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The Impact of Equity Ownership Groups on Investment: Evidence from Ukraine*

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Equity Ownership Groups, Investment and Liquidity: Evidence from Ukraine

Abstract

We empirically investigate the impact of different ownership groups on companies' investment in Ukraine with a novel dynamic investment model where investment is based on present and historical levels of profitability (market-to-book value of equity) and lagged investment. Groups include state, insider, non-domestic, financial and financial and industrial group (FIG) ownership. Contrary to the literature, we find that the past level of profitability significantly affects investment; the presence of and increases in state ownership have a negative impact on firms' investment, as is the case for non-domestic and financial companies' ownership. Insider and FIG ownership have no impact on investment. We explain the results by the extent of liquidity concerns (hard and soft budget constraints) and the extent of asset stripping for the corresponding ownership group and relate them to over- and under-investment, and to the free cash flow or cash constraint hypothesis.

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

1. Introduction

Recent research in corporate finance and governance provides evidence that agency and informational issues make the ownership structure of firms relevant for its performance (for example, Lemmon and Lins (2003) and Demsetz and Villalonga (2001)). Recent studies of companies' investment behavior and ownership structures emphasize the role of liquidity (hard and soft budget constraints) and asset stripping.

In this paper, in contrast to the literature, we empirically investigate the impact of different equity ownership groups on companies' investment with a novel dynamic investment model where investment is based on present and historical levels of profitability (market-to-book value of equity), lagged investment and the sensitivity of investment with respect to cash flow of the ownership groups to capture soft and hard budget constraints. Companies may base their investment decisions not just on current profitability of investment or Tobin's Q but also on historical values thereof and a good predictor for current investment may be past investment. We apply this model to a panel data set of Ukrainian stock market listed industrial and manufacturing firms for the period 2002 to 2007. The ownership groups include state, insider, non-domestic, financial, and financial and industrial group (FIG) ownership. We also investigate the impact of the existence of a significant minority with the ability to block major decisions within the company on investment.

In addition, we investigate a reduced form regression (Hoshi, Kashyap and Scharfstein (1991) and Perotti and Vesnaver (2004)) with the present value of the market-to-book value and the overall cash flow sensitivity of investment as explanatory variables.

Contrary to the literature, we find that the *past* level of the market to book value of equity (MBV) significantly affects investment; the presence of and increases in state ownership have a negative impact on firms' investment, as is the case for non-domestic and financial companies' ownership. Insider and FIG ownership have no impact on investment. We explain the results by the extent of liquidity concerns (hard and soft budget constraints) and the extent of asset stripping for the corresponding ownership group, gauge the relative effect of these factors and relate them to over- and 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). The following stylized

facts emerge. First, the market-to-book value of equity (MBV), a measure of the profitability of investment, is usually not used in these investment regressions. If the market to book value is used, as in Perotti and Vesnaver (2004), it turns out not to have explanatory power for investment. This is usually attributed to immature capital markets. The conventional wisdom is that especially in Central and Eastern European capital markets, a Tobin's Q model should not be used in analyzing investment. Second, state ownership has a negligible impact on companies' investment rates. Third, there is evidence for the presence of soft budget constraints for state ownership and financial imperfections for other groups and evidence for the cash constraint theory.

In a related paper, Mykhayliv and Zauner (2013), with a data set that also includes financial firms, use the change in Tobin's Q, but not lagged investment, as explanatory variables and emphasize the role of private benefits of control. They provide evidence for a significantly negative impact of state ownership on investment, but a positive impact of financial firm ownership on investment. Mykhayliv and Zauner (2015) analyze the probability of investment using a survey of non-listed Ukrainian manufacturing firms.

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 state ownership structures to Western market economies (Megginson and Netter (2001)), the analysis of the determinants of the growth of fixed assets of firms is even more important. The Central and Eastern European economies were subject to privatization efforts to move them away from state ownership structures and closer to market economies, and, thereby, it had been hoped, improving the performance of firms (see Roland (2000)). The relationship between state ownership and companies' performance is of particular interest (Megginson and Netter (2001)). Surprisingly, a stylized fact is that the impact of state ownership on investment is weak in Central and Eastern European countries (cf. World Bank (2002)).

