Mitigating Financing Constraints on Investment: Ownership and Transparency in Russia *

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Abstract

This study examines the impact of transparency and disclosure scores on fixed investment within the unique context of the Russian capital market. I find that transparency has a positive and significant impact on fixed investment. However, *state-owned enterprises* are more sensitive than *oligarch-owned enterprises* to improved transparency. I find robust evidence that greater transparency of *financially constrained* firms positively affects investment. Transparency, therefore, is a valid mechanism for reducing financing constraints on investment.

1. Introduction

This paper investigates the influence of corporate governance, as measured by transparency and disclosure practices, on investment behaviour. I address the following question: by being better governed, are firms able to attract sufficient amounts of external capital to lift financing constraints on investment projects? I test the effect of corporate governance through the mechanism of firm *Transparency and Disclosure* (TD) on fixed *investment* in Russia; this is a factor that has not been tested extensively in this context since most of the literature examines the effect of governance on such variables as firm value, profitability, and performance. In other words, the broader research gap addressed by this paper is the relationship between TD practices, financing constraints, and investment behaviour in an emerging economy context where very specific ownership patterns prevail.

My research focuses on the period of 2002–2009, which was a time of rapid political and economic change in Russia, Vladimir Putin having succeeded Boris Yeltsin as President of Russia in March 2000. This period also saw important changes in governance practices that followed the introduction and implementation of Russia's new code of conduct for governance in 2002–2004. Since 1998, Russia has achieved an incredible turn-around to become the world's 5th largest economy (measured in Purchasing Power Parity; World Bank, 2015). In short, the Russian context provides an appropriate setting to test the relationship

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between TD and investment, and serves as a natural experiment for studying the longitudinal effect of governance over this period.

The study builds on the literature dealing with financing constraints on fixed investment, most particularly those studies that introduce the corporate governance framework into the investment-cash flow relationship (Ağca/Mozumdar 2017; Brown/Petersen 2009; Fazzari et al. 1988, 2000; Francis et al. 2013; Guariglia/Yang 2016; Kaplan/Zingales 1997, 2000; Hadlock/Pierce 2010; Hubbard 1998; Moyen 2004; Lu/Wang 2015; Mulier et al. 2016, Raith et al. 2007). To my knowledge, there is no peer-reviewed empirical research on the effects of governance on investment behaviour in Russia except for Perotti and Gelfer (2001), which is based on a much earlier economic period, and Grosman and Leiponen (2018), which does not explicitly test the effect of ownership in relation to TD and investment. The few remaining papers on Russia address single corporate governance mechanisms (mainly ownership) and examine their impact on performance outcomes that are not directly related to investments, such as firm value or profitability measures (Estrin/Wright 1999; Filatotchev et al. 2001; Black 2001; Black et al. 2006; Goetzmann et al. 2003; Judge et al. 2005; Estrin et al. 2009) and productivity measures (Jones 1998; Linz/Kruger 1998; Filatotchev et al. 2001; Earle/Estrin 2003). These studies tend to focus on one period or a relatively short time frame in the aftermath of the collapse of the Soviet Union. For a complete review of this post-privatisation literature, see Djankov and Murrell (2002) and Estrin et al. (2009). The consensus of the literature is that better TD practices tend to lower the cost of capital, boost performance, and increase firm value. However, the moderating effects of ownership structures and TD processes on the investment-cash flow relationship remain unclear. On the one hand, state ownership (which dominates in Russian listed firms) is often described in the literature as being associated with weak governance standards, but at the same time, this form of ownership may be more beneficial to investments due to its *soft budget* constraints (Lizal/Svejnar 2002). On the other hand, oligarch-controlled firms, another category of firms highly prevalent in Russia, may be more transparent, especially if they have a dual listing. However, the moderating impact of TD on investments is unclear. This study aims to disentangle the effects of TD on investments in the presence of financial constraints for the two main types of ownership structures in Russia: state-owned enterprises (SOEs) and oligarch-controlled firms.

The key findings of this study are as follows. First, it reveals a positive direct effect of TD score on investment. Second, the relationship between TD and investment depends on ownership characteristics. For SOEs, the relationship between TD and investment is positive and significant, while for oligarch firms the relationship is non-linear and convex. Third, and most importantly, the results reveal that financially constrained firms benefit from improved TD scores. The results obtained from the panel fixed effects are compared to dynamic panel esti-

mations (GMM). The results of this study have important practical implications too. They improve understanding of firm dynamics when it comes to corporate governance in Russia, and they provide empirical support for the argument that financially-constrained firms should improve their transparency and disclosure standards prior to seeking funds for fixed investments.

