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Reexamination of the determinants of firms' growth in periods of crisis*

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Abstract

The recent financial crisis has underlined the necessity to recognize why some firms and economies are more severely affected while others are more resilient to crisis and how different financial characteristics affect firms' growth path. In order to explore these issues empirically, we reexamine the determinants of corporate growth during the crisis and post-crisis period (2008-2013) on the sample of 10 Central and East European countries belonging to two different regional groups – “Visegrad four” and the group of former Yugoslavian countries. Our analysis covers the sample of 3,660 firm-year observations. We model firm growth as a function of two country-specific variables (inflation and capital market liquidity) and four company-specific variables (financial leverage, asset turnover, profit margin and ratio between cash flow and assets). Our study indicates the importance of infrastructure prerequisites and macroeconomic policies for the companies' growth in the conditions of crisis. Our results reveal a specific relation between leverage and firm growth during the crisis period, whereby the impact of leverage is perceived by a comprehensive result of the degree of firm indebtedness, the level of capital market development, the position of banking sector and the cost of debt. Finally, our results show some intriguing patterns in firm profitability – growth as well as asset efficiency – growth relation.

Key words: firm growth, crisis, capital market, country-specific variable, company-specific variable

JEL classification: G30, N20, M20, P30

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1. Introduction

In the wake of the global financial crisis, the issue of firm growth becomes a new dimension. The environment characterized by the growing risks, investors' hesitation and depressed investments, limited availability of financial sources, rising financial expenses and cost of capital, implies the decline of firm output. Consequently, firm growth is disrupted and negative growth rates are frequently associated with the crisis. Recovery of enterprises must be accompanied by removal of structural imbalances, creation of a simulative business environment and conditions for sustainable growth at the level of the individual companies. All the above mentioned implies the need for reexamination of the impact of the key determinants of the company growth.

Even though a large body of literature has been concerned with the examination of factors influencing firm growth, these studies mainly cover non-recession period. This study aims at providing insights to bridge this gap by offering evidence for the financial determinants of firm growth in the context of two groups of economies at the different stage of development (Visegrad group and ex-Yugoslav countries) during the crisis and post crisis period. Both groups of national economies were extremely vulnerable to economic shocks. However, differences in country specific settings appear to have important impact of firm' capacity to resist the recession.

In this paper we test impact of key independent variables on firm growth which is measured by a change in the asset value in the current in relation to the previous year. The independent variables are divided into two groups: macro variables (reflect the business environment in which companies operate) and micro variables, i.e. the determinants of growth at the company level.

Access to financial resources depends on the level of liquidity of a country's financial sector. As financial liquidity reduces the cost of external financing to financially dependent firms, it has a substantial supportive influence on the rate of firm growth (Rajan and Zingales, 1998). The economic crisis causes an increase in the cost of capital and reduces investments, which adversely affects the firm growth. Narrowing of competition in the financial markets led to the lack of financing sources, the increase of cost of borrowing and the falling of profitability. Overall, all these have restrictive impact on firm growth. Based on the theories and the previous empirical findings, we come to the **Hypothesis 1: Capital market liquidity has a positive impact on firm growth.**

Strengthening of the national currency is not favorable for exporters, since it raises the price of exported products; the competitiveness of export-oriented enterprises is falling, while the current account deficit is growing. On the other hand, a weakening of the national currency causes the introduction of the currency clauses and the emergence of negative exchange differences in borrowing in foreign currency,

which results in increasing of the total financial expenditures and reducing the yield for owners. In the original study on sustainable growth, Higgins (1977) and Higgins (1984) conclude that inflation has a negative impact on sustainable growth. The well-known Tobin's study (1965) points to a two-sided influence of inflation on firm growth. Negative effect is a consequence of a decline in the sales to asset ratio. On the other hand, so-called *Tobin effect* describes a possible positive impact on growth by lowering real interest expense. Based on the theories and the previous empirical findings, we come to the following **Hypothesis 2: Inflation has a neutral impact on firm growth.**

According to theory, the increase in financial leverage leads to the increased profitability and growth as long as the return on asset is higher than the cost of capital. Knudsen (2011) gives evidence that high pre-recession growth and pre-recession debt ratio make firms more vulnerable to recessions. Irrespective of the fact that in times of economic crisis there is a reduced possibility of borrowing due to the increased financial risk and an increase of the cost of capital, generally it is logical to expect a positive effect of financial leverage on growth. Based on theory and previous findings, we propose **Hypothesis 3: The leverage of a company has a positive impact on its growth.**

Under normal business circumstances, it is realistic to expect a positive correlation between business efficiency and growth. In times of economic crisis, due to the decline in operating activity which is not accompanied by the same decline in fixed costs, expected slower growth of revenues from sales would result in a decline in profit margins and a drop in efficiency. These processes, as a result of the reduction of available internal sources of financing, could narrow space for sustainable growth. Accordingly, **Hypothesis 4: The efficiency ratio of a company, measured by assets turnover ratio, has a positive impact on its growth.**

Different theories on growth and profitability offer contrasting perspectives of the relationship between them (the Theory of financial constraints (Jang and Park, 2011), the Agency theory (Soininen et al., (2012), the Kaldor and Verdoorn's Law in economics (Kaldor, 1996), (Verdoorn, 1949). In agreement with the majority of the academic proofs, we are testing the validity of the positive effect of profitability on firm growth and formulate **Hypothesis 5: Profitability has a positive impact on firm growth.**

Internal finance plays an important role in achieving the growth of company by overcoming financial constraints. According to a hierarchy theory (Myers and Majluf, 1984), firms prefer to fund themselves with resources generated internally before resorting to the market. In these circumstances, firms with large cash flows will grow faster, and thus a positive correlation between cash flow and firm growth is expected. However, during the economic crisis, especially in countries where capital markets are inactive and where bank loans are expensive, reluctance of

investors due to unfavorable conjuncture may affect that the increase in cash flows does not lead to growth. We propose **Hypothesis 6**: *A positive correlation between cash flow and firm growth is expected.*

By testing the above cited hypotheses, our research point out to the importance of infrastructure prerequisites and macroeconomic policies for the companies' growth in the conditions of crisis, and reveals some specific relations between firm financial characteristics and growth during the crisis period. The contributions of the paper are twofold. Firstly, to the best of our knowledge this is the first attempt of a comparative analyze of a hierarchical set of determinants of firm's grow in the specific sample of two groups of CEE countries. Secondly, we proved the evidence that some determinants of firm growth may have different importance in different country settings and different economic cycles.