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), Perotti and Vesnaver (2004)) on one hand and state ownership on the other is weak.

The second factor in explaining investment 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 without 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)), that is, it does not matter whether internal or external funds are used to finance investment. However, it is well known that external funds are typically costlier than internal funds due to agency and informational issues. Given these three and other factors, ownership plays an important role in the performance and investment behavior of companies, particularly where ownership and control functions are separated (Fama and Jensen (1983), Belkhir et al. (2014)).

We relate our results to recent 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 management discretion theory and the free cash flow 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.

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. The ownership data relate for almost all observations to the year 2005. For some companies the ownership data relate to 2006. There are a few companies for which the ownership data relate to 2005 and 2006. We assume the ownership data for earlier [later] years are the same as the ownership data for the first [last] available year. Therefore, the time dependency of the ownership data is extremely limited and can be viewed as constant over the period. Summary statistics of the ownership group shares are given in Table II.

We drop financial firms from the sample as their behavior appears to be different from manufacturing, industrial and utility firms and we are left with a pool of 566 observations and 125 firms.

Table I: Summary of Financials in US$.

Financials	*Mean*	*Std. Dev*	*Min*	*Max*
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

Variable	*Mean (%)*	*Std. Dev.*	*Min (%)*	*Max(%)*
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 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) where the change in Tobin's Q is used, in this paper, we empirically investigate a Tobin's Q model with persistence in the market-to-book value of equity in the sense that investment depends on current and past market-to-book values. We hypothesize that investment decisions are based on present and historical values of the profitability of investment. In addition, we introduce lagged investment as an explanatory variable in order to capture the effect that the best predictor of investment at the company level may be lagged investment (Eberly et al. (2012)).

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 potentially 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 or indicators may indicate the impact of private benefits of control on investment not already captured by cash flow.

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 as an explanatory variable. 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 or indicators. 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, and the log of total assets is a proxy for size.

In this regression, we use a proxy related to the tangibility of assets (Almeida and Campello (2007), Perotti and Vesnaver (2004)). Perotti and Vesnaver (2004) use the ratio of fixed assets to total assets. Since we normalize the regression equation by fixed assets, we use the total assets to fixed assets ratio, the reciprocal of Perotti and Vesnaver's (2004) variable. We interpret the ratio of total assets to fixed assets as a proxy for the *intangibility* of assets. We expect that the total assets to fixed assets ratio has a negative impact on investment since firms with a large value of this variable tend to have a large value of intangible assets which is likely to imply a negative impact on investment, the change in fixed assets. This negative impact of the intangibility of assets on investment is consistent with Perotti and Vesnaver (2004) who find a significantly positive impact of the fixed assets to total assets ratio (the reciprocal variable we use) on investment.

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

The two regressions are given by

$$\frac{I_{it}}{A_{it}} = \alpha + \beta_1 MBV_{it} + \beta_2 \frac{CF_{it}}{A_{it}} + \beta_3 \frac{Assets_{it}}{A_{it}} + \beta_4 \frac{L_{it}}{A_{it}} + \beta_5 \log(Assets_{it}) + \sum_k \beta_k s_{it}^k + \delta_{\min ority} d_{it}^{\min ority} + \delta_t d_t + \eta t + \nu_i + \varepsilon_{it},$$

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 (so that $\frac{Assets_{it}}{A_{it}}$ is the total assets to fixed assets ratio, our proxy for the intangibility of assets); 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; $d_{it}^{\min ority}$ is indicator for *minority*; d_t are time indicators, t is a time trend, ν_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 and in indicator variables. We employ a random effects regression in order to estimate the coefficients of the ownership variables that have a very limited time dependency.