This study's findings contribute to the literature in at least two important ways. First, I test the boundary conditions of traditional investment and agency theories and extend these to an emerging economy context, where the *state* and *oligarchs* play pivotal roles that do not present in developed economies. Second, I analyse how a combination of mechanisms (ownership and TD) rather than a single governance mechanism affects investment behaviour.

The rest of the paper is organised as follows. I describe the research design in the next section. Section 3 discusses the data and methods of analysis. Section 4 deals with results. Robustness tests are provided in Section 5. The final section concludes.

2. How financing pressure affects investment

Financing constraints affect all publicly listed companies but particularly so in the emerging markets where the debt and equity capital markets are underdeveloped or illiquid (La Porta et al. 1997, 2000). The higher the asymmetry of information between managers (owners) and investors, or the lower the standards of governance, the higher the effect of governance on financing constraints (Hubbard 1998) where such constraints exist. Specifically, if asymmetric information is severe, investors will tend to rely on general assurances, such as corporate governance practices and indices, to ascertain if companies are complying with good practices.
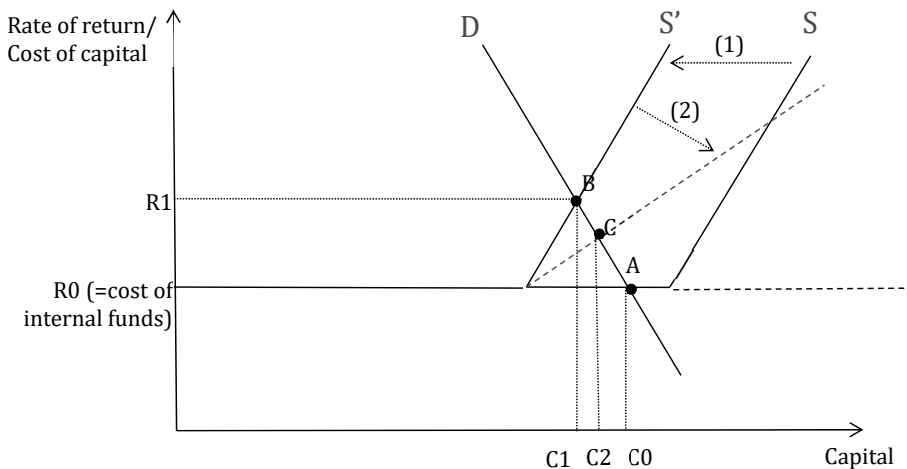
2.1. Corporate governance effects on the supply of finance

There is a 'pecking order' in managers' choice of finance for investment projects. Internal finance is preferred (point A in Figure 1) to external finance (Myers 2003). This preference ordering corresponds to a kink in the supply curve, where the cost of finance rises as the firm expands beyond the point that can be satisfied from internal resources. If the demand for investment funding intersects the rising portion of the supply curve, the investment return will have to be higher to justify the cost. Good governance can, when transparency and information availability reassure investors, flatten the upward part of the supply curve, hence alleviating financing constraints.

For illustrative purposes, suppose that the demand curve initially cuts through the supply curve close to the kink point and the equilibrium is at point A (Figure 1). If at this point internal finance was to fall short of expectations

(a translation to the left of the kinked supply curve from S to S' as indicated in step 1), the firm might find itself finance-constrained in that finance would now only be available at a rate R1 that could not justify the planned level of investment. The equilibrium thus moves from A to B (step 1) so that investment drops from C0 to C1. The sensitivity of the fall in investment depends upon the slope of the supply schedule beyond the kink, and the angle of this slope is flatter for better-governed firms. For firms with a 'better' governance regime, the investment would fall only to C2 (step 2).
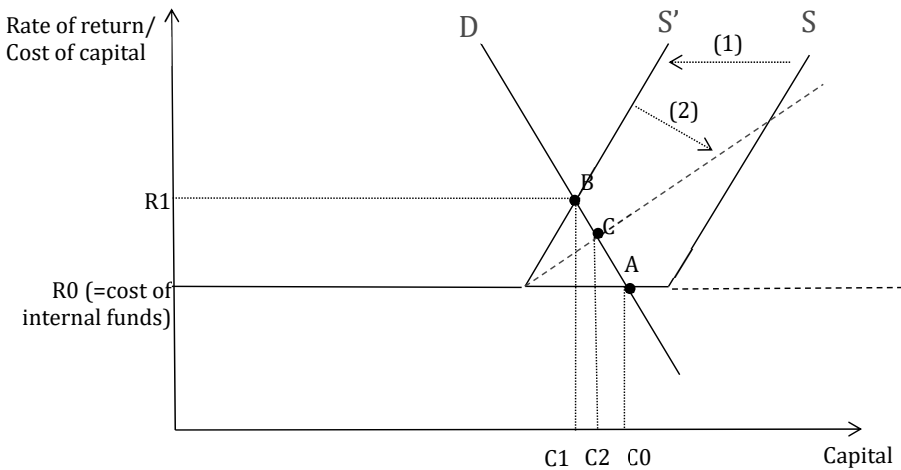
Figure 1: Governance Effects on the Supply of Finance

