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Citation: Mykhayliv D and Zauner KG (2016) The Impact of Ownership on Companies' Investment Rates Using Present and Past Values of Profitability. Working Paper. The Authors.

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The Impact of Ownership on Companies' Investment Rates Modelled Using Present and Past Values of Profitability*

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August 29, 2016

We would like to thank the Editor and two anonymous referees for their very valuable comments that improved the paper significantly. We are also grateful to Anton Andrianov and to Dragon Capital for permission to use their data.

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Abstract

We empirically analyze the impact of different ownership groups on companies' investment rates in Ukraine allowing investment rates to depend on present and past market-to-book values of equity. We relate the impact to the presence of soft and hard budget constraints, to the free cash flow and the cash constraint hypothesis and discuss over- and under-investment. Several robustness checks, in particular, the potential endogeneity of ownership variables are considered.

Keywords: Investment, Ownership, Corporate Governance, Investment, Financial Constraints, Soft Budget Constraints.

1. Introduction

Analyzing the determinants of the performance of firms including firms' investment has been an important topic in the economic literature for decades. In the context of economies that are in transition from economic structures monopolized by the state to Western-style market economies (Megginson and Netter (2001)), the analysis of the determinants of the growth of fixed assets of firms is even more important for smoothing this transition. The Central and Eastern European economies witnessed large privatization efforts to move the economies away from state ownership and closer to market economies, initially transitioning into structures of varying forms of insider ownership (see Roland (2000)). One important underlying notion of these processes has been that ownership impacts on firms' performance and investment. Recent research in corporate finance and governance provides evidence that agency and informational issues render the ownership structure of the firm relevant for the performance of firms (for example, Lemmon and Lins (2003) and Demsetz and Villalonga (2001)).

Recent studies on companies' investment rates in Eastern European economies (for example, Lizal and Svejnar (2002), Perotti and Vesnaver (2004), Mykhayliv and Zauner (2013)) provide evidence for the explanatory power of different ownership groups and corporate governance variables. The main reasons for the relevance of the ownership structure for investment seem to be the role of soft and hard budget constraints and the varying degree of the magnitude of private benefits of control (Mykhayliv and Zauner ((2013), (2015)) of the different ownership groups.

Here, in contrast to the literature, we analyze investment rates using a dynamic Tobin's Q model where companies' investment rates are allowed to depend on the present and past market-to-book value of equity, the proxy for Tobin's Q. The interpretation for this is that companies' managers may base their investment decisions not just on expected future growth rates or profitability, but also on historical values thereof.

We allow for this more general investment model as it is typically the case, in particular, in Central and Eastern European transitional economies, that the market-to-book value has no explanatory power in investment regressions.

In the context of companies in transitional economies, the relationship between state ownership and companies' performance is of particular interest (Megginson and Netter (2001)). An important factor in explaining companies' investment rates of state owned companies is the concept of soft budget constraints (Kornai (1979), Kornai (1980), Kornai, Maskin and Roland (2003)), that is, activities that allow companies to neglect financial discipline. Even though there is ample evidence for the presence of soft budget constraints, the empirical link between companies' performance (Djankov and Murrell (2002), Estrin and Rosevear (1999, 1999a), Grygorenko and Lutz (2007)) or investment (Lizal and Svejnar (2002) and Perotti and Vesnaver (2004)) and state ownership is surprisingly weak in Central and Eastern European countries. An important hypothesis is therefore whether the state ownership is negatively related to companies' investment rates.

There are two more important factors that weigh on investment rates and the performance of companies in transition countries. The second factor is related to actions that reduce the value of the company in order to improve the private welfare of some individuals or groups who are able to exert control over the company against the welfare of shareholders. These actions are commonly labelled tunnelling ((Johnson, La Porta, Lopez-de-Silvanes and Shleifer (2000)), asset stripping (Campos and Giovannoni (2006), Ochoa et al. (2015)) or, in a less pronounced form, private benefits of control ((Grossman and Hart (1988), Mykhayliv and Zauner (2013)).

The third factor is related to financial imperfections in the form of hard budget constraints or financial constraints (Fazzari, Hubbard and Petersen (1988), see also Barran and Peeters (1998), Bassetto and Kalatzis (2011), Wet (2004)). Under perfect capital markets with no taxes and the assumption that the individual investor faces the same borrowing rate as firms, the capital structure of a company is irrelevant (Modigliani and Miller (1958)) and it does not matter whether internal or external funds are used to finance investment. However, as it is well known that external funds are typically more costly than internal funds due agency and informational issues.

