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Abstract

Estimating an error-correction model and an Euler-equation specification, we found that corporate investments in Slovenian firms have been significantly affected by the financial constraints during the period of economic crisis that hit the economy in 2009. The effect of financial constraints intensified in 2009 and slightly alleviated in 2010, however being still significantly more intense than in 2008. The results indicate that financial constraints have a significant effect in the firms with high, as well as low leverage. However, the firms operating with above-average leverage have more severe difficulties in closing the gap between desired and actual stock of capital.

Keywords: investment decisions, financial constraints, error-correction model, Euler-equation specification

JEL classification: G31, G01

1. Introduction

There is an ongoing debate in Slovenia whether banks provide sufficient liquidity to the corporate sector and whether the banks impede economic recovery. The banks argue that on average Slovenian firms are overlevered, however, that the firms with good credit rating can still obtain credit. It is true that Slovenian firms are significantly more levered compared to the EU counterparts. Bank of Slovenia (2012) reports that the D/E ratio of the Slovenian corporate sector amounted to 1,43 in 2011, while the average D/E ratio in the euro area hardly exceeds 1. Leverage of the Slovenian firms has increased enormously in the period after 2006, since Črnigoj and Mramor (2009) still report relatively low leverage of the Slovenian corporate sector in 2006. And, it is true that the bank financing plunged in 2009. Bank of Slovenia (2012) reports that the increase of credit obtained by banks dropped from 3.438 million EUR in 2008 to only 216 million EUR in 2009 and only 139 million EUR in 2010. What is more, there was a negative flow of the bank credit to the corporate sector in 2011. Being aware of the significant drop of corporate investment, Institute of macroeconomic analysis and development (IMAD, 2012 and IMAD, 2011) reports that corporate investments dropped by 21,6 % in 2009 and further by 6,7 % and 10,7 % in 2010 and 2011, respectively, we address the question by investigating the effect of financial constraints on corporate investments.

Assuming a perfect capital market, in which a firm can raise as much finance as it desires and internal and external funds are perfect substitutes, the firm's investment decisions are not related to its financial decisions (Modigliani and Miller, 1958). However, as argued by Fazzari et al. (1988), the separability between the investment and the financial decisions no longer holds if the capital market is not perfect and firms cannot raise as much finance as desire and internal and external funds are not perfect substitutes. Investment decisions in this case depend on the financial factors such as availability of the internal finance and access to new finance. For example, having in mind pecking order hypothesis (Myers, 1984), a firm with internal funds available may have a cost advantage and would decide to invest at lower expected rate of return. On the other hand, a firm without internal funds available would have to use costlier external finance and would decide to invest only at relatively higher expected rate of return. If the cost disadvantage of external finance is large or in the extreme case in which external finance are not available, firm's investments fluctuate with the availability of the internal finance.

Most of the empirical evidence show that financing constraints significantly affect corporate investments. Bond at al. (2003) tested the effect of financial factors in Belgium, France, Germany and the UK and found significant effects in all the countries. They documented statistically and quantitatively more significant results for the UK, suggesting that financial constraints on investments may be relatively more severe in the more market-oriented UK financial system than in the continental European countries that tend to be bank-based. Similar findings were obtained by Hall et al. (1999) who had tested if cash flow affects investments and R&D in French, Japanese, and the US high-tech firms. They report significant effect in all the countries and higher sensitivity of investments and R&D in the US that can be as the UK characterized by the market-based financial system. Significant effects were also found in the Canadian firms. (Schaller, 1993).

Because financial systems tend to be characterized by severe market frictions in emerging markets, one would expect financial constraints to play even more important role here. Empirical evidence documented significant financial constraints in European transition countries, Turkey, Russia, India, China, Taiwan and Brazil (Arslan et al., 2006; Budina et al., 2000; Chow and Fung, 1998; Kalatzis, 2008; Mickiewicz et al., 2004; Perotti and Gelfer, 2001; Perottti and Vesnaver, 2004; Poncet et al. 2010; Rizov 2004; Saeed and Vincent, 2012; Tseng, 2012). However, lower cash flow sensitivity for some of the firms in these countries does not always imply lower financial constraints or the absence of financial constraints but often the persistence of soft budget constraints. Hutchinson and Xavier (2006) compared the role of internal finance on the growth of firms in a transition country (Slovenia) and an established market economy (Belgium). They found that firms in the transition country are more sensitive to financing constraints than their counterparts from established market economy. They pointed out at de novo firms, micro firms and SMES as the firms that face great difficulties in accessing external sources of finance, in contrast to foreign firms that are able to raise external finance. Their findings appear to indicate that although Slovenian firms are no longer recipients of soft budget constraints; the financial environment is not yet fully functional.