Source: Adapted from Driver and Temple (2012)

2.2. Corporate governance effects on the demand for finance

At the same time, corporate governance can translate the demand curve to the left or right, depending on whether it depresses or encourages investment. Negative effects on investment can ensue by, say, reducing managerial empire-building, whereas positive effects are derived from, say, a reduction in the occurrences of tunnelling (Figure 2). That being said, because managers in Russia do not over-invest (Dzarasov 2011) (see the next section for a discussion of this), I do not expect corporate governance to reduce investment (i.e., shift the demand curve to the left) in this study's empirical setting.

Figure 2: Governance Effects on the Demand for Finance

Source: Adapted from Driver and Guedes (2012)

2.3. Corporate governance effects on fixed investment in Russian firms

As illustrated in Figure 2 by the demand shift to the right (if the demand curve crosses the supply curve before the kink point), unconstrained firms will also benefit from good governance since this improves their operational transparency and efficiency, which will, in turn, make internal cash-flows more visible and controllable. This will promote the more efficient allocation of internal funds that can stimulate investment expenditure. Over the period of this study and beyond, internal cash-flows were considered by 33–43 % of Russian firms to be their main source of finance for capital investment (Aukutsionek 2020). Conceptually, the claim that governance will invariably have a positive effect on investment cannot be straightforwardly justified. For example, Jensen (1986) argues that managerial opportunism leads managers to overinvest in 'pet' projects that do not create shareholder value; therefore, good governance might stop managers from investing, which will ultimately reduce investment. However, it must be noted that Jensen's argument is based on events in the 1970s-80s related to US oil companies who wasted funds on pet projects and diversification. The overinvestment problem is likely to be more pronounced in stable, cash-rich companies in mature industries that have few growth opportunities.

The Russian institutional context allows me to hypothesise that Russian managers are unlikely to overinvest. Most Russian firms, operating in the aftermath of the Soviet regime, already have old and fully amortized assets and are heavy users of outsourcing rather than reliant on their own production systems. The current average longevity of equipment in Russia is twice its desired levels.

Even after Russia's prolonged recovery in 1999–2008, capital investment by Russian firms remained low and of poor quality. The majority of Russian firms regarded their productive assets as underinvested and obsolete in the face of growing competition and market demand (Aganbegyan 2008; Dzarasov 2011). This assumption of underinvestment still holds, with the most recent survey showing that a large proportion of firms (36 percent) did not buy equipment over two or more months in 2019, while 22 percent of firms made no capital investment in 12 months (Aukutsionek 2020).

Russian firms are characterised by the inseparability of management and control; this is mainly due to the influence of large shareholders over management. Such shareholder influence is not unusual for firms with concentrated ownership, even in developed economies. But unlike the developed economies, legal deficiencies in Russia allow majority shareholders (albeit with the consent of managers) to tunnel funds out of firms rather than to invest in long-term assets and infrastructure (Grosman et al. 2019). Referring back to Figure 2, I do not expect governance to make demand shift to the left to contract investment. This institutional impediment to investment growth supports the proposition that good governance improves investment. Therefore, I posit that:

Hypothesis 1.   Greater transparency has a positive effect on fixed investment

2.4. The role of ownership in the effect of governance on investment

My second hypothesis refers to ownership as a condition that may influence the relationship between TD and investment. Blockholders play a significant role in corporate governance in Russia (Grosman/Leiponen 2018; Grosman et al. 2019). Nearly all publicly listed companies have had at least one blockholding exceeding 25 % (Deloitte 2012, 2016). Although the government remains the dominant shareholder for many companies (known as state-owned enterprises or SOEs), the collapse of the Soviet Union ushered in a new class of owners-oligarchs (wealthy businessmen). These two types of blockholders are quite different from the institutional shareholders in developed economies because they overtly exert great control over the firms they own (Grosman et al. 2016). During the period of my study, oligarchs needed funds to restructure their assets. They lacked the internal funding enjoyed by SOEs and had to rely more on external funds. This required them to improve their corporate governance standards. It is therefore likely that they were, from fairly early on, more transparent than SOEs so they could appear more attractive to external investors. However, SOEs also became interested in TD during this period, having traditionally lagged behind privately-owned firms in their corporate governance standards. Their TD, therefore, required rather vigorous improvements. SOEs were also known to engage in corporate raiding on non-state assets, with the government using illegal methods such as corrupt law officials, blackmail, or falsified docu-

ments (Rochlitz 2014). These challenges amplified the need for the increased monitoring and transparency of corporate practices in SOEs. Hence, TD may be more effective in SOEs than in private firms, including those controlled by oligarchs, at improving capital allocation and investment.