The paper is structured as follows. A brief literature review is given in Section 2. The descriptions of methodology and the context of analysis are presented in Section 3. Section 4 describes the dataset and the research analysis, while Section 5 discusses the regression findings. In the last section we provide conclusions, emphasize some limitations of the study and propose the objectives of future research.

2. Literature review

A wide range of firm growth determinants is analyzed by several theories, such as neoclassical economic theory, behavioral economic theory, stochastic growth theory, and various models of learning and selection, which are linked to the stochastic firm growth theory. The main implication of the classical model is that firm growth is always limited by the optimum firm size. Behavioral approach and its "managerial theory" suggest that firms can be oversized due to the division between the control and ownership structures. Behaviourist economists (Baumol, 1959; Penrose, 1959; Chandler, 1962) explain that managers maximize their own satisfaction instead of the firm's value. Stochastic growth models (Gibrat, 1931; Champernowne, 1973), aim at identifying the presence of stochastic factors that influence firm behaviour and to study the inequality and concentration among firms. According to Gibrat (1931) there is no relationship between the size of a firm and its growth. Firm growth is, in reality, the outcome of a multiplicative process and both internal and external factors that affects the initial size. The main characteristics of the learning and selection models are that they link firms' chances to survive with the dynamics of firms and their level of efficiency (Jovanovic, 1982; Ericson and Pakes, 1998; Geroski, 1995).

In different theories, firm growth is considered to be a consequence of numerous factors, such as demographic characteristics, financial factors, research and development and innovation activity. At the macro level, the most explored have

been: gross domestic product, inflation, corporate income tax rate, size of the market, or level of stock market development. Empirical studies on the firm growth and its determinants have been realized in almost all European countries, in different periods and taking into account various samples. For the purpose of this study, the most valuable are the results of the papers concentrated on firms' growth in circumstances of crisis (Gertler and Gilchrist, 1994; Hardwick and Adams, 2002; Fort et al., 2013; Geroski and Gregg, 1996; Knudsen, 2011; Kim and Barrett, 2002) as well as the studies done in the CEE countries (e.g. by Grinberger and Nehrebecka, 2015; Strielkowski, 2012; Studena, 2004; Mrak et al., 2000; Konings and Xavier, 2002).

A comparative analysis regarding firm growth determinants in CEE economies has been performed in several papers. Burger et al. (2017) analyze what kind of CEEs firms' characteristics makes some of them more resilient to crisis than the others. Mateev and Anastasov (2010) emphasize that beside size and age, other firm specific characteristics such as leverage, current liquidity, future growth opportunities, internally generated funds, and factor productivity are important factors in determining a firm's growth and performance. Perić and Vitezić (2016) examine whether growth rates of manufacturing and service industries are independent of firm size during the period of economic crisis and show that turnover growth is positively associated with companies' size during the observed period of economic recession 2008–2013. Overall, the comparative studies on determinants of firm growth in the CEE countries are limited. This study aims to fill a gap in the literature by reexamining the determinants of firm growth in the context of two groups of economies at the different stage of development during the crisis period, 2008–2013.

3. Methodology

The study of the impact of economic crisis on individual national economies and broader regional groups of countries which experienced similar paths during transition and the prospects for their recovery and achievement of desired growth rates, raises important growth-related issues: Do the key determinants of growth, defined in various research studies, have the same impact on growth in normal business conditions and in times of crisis? Do the key determinants of growth have the same effect on growth in all transition countries, regardless of the speed of transition, their financial strength or their ability to deal with the consequences of the crisis?

There is no agreement in the existing literature on the firm growth measurement. Garnsey et al. (2006) emphasize that firm growth can be measured in terms of inputs (investment funds, employees), in terms of the value (assets, market capitalization, economic value added) or outputs (sales revenues, profits). Additionally, growth can be measured in absolute or relative terms. Growth in sales, total asset and employment, as the most used ways of operationalizing firm growth, are according

to Freel and Robson (2004) relatively uncontroversial (methodologically) and easily available, resulting in the increase of the scope for cross study comparability. In order to explore its determinants, we measure firm growth by a relative change in the asset value in the current in relation to the previous year. By examining the relative changes of total assets as a measure of growth, we capture a broad range of activities undertaken by the firm. As firms grow, they expand not only their physical capital, but also gross working capital. Moreover, examination of the change in total assets enables us to make a prediction about the relationship between firm growth and internal finance. By choosing relative change in the asset value as the dependent variable, we stay close to the model of Glancey (1998) and Norvaisiene and Stankeviciene (2007).

Our approach in this study is to relate firm growth not with the traditional determinants (such as age or size) but to other specific determinants associated with a firm's financial constraints during crisis period. These constraints come both from the environment (such as challenges driven by inflation and the capital market liquidity) and internally, from a firm's financial position and strength. In line with Manova et al. (2009) and Burger et al. (2013), we examine indebtedness as one of the main factors that restrains firms' growth in economic recession. Following Aggarwal (2015), we create a variable that records the effectiveness with which a firm's management uses its assets to generate sales in periods of crisis. In our model firm profit margin captures the fundamental factor that impacts the long-term growth prospects of a company and defines the opportunities for investments. In order to capture the influence of internally generated capital on firm growth during crisis period, a variable cash flow to total assets is constructed.