Table III: Impact of Ownership on Investment Rates: Group Ownership Shares (Shares) and Group Ownership Indicator Variable (Indicator) Specification

	Shares	*Indicator*
Market-to-	-.0033	-.0033
book value	(.0046)	(.0046)
Cash Flow	.9484***	.9493***
	(.0114)	(.0114)

Intangibility	-.4760***	-.4764***
of Assets#	(.0074)	(.0074)
Leverage	.5244***	.5252***
	(.0097)	(.0097)
Log Total	.0289	.0280
Assets	(.0283)	(.0281)
State	-.4139***	-.3112***
	(.1268)	(.0938)
Insider	.0902	.0622
	(.1238)	(.0950)
Non-domestic	-.0972	-.0876
	(.0949)	(.0778)
Finance	.0968	-.0106
	(.0997)	(.0852)
FIG	.0094	.0376
	(.0878)	(.0725)
Significant	.1141	.1471
Minority	(.1024)	(.1038)
Constant	57.9526	60.8004
	(48.7286)	(48.8446)
Wald χ^2	7036.50	7016.69
	(.0000)	(0.0000)
R^2	0.8810	0.8796

Note. Random Effects Estimation. Standard errors are given in brackets below the estimates. The 10 (5) [1] % level is shown as * (**) and [***]. The estimates for a time trend and year indicator variables are not reported. # The intangibility of assets is defined as the ratio of total assets to fixed assets.

The results show that the market-to-book values of equity are not significant in these regressions, as in Perotti and Vesnaver (2004). The estimate for the cash flow variable is positive and highly significant, consistent with the presence of financial constraints. Larger firms have higher investment rates. In contrast to Perotti and Vesnaver (2004), leverage positively impacts investment and is highly significant. The intangibility of assets has a negative impact on investment. In contrast to Lizal and Svejnar (2002) and Perotti and

Vesnaver (2002), state ownership has a negative impact on investment. Other ownership variables have no significant effect on investment rates.

We apply further robustness checks on the models in Table III. Ordinary least squares regression while controlling for industry fixed effects (19 different industries) produce quantitatively similar results. Similarly, a firm random effects specification and, at the same time, controlling for industry-fixed effects again produces similar results. 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 explanatory variables.

We also run random effects regressions where we drop the variable related to the intangibility of assets in the above regression equation. In these regressions, all the ownership group variables turn out to be insignificant.

There may be concerns about the potential endogeneity of the ownership variables. Concerns about endogeneity of the ownership variables are of little importance due to the following reasons. First, recall that the ownership variables are only related to the year 2005 and for some observations (less than 10 percent of observations) ownership data are also available for 2006. If ownership data are available for 2006, then for most of these observations, the ownership data in year 2005 and 2006 coincide. To obtain ownership observations for the other years, we assume that the ownership data for the years 2002 to 2004 are the same as in 2005 and the ownership data for 2007 are the same as in 2006 (or 2005 if 2006 data not available). Therefore the ownership data are essentially constant over the 2002 to 2007 period. However, other variables of interest, including investment rates and the market-to-book value of equity, have a relatively high degree of time-variability as they are observed in each period and are different across periods. Second, the ownership variables and many right hand variables, for example, the market-to-book value, are observed at the beginning of the period, whereas investment is observed during the period. As it is well known in firms' investment studies (for example, Hennessy, Levy and Whited (2007, p. 707)), such explanatory variables, although not strictly exogenous, can be viewed as predetermined. Third, the state ownership category in the sample has an even lower degree of

time-variability than other ownership categories. For these reasons, concerns about the endogeneity bias in the ownership variables are of little importance.[1]