Given these three and other factors, ownership plays an important role in the performance and investment behaviour of companies, particularly where ownership and control functions are separated (Fama and Jensen (1983), Belkhir et al. (2014)). This paper tries to analyze the impact of different ownership groups (state, insider or management, non-domestic, finance, and financial and industrial groups (FIG)) on investment rates. We also

investigate the impact of the existence of a significant minority with the ability to block major decisions within the company on investment rates. We also try to gauge the effect of the three different factors detailed above in explaining investment rates.

The question also arises whether firm's investment is at an optimum level or whether there is too much or too little investment (over-investment or under-investment) that erodes shareholder value. The firm's ownership structure via the indicated factors plays an important role in determining over- and under-investment.

There are two theories that to a large degree explain companies' investment rates, the cash constraint and the management discretion theory (Hadlock (1998)) or the free cash flow theory of Jensen (1986). The cash constraints theory relates investment rates to hard budget constraints whereas the manager discretion theory relates them to the abusive use of funds by the management to build empires and to increase their private welfare to the detriment of the value of the company or to soft budget constraints. These two theories are also relevant for the issue of over- versus under-investment.

There are several studies analyzing the impact of ownership structures on companies' investment in Central and Eastern European transition countries: Lizal and Svejnar (2002) (Czech Republic), Perotti and Vesnaver (2004) (Hungary), Mickiewicz, Bishop and Varblane (2004) (Estonia), Colombo and Stanca (2006) (Hungary). Typically (except Perotti and Vesnaver (2004)), the market-to-book value of equity is not used in these investment regressions. The results typically show evidence for soft budget constraints and financial imperfections and the cash constraint theory. Typically, state ownership has a negligible impact on companies' investment rates. Mykhayliv and Zauner (2013) use the change in the market-to-book value of equity and emphasize the role of private benefits of control to provide evidence for a significantly negative impact of state ownership on investment.

The plan of the paper is as follows. Section 2 presents the data and the models. Section 3 provides the estimation results. Section 4 concludes.

2. Companies' Investment Rates and Ownership Groups

In this paper, we use the data set in Mykhayliv and Zauner (2013) with 134 listed, large Ukrainian companies and 590 observations over the years 2002 to 2007. The companies in

the data set come from different sectors of the Ukrainian economy, in particular, electricity and energy (21.54%), engineering (11.96%), mining (11.96%), metals (6.72%), steel (6.72%), chemicals (6.72%), and others. More details on the data set can be found in Mykhayliv and Zauner (2013). Summary statistics are contained in Table I. The data set is derived from Dragon Capital (2006, 2007)), the First Securities Trading System PFTS (<http://www.pfts.com.ua/ukr/>) and the Agency for the Development of Infrastructure for Funds Market in Ukraine (www.smida.gov.uk). The ownership data were checked using the Ukrainian business press and relate to 2005 and 2006 and display a very limited time variability. Summary statistics of the ownership group shares are given in Table II.

Table I: Summary of Financials in US\$.

<i>Financials</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>
Total Assets	358938.7	643963.5	8558	74199651
Fixed Assets	162428.8	264431	433	2052003
Investment	35233.5	82375.06	-114297	803287
MBV	2.368675	6.148593	0	99.56863
Net Income	22927.35	65477.76	-162091	580383
Depreciation	12509.5	37864.57	-2628	756780

Note. Mean, standard deviation, minimum and maximum of financials in thousands of US\$. MBV is the market-to-book value of equity. Source: Mykhayliv and Zauner (2013)

Table II: Ownership Group Shares

<i>Variable</i>	<i>Mean (%)</i>	<i>Std. Dev.</i>	<i>Min (%)</i>	<i>Max(%)</i>
State	14.74	0.2784	0	96.8
Insider	12.57	0.2841	0	96
NonDomestic	18.21	0.3203	0	98.3
Finance	16.94	0.312	0	100
FIG	35.88	0.4064	0	100

Note. Mean, standard deviation, minimum and maximum of the ownership group shares. FIG stands for financial and industrial groups. Source: Mykhayliv and Zauner (2013)

Mykhayliv and Zauner (2010, 2013) introduce private benefits of control into a marginal Tobin's Q investment model. The private benefits of control are modeled as shares

of cash flow that can be diverted out of the company at the expense of passive shareholders. This implies that investment is impacted by marginal Q, a measure of the profitability of investment, hard and soft budget constraints, shares of ownership groups potentially enjoying private benefits of control and control variables.

In contrast to Mykhayliv and Zauner (2013), we empirically investigate a Tobin's Q model with persistence in the market-to-book value of equity in the sense that the investment rates are allowed to depend on current and past market-to-book value. We hypothesize that investment decisions are based on present and historical values of the profitability of investment. This generalization is necessary since typically in this literature the present market-to-book value does not have explanatory power for investment..