In other to test the effect of financial constraints on corporate investments, we constructed a panel data set that covers Slovenian firms in the period 2006-10. The panel combine accounting data provided by The Agency of the Republic of Slovenia for Public Legal Records and Related Services and data from the Survey on gross investments (INV-1) conducted by the Statistical office of the Republic of Slovenia. In order to determine the effect of financial constraints on corporate investments, we estimated an error-correction model. The Error-correction model is a reduced model, in which in contrast to structural models, such as the Q model or the Euler-equation specification, long-run formulation for the level of the capital stock is specified to be consistent with a simple model of the firm's demand for capital, but in which the short-run investment dynamics are found from as empirical specification search, rather than being imposed a priori. As a robustness check, we estimate also an Euler-equation specification. We found that Slovenian corporate investments were significantly affected by financial constraints in the period of current financial crisis. The effect of financial constraints intensified in 2009 and slightly alleviated in 2010, however being still significantly more intense than in 2008. The results indicate that financial constraints have a significant effect in the firms with leverage above, as well as below median leverage, however corporate investments being more severely affected in the firms that operate with above average leverage. The firms operating with above-average leverage have more severe difficulties in closing the gap between desired and actual stock of capital.

The paper is structured as follows. In section 2 we present theoretical framework and the empirical models. In section 3 we analyze the data. In section 3 we present the result and in section 4 we make concluding remarks.

2. Theoretical framework and the empirical models

Empirical tests of corporate investment decisions, as well as the effects of financial constraints on corporate investments, build on the dynamic factor demand models; structural and reduced form models. Structural models that include the Q model, the Abel and Blanchard model and the Euler-equation specification, have not been very successful in characterizing the adjustment process. Since firm's capital cannot be adjusted costlessly and immediately and thus we cannot resort to static models, econometricians proposed to rely on dynamic specification that is not explicitly derived as optimal adjustment behavior for some particular structure of adjustment costs. As argued by Bond and Van Reenen (2007), a favorable interpretation of the reduced form models, such as the accelerator model and the error-correction model, is that they represent an empirical approximation to some complex underlying process that generate the data. However, they compound the parameters of the adjustment process with the parameters of the expectations-formation process and can be subject to Lucas (1976) critique. Our empirical tests rely on the error-correction model, while we estimate an Euler-equation specification as a robustness check.

2.1. Error-correction model

The error-correction model was introduced to the investment literature by Bean (1981), while it was first used in the context of firm-level data by Bond et al. (2003). The idea of the model is to nest a long-run specification for the firm's demand for capital within the regression model that allows a flexible specification for short-run investment dynamics to be estimated from the data.

Being aware that firms have some desired capital stock, we can expect a firm to invest in order decrease the gap between its actual and desired capital stock. The desired capital stock of the firm (k_{it}) can be written as a log linear function of its output (y_{it}) and its cost of capital (j_{it}):

$$k_{it} = \alpha_i + y_{it} - \sigma j_{it} \quad (1)$$

Under the assumption of no adjustment costs, the firm would adjust the actual capital stock to the desired capital stock immediately. In the presence of the adjustment costs the firm does not adjust immediately to its target. Allowing the adjustment process to be determined by the data, we nest equation (1) within the autoregressive-distributed lag (ADL) specification. Implicitly we assume that the firm's desired capital stock in the presence of the adjustment costs is proportional to its desired capital stock in the absence of the adjustment costs and that the short-term dynamics are stable enough to be well approximated by distributed lags in the regression model.

Assuming ADL specification with first and second order dynamics, the model can be written as:

$$k_{it} = \alpha_1 k_{i,t-1} + \alpha_2 k_{i,t-2} + \beta_0 y_{it} + \beta_1 y_{i,t-1} + \beta_2 y_{i,t-2} + d_t + \mu_i + \vartheta_{it} \qquad (2)$$ [1]

where d_t is a time dummy and μ_i is an unobserved firm-specific effect and ϑ_i is an error term.