In order to empirically test the relationship between firm's growth and six independent variables, we employ the model in line with Aggrawal (2015), and Matev and Anastasov (2010):

$$GR_{it} = \alpha + \beta_1 IR_{it} + \beta_2 CML_{it} + \beta_3 FL_{it} + \beta_4 AT_{it} + \beta_5 PM_{it} + \beta_6 CF_{it} + \varepsilon_{it}$$

where GR_{it} – firm's growth represented by the year to year change in total assets of i -firm in t -year, IR_{it} – inflation rate (%) of country, where i firm is located in t -year, CML_{it} – capital market liquidity in t -year measured for the stock exchange where company i is listed, FL_{it} – financial leverage of i -company in t -time, AT_{it} – firm i 's asset turnover in t year, PM_{it} – company i 's profit margin in t -year, CF_{it} – cash flow to total assets of i firm in t year.

The structure of our dataset permit the use of panel data methodology which can control for firm heterogeneity, and reduce collinearity among the variables that are contemplated (Arellano and Bond, 1991). The model is employed using a panel regression approach over three samples: general, ex-Yugoslavian and Visegrad sample. Panel regression allows us to control variables that change over time

alongside with the business cycle but not across companies. For each sample, we performed the Hausmann test in order to determine if a model with fixed or random effects is more appropriate. In the case of all samples, the Hausmann test suggests that the model with entity fixed effects is more appropriate. We tested model for multicollinearity using VIF (variance inflation factor) and the results show that (all VIFs are between 1 and 10), there is no collinearity problem between variables.

4. Empirical data and analysis

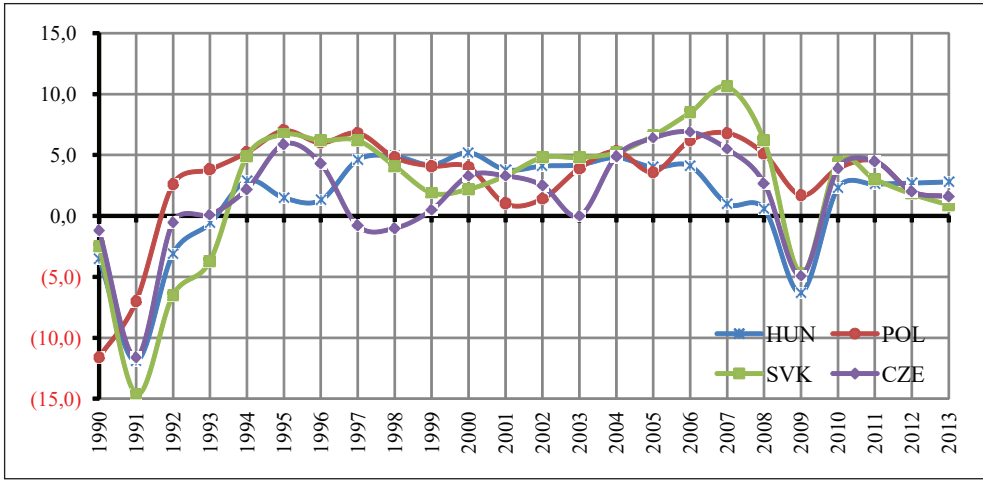
We investigated the determinants of firm's growth in the crisis and post-crisis period over a sample of listed companies from Central-Eastern European countries. All countries in the sample can be classified as emerging economies and we believe that results of this study can be generalized to some extent to companies from other emerging economies.

Our research includes two internally relatively homogeneous groups of countries: the countries belonging to the so-called "Visegrad Group" (Poland, Hungary, the Czech Republic and Slovakia) and the countries that constituted the former Yugoslavia (Bosnia and Herzegovina, Croatia, North Macedonia, Montenegro, Slovenia and Serbia). The countries within the same group have similar cultural characteristics, similar geographical and geopolitical positions and share a common tradition in many areas. The groups differ from each other in terms of the speed of transition, time of the accession to the European Union, efficiency in developing market and regulatory institutions, political stability, etc.⁴

As far as economic performance is concerned, there are also significant differences between these groups of countries. The Visegrad Group ("Visegrad Four" or simply "V4"), was formed with the aim of strengthening regional cooperation and collaboration in the fields of common interest. The V4 joined the European Union in 2004. The members of this group had completed the transition process more quickly, as measured by the speed of reaching the activity volume from the period immediately preceding the transition. After the initial phase marked by a decline in economic activity and negative GDP growth rates which had lasted until 1992, these countries rather quickly entered the zone of relatively stable GDP growth and remained there until the onset of the economic crisis whose effects began to manifest themselves in the financial statements of companies starting from 2008 (Figure 1).

⁴ Additional research on social, organizational, ecological and cultural characteristics of observed countries could offer more detailed insight into determinants of growth. However, the research on those variables is beyond the scope of this paper. The main idea of the paper is to reexamine the financial determinants of firms' growth in periods of crisis. Thereby, we examine the effects of frequently used financial determinants in order to establish whether the impact of those determinants changes in crises compared to stable business environment.