We follow the literature and use a positive cash flow coefficient as evidence for hard budget constraints and an insignificant or negative cash flow coefficient as evidence for soft budget constraints (Mickiewicz, Bishop and Varblane (2004), Lizal and Svejnar (2002)). As in Mykhayliv and Zauner (2013) we use ownership shares and indicators of different categories of firms to measure the ownership shares of controllers enjoying private benefits. Since private benefits of control have to be financed, cash flow may also reflect the constraints from financing private benefits. Hence, the estimate for the ownership shares may indicate the impact of private benefits of control not already captured by cash flow and presents a low estimate for the impact of private benefits of control on investment.

3. Dynamic Q model and Results

First, in contrast to Mykhayliv and Zauner (2013), we investigate a reduced form regression motivated by Hoshi, Kashyap and Scharfstein (1991) and Perotti and Vesnaver (2004) with only the present value of the market-to-book value. We focus on a model where the dependent variable is the investment rate (investment to fixed assets ratio), the explanatory variables are the *present* market-to-book value of equity and ownership group shares. Control variables are the cash flow to fixed assets ratio, the total assets to fixed assets ratio, the leverage to fixed assets ratio and the log of total assets. In this regression, the market-to-book value of equity is a proxy for the investment's profitability. Cash flow is a proxy for liquidity, soft or hard budget constraints. The ratio of total to fixed assets is a proxy the tangibility of assets and the log of total assets is a proxy for size. The regression includes the following set of ownership groups: state ownership (*state*), insider or management ownership (*insider*),

non-domestic ownership (*non-domestic*), ownership by banks and other financial companies (*finance*) and ownership by financial and industrial groups and holdings (*FIG*). We also investigate a corporate governance variable, *minority*, that is, majority ownership with a blocking minority, which relates to the effectiveness of minority shareholder protection.

We look at two versions of the model, by focussing on a specification where the ownership is measured in shares and where the ownership is measured by an indicator variable with a 50% cut-off value.

The two regressions are given by

$$\frac{I_{it}}{A_{it}} = \alpha + \beta_1 MBV_{it} + \beta_2 \frac{CF_{it}}{A_{it}} + \beta_3 \frac{Assets_{it}}{A_{it}} + \beta_4 \frac{L_{it}}{A_{it}} + \log(Assets_{it}) + \sum_k \beta_k s_{it}^k + \delta_{minority} d_{it}^{minority} + \delta_t d_t + \eta t + v_i + \varepsilon_{it},$$

where i relates to firm i , t relates to year; I_{it} is *new* investment, the difference between fixed assets at the end and the beginning of year t taking depreciation into account, A_{it} is fixed assets at the beginning of year t ; MBV_{it} is the market-to-book value of equity at the beginning of period t ; CF_{it} is cash flow in year t ; $Assets_{it}$ are total assets at the beginning of year t , L_{it} is leverage (total debt) at the beginning of year t ; \log is the natural logarithm; s_{it}^j is ownership of group j ($j = state, insider, non-domestic, finance, FIG$) where the ownership is either measured in shares or as an indicator with value 1 if there is a majority ownership of the respective ownership group; $d_{it}^{minority}$ is indicator for *minority*; d_t are time indicators, t is a time trend, v_i is a firm specific error term; and ε_{it} is the usual ordinary least squares error term.

Table III presents the results of a random effects regression of ownership in shares. We employ a random effects regression in order to estimate the coefficients of the ownership variables that have a very limited time dependency. The Hausman tests check the appropriateness of a random versus a fixed effects specification.

Table III: Investment Rates and Ownership Shares: Present Market-to-Book Value

	<i>Shares</i>	<i>Indicator</i>
Market-to-	.0021	.0021
book value	(.0091)	(.0091)
Cash Flow	.7395 ^{***}	.7387 ^{***}
	(.0185)	(.0184)
Total Assets	-.3279 ^{***}	-.3287 ^{***}
	(.0111)	(.0110)
Leverage	.3491 ^{***}	.3506 ^{***}
	(.0150)	(.0149)
Log Total	.2226 ^{***}	.2308 ^{***}
Assets	(.0787)	(.0785)
State	-1.0470 ^{***}	-.8541 ^{***}
	(.3933)	(.2904)
Insider	.09573	.0295
	(.36042)	(.273)
Non-domestic	.5341 [*]	.4888 ^{**}
	(.2756)	(.2222)
Finance	.8788 ^{***}	.7547 ^{***}
	(.2822)	(.2385)
FIG	-.8101 ^{***}	-.8792 ^{***}
	(.2519)	(.2048)
Significant	1.0647 ^{***}	1.0566 ^{***}
Minority	(.2945)	(.2959)
Constant	15.0278	20.9138
	(85.63647)	(84.9994)
Wald χ^2	1625.92	1667.94
	(.0000)	(0.0000)
Breusch and	28.01	32.43
Pagan	(.0000)	(0.0000)