Hypothesis 2.   Greater transparency has a stronger effect on fixed investment in SOEs than in oligarch-owned firms

2.5. Corporate governance effects on mitigating financing constraints

My *third hypothesis* relates to the external capital markets channel discussed in section 2.1., which concerned how to mitigate financing constraints. Limited access to finance is the most important factor to constrain capital investments. Throughout the period of my study (2002–2009), between 73 % and 84 % of Russia's firms were financially constrained (Aukutsionek 2020). While this situation has improved over recent years, access to the global financial markets remains the biggest hurdle to investment for 46 % of firms. Over the studied period, 9–16 % of firms sought to obtain bank loans but were not successful, mainly due to high credit rates (Aukutsionek 2020). By improving governance, and thereby reducing the asymmetry of information between agent and principal (external shareholder or debtholder), firms may be able to mitigate financing constraints on investment. It has been shown that better shareholder protection alleviates financing constraints even in an environment with a low level of investor protection, such as Russia (Sprenger/Lazareva, 2021). Thus, I expect TD to exert a mitigating effect on financing constraints. A firm's greater transparency will attract external investors and improve access to the local and global financial markets, enabling the firm to raise more funds externally via capital markets and at more affordable credit rates.

Referring back to Figure 1, the steeper the upward-sloping portion of the supply curve, the higher the cost of capital. Whether governance has the effect of making this slope shallower can be investigated by testing its *interaction* effect with a measure of financing constraints. In terms of observable variables, I expect the interaction between TD and a proxy of financing constraints to positively influence investments. This means that for firms *a priori* financially constrained, an improvement in TD is expected to lead to an improvement in investments.

Hypothesis 3.   Greater transparency reduces financing constraints on fixed investment

3. Data description and methods of analysis

3.1. *The transparency and disclosure score: Methodology and description*

The mechanisms of governance can be assessed according to TD, board and management structures, and shareholder rights. TD was the most frequent measure of governance standards by rating institutions in Russia during the studied period. Moreover, sophisticated governance indices have not necessarily been better predictors. Black et al. (2006) found the TD scores to be more useful measures of governance, in that they predicted Tobin's Q, a proxy for investment opportunities, and, therefore, correspond to those elements of governance that matter to investors.

In this study, I use TD rankings of Standard & Poor's rating agency (S&P) as proxies for corporate governance. This measure has been extensively used and validated in empirical research (Durnev/Kim 2005; Doidge et al. 2007; Grosman/Leiponen 2018; Khanna et al. 2004). The TD scores produced for 90 companies as of 2009, selected by size and liquidity, consist of three components: *ownership structure and shareholder rights*; *financial and operational information*; and *board and management structure*. These three sub-scores are positively correlated with one another. The S&P methodology consists of searching for 110 TD attributes (constructed from the perspective of an international investor) relating to the three components[1]. Each attribute is scored on a binary basis to ensure objectivity, and the scores for the three components are based on the scores for individual attributes. Scoring accounts for the information included in three major sources of public information – annual reports, web-based disclosures, and public regulatory reporting documents filed with the stock exchanges. According to the weighting system, public disclosure, regardless of its source, yields 80 % of the maximum score. The remaining 20 % of points (10 % each) are awarded if this information is also available from the other two sources. This methodology reflects the notion that replication of information in various sources represents value for investors since it makes the information more easily accessible. The TD score is an objective measure in the sense that the information is either disclosed or not, although the accuracy of the information is not fully assessed. However, the disclosure of audited accounts, especially if they accord with IFRS or US GAAP standards or are conducted by a top-tier auditor, fosters a degree of confidence in the accuracy of the information disclosed.

The strengths of the TD score lie in its *usage* and *applicability*. First, there is enough inter-firm and temporal variation among scores to make the TD score an interesting variable for a longitudinal study. The 2009 scores range from 20 % for the lowest scored company to 80 % for the highest. In 2009, the transparency index, calculated as the average score for the 90 Russian companies, was only

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1 The list of 110 TD attributes (p. 17–19) for 2009 survey of Russian companies accessed on 27 October 2015 via http://tinyurl.com/ojz7gc9.

56 %. In the UK, France, and the US, the scores were 71 %, 68 %, and 70 %, respectively[2].

Second, TD scores matter to investors, especially foreign ones, since they are willing to pay the highest premium for Russian firms with the best governance practices relative to firms from other countries (McKinsey 2002). Examples of these firms include MTS, Vimpelcom, and Wimm-Bill-Dann, which had a higher market value than their counterparts as a result of stronger investor appetite (Shekshnia 2004).