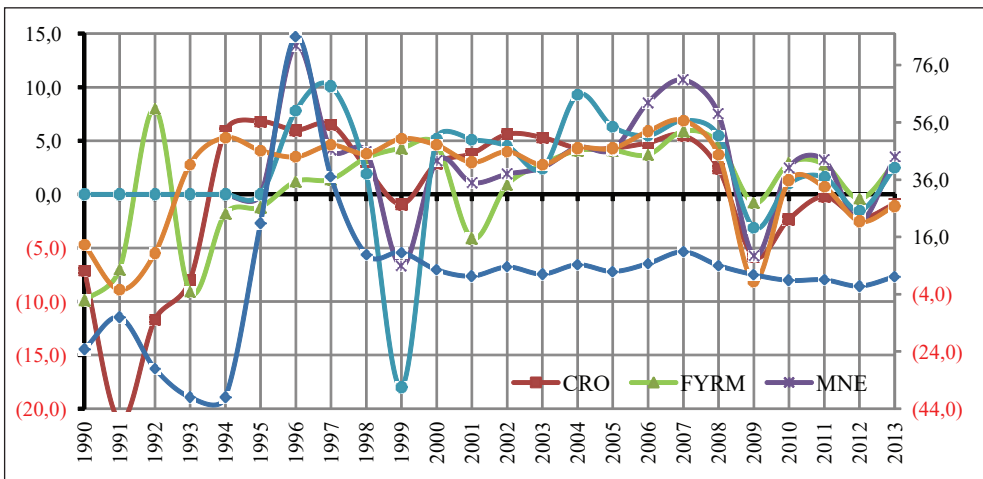
Figure 1: Growth in real GDP – Visegrad Group



Source: Author's calculation according to data obtained from Transition Reports 1999-2013 and Eurostat

On the other hand, the transition period lasted much longer in the countries that constituted the former Yugoslavia (hereinafter referred to as the ex-YU countries). These countries are also in different stages of the European integration process. Real GDP growth rates were very unsteady, with the differences between some countries that make up the ex-YU group being far more pronounced compared to the countries belonging to the V4 (Figure 2).

Figure 2: Growth in real GDP – EX-YU countries

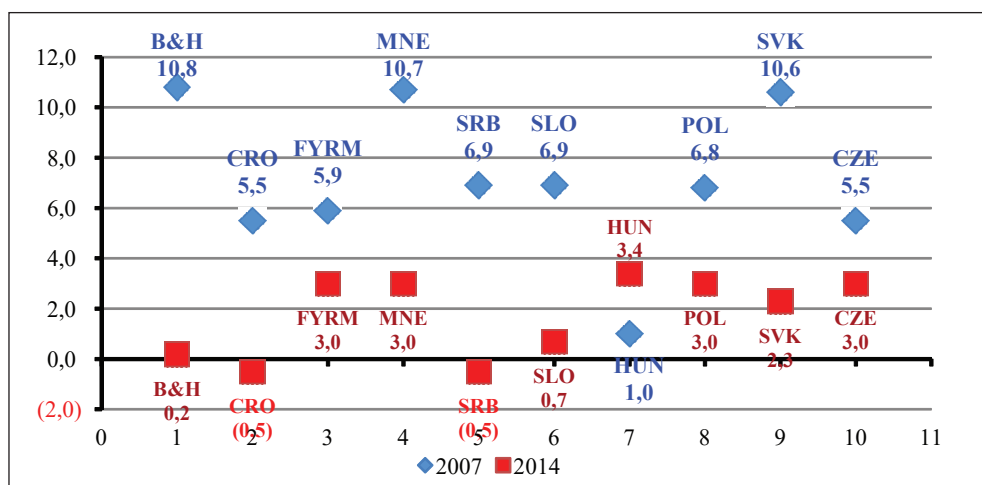


Source: Author's calculation according to data obtained from Transition Reports 1999-2013

However, a long period of coexistence within the common state (SFRY), close historical and cultural ties, shared tradition in many areas, geographical proximity and economic relations have contributed to the homogeneity of this group of countries, at the same time making it different enough from the V4.

The recovery, which had been announced in 2010 and 2011, did not result in the desired growth rates in either of the groups of countries by 2013. Generally speaking, the growth was quite modest from 2011 to 2013. For the purpose of our analysis, we decided to observe precisely the period between 2008, when the effects of the crisis had first appeared in the financial statements, and 2013, when the growth rates from the pre-crisis period had not been reached yet (with the exception of Hungary whose growth rate was very low in 2007), which can be clearly seen in Figure 3.

Figure 3: GDP growth 2007 vs 2014



Source: Author's calculation according to data obtained from Transition Reports 1999 and 2013

That is the case with both groups of countries. The period from 2008 to 2010, in which negative growth rates were recorded in 2008 and 2009, and the period of sluggish growth from 2010 to 2013 seem very interesting to observe.

Due to a growing level of debt and increased financial risks, the credit ratings of most ex-YU countries were downgraded. Bearing in mind their difficulties in maintaining fiscal balance, investment decline and increasing indebtedness, these national economies were extremely vulnerable to economic shocks. On the other hand, relatively stable macroeconomic environment, more efficient implementation of structural reforms, greater commitment to the development of market and regulatory institutions and improved market efficiency resulted in the enhanced

competitiveness of the V4 countries. Such circumstances led to a greater resistance to negative effects of the economic crisis.

The decline in economic activity often leads to the growth of the debt, the fall in profitability and the employment as well as to the increase of the bankruptcy risk. In addition, the decline in the volume of business activity limits the possibilities for financing that would correspond to the target capital structure, which leads to slow or negative growth. Consequently, in such new circumstances there is the need to review the impact of the key determinants of the company growth.

We use annual data from financial statements (acquired from Amadeus database), and macroeconomic data, which were acquired in Eurostat and World Bank database, websites of selected national banks and Federation of European Securities Exchanges database and official web sites of various stock exchanges. Our sample is limited to non-financial companies listed on the stock exchange. Thereby, companies whose shares were not traded in the analyzed period are excluded from the sample. Further, we limit our sample to medium and large-sized companies with more than 10 million euros of total assets.⁵ Firms with negative book value are also excluded. The final sample consists of 3,660 firm-year observations, from which 1,736 are included in ex-Yugoslavian and 1,924 in Visegrad sample (Table 1).

