that there is a linear dependence between the level of indebtedness of the analyzed firms and the macroeconomic analyzed variables. So, since, as of 2008, the values recorded by the two macroeconomic variables analyzed were significantly affected by the current financial crisis, and they have a significant impact on level of indebtedness of the firms, we can say that the current financial crisis has had a significant impact on the level of indebtedness of the 245 companies analyzed from the CEE countries, which confirms the hypothesis M1, determining its decrease (see Figure 1).

Figure 1. The evolution of the level of indebtedness (%) of the 245 analyzed firms, between 2004 and 2009



(Source: own analysis based on data from Amadeus database)

Also, analyzing the time effects we see that a significant negative effect is recorded in 2007, followed by a slightly gradual reduction of this negative effect in 2008 and 2009. The first negative coefficient is registered in 2007, but this negative effect is very small. The effect of the financial crisis is felt strongly starting with 2008 in the seven analyzed countries, as demonstrated by the negative coefficient much larger than the effect seen in the other years (until 2008).

4. Conclusion

Based on this analysis, we find that the financial crisis has led to unfavourable effects on financing decision of non-financial firms sector from the seven analyzed countries from CEE.

The general conclusion of this research conducted through a multiple linear regression model is that the specific factors of the external environment of the firms have a significant influence on the firms' decision of financing. When this environment becomes turbulent, the firms are facing serious problems in their activities. Thus, they are forced to make significant changes regarding the financing activity, in our case reducing the indebtedness level. Thus, we consider that this research paper can contribute to the expansion of scientific knowledge in the field of firms financing. Analyzing a broad sample of 245 firms and using recent data has a novelty character and allows us to obtain some comprehensive results regarding the changes in the financing decision in the context of the current financial crisis.

However we can not generalize the results of this econometric analysis because, the analysis performed was done on a sample of large non-financial firms. According to various other studies, limited access to finance has affected to a greater extent small and medium-sized firms which are perceived as lenders with a higher risk than the large firms. Therefore, in future research we propose, first, to consider the influence of more macroeconomic factors on the decision to finance of the firm, because macroeconomic phenomena, such as the current financial crisis or other disturbances (e.g. recession) are complex and their impact on firms can not be measured only by changes in three factors. Secondly, we plan to extend the analysis and include in the sample small and medium enterprises, in order to highlight the differences that arise in making the decision to finance enterprises by size.

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