Third, transparency and disclosure are integral to corporate governance (Patel et al. 2002). Firms with higher corporate governance standards make more informative disclosures (Beekes/Brown 2006, Li et al. 2015). Transparency and full disclosure of information is important for emerging markets and particularly Russia, where external capital is necessary to sustain the high growth rate and whose biggest agency problem centres on asymmetric information and expropriation by majority shareholders (Aksu/Kosedag 2006).

3.2. Descriptive statistics

The breakdown of firms used in each year of the study period is presented in Table 1. TD and governance standards in Russia are improving gradually as more Russian firms participate in the international capital markets. In 2009, over 60 Russian companies were listed abroad. Firms that were listed on the main markets of the London Stock Exchange (LSE) and the New York Stock Exchange (NYSE) were substantially more transparent than those not so listed.[3] The data also show that companies electing independent directors to their supervisory boards have higher levels of transparency.

Table 1: Total Number of Firms with TD Scores per Year

Year	Total	Included in the previous year (>=2 consecutive)	Included in two previous years (>= 3 consecutive)	State-controlled (SOEs)	Oligarch-controlled	Institutional Investor-controlled	Other ownership types
2002	42	n/a	n/a	15	10	1	16
2003	60	40	n/a	18	13	1	28
2004	60	54	38	20	15	1	24
2005	67	55	49	20	20	1	26
2006	70	50	42	20	20	2	28

2 In 2003, the last year the survey was conducted.

3 Companies that traded only in Russia had an average transparency index of 50 %, whereas the transparency index for companies listed on the LSE was 63 %, and for NYSE-listed firms, 74 %.

Year	Total	Included in the previous year (>=2 consecutive)	Included in two previous years (>= 3 consecutive)	State-controlled (SOEs)	Oligarch-controlled	Institutional Investor-controlled	Other ownership types
2007	79	62	44	22	22	2	33
2008	90	71	54	19	24	4	43
2009	90	71	55	18	22	1	49
TOTAL	558	n/a	n/a	152	146	13	247
TOTAL%	100 %	n/a	n/a	27 %	26 %	2 %	44 %

The baseline model (1) of Table 4 contains five independent variables and a lagged dependent variable, and has a total of 281 firm-year observations. I present the summary statistics relating to this specification in Table 2.

Table 2: Summary Statistics

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
Investment	281	814	194	2,158	0	20,608
Sales	281	5,601	1,482	11,570	53	86,215
EBIT margin	281	0.18	0.17	0.17	-0.85	0.63
Gross cash-flow	281	1,282	230	3,094	-1,163	24,519
Tobin's Q	281	0.99	0.79	0.83	0.02	6.57
New long-term debt	281	329	10	960	0	7,687
New common equity	281	173	0	644	0	6,436
Transparency and disclosure scores						
Total score	281	0.56	0.58	0.15	0.11	0.85
Financial & operational disclosure	281	0.58	0.62	0.17	0.11	0.90
Ownership & shareholders' rights	281	0.56	0.57	0.17	0.11	0.93
Board & management structures	281	0.50	0.50	0.15	0.12	0.86

Notes: Financial metrics are in million EUR.

Financial and accounting data, e.g., sales, investment, gross cash-flow, Earnings before Interest and Tax (EBIT), Tobin's Q, debt and equity, are from the Compustat Global database. *Investment* is defined as annual capital spending on physical assets. Over the period of the study, a large proportion of firms (29–43 %) reported investing in fixed assets to enable the provision of new products or processes (Aukutsionek 2020). More recently, firms also invested in new assets to reduce production costs (27 %) or increase production capacity (32 %). The ultimate data on *Ownership* were collected from annual reports and web-based disclosures. Russian firms are mostly owned by majority (>50 %) shareholders; hence I use this threshold for the ownership variables. State ownership is de-

fined as 1 when it is >50 % and 0 otherwise. Oligarch ownership is defined as 1 when an individual's ownership is >50 % and 0 otherwise. Even if in some cases firm ownership is formally anonymous or non-disclosed, the media often infers who controls each large, listed firm (Chernykh 2008; 2011). I also compile summary statistics (untabulated) for the two main subgroups of firms – SOEs, and firms controlled by an oligarch. Other groups of firms are those controlled by institutional investors, and those without a majority shareholder but with either a blockholder (>25 % and <50 %) share, or dispersed ownership[4]. SOEs have lower than average TD scores and investment. Disclosures of their board and management structures are particularly low, with an average of 46 %. Firms controlled by oligarchs have higher than average TD scores and levels of financial and operational disclosure. The average investment of oligarch firms is also higher than the average investment of SOEs.