Table 1: Sample size and structure by country and group

Country	Stock Exchange	Initial sample	2008	2009	2010	2011	2012	2013	Total
Bosnia and Herzegovina	Sarajevo SE and Banja-Luka SE	72	71	71	71	71	72	71	427
Croatia	Zagreb SE	102	99	100	100	98	98	97	592
North Macedonia	Macedonian SE	13	0	0	0	0	0	0	0
Montenegro	Montenegro SE	20	13	15	18	20	19	1	86
Serbia	Belgrade SE (BGSE)	77	77	76	76	76	77	76	458
Slovenia	Ljubljana SE	30	29	29	29	30	29	27	173
No. of observations		314	289	291	294	295	295	272	1 736
Czech Republic	Prague SE	7	7	7	7	7	7	7	42
Hungary	Budapest SE	16	13	13	15	16	16	16	89
Poland	Warsaw SE	307	216	240	278	307	307	307	1 655

⁵ We opted for 10 million euros of total assets as the minimum threshold. Since the thresholds in analyzed countries differ, we decided to include all large and medium-sized companies that satisfy this condition. Since we measured firm growth by growth of assets (dependent variable), we used assets alone as the criterion for measurement the size of the company. Bearing in mind all of the above mentioned, as well as the fact that only the liquid companies on regulated segments of the capital markets remained in the sample, we consider that the formed sample is representative enough for generalization of conclusions on companies listed on the stock exchange in emerging markets.

Country	Stock Exchange	Initial sample	2008	2009	2010	2011	2012	2013	Total
Slovakia	Bratislava SE	24	21	21	24	24	24	24	138
No. of observations		354	257	281	324	354	354	354	1 924
No. of observations (Total)		668	546	572	618	649	649	626	3 660

Source: The data were obtained from Amadeus database according to previously defined criteria

The focus of the study is on the crisis and post-crisis period and therefore the analyzed period covers six years: 2008-2013. The descriptive statistics of both dependent and explanatory variables are shown in Table 2.

Table 2: Descriptive statistics

TOTAL SAMPLE								
Variables	Min.	Max.	Mean	Median	St. Dev.	Variance	Skewness	Kurtosis
Asset Growth	-3.062	1.000	0.043	0.026	0.220	0.049	-2.654	39.940
Inflation rate (%)	-0.400	12.200	3.490	3.700	2.506	6.228	1.341	5.354
Capital Market Liquidity	0.004	1.572	0.136	0.153	0.152	0.023	4.967	38.641
Financial Leverage	0.001	1.810	0.444	0.435	0.221	0.049	0.278	3.085
Asset Turnover	0.000	11.259	0.864	0.697	0.798	0.636	2.993	21.345
Profit Margin	-1.000	1.000	0.029	0.028	0.241	0.058	-0.826	11.895
Cash Flow to Total Assets	-2.004	1.376	0.056	0.050	0.099	0.010	-4.654	116.038
ex-Yugoslavian sample								
Asset Growth	-3.062	1.000	0.019	0.006	0.180	0.033	-3.431	59.559
Inflation rate (%)	-0.400	12.200	3.888	2.200	3.326	11.063	0.956	2.993
Capital Market Liquidity	0.010	0.175	0.054	0.040	0.041	0.001	1.849	5.892
Financial Leverage	0.001	1.000	0.411	0.393	0.239	0.057	0.329	2.293
Asset Turnover	0.000	7.833	0.648	0.505	0.593	0.351	3.115	23.180
Profit Margin	-1.000	1.000	0.015	0.016	0.240	0.570	-0.567	10.981
Cash Flow to Total Assets	-2.004	1.376	0.051	0.044	0.096	0.009	-5.051	148.747
Visegrad sample								
Asset Growth	-3.162	0.918	0.065	0.056	0.245	0.062	-2.441	31.879
Inflation rate (%)	0.600	6.300	3.131	3.700	1.301	1.692	-0.785	2.563
Capital Market Liquidity	0.004	1.572	0.210	0.179	0.176	0.031	4.901	31.589
Financial Leverage	0.008	1.810	0.474	0.470	0.198	0.039	0.420	4.466
Asset Turnover	0.001	11.259	1.067	0.913	0.905	0.819	2.769	18.828
Profit Margin	-1.000	1.000	0.042	0.039	0.242	0.059	-1.073	12.938
Cash Flow to Total Assets	-1.211	0.625	0.072	0.073	0.108	0.016	-3.910	47.072

Source: Authors' calculations

In order to test interdependence between variables, we calculate correlation matrix over a general sample consisted of ex-YU and Visegrad companies (Table 3) and show that there is no strong correlation between any of investigated variables. The results within ex-YU or V4 sample provide similar results showing lack of correlation between any of two pairs of variables.

Table 3: Correlation matrix of independent variable and six independent variables

Variables	GR	IR	CML	FL	AT	PM	CF
GR	1,000						
IR	0,004	1,000					
CML	0,016	0,036	1,000				
FL	0,000	0,058	0,081	1,000			
AT	-0,162	0,107	0,148	0,263	1,000		
PM	0,039	0,077	0,051	-0,249	0,032	1,000	
CF	-0,219	0,090	0,103	-0,208	0,236	0,526	1,000

Source: Authors' calculations

The established systematization of explanatory variables, including country and company-specific variables, has largely determined the order of topics that will be discussed in this part of the paper. The analysis of the variables belonging to the first group aims to draw attention to the importance of infrastructure prerequisites and macroeconomic policies for the companies' growth in the conditions of crisis, while the insight into the variables of the second group is intended to shed some light on the impact of individual characteristics of companies on their growth. In all the models presented in Table 4 F-test is lower than 0.05, which demonstrates that all coefficients in the model are different from zero.