Hausman	354.23	350.50
(efficient)	(.0000)	(0.0000)
R ² overall	0.6203	0.6194

Note. Random Effects Estimation. Standard errors below the coefficient in brackets. The 10 (5) [1] % level is shown as * (**) and [***]. Wald, Breusch and Pagan, and Hausman test statistics (p-values in brackets) uses the estimated co-variance matrix of the efficient estimator.

The results show that the market-to-book value of equity is not significant in these regressions, as in Perotti and Vesnaver (2004). The estimate for cash flow variable is positive and highly significant, consistent with the presence of financial constraints. Larger firms have a higher investment rate. In contrast with Perotti and Vesnaver (2004), leverage is positively related to investment and highly significant. In contrast with Lizal and Svejnar (2002) and Perotti and Vesnaver (2002), state ownership has a negative impact on investment. Ownership by financial and non-domestic firms has a positive effect on investment rates. Ownership by financial and industrial groups exerts a negative influence on investment.

Regarding the corporate governance variables, the existence of a significant minority has a positive effect on investment. A possible explanation is that a significant minority exerts a disciplining factor on the insider and private benefits of controllers and improves corporate governance structures.

We apply further robustness checks on the models in Table III. Ordinary least squares while controlling for industry fixed effects (19 different industries) produces quantitatively similar results, even though the state ownership variable becomes insignificant. Similarly, a firm random effects specification and, at the same time, controlling for industry-fixed effects again produces similar results with state ownership rendered insignificant. As expected, due to the very limited time variability of the ownership data, a firm fixed effects specification with industry fixed effects renders all ownership variables insignificant but confirms the sign and magnitude of all other regressors.

As another robustness check, we also investigate the potential endogeneity of ownership variables. We follow the approach in Lins (2003) (see also Lemmon and Lins (2003)) adapted to investment regressions. The limited time-dependency of the ownership data is an issue to be aware of. Recall that there are only two dates where we observe ownership and that for a large proportion of the data set the ownership data on the two dates are the same. This leads to a simple specification similar to the large literature where

endogeneity is modelled in a cross-sectional framework (for example, Demsetz and Villalonga (2001)). To avoid identification issues, we investigate the potential endogeneity for one ownership variable at a time. Motivated by Lins (2003), the investment equation mirrors the previous model except that size (the log of total assets) is not included. The first stage (or ownership) equations have the ownership variable of interest as the dependent variable, the investment rate as the simultaneously determined variable and controls; and the log of total assets, the producer price index and sales growth as instrumental variables. The identification of the instrumental variables requires that these variables plausibly only influence investment or ownership, but not both.

We report the results on state ownership as all the other results appear to provide support of model in Table III (with the market-to-book value remaining insignificant) and the exogeneity of the ownership variables. The results of the instrumental variables regressions for the state ownership variable are displayed in Table IV.

Table IV: Two Stage Least Squares Random Effects Panel Data Estimation: State Ownership

	<i>Shares</i>	<i>First Stage</i>	<i>Indicator</i>	<i>First Stage</i>
<i>Dependent Variable</i>	<i>Investment</i>	<i>State Ownership</i>	<i>Investment</i>	<i>State Ownership</i>
MBV	.0205 (.0143)	.0044*** (.0015)	.0226 (.01462)	.0064*** (.0020)
Cash Flow	.6527*** (.0279)	.0142*** (.0051)	.6473*** (.0282)	.0182*** (.0069)
Total Assets	-.2639*** (.0168)	-.0085*** (.0024)	-.2627*** (.0169)	-.0111*** (.0032)
Leverage	.2770*** (.0238)	.0105*** (.0029)	.2766*** (.0238)	.0138*** (.0039)
State	-6.2614*** (1.2884)	--	-4.7810*** (.9482)	--
Insider	-2.4234*** (.6460)	-.4279*** (.0361)	-1.7411*** (.4582)	-.3880*** (.0383)