Imposing the long-run elasticity restriction that requires $(\beta_0 + \beta_1 + \beta_2) / (1 - \alpha_1 - \alpha_1) = 1$ and reparameterizing the ADL model in error-correction form, we get:

$$\Delta k_{it} = (\alpha_1 - 1)\Delta k_{i,t-1} + \alpha_2 + \beta_0 \Delta y_{it} + (\beta_0 + \beta_1)\Delta y_{i,t-1} - \\ -(1 - \alpha_1 - \alpha_2)\left(k_{i,t-2} - y_{i,t-2}\right) + +d_t + \mu_i + \vartheta_{it} \qquad (3)$$

To obtain the specification for the investment rate, we approximated $\Delta k_{it} \approx I_{it}/K_{i,t-1} - \delta_i$, in which I_{it} denotes gross investment, K_{it} denotes the capital stock and δ_i denotes firm-specific depreciation rate. To investigate the effects of financial constraints on corporate investments, we include in addition current and lagged value of the firm's cash flow (normalized by $K_{i,t-1}$). The model we estimate has the form:

$$\frac{I_{it}}{K_{i,t-1}} = \rho \frac{I_{i,t-1}}{K_{i,t-2}} + \gamma_0 \Delta y_{it} + \gamma_1 \Delta y_{i,t-1} + \emptyset\left(k_{i,t-2} - y_{i,t-2}\right) + \\ +\pi_0 \frac{CF_{it}}{K_{i,t-1}} + \pi_1 \frac{CF_{i,t-1}}{K_{i,t-2}} + d_t + \mu_i + \vartheta_{it} \qquad (4)$$

The model requires $\Phi < 0$ in order the model is consistent with error-correcting behavior, implying that capital stock below desired level is associated with positive future investments, and vice versa.

2.2. Euler-equation specification

The Euler-equation specification was introduced in the investment literature by Abel (1980), however the specification we consider in this paper is based on Bond and Meghir (1994). In contrast to the error-correction model, the Euler-equation specification is based on explicit theoretical generalization of first-order condition to the case of strictly convex costs of adjustment. This particular specification describes the relation between investment rates in successive periods, derived from dynamic optimization in the presence of symmetric, quadratic adjustment costs.

In the derivation we consider a firm with the net present value at the start of the period in the absence of taxes being equal to:

[1] Variation in the firm's user cost of capital is controlled for by including time-specific and firm-specific effects.

$$V_{i,t}(K_{i,t-1}) = \max_{L_{it},I_{it}}\{\Pi(K_{it}, L_{it}, I_{it}) + \beta^t_{i,t+1}E_{it}[V_{i,t+1}(K_{it})]\} \quad (5)$$

in which $\Pi(\cdot)$ is the net revenue function (L_{it} represens costlessly adjustable factors). The firm invests at the beginning of the period and is immediately productive, but the firm faces strictly convex adjustment costs. The capital stock evolves according to the equation $K_{it} = (1-\delta)K_{i,t-1} + I_{it}$.The expectations operator $E_{it}(\cdot)$ is conditional on information available at the beginning of the period and expectations are taken over future interest rates, input and output prices and technologies.

The Euler equation characterizing the optimal path of investments can be written as:

$$\lambda_{it} = (1-\delta)\left(\frac{\partial\Pi}{\partial K}\right)_{it} + (1-\delta)\beta^t_{i,t+1}E_t[\lambda_{i,t+1}] \quad (6)$$

In which $\lambda_{it} = \partial V_{it}/\partial K_{i,t-1}$ is the shadow value of capital. From the first-order condition for investments we can obtain:

$$(1-\delta)\left(\frac{\partial\Pi}{\partial I}\right)_{it} + \lambda_{it} = 0 \quad (7)$$

Combining (6) and (7), we can write the Euler equation in terms of observables as:

$$-(1-\delta)\beta^t_{i,t+1}E_{it}\left[\left(\frac{\partial\Pi}{\partial I}\right)_{i,t+1}\right] = -\left(\frac{\partial\Pi}{\partial I}\right)_{it} - \left(\frac{\partial\Pi}{\partial K}\right)_{it} \quad (8)$$