From the pairwise correlations summary (Table 3), I observe a significant correlation between firm size (proxied by sales) and TD. Larger publicly-listed firms tend to be more attentive to the appropriate governance levels. Investment is strongly correlated with gross cash-flow (GCF), which is in line with mainstream finance theory. New debt is strongly correlated with TD: the higher the disclosure, the lower the cost of capital due to reduced asymmetric information and, therefore, greater access to external financing.

Table 3: Pairwise Correlations

	Investment	Sales	GCF	Q	Debt	Equity	Total TD
Investment	1						
Sales	0.911***	1					
GCF	0.964***	0.917***	1				
Tobin's Q	-0.0388	-0.0471	-0.0197	1			
Debt	0.594***	0.534***	0.593***	-0.104	1		
Equity	0.133**	0.132**	0.113*	-0.0611	0.407***	1	
Total TD	0.164***	0.176***	0.156***	0.0894	0.223***	0.0118	1

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$

3.3. Methodology

My approach is in the spirit of Mairesse et al. (1999), in that I have chosen to use an accelerator model of investment in error correction form. Most research

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4 There are 7 observations for firms that are majority-owned by institutional investors (e.g., Baltika Brewery of Carlsberg Group, with a free float of 71 % of capital), when controlling for other regressors. There are 68 observations for firms without a majority shareholder. 7+68+56+67=198 corresponds to the total sample (model (2) of Table 4) when controlling for other regressors.

shows that investment is non-stationary, so the error correction form is preferred (Becker/Hall 2009; Bond et al. 2003; Mairesse et al. 1999; Bond et al. 1997; Bean 1981). An accelerator model in error correction form has the advantage over other investment models such as the Euler or Q models because it allows the specification of long-run determinants of investment to be separated from those of short-run adjustment and expectation lags. I can thus assume that sales and investment are proportional in the long run, as in the simple neoclassical theory, even though the dynamic between the two may be more complex in the short run. The investment literature contains a wide variety of specifications. The original econometric literature used the level of investment (Jorgenson et al. 1970) whereas Clark et al. (1979) and Bernanke et al. (1988) used the investment to sales ratios. A concern with stationarity issues has caused many authors to use the first difference of investment in an error correction framework (Driver/Moreton 1991), which is what I adopt here to reduce the problems of skewness and heteroscedasticity, as follows:

$$\Delta i_{it} = \beta_0 + \beta_1 \Delta i_{i,t-1} + \beta_2 (i_{i,t-2} - s_{i,t-2}) + \beta_3 \Delta g_{it} + \beta_4 \Delta gcf_{i,t-1} + \beta_5 X_{it} \qquad (1),$$
$$+ d_t + \epsilon_{it}$$

where Δi_{it} is the first difference of the logarithm of fixed investment. X_{it} represents a vector of the variables that have been emphasised as determinants of investment from a variety of theoretical perspectives. It includes the first difference in sales in logarithms Δs_{it}. The rationale for the inclusion of a lagged investment term, based on formal models of investment behaviour, is the presence of adjustment costs of investment (Brown/Petersen 2009). $\Delta gcf_{i,t-1}$ —which is the first difference of the logarithms of the firm's gross cash flow at the end of period *t-1*—is defined as the sum of net income and depreciation and amortization charges. The coefficient of $\Delta gcf_{i,t-1}$ represents the potential sensitivity of investment to fluctuations in the available internal finance and could reflect the presence of financing constraints on investment (Fazzari et al. 1988; Kaplan/Zingales 1997; Cleary 1999; Guariglia/Yang 2016). I lag the difference in gross cash-flow by one year to avoid reverse causality since once the firm has invested, it might become financially constrained. I also compute an *a priori* measure of financing constraints, defined as a binary variable; it takes the value 0 for unconstrained firms, e.g., firms that paid common or preferred dividends (Bond/Meghir 1994; Fazzari et al. 1988; Goergen/Renneboog 2001) and did not issue common equity (Angelopoulou/Gibson 2009), and 1 for constrained firms, e.g., firms that issued new common equity over the studied period. Firms in emerging economies mostly rely on equity to finance their investment needs (Seifert/Gonenc 2010). Financing constraints are lagged by one year to avoid reverse causality.

The term $\left(i_{i,\,t-2} - s_{i,\,t-2}\right)$ is the error correction term, where $i_{i,\,t-2}$ is the natural logarithm of fixed investment and $s_{i,\,t-2}$ is the natural logarithm of sales at the end of period *t-2*. The error correction term represents the long-run properties of this model. 'Error correcting' behaviour requires that $\beta_1 < 0$ so that investment above the desired level is associated with a lower future investment, and vice versa. Δg_{it} is the first difference between TD (natural logarithm). d_t controls for year fixed effects, and ϵ_{it} is a random error term. The unit of analysis is firm *i* at time *t*. Firm fixed effects are removed by first differencing.