Non-domestic	-0.6542*	-0.1546***	-0.5660*	-0.1818***
	(.3488)	(.0297)	(.2943)	(.0328)
Finance	-0.1182	-0.1267***	-0.1582	-0.1400***
	(.3299)	(.0314)	(.2789)	(.0357)
FIG	-2.178***	-0.3223***	-1.9268***	-0.3545***
	(.4481)	(.0247)	(.3673)	(.0276)
Significant	1.3117***	0.13588***	1.6804***	0.2597***
Minority	(.3432)	(.0334)	(.3860)	(.0449)
Investment	--	-0.01450**	--	-0.02139**
		(.0063)		(.0085)
Log Assets	--	0.0539***	--	0.0738***
		(.0082)		(.0109)
Producer	--	0.0517	--	0.122943
Price Index		(.0740)		(.0995)
Sales Growth	--	-0.0071	--	-0.0081
		(.0051)		(.0069)
R ² overall	0.4368		0.4313	

Note. Two Stage Least Squares Random Effects Panel Data Estimation. Standard errors are given in brackets below the estimated coefficient. The 10 (5) [1] % level is shown as * (**) and [***].

The results show that, looking at the investment regression, controlling for simultaneity, the investment rate is still negatively impacted by state ownership, albeit at a very large magnitude. This is true both for the shares and indicator ownership specification. The ownership equation or first stage regression shows that state ownership is negatively impacted by investment. A possible interpretation of this result is that there is some evidence in this specification that state ownership is negatively related to investment, but that there is no causation.

Comparing the results from Table III to the results from the structural equation results in Table IV, many of the other ownership variables now have the opposite sign and the magnitude is much larger. There is also some indication that the instrumental variables are weak since only the log of total assets is significant and the other two instrumental variables have large p-values in the ownership equation.

Present and Past Market-to-Book Value of Equity

Since the present profitability of investment plays no role in the reduced form regression above, we try to model the market-to-book value of equity more carefully. First, we introduce interaction terms between cash flow and the different ownership groups to test for soft and hard budget constraints of the different ownership groups and, second, in contrast with the literature, we introduce *present* and *past* market-to-book value of equity in the regression in order to take into account that investment decisions may also be based on historical values of the profitability of investment. The regressions are given by

$$\frac{I_{it}}{A_{it}} = \alpha + \beta_1 MBV_{it} + \beta_2 MBV_{it-1} + \sum_k \beta_k \frac{CF_{it}}{A_{it}} d_{it}^k + \beta_3 \frac{D_{it}}{A_{it}} + \beta_4 \log(A_{it}) + \sum_k \beta_k s_{it}^k + \delta_{minority} d_{it}^{minority} + \delta_t d_t + \eta t + v_i + \varepsilon_{it},$$

where, in addition to above, d_{it}^k is the indicator related to ownership group k (with cut-off level at 50%) and the interaction term between cash flow and ownership group indicator, in other words, the cash flow sensitivity of investment, $\frac{CF_{it}}{K_{it}} d_{it}^k$, is a proxy for soft and hard budget constraints of ownership group k .

In order to deal with the issue of contemporaneous and lagged values of the market-to-book ratio, the potential multicollinearity and inconsistency of the estimators, we analyze this dynamic model to control for potential endogeneity of the explanatory variables and employ the two-step system Generalized Methods of Moments estimator (Arellano and Bover (1995) and Blundell and Bond (1998)) and its improvement by Windmeijer (2005) where the regression is estimated simultaneously in levels and first differences. Standard statistical tests are used to test the suitability and validity of the instrumental variables without having to resort to analyzing a first stage regression.

In this estimation we believe that the market-to-book value of equity and the variables related to cash flow may be potentially endogenous, that is, current and past errors may be correlated with current and future values of the market-to-book value and the variables related to cash flow. Generalized Methods of Moments instruments of the level and difference regression equation for the market-to-book value of equity and the interaction

terms cash flow with indicators of ownership groups are specified as the values of the twice-lagged and earlier variables. Generalized Methods of Moments instruments for the predetermined variable Leverage are specified as the values of the once-lagged variable. The usual instruments for the level and difference regression equation are the exogenous ownership variables and the lagged-once capital intensity, time dummies and a time trend. In order to reduce the instrument number, we collapse the instruments as discussed in Roodman (2006, section 3.2 and 3.5).

We test the suitability of the instruments using standard tests in the Generalized Methods of Moments framework, the Sargan (1958) test and Hansen (1982) J-test, including all subgroups of instruments. If the instrumental variables regression is over-identified, both tests allow us to verify whether the moment conditions are jointly valid. All difference-in-Hansen tests for the null hypothesis that the instrument subsets are exogenous are insignificant, with the lowest p-value of 0.267 (0.218) in the percentage (indicator) ownership model. We also check the suitability of the instruments using the Arellano-Bond (1991) test for the autoregressive model of order 1 and the autoregressive model of order 2 in first differences which looks for autocorrelation in the errors. Both tests do not lead us to question the validity of the instruments and the employed lags in the instruments. We present the results of the Generalized Methods of Moments estimation of the investment model in Table V.