Assuming that the capital market is not perfect and internal and external funds are not perfect substitutes, Euler equation characterizing the optimal path for investments can be written as:

$$-(1-\delta)\beta^t_{i,t+1}E_t\left[(\gamma_{i,t+1} + \lambda^D_{i,t+1})\left(\frac{\partial\Pi}{\partial I}\right)_{i,t+1}\right] = -(\gamma_{it} + \lambda^D_{it})\left(\frac{\partial\Pi}{\partial I}\right)_{it} - (\gamma_{it} + \lambda^D_{it})\left(\frac{\partial\Pi}{\partial K}\right)_{it} - -\vartheta_t\left(\frac{B^2_{it}}{p^I_{it}K^2_{it}}\right) \quad (9)$$

in which B_{it} denotes the firm’s debt and ϑ_{it} characterizes the optimal debt policy.

We obtain the empirical model by assuming the following net revenue function:

$$\Pi_{it}V_{it}\big(K_{i,t-1}\big) = p_{it}F(K_{it}, L_{it}) - p_{it}G(I_{it}, L_{it}) - w_{it}L_{it} - p_{it}^{I}I_{it} \qquad (10)$$

where p_{it} is the price of the firm's output, $G(I_{it}, L_{it}) = \frac{1}{2}bK_{it}[(I/K)_{it} - c]^2$ is a symmetric adjustment-cost function which is linearly homogenous in investments and capital, w_{it} is the vector of prices for the variable inputs and p_{it}^{I} is the price of investment goods. Besides, we replace unobserved expectations with realized values. The resulting empirical model can be written as:

$$\left(\frac{I}{K}\right)_{i,t+1} = \beta_1\left(\frac{I}{K}\right)_{it} - \beta_2\left(\frac{I}{K}\right)_{it}^2 - \beta_3\left(\frac{CF}{K}\right)_{it} + \beta_4\left(\frac{Y}{K}\right)_{it} - \beta_5\left(\frac{B}{K}\right)_{it}^2 + d_t + \mu_i + \vartheta_{it} \qquad (11)$$ [2]

β_1 is expected to be positive and greater than one, β_2 is expected to be negative and greater than one. β_3 is expected to take negative value under Modigliani-Miller irrelevance theorem, while it is expected to take positive value if investment and financial decisions are related. The value of the coefficient depends on the magnitude of adjustment costs. The output term (Y/K) that controls for imperfect competition is expected to drop out under perfect competition and to take positive value if there is imperfect competition. The debt term $(B/K)^2$ that controls for non-separability between investment and financial decision is expected to drop out and to take positive values if investment and financial decisions are related.

3. Data

We constructed a panel data set that covers Slovenian firms in the period 2006-10. The panel combine accounting data provided by the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES) and data from the Survey on corporate gross investments (INV-1) conducting yearly by the Statistical office of the Republic of Slovenia. AJPES database includes income statements and balance sheets of all Slovenian firms, while INV-1 that include data about corporate investments and financing resources used to fund the investments covers the firms with more than 10 employees.

Combining the data from AJPES and INV-1 and calculating the variables of interests, we end up with a panel that consists of 14.304 firm-year observations. Table 1 in the appendix shows descriptive statistics of the panel. The firms in the panel generated on average 17 million EUR of sales, 1 million EUR of EBIT and 300 thousands EUR of net income yearly. The firms had 19 million EUR of assets and employed 120 employees. The median values of the corresponding variables that are on average more than 50 % smaller suggest that the size distribution is highly skewed.

[2] Variation in the firm's user cost of capital is controlled for by including time-specific and firm-specific effects.

The variables we use in our models are investments, output, cash flow, debt and stock of capital. Investments are obtained from INV-1, while other variables from AJPES. We consider investments in property, plants and equipment, as well as intangible assets. We try also to measure investments only by taking into account investments in tangible assets, but the results remains roughly the same. We approximated output by the firm's sales. We calculated the measure of cash flow by adding back depreciation to the reported net income. Debt takes into account long-term and short-term debt. The stock of capital is approximated by the book value of property, plants and equipment, and intangible assets or only book value of tangible assets, depending on what is considered to represent the investments. We control for industry specific effects and time effects by including industry and time dummies.