4. Results

4.1. A direct effect of governance on investment

In Table 4, I test the first hypothesis for the direct effect of governance on investments. Governance is statistically significant in Models (1), (2), (3), (6), and (7) of Table 4. In terms of economic significance, and since I am considering a linear relationship between TD and investment, a 1 % increase in TD score, *ceteris paribus*, means a 0.338 % increase in investment, according to Model (2) for example. The *t*-test on the error correction term (*ect)* shows that *ect*'s coefficient is significant in all three models, which means that cointegration exists. In other words, the error correction term incorporates long-run information on sales and investment in the model. I test for heteroscedasticity in the error terms with White's test (White 1980) by reporting White's robust standard errors.

Table 4: Investment and Direct Impact of Governance, Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dependent Variable: Investment, first difference Δi_{it}			
	Full sample	Full sample	Full sample	(Oligarchs-owned firms)	(Oligarchs-owned firms)	SOEs sample	SOEs sample
Governance, Δg_{it}	0.202* (0.103)	0.338** (0.141)	0.292* (0.152)	-0.120 (0.328)	-0.369 (0.360)	0.939** (0.358)	1.166** (0.429)
Governance², Δg_{it}^2			0.174 (0.236)		0.757* (0.377)		0.700 (0.648)
Tobin's Q², Δq_{it}^2		0.098* (0.049)	0.093* (0.048)	0.207** (0.088)	0.231** (0.086)	0.287* (0.148)	0.267* (0.139)
Investment, $\Delta i_{i,t-1}$	-0.368*** (0.087)	-0.344*** (0.097)	-0.351*** (0.102)	-0.682*** (0.216)	-0.686*** (0.210)	-0.161 (0.120)	-0.197 (0.120)
Sales, Δs_{it}	0.675*** (0.168)	0.783*** (0.269)	0.793*** (0.276)	0.168 (0.418)	0.104 (0.378)	1.237*** (0.429)	1.321** (0.488)
Gross Cash-Flow, $\Delta gcf_{i,t-1}$	0.088 (0.054)	0.038 (0.077)	0.039 (0.077)	0.225 (0.145)	0.301** (0.142)	-0.017 (0.125)	-0.012 (0.133)
ect, $(i_{i,t-2} - s_{i,t-2})$	-0.671*** (0.099)	-0.662*** (0.105)	-0.676*** (0.114)	-0.583*** (0.201)	-0.902*** (0.252)	-0.585*** (0.158)	-0.592*** (0.163)
Constant	-1.401*** (0.195)	-1.457*** (0.264)	-1.505*** (0.302)	-0.952* (0.483)	-1.672** (0.597)	-1.615*** (0.438)	-1.730*** (0.505)
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R²	0.460	0.511	0.513	0.708	0.724	0.611	0.618
N	281	198	198	56	56	67	67

Notes: * p<0.10, ** p<0.05, *** p<0.01.
All variables are logged except Tobin's Q. *ect* – error correction term.
Numbers in parentheses are White's robust standard errors.

In models (2)-(7), I control for investment opportunities with Tobin's Q ($\Delta q_{i,t-1}$). Since some firms were only recently listed or they lack share price information for the early years of the study period, the number of observations for the total sample settles at 198. Tobin's Q is positive and significant for investment—more investment opportunities lead to more investment, providing support for the findings in the classical investment literature. When controlling for firm size with the first difference in total assets, in addition to first and second differences in sales, the results of the model (1) are unchanged. Governance remains a significant and positive factor for investment in the presence of a majority shareholder (>50 %), whether this be a state entity or a private investor (untabulated results).

Including fixed effects in all models in Table 4 is equivalent to time-demeaning all the variables. Thus, controlling for past investments would account for the dynamic nature of investments. In an additional (untabulated) analysis, I carry out a dynamic fixed effects regression using lags of investment difference at *t-1*, *t-2,* and *t-3* as regressors to investment difference at time *t*, controlling for other firm characteristics and time dummies. The analysis shows significance in these coefficients, confirming the dynamic nature of investment and justifying the inclusion of a lagged dependent variable. Despite using an unbalanced panel, the data are persistent. For example, when selecting a sub-sample from the panel with three consecutive non-missing observations of TD score (a total of 225 observations), the results for Model (1) and (2) remain statistically unchanged.

4.2. The effects of ownership on investment

I then analyse the companies owned by majority shareholders and look at the sub-panels with (i) an oligarch as the controlling shareholder (see models (4) and (5) of Table 4), and (ii) the state as the controlling shareholder (models (6) and (7) of Table 4). I find that greater transparency and disclosure is a positive factor for investment in SOEs. SOEs are poorly governed; their TD scores are much lower than the average score or scores of non-SOEs, therefore, any improvement in their disclosure might have a significant impact on the level of their capital expenditure. The coefficient of governance in the state-sub panel (0.94 – 1.17) is triple that of the full panel (model (2), 0.34).