Table V: Investment Rates and Ownership: Generalized Methods of Moments Estimation

<i>Investment</i>	<i>Percentage</i>	<i>Indicator</i>
Market-to-book		
value		
-present	-.0019 (.0043)	-.00051 (.0038)
-1 lag	.0031*** (.0007)	.0031*** (.0006)
State*CF	-.0078 (.1159)	-.0541 (.1437)
Insider*CF	.0796 (.2488)	.0503 (.1963)

Non-domestic*CF	.9836 ^{***} (.0175)	.9861 ^{***} (.0149)
Finance*CF	1.3833 ^{**} (.5591)	1.3450 ^{**} (.5142)
FIG*CF	-.9665 [*] (.5775)	-.9230 [*] (.5214)
Leverage	-.0119 (.0143)	-.0157 (.0145)
Log Total Assets	-.0004 (.0170)	.0098 (.0158)
State	-.1192 [*] (.0682)	-.0817 [*] (.0477)
Insider	.0011 (.0924)	.0004 (.0618)
Non-domestic	-.2294 ^{***} (.0525)	-.2352 ^{***} (.0497)
Finance	-.2964 ^{**} (.1361)	-.2513 ^{**} (.1203)
FIG	.1975 (.1489)	.1772 (.1169)
Significant Minority	.0253 (.0689)	.0545 (.0654)
Constant	.2274 (.2022)	.0914 (.1886)
F-Test	268.72	326.80
(p-value)	(.0000)	(.0000)
Number Instruments	40	39
Sargan	26.49	26.80
(p-value)	(0.231)	(0.177)
Hansen J	20.85	20.03
(p-value)	(0.530)	(0.519)

The estimate for the present market-to-book value of equity is still insignificant, however, the past value is highly significant and positive providing support for the more general model.

We discuss the impact of the ownership categories on firms' investment in turn, both for the indicator and percentage model. The indicator specification can be interpreted as the impact of the presence of a majority ownership of the respective ownership group on investment rates, whereas the percentage specification can be interpreted as the impact of an increase in ownership shares of the respective ownership group on firms' investment rates. For each ownership group we discuss the impact of the particular ownership type on firms' investment rates and also on the interaction of cash flow and the indicator of the particular ownership type to provide evidence for soft and hard budget constraints of the ownership type.

State ownership exerts a negative influence on firms' investment. This is in contrast with the typical result regarding Eastern European economies (see, for example, Lizal and Svejnar (2002) and Perotti and Vesnaver (2004)). The cash flow sensitivity with respect to state ownership ($State*CF$) is not significant which indicates that state-owned companies face soft budget constraints. State ownership has a significantly negative impact on firms' investment rates. The two results together are consistent with the presence of free cash flow (Jensen (1986)), and private benefits of control (Grossman and Hart (1988)). Even though there is evidence for free cash flow, the negative relationship of state ownership and investment, and the fact that on average companies with state ownership have market-to-book values of less than unity indicates that there is evidence for under-investment.

Insider ownership does not significantly impact firms' investment rates. The variable $Insider*CF$ is positive, but insignificant indicating that insider owned firms do not face hard but soft budget constraints and appear to be subject to free cash flow (Jensen (1986)) and private benefits. These two results seem to indicate that that there is over-investment for insider ownership.

Firms with ownership by *non-domestic entities* and by *banks and financial firms* experience a negative impact on firms' investment rates and hard budget constraints. These findings are consistent with the cash constraint hypothesis and can be interpreted as evidence for under-investment.

Ownership by *financial and industrial groups* (FIG) faces free cash flow and soft budget constraints, but the investment rates are not significantly impacted. This provides some evidence for over-investment. The corporate governance variable related to a blocking minority does not impact on firms' investment rates significantly.

As robustness checks, we entertain the possibility that also the ownership variables are endogenous. Treating all the percentage [dummy] ownership variables as endogenous and instrumenting them by lags two and higher, we find that the instrument count increases to 55 [54] and the Sargan test (p-value of 0.012) [0.011] rejects the null hypothesis that the over-identification restrictions are valid. In addition, all percentage ownership variables are now insignificant except the non-domestic ownership percentage with an estimate of $-.2427$ [$-.2647$] (p-value 0.0000).