In table 2, we present the means and standard deviations of the variables in our models. The investment rate (I_t/K_{t-1}) amounted to almost 0,5 in 2006 but dropped slightly below 0,4 in 2007 and 2008 and as low as 0,27 and 0,25 in year 2009 and 2010. A somewhat similar trend can be observed when analyzing the growth rate of sales (Δy_t) and cash flow rates (CF_t/K_{t-1}). The growth rate of sales (Δy_t) decreased from 0,17 in 2007 to as low as -0,10 in 2009 when the crisis most severely hit the economy, but picked up again in 2010 when it reached 0,07. The cash flow rates (CF_t/K_{t-1}) decrease from the level of almost 0,7 in 2007 to slightly below 0,5 in 2009 and 2010. Other variables that are not included in the error-correction model and enter the Euler-equation specification are the sales/capital ratio (Y_{t-1}/K_{t-1}) and the debt term ($(B_{t-1}/K_{t-1})^2$). The sales/capital ratio (Y_{t-1}/K_{t-1}) was increasing until 2009 and dropped in 2010, while the debt term ($(B_{t-1}/K_{t-1})^2$) is increasing throughout the whole period.

4. Results

In table 3, we report the regression results for the error-correction model outlined in equation (4). The model was estimated using GMM method, the instruments used include lagged values of RHS variables ($t - 1$ and $t - 2$). GMM controls for biases due to unobserved firm-specific effect, as well as endogenous explanatory variables. GMM eliminates the firm-specific effects by differencing the equations, and then uses lagged values of endogenous variables as instruments. If the error term (v_{it}) in levels is serially uncorrelated, then the error term in first differences is MA(1), and instruments dated $t - 2$ and earlier should be valid in the differenced equations and thus consistent estimates can be obtained. We test the validity of the instruments used by reporting Sargan test of the overidentifying restrictions.

The results in table 3 show significant effects of financial constraints on corporate investment. In specification (1) and specification (2) the model is tested on the whole sample, the former considers investments in property, plants and equipment, as well as intangible assets, while the latter only investments in tangible assets. Coefficients on current cash flow rate (CF_t/K_{t-1}) and lagged cash flow rate (CF_{t-1}/K_{t-2}) are highly significant and amount to 0,24 and 0,83 in specification (1) and only slightly lower in specification (2). To assess the dynamics of the financial constraints effect we use two interactive terms that were obtained by multiplying cash flow rates and time dummies ($CF_t/K_{t-1} * d\_2009$, $CF_t/K_{t-1} * d\_2010$, $CF_{t-1}/K_{t-2} * d\_2009$, $CF_{t-1}/K_{t-2} * d\_2010$). The coefficients on these interactive terms suggest that the effect of financial constraints intensified in 2009 and slightly alleviated in 2010, however being still significantly more intense than in 2008.

To investigate the difference in the effect of financial constraints in financially unconstrained and financially constrained firms, we first had to identify the firms that face financial constraints. The criteria used in the literature are dividend payout behavior and the leverage of the firms (Fazzari et al.,1988); Bond and Meghir, 1994). Because Slovenian firms have been highly indebted, moreover banks mention overleverage as a main argument to deny credit, we used the firm's leverage as a sample splitting criteria. We identified financially constrained firms if the firm's leverage exceeds median leverage, while the firms with leverage bellow median leverage were regarded as financially unconstrained.

In (3) and (4), we test the model on subsamples of financially unconstrained firms and financially constrained firms, respectively. The coefficient of on current cash flow rate (CF_t/K_{t-1}) in financially constrained firms amounts to 0,12, while it amounts to 0,51 in financially constrained firms. The relation between the values of the coefficients on lagged cash flow rate (CF_{t-1}/K_{t-2}) is right the opposite, taking higher value in financially unconstrained firms. Specification (5) is aimed to evaluate the significance of the difference of the effect of financial constraints, thus being again estimated on the whole sample and including financially unconstrained and financially constrained firms but including two interactive term that were obtained by multiplying cash flow rates and dummy for financially constrained firms. ($CF_t/K_{t-1} * d\_FC$, $CF_{t-1}/K_{t-2} * d\_FC$). The estimated coefficients on these terms confirmed significant difference in the effect of financial constraints in financially unconstrained and financially constrained firms.