R-squared and adjusted R-squared show that model explains more than 65% (55%) i.e. 43% (31%) of variance of firm's growth for Visegrad and ex-Yugoslavian sample respectively. The model exhibits almost the same explanatory power in the case of a total sample, respectively 43% (R-squared) and 31% (adjusted R-squared). The difference in explanatory power suggests that variables diversely affect a firm's growth in ex-Yugoslavian and Visegrad countries.

Table 4: Regression model results for three samples: general, ex-Yugoslavain and Visegrad countries

Independent variable	General sample				ex-Yugoslavain countries				Visegrad countries			
	Coeff.	Std. error	t-statistic	p-value	Coeff.	Std. error	t-statistic	p-value	Coeff.	Std. error	t-statistic	p-value
(Constant)	0.88701	0.095	9.37	0.000	1.02108	0.113	9.03	0.000	0.29298	0.061	4.77	0.000
IR	0.00662	0.007	0.98	0.328	0.00107	0.008	0.14	0.889	0.02444	0.007	3.73***	0.000
CML	0.58122	0.192	3.03***	0.002	2.05754	0.464	4.43***	0.000	0.03914	0.063	0.62	0.535
FL	-0.07696	0.190	-0.40	0.686	-0.20827	0.236	-0.88	0.377	0.34831	0.111	3.14***	0.002
AT	-1.15973	0.062	-18.56***	0.000	-1.41900	0.080	-17.64***	0.000	-0.58062	0.032	-17.94***	0.000
PM	0.62448	0.099	6.32***	0.000	1.01057	0.135	7.49***	0.000	-0.07213	0.046	1.57	0.118
CF	-2.32204	0.229	-10.13***	0.000	-3.38222	0.113	9.03***	0.000	0.68955	0.061	4.77***	0.000
Prob> F	0.0000				0.00000				0.0000			
R-squared	0.4380				0.43930				0.6599			
Adjusted R-squared	0.3155				0.31710				0.5581			
Root MSE	0.7085				0.70770				0.1882			

Notes: *** Significance at 1% level, ** significance at 5% level, * significance at 10% level.

Source: Authors' calculations

5. Results and discussions

The results of the analysis indicate that over the observed period inflation (as measured by the median) was slightly higher in the V4 (3.70) than in the ex-YU countries (2.20). In the case of ex-YU countries, the frequency distribution curve is skewed to the right, which means that the mean is sensitive to extreme values that appear at the right end of the curve, while the situation is completely reverse when it comes to the V4 countries. The results of regression analysis show that the impact of inflation on growth is statistically significant at the level of 1% only in the case of the Visegrad Group.

On the other hand, despite a lower median, standard deviation and variance are many times higher in the ex-YU countries compared to the Visegrad Group, which indicates a greater volatility of inflation expectations and increased risk. Due to the unpleasant experience of hyperinflation during the 1990s, price stability has gained particular importance in the ex-YU countries. More pronounced fluctuations in prices increase the uncertainty of national economies making them less attractive to both domestic and foreign investors. Besides, the key policy rates, which were many times higher in the ex-YU countries than in the EU, had an adverse impact on borrowing terms and conditions. The high cost of capital resulted in low levels of return on equity, quite often negative. We believe that the investors' abstinence from making substantial investment under such conditions was one of the reasons why inflation had neutral impact on growth.

A positive correlation between the capital market liquidity and growth exists only in the case of the ex-YU countries. In this regard, we must be aware of the fact that the liquidity of capital markets of the V4 is significantly higher (mean = 21.0%) relative to the ex-YU countries (mean = 5.4%). The capital markets in ex-YU countries have failed to reach a desired level of attractiveness to investors, especially after the first waves of privatization. Insufficient liquidity leads to increased investment risk and higher transaction costs, at the same time providing speculators with the opportunity to achieve greater returns than on liquid markets. Due to extremely expensive banking sources of funding and lack of foreign investment, companies are forced to seek alternative sources of funding. Since our analysis does not cover all companies, but predominately those that are to some extent involved in capital markets, it is realistic to expect that at least some of them raise funds through primary issue of shares and corporate bonds. Therefore, despite the risk aversion of investors, it comes as no surprise to find out that the increase in liquidity contributes to the companies' growth.

Perhaps more surprising is the finding that the liquidity of capital markets does not represent a statistically significant variable of growth in the V4 countries. It seems that this factor is becoming less relevant to the companies' growth in the conditions of an easier access to alternative sources of funding and availability of

additional external sources of funding under more favorable terms. Furthermore, it follows that the investors in more developed capital markets are more cautious in the conditions of crisis than the investors oriented to less developed markets. In the early stage of development, capital market liquidity is of crucial importance. Above a certain point of development capital market liquidity is apparently of lesser importance for the firm's growth.

When it comes to the V4 countries, the analysis has shown a positive correlation between financial leverage and companies' growth. The average level of debt of these countries amounts to around 47%. A positive effect of financial leverage occurs when companies have access to alternative sources of funding and can borrow under favorable terms to finance profitable projects. Consequently, a return that exceeds the costs of debt is distributed to shareholders, net income is increasing, which enhances borrowing capacity and ensures sustainable funding of asset growth. Such trends stimulate the growth of companies.

Regression analysis indicates no statistically significant correlation between financial leverage and growth in the case of ex-YU countries. This is quite unexpected given the fact that these companies are less leveraged (mean = 41.1%, median = 39.3%), giving more room for additional borrowing. Such a result seems surprising only at first glance. A negative effect of financial leverage happened to the great number of companies that constitute this group. Lack of alternative sources of funding and the consequent high interest rates on bank loans, inclusion of a currency clause and considerable changes in foreign exchange rates often significantly reduce net income of companies and push them into the zone of loss. In such circumstances, net income is shrinking, while increasing risk leads to a higher cost of capital. In general, companies that belong to different analyzed groups also have different structures of operating and financial expenses, but the companies from the ex-YU countries are to a much greater extent burdened with financial expenses (Malinić and Milićević, 2013). We think that these trends are the main reason why financial leverage has not been a statistically significant determinant of growth.