Lagged Investment, 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 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 and third, we introduce lagged investment as an explanatory variables in order to capture the effect that the best predictor of investment at the company level is lagged investment (Eberly et al. (2012)). The regressions are given by

$$\frac{I_{it}}{A_{it}} = \alpha + \beta_0 \frac{I_{it-1}}{A_{it-1}} + \beta_1 MBV_{it} + \beta_2 MBV_{it-1} + \sum_k \beta_k \frac{CF_{it}}{A_{it}} d_{it}^k + \beta_3 \frac{D_{it}}{A_{it}} + \beta_4 \log(Assets_{it}) + \sum_k \beta_k s_{it}^k + \delta_{\min ority} d_{it}^{\min ority} + \delta_t d_t + \eta t + v_i + \varepsilon_{it},$$

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, $\frac{CF_{it}}{A_{it}} d_{it}^k$, 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

[1] In a previous version, we experimented with an instrumental variables approach motivated by Lins (2003) and Demsetz and Villalonga (2001).

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 investment depends on lagged investment (Eberly et al. (2012) and 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 numbers of instruments, 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 0.121 (0.143) 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 IV.

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

Investment	*Percentage*	*Indicator*
Lagged Investment	-.1547	-.1740
	(.1123)	(.1109)

Present MBV	-.0006	.0010
	(.0038)	(.0045)
Lagged MBV	.0028***	.0029***
	(.0007)	(.0007)
State*CF	-.0399	-.0692
	(.1333)	(.1320)
Insider*CF	.0214	-.0425
	(.2510)	(.1872)
Non-domestic*CF	.9890***	.9886***
	(.0096)	(.0096)
Finance*CF	1.3063**	1.3223**
	(.5636)	(.5311)
FIG*CF	-.8466	-.8463
	(.5822)	(.5413)
Leverage	-.0190	-.0252
	(.0191)	(.0173)
Log Total Assets	.0066	.0137
	(.0180)	(.0190)
State	-.1355*	-.0998*
	(.0742)	(.0552)
Insider	.0080	.0360
	(.0937)	(.0669)
Non-domestic	-.2301***	-.2340***
	(.0568)	(.0521)
Finance	-.2411*	-.2197*
	(.1435)	(.1221)
FIG	.1508	.1499
	(.1441)	(.1146)
Significant Minority	-.0129	.0212
	(.0751)	(.0665)
Constant	.1832	.0869
	(.2138)	(.2250)

F-Test	847.86	924.94
(p-value)	(.0000)	(.0000)
Number Instruments	40	39
Sargan	27.28	25.32
(p-value)	(0.162)	(0.189)
Hansen J	20.21	19.74
(p-value)	(0.508)	(0.474)

Lagged investment (Eberly et al. (2012)) does not have explanatory power in the regressions.

The estimate for the present market-to-book value of equity is 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.

In contrast to Mykhayliv and Zauner (2013) who investigate a related Tobin's Q model using a data set that also includes financial firms, we find that the past market to book value of equity has a significant effect on investment rates and that financial companies' ownership has a negative impact on investment and suffers from hard budget constraints. However, that paper also provides useful robustness tests that show that other main results still hold in this novel investment model.

4. Conclusions

Using data from large Ukrainian firms for the period 2002-2007, we study companies' investment rates as a function of ownership. We focus on two specifications: (i) the presence of a particular ownership group with a majority and (ii) increases in the shares of particular ownership groups. In contrast to the literature, we use present and past market-to-book values of equity and lagged investment as explanatory variables in the regressions. 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. However, lagged investment does not have explanatory power in the investment regressions.

The results add to the literature. *State* ownership is related to soft budget constraints and free cash flow (Jensen (1986)) and negatively impacts investment due to private benefits of control. State owned firms suffer from under-investment. Ownership by *insiders* is related to free cash flow and soft budget constraints and do not suffer from under-investment. Ownership by *non-domestic* or *finance* firms is related to hard budget constraints consistent with the cash constraint hypothesis. The negative impact of non-domestic and finance company ownership on investment rates is evidence for under-investment in such companies.

The empirical model that includes past values of the market to book value of equity is supported by the data, as is the importance of liquidity and asset stripping in explaining firms' investment. For future research, we aim to extend the analysis to other transitional economies and provide a theoretical structural model.

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