Coefficients on error-correction term $(k_{t-2} – y_{t-2})$ is correctly signed indicating that firms on average close 18 % of the gap between desired and actual capital stock per year (see specification (1) and specification (2)). The dynamics of closing the gap in financially unconstrained firms (see (3)) is compared to average twice as fast, since these firms close 36 % of gap yearly. The coefficient on error-correction term $(k_{t-2} – y_{t-2})$ in financial constrained firms (see (4)) is very low, however not significant, suggesting these firms have difficulties to close the gap.

Sargan test of the overidentifying restrictions rejects the null hypothesis of valid overidentifying restrictions. Only Sargan test for the model tested on sub sample may indicate possible bias in our results.

In table 4, we present the results of the Euler-equation specification. In line with the results obtained with the error-correction model we observe significant effect of financial constraints on corporate investments, the coefficient on cash flow rate (CF_{t-1}/K_{t-1}) is positive and significant in both specifications. In specification (1) we consider investments in property, plants and equipment, as well as intangible assets, while in specification (2) only investments in tangible assets. Negative coefficient on debt term ($(B_{t-1}/K_{t-1})^2$) also rejects the hypothesis of separability between investment and financial decision and suggests that financial decisions are not irrelevant for investments decisions. Sargan test reject the null hypothesis that instruments used to estimate the model are valid, indicating possible biases in our results.

5. Conclusions

In other to assess the effect of financial constraints on the corporate investments, we constructed a panel data set that covers Slovenian firms in the period 2006-10. Estimating an error-correction model and an Euler-equation specification, we found that corporate investments in Slovenian firms have been significantly affected by financial constraints during the period of economic crisis that hit the economy in 2009. The effect of financial constraints intensified in 2009 and slightly alleviated in 2010, however being still significantly more intense than in 2008.

The results indicate that financial constraints have significant effect in the firms with leverage above, as well as below median leverage, however corporate investments being more severely affected in the firms that operate with above average leverage. However, the firms operating with above-average leverage have more severe difficulties in closing the gap between desired and actual stock of capital.

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Appendix

Table 1: Descriptive statistics

The table present descriptive statistics of the panel (mean, median and standard deviations). Leverage ratio is calculated as the ratio of short and long term debt to total assets.

	2006	2007	2008	2009	2010	Sum
Sales	16.536.793	17.133.344	17.243.008	15.932.880	17.198.090	16.821.673
	4.236.386	4.307.632	4.510.836	4.086.970	4.310.009	4.290.371
	68.903.579	72.258.470	77.846.868	70.738.415	77.625.621	73.650.515
EBIT	967.356	1.006.010	1.005.741	948.362	982.149	982.795
	189.768	209.176	212.019	179.232	168.484	192.885
	5.025.026	4.872.768	5.465.442	5.409.774	5.438.082	5.249.126
Net income	663.497	736.067	310.608	208.633	184.043	420.911
	82.636	87.992	62.655	41.570	40.919	61.998
	4.603.579	4.935.485	6.585.176	5.158.676	6.611.109	5.664.518
ROA	0,03363	0,05599	0,04159	0,01203	0,01464	0,03212
	0,04116	0,04850	0,04255	0,02707	0,02759	0,03684
	0,49317	0,26035	0,21578	0,28084	0,28888	0,31911
Assets	17.552.010	18.360.894	19.678.509	20.570.276	19.752.086	19.192.749
	3.646.434	3.617.642	3.753.338	3.841.653	3.727.497	3.719.408
	73.906.018	85.206.944	95.718.859	99.458.114	94.709.042	90.411717
Leverage	0,22818	0,23883	0,27115	0,32192	0,28410	0,26875
	0,18476	0,19330	0,23368	0,24814	0,24334	0,21824
	0,22685	0,25133	0,26884	2,27685	0,38050	1,03963
Employees	127,60810	122,10660	115,57220	112,12850	111,04930	117,66320
	47,50000	45,05000	44,32000	44,16500	43,25000	44,89000
	401,84350	387,34100	374,04220	348,12920	356,12250	374,06850
N	2.740	2.966	3.158	2.824	2.751	14.439

Table 2: Means and standard deviations of the variables in the models

The table present the means and standard deviations of the variables used in the models and number of firms/observations in the studied period.