While governance is important for SOEs, the coefficient of gross cash flow is insignificant. This is in line with previous studies (Cull et al. 2015). The absence of sensitivity of investment to internal funds in the case of SOEs could be evidence of *soft budget* constraints, such as the access to cheaper funds from government or the state-owned banks. Another explanation of the non-sensitivity of investment to cash-flow would be that SOEs operate in frictionless markets, where it is cheaper to get external than internal funds. Conversely, oligarch-owned firms are more sensitive to the levels of internal funds (sig-

nificance in the $\Delta \operatorname{gcf}_{i,t-1}$ coefficient), while there is no linear relationship between governance and investment for such firms.

To further understand why there is no linear relationship for oligarch-owned firms between TD and investment, I test for a curvilinear relationship of TD to investment with a quadratic term of governance Δg_{it}^2 in models (3), (5), and (7) of Table 4. I find that for oligarch-owned firms in model (5), the relationship between governance and investment might indeed be convex, as signalled by the positive coefficient of the quadratic governance variable. This means that it is only from a certain (higher) threshold that an improvement in TD becomes very beneficial for oligarch-owned firms. This relates to the fact that oligarch-owned firms already have a sufficient level of transparency, so the TD score needs to be significantly improved in order to have an effect on investment. This contrasts with the finding that SOEs can benefit from even marginal improvements in TD. I do not find any non-linear effect of governance in the total sample or the SOE sub-sample.

4.3. Effect of governance on mitigating financing constraints on investments

In Table 5, I present the models testing the second hypothesis: does good corporate governance help external capital markets to lift financing constraints on investment? Governance is significant in models (1) and (2) of Table 5. In models (2) and (3), I measure *a priori* financing constraints and interact them with the variable of interest (i.e., the TD scores). I include a debt term to control for possible omitted variable biases and to evaluate the changing role of external finance on investment (Bond/Meghir 1994; Brown/Petersen 2009). Statistically, firms in my sample have low leverage (on average, they have a 1.5 Debt/EBITDA[5] ratio) and in this situation, I could argue that they finance their deficits by raising external equity before debt. If firms want to raise equity, being transparent becomes more important to them since they are facing public investors who need TD scores to assess firms' credibility. TD scores are less important to banks: they already have the necessary information since they monitor the firms through debt covenants.

In model (3) of Table 5, the interaction term between financing constraints and governance is statistically significant and positive. This means that financially constrained firms benefit significantly more from improved TD practices than unconstrained firms. This is evidence that companies with financing needs suffer from underinvestment, and it provides support for Hypothesis 2 when I control for constrained firms. Corporate governance matters and has a positive impact on investment for firms that are *a priori* financially constrained. The results are

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5 Earnings before Interest, Taxes, Depreciation & Amortization.

unchanged when adjusting the dependent variable for the outliers at 1 % and winsorizing.

Table 5: Investment and External Finance, Fixed Effects

	Dependent Variable: Investment, first difference Δi_{it}		
	(1)	(2)	(3)
Governance, Δg_{it}	0.231*	0.228*	-0.249
	(0.128)	(0.131)	(0.219)
Governance^2, Δg_{it}^2	0.023	0.022	-0.063
	(0.048)	(0.048)	(0.054)
Investment, $\Delta i_{i,t-1}$	-0.346***	-0.347***	-0.350***
	(0.090)	(0.090)	(0.088)
Sales, Δs_{it}	0.672***	0.677***	0.727***
	(0.171)	(0.175)	(0.184)
ect, $(i_{i,t-2} - s_{i,t-2})$	-0.641***	-0.642***	-0.624***
	(0.106)	(0.107)	(0.102)
$Debt_{it}$	0.023***	0.023***	0.023***
	(0.007)	(0.007)	(0.007)
$Fin\ Constraints_{i,t-1}$		0.016	-0.020
		(0.071)	(0.067)
$Fin\ Constraints_{i,t-1} * \Delta g_{it}$			0.744***
			(0.275)
Constant	-1.402***	-1.410***	-1.207***
	(0.217)	(0.226)	(0.213)
Time Dummies	Yes	Yes	Yes
R^2	0.449	0.449	0.465
N	295	295	295

Notes: * p<0.10, ** p<0.05, *** p<0.01.
All variables are logged except $Fin\ Constraints_{i,t-1}$. *ect* – error correction term.
Numbers in parentheses are White's robust standard errors.

5. Robustness Checks

5.1. *Dealing with endogeneity*

Endogeneity issues are frequent in studies that analyse governance practices at the firm level (Klapper/Love 2004). This is because it is