Descriptive statistical analysis shows that during both the crisis and the post-crisis period the values of return on assets (profit margin multiplied by asset turnover) were very low, amounting to 4.5% for the V4 and to only 0.98% for the ex-YU countries. As far as profit margin is concerned, a statistically significant positive correlation between profit margin and growth exists only in the case of ex-YU countries. On the other hand, asset turnover is negatively correlated with growth at all sample levels (ex-YU, V4, and total).

From the theoretical point of view, a positive correlation between profit margin and growth is unequivocal (Higgins, 2009: 127–131). Higher profit margins imply higher income, greater availability of internal sources of funding and increasing

borrowing capacity, which generally should have a positive impact on growth. This is even more obvious in the countries with less developed capital markets owing to the fact that in the absence of more attractive external sources of funding companies often have no choice but to rely on internally generated sources and reinvest the largest portion of their income. Since profit margins tend to be rather low in the years of crisis, the growth that can be achieved in this way is modest. On the other hand, the absence of correlation between profit margin and growth in the case of Visegrad Group may be due to substantial dividend payments and greater reliance on external sources of funding.

In the context of this research, it is more interesting to observe changes in asset turnover as a determinant of a company's profitability and growth. Turnover has a multiplier effect on return on assets, which means that an increase in turnover, coupled with stable profit margin, enhances profitability. The results obtained at all level (ex-YU, V4, and total) seem very surprising as they indicate that increased efficiency of asset management has a negative impact on growth. In order to better understand this trend, we should take into account two facts. First, average profit margins in each of analyzed groups of countries are very low; the analyzed sample includes some companies that achieved positive profit margins, but also a considerable number of those with negative profit margins. The potential presence of a negative effect of financial leverage is certainly one of the causes of such performance. Second, the above-mentioned multiplier effect of asset turnover on the rate of return works in both directions. When a rising asset turnover is accompanied by a negative profit margin, the rate of return will decline. Taking all this into account, we conclude that when there are companies with negative profit margins, an increase in asset turnover can trigger a decline in profitability, which in the conditions of scarce favorable external sources of funding and a negative effect of financial leverage will hamper growth. However, this issue needs extended investigation in further research.

Cash flow/Total assets ratio reflects a company's ability to finance growth from internally generated sources, thus, a positive correlation between this variable and growth is expected. This is confirmed only in the case of the companies belonging to the Visegrad Group. However, while interpreting these results it is necessary to bear in mind two facts. First, the research relates to the crisis and post-crisis period, when the real opportunities for growth were limited. Secondly, we have already pointed out that the V4 countries were in a much stronger financial position in the period before the economic crisis in relation to the ex-YU countries, i.e. less vulnerable to external shocks. It is also possible that the companies from different samples, depending on their financial predispositions, allocate cash flow in different ways.

As regards this particular case, we believe that the results that were obtained for the ex-YU countries were mostly due to different structures of cash inflows and

outflows from operating activities. For the purposes of this paper we defined cash flow as the sum of net income and depreciation costs, which is not so unusual practice. But, such an approach leaves out the changes in working capital and short-term liabilities from the cash flow from operating activities. In the conditions of crisis companies that do not have adequate financial strength (which are certainly more numerous in the ex-YU than in the V4 countries), are prone to encounter serious liquidity problems. Illiquidity, as a typical feature of insufficiently developed national economies in the conditions of crisis, leads to difficulties with the collection of receivables, reduction in inventory investment to the amount that is sufficient to maintain the existing activity level, and decrease in advance payments. In a situation like this, companies often unduly delay their payments to suppliers, which is especially common in the countries in which the bankruptcy legislation is not effective (Denčić Mihajlov et al., 2015). In these circumstances, the liquidity is what matters most, while the growth is of secondary importance. Therefore, it may happen that a decline in the cash flow as the sum of net income and depreciation costs is accompanied by a simultaneous increase in the cash flow from operating activities, which could lead us to different findings. The problem is that the increase in accounts payables beyond an acceptable level does not generate cash flow that could be sustained in the long run (Wild et al., 2004). Anyway, there is still room for further research in this field.

The refined economic insights of our study are as follows: first, the key financial determinants of growth in stable business conditions, examined in numerous research studies, can have a different impact on growth in times of crisis. Second, the impact of the same financial determinants of growth can have a different effect on the company growth in different business environments. Third, during crisis periods and the conditions of scarce favorable external sources of funding, investors need to be more cautious, since the asset turnover – profitability relation in combination with negative effect of financial leverage may inhibit firm growth. Fourth, during the crisis period, the capital markets in ex-YU countries became less attractive with higher uncertainty for investors and the increase of cost of capital. Our findings imply that policymakers in these countries should reconsider the key factors that fuel their economy, while firm managers should recognize and select those characteristics that predominantly cause their firm to grow better during crisis periods and under unfavorable macroeconomic conditions. Business managers should strengthen the firm internal finance and asset efficiency, and cautiously manage firm leverage. Policy makers, on the other hand, may pursue to deter a financial crisis and improve the economy by giving priority to capital market development, quality of institutional and political environment. As it is found in the case of V4 group, the importance of capital market liquidity is becoming less relevant to the companies' growth at the *capital markets* that do not face challenges regarding the *availability, diversity, and pricing* of financial instruments.