Treating the percentage [dummy] ownership variables as endogenous one at a time, we find similar results to the ones reported Table IV above. The only exception in the *percentage* formulation is the case where state ownership is treated as potentially endogenous. In this case, the percentage state ownership variable becomes insignificant with the Sargan test (p-value 0.082) as well as the Hansen test for this instrument subset (p-value 0.054) indicating potential issues with the appropriateness of the instruments. In the dummy variables specification entertaining the possibility endogenous state ownership the results are similar to Table IV except that the estimate for Tobin's Q becomes insignificant

4. Conclusions

Using data from large Ukrainian firms for the period 2002-2007, we studied companies' investment rates as a function of ownership and corporate governance variables. We focus on a specification using the presence and increases of a particular ownership type. The empirical analysis shows that the past market-to-book value of equity explains investment rates implying that investment decisions are taken based also on historical values of the profitability of investment.

The paper provides the following results on the impact of ownership on investment. *State* ownership appears to be related to soft budget constraints and free cash flow (Jensen (1986)) and appears to be negatively related to investment due to private benefits of control, tunnelling. State owned firms are also likely to suffer from under-investment.

Ownership by *insiders* is related to free cash flow and soft budget constraints and it is likely that they suffer from over-investment.

Ownership by *non-domestic* or *finance* firms appears to be related to hard budget constraints consistent with the cash constraint hypothesis. The negative impact of these ownership categories on investment rates can be interpreted as evidence for under-investment.

Ownership by *financial and industrial groups (FIG)* appears to be related to soft budget constraints consistent with the free cash flow hypothesis of Jensen (1986). The insignificant relationship of this ownership category with investment rates indicates that such firms are likely to over-invest.

REFERENCES

- Arellano, M., and S. Bond, 1991, Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies* 58, 277-97.
- Arellano, M., and O. Bover, 1995, Another Look at the Instrumental Variable Estimation of Error Components Models, *Journal of Econometrics* 68, 29-51.
- Barran, F., and M. Peeters, 1998, Internal finance and corporate investment: Belgian evidence with Panel data, *Economic Modelling* 15, 67-89.
- Bassetto, C., and Kalatzis, A., 2011, Financial distress, financial constraint and investment decision: Evidence from Brazil, *Economic Modelling* 28, 264-271.
- Belkhir, M., S. Boubaker, and I. Derouiche, 2014, Control-ownership wedge, board of directors, and the value of excess cash, *Economic Modelling* 39, 110-122.
- Blundell, R., and S. Bond, 1998, Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics* 87, 115-143.
- Blundell, R., S. Bond, M. Devereux, and F. Schiantarelli, 1992, Investment and Tobin's Q: Evidence from Company Panel Data, *Journal of Econometrics* 51, 233-257.
- Campos, N. , and F. Giovannoni, 2006, The Determinants of Asset Stripping: Theory and Evidence from Transition Economies, *Journal of Law and Economics* 56, 681-706.
- Colombo, E., and L. Stanca, 2006, Investment decisions and the soft budget constraint: Evidence from a large panel of Hungarian firms, *Economics of Transition* 14, 171-198.

- Demsetz, H., and Villalonga, B., Ownership and Corporate Performance, *Journal of Corporate Finance* 7, 209-233.
- de Wet, W. A., 2004, The role of asymmetric information on investments in emerging markets, *Economic Modelling* 21, 621-630.
- Djankov, S., and P. Murrell, 2002, Enterprise Restructuring in Transition: A Quantitative Survey, *Journal of Economic Literature* 40, 739-792.
- Dragon-Capital, 2006, Ukraine Equity Guide, (Kyiv, Ukraine).
- Dragon-Capital, 2007, Ukraine Equity Guide, (Kyiv, Ukraine).
- Estrin, S., and A. Rosevear, 1999, Enterprise Performance and Ownership: The Case of Ukraine, *European Economic Review* 43, 1125-1136.
- Estrin, S., and A. Rosevear, 1999a, Enterprise Performance and Corporate Governance in Ukraine, *Journal of Comparative Economics* 27, 442-458.
- Fama, E.F., and M.C. Jensen, 1983, Separation of Ownership and Control, *Journal of Law and Economics* 26, 301-325.
- Fazzari, S., G. Hubbard, and Bruce C. Petersen, 1988, Financial Constraints and Corporate Investment; Comments and Discussion, *Brookings Papers on Economic Activity* 1, 141-206.
- Grossman, S., and O. Hart, 1988, One Share-One Vote and the Market for Corporate Control, *Journal of Financial Economics* 20, 175-202.
- Grygorenko, G., and S. Lutz, 2007, Firm Performance and Privatization in Ukraine, *Economic Change and Restructuring* 253-266.
- Hadlock, C.J., 1998, Ownership, Liquidity, and Investment, *Rand Journal of Economics* 29, 487-508.
- Hansen, L., 1982, Large Sample Properties of Generalized Method of Moments Estimators, *Econometrica* 50, 1029-1054.
- Hausman, J.A., 1978, Specification Tests in Econometrics, *Econometrica* 46, 1251-1271.
- Hoshi, T., Kashyap, A., and Scharfstein, D., 1991, Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups, *The Quarterly Journal of Economics* 106, 33-60.
- Jensen, M., 1986, Agency costs of free cash flow, corporate finance and takeovers, *American Economic Review* 76, 323-329.
- Jensen, M.C., and W.H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3, 305-60.