	2006	2007	2008	2009	2010	Sum
I_t / K_{t-1}	0,477	0,382	0,395	0,270	0,250	0,355
	5,084	1,245	1,335	1,844	1,055	2,543
Δy_t	0,143	0,173	0,122	-0,103	0,072	0,082
	0,285	0,304	0,298	0,299	0,284	0,310
$(k_{t-2} - y_{t-2})$		-1,308	-1,386	-1,440	-1,408	-1,387
		1,245	1,245	1,268	1,299	1,265
CF_t / K_{t-1}	0,598	0,690	0,650	0,548	0,539	0,606
	1,248	1,381	1,298	1,051	0,974	1,204
I_t/K_t	0,257	0,230	0,236	0,171	0,167	0,213
	1,090	0,292	0,527	0,409	0,444	0,611
$(I_{t-1}/K_{t-1})^2$		1,412	0,205	0,140	0,208	0,470
		48,925	3,290	1,078	4,808	23,799
CF_{t-1}/K_{t-1}		0,533	0,611	0,592	0,565	0,577
		1,171	1,644	1,422	1,151	1,369
Y_{t-1}/K_{t-1}		10,486	10,503	11,360	10,056	10,605
		25,540	23,247	28,109	23,720	25,212
$(B_{t-1}/K_{t-1})^2$		0,485	5,074	6,416	6,877	4,801
		4,851	29,641	32,993	38,425	29,820
N	2.685	2.901	3.089	2.840	2.789	14.304

Table 3: Error-correction model

*The table presents regression results for the error-correction model (regression coefficients, statistical significance of the coefficients where * denotes significance at 0,1 probability level, ** significance at 0,05 probability level and *** significance at 0,01 probability level). Besides, Sargan test for overidentifiying restrictions and corresponding p-value is reported.*

	(1)	(2)	(3)	(4)	(5)
I_{t-1} / K_{t-2}	–0,002147	–0,004062	–0,005173	0,030266*	–0,004131
Δy_t	0,103195*	0,158099**	0,115182	0,104699	0,136726**
Δy_{t-1}	0,153654***	0,200457***	0,312434***	0,006793	0,211363***
$k_{t-2} - y_{t-2}$	–0,180577***	–0,175136***	–0,355555***	–0,028269	–0,240497***
CF_t / K_{t-1}	0,238424***	0,267281***	0,116054***	0,505852***	0,202057***
CF_{t-1} / K_{t-2}	0,082708***	0,062252***	0,095945***	0,054760*	0,140977***
$CF_t / K_{t-1} \cdot d\_2009$	0,314135***	0,174889***	0,403314***	–0,090449	–
$CF_t / K_{t-1} \cdot d\_2010$	0,187032***	0,165983***	0,151571**	0,314147***	–
$CF_{t-1} / K_{t-2} \cdot d\_2009$	–0,012688	–0,023748	–0,009884	–0,079500*	–
$CF_{t-1} / K_{t-2} \cdot d\_2010$	0,148998**	0,093100	0,175213**	–0,151288	–
$CF_t / K_{t-1} \cdot d\_FC$	–	–	–	–	0,348809***
$CF_{t-1} / K_{t-2} \cdot d\_FC$	–	–	–	–	–0,200478***
Observations	6.456	6.455	3.232	3.224	6.456
Firms	2.683	2.682	1.517	1.568	2.683
Sargan test	3,6665	8,1632	1,3972	13,448	5,0753
p–value	0,5984	0,1475	0,9246	0,0195	0,4068

Table 4: Euler-equation specification

*The table presents regression results for the Euler-equation specification (regression coefficients, statistical significance of the coefficients where * denotes significance at 0,1 probability level, ** significance at 0,05 probability level and *** significance at 0,01 probability level). Besides, Sargan test for overidentifiying restrictions and corresponding p-value is reported.*

	(1)	(2)
I_{t-1} / K_{t-1}	0,371978***	0,242506***
$(I_{t-1} / K_{t-1})^2$	–0,019935***	–0,000730***
CF_{t-1} / K_{t-1}	0,028202***	0,027596***
Y_{t-1} / K_{t-1}	0,002645***	0,002464***
$(B_{t-1} / K_{t-1})^2$	–0,000140	–0,000507**
Observations	6.563	6.562
Firms	2.725	2.725
Sargan test	39,040	20,839
p–value	0,0000	0,0009

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