The evidence provided in this study is relevant to decisions aiming at improving the effectiveness of policy makers on capital market operations as well as management on firm's activity. The main contribution of the paper is applicable to selected Central and East European countries, but is broadly applicable to other developing market contexts. The fact that financial crises repeat (Reinhart and Rogoff, 2009) implies the need for the appropriate responses to them. To be able to better respond to the challenges of financial crisis in the future, we indicate that firms have to identify the significance of the impact of individual determinants of growth and, accordingly, to choose the types of behavior that will ensure greater resistance to the crisis situations and a faster recovery if they occur. The governments should build appropriate monetary policy and encourage capital markets development and greater market diversity, so that the next crisis will not produce harmful consequences on the firm growth and the sustainability of the whole economy.

6. Conclusions

This paper, being focused on the analysis of the impact of particular macro and micro variables on the companies' growth during the crisis and post-crisis period, led us to several conclusions.

Firstly, during the analysed crisis and post-crisis period (2008-2013) some of the very same determinants of growth at the company level and at the economy level may have a different impact on growth depending on the economic features of regional groups to which companies belong. Countries that managed to make more progress in transition, to implement structural reforms in a timely manner, to successfully complete the process of European integration, to develop institutional infrastructure on a sound basis (the Visegrad Group), were better prepared to cope with the crisis than others (the ex-YU countries). The first group turned out to be far more resilient to shocks arising from the crisis and succeeded in adapting more quickly, while the second group, due to its greater vulnerability, suffered more severe consequences of the crisis.

Secondly, there is a close relationship between the quality of business environment and macroeconomic policies on the one hand, and growth, on the other. Given that in the conditions of crisis the key policy rates are kept at low levels, export-oriented economies tend to benefit from moderate and stable inflation. In such circumstances, the competitiveness of both companies and national economies increases which positively affects growth. The findings relating to the Visegrad Group have confirmed this fact. On the other hand, a positive correlation between the liquidity of capital market and growth, found in the case of ex-YU countries, indicates that countries with undeveloped capital markets urgently need alternative sources of funding. In this respect, the creation of favorable business environment requires a clear vision

and strategy for capital market development, especially in the countries in which the banking sector holds a monopoly. In the period of the crisis, the daunting challenge for economic policy-makers is to act in time and to create macroeconomic environment which will energize growth, instead of limiting its prospects.

Thirdly, the availability of alternative sources of finance and lower cost of debt in the V4 countries, on the one hand, and a monopoly position of banking sector, expensive loans, significant changes in foreign exchange rates and the consequent high financial expenses in the ex-YU countries, on the other, clearly demonstrate the effects of borrowing on growth. The monopoly position of banking sector, exerted through expensive loans, jeopardizes the growth of national economies and, due to an unfair distribution of income between creditors and shareholders, discourages new investment and growth. Further, when profit margins are predominately negative (as is often the case in ex-YU countries during the crisis), an increase in asset turnover will lead to a fall in growth owing to the multiplier effect of asset turnover on the rate of return. Finally, a positive correlation between cash flow and growth that is detected at the V4 sample is quite expected. Also, there is no need to worry much about completely different results that were obtained for the ex-YU countries. Assuming that the trend in cash flow from operating activities is diametrically opposite to the trend in the sum of net income and depreciation, the findings would be expected to be different. However, this issue requires further exploration.

In the end, we should also outline some limitations of this research. First, in accordance with the study objectives, the obtained results are presented at the levels of two distinctive groups of countries. The fact that both groups include the countries which differ from one another in many ways, pinpoints the need for additional research in this field. Second, this research, unlike others that have focused exclusively on companies that constitute stock indices, has enabled us to increase sample and achieve a higher level of generalization of findings. However, we should bear in mind that the assets of companies that make up stock indices are the most liquid, particularly in less developed markets, which would potentially raise the quality of the analysis, but the possibility of generalization of findings would be reduced. Third, the explanatory variables at the company level are based on the information from financial statements, which are subject to manipulation and need additional caution. However, we are inclined to believe that, despite inherent risks, the quality of reporting in the companies that actively participate in capital markets are higher relative to other companies.

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Preispitivanje determinanti rasta poduzeća tijekom kriznih perioda

Dejan Malinić¹, Ksenija Denčić-Mihajlov², Konrad Grabiński³**Sažetak**

Nedavna financijska kriza je istakla potrebu razmatranja zašto su neke firme i ekonomije ugroženije, dok su druge otpornije na krizu i kako različite financijske karakteristike poduzeća mogu utjecati na rast firmi. S ciljem empirijskog istraživanja ovih pitanja, analizirali smo determinante korporativnog rasta tijekom kriznog i post-kriznog perioda (2008-2013) na uzorku od 10 zemalja srednje i istočne Europe koje pripadaju dvjema različitim regionalnim grupama – “Višegradska četvorka” i grupi zemalja bivše Jugoslavije. Naša analiza obuhvaća uzorak od 3,660 opservacija. Rast poduzeća razmatran je kao funkcija dvije makro varijable (inflacija i likvidnost tržišta kapitala) i četiri varijable povezane s karakteristikama poduzeća (financijska poluga, obrt imovine, profitna marža i odnos između novčanog toka i imovine). Istraživanje ukazuje na značaj infrastrukturnih preduvjeta i makroekonomske politike za rast poduzeća u kriznim uvjetima poslovanja. Naši rezultati također ističu specifičan odnos između financijske poluge i rasta tijekom kriznog perioda, pri čemu se utjecaj financijske poluge analizira kao sveobuhvatan rezultat stupnja zaduženosti poduzeća, nivoa razvoja tržišta kapitala, položaja bankarskog sektora i cijene duga. Konačno, naši rezultati ukazuju na intrigantnu prirodu veze između profitabilnosti i rasta, kao i između efikasnosti upravljanja imovinom i rasta poduzeća u kriznim periodima.

Gljučne riječi: rast poduzeća, kriza, tržište kapitala, makro varijalbe, varijable povezane s karakteristikama poduzeća

JEL klasifikacija: G30, N20, M20, P30

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