- Johnson, S., R. La Porta, F. Lopez-de-Silvanes, and A. Shleifer, 2000, Tunneling, *American Economic Review Papers and Proceedings* 90, 22-26.
- Konings, J., M. Rizov, and H. Vandenbussche, 2003, Investment and financial constraints in transition economies: micro evidence from Poland, The Czech Republic, Bulgaria and Romania, *Economics Letters* 78, 253-258.
- Kornai, J., 1979, Resource-Constrained Versus Demand-Constrained Systems, *Econometrica* 47, 801-819.
- Kornai, J., 1980. *The Economics of Shortage* (Amsterdam: North-Holland).
- Kornai, J., E. Maskin, and G. Roland, 2003, Understanding the Soft Budget Constraint, *Journal of Economic Literature* 41, 1095-1136.
- Lang L., and Litzenger, R., 1989, Dividend announcements: Cash flow signalling vs. free cash flow hypothesis?, *Journal of Financial Economics* 24, 181-191.
- Lemmon, M. and Lins, K., 2003, Ownership Structure, Corporate Governance, and Firm Value: Evidence from the East Asian Financial Crisis, *Journal of Finance* 58, 1445–1468.
- Lins, K. V., 2003. Equity Ownership and Firm Value in Emerging Markets, *Journal of Financial and Quantitative Analysis* 38, 159-184.
- Lizal, L., and J. Svejnar, 2002, Investment, credit rationing and the soft budget constraint: evidence from Czech Panel data, *The Review of Economics and Statistics* 84, 353-370.
- Meggison, W., and Netter, 2001, From State to Market: A Survey on Empirical Studies on Privatization, *Journal of Economic Literature* 39, 321-339.
- Mickiewicz, T., K. Bishop, and U. Varblane, 2004, Financial Constraints in Investment - Foreign versus Domestic Firms. Panel Data Results from Estonia 1995-1999, *Acta Oeconomica* 54, 425-449.
- Modigliani, F., and M. H. Miller, 1958, The Cost of Capital, Corporation Finance and the Theory of Investment, *American Economic Review* 48, 261-297.
- Mycyk, A., E. Cook, and D. Fedoruk, 2007, Corporate governance and disclosure in Ukraine, *International Journal of Disclosure and Governance* 4, 49-74.
- Mykhayliv, D. , and K. Zauner, 2010, On the Q Theory of Investment with Private Benefits of Control, (Leeds University Business School).

- Mykhayliv, D. and K. Zauner, 2013, Investment behavior and ownership structures in Ukraine: Soft budget constraints, government ownership and private benefits of control, *Journal of Comparative Economics* 41, 265-278.
- Mykhayliv, D. and K. Zauner, 2015, Investment Behaviour, Corporate Control and Private Benefits of Control: Evidence from a Survey of Ukrainian Firms, *Bulletin of Economic Research* 67, 309-323.
- Ochoa, D., R. Correia, J. I. Pena, and K. Población, 2015, Expropriation risk, investment decisions and economic Sectors, *Economic Modelling* 48, 326-342.
- Perotti, E. C., and L. Vesnaver, 2004, Enterprise Finance and Investment in Listed Hungarian Firms, *Journal of Comparative Economics* 32, 73-87.
- PFTS, 2002-2008, Annual Reports.
- Ochoa, D., R. Correia, J. I. Pena, and K. Población, 2015, Expropriation risk, investment decisions and economic Sectors, *Economic Modelling* 48, 326-342.
- Roland, G., 2000, Transition and Economics: Politics, Markets, and Firms, MIT Press.
- Roodman, D., 2009, How to Do xtabond2: An Introduction to Difference and System GMM in Stata, *The Stata Journal* 9, 86-136.
- Shleifer, A., and R. Vishny, 1997, A Survey of Corporate Governance, *Journal of Finance* 52, 737-783.
- Windmeijer, F., 2005, A Finite Sample Correction for the Variance of Linear Efficient Two-Step GMM Estimators, *Journal of Econometrics* 126, 25-51.
- World-Bank, 2002, Transition: The First Ten Years, Analysis and Lessons for Eastern Europe and the Former Soviet Union, *Washington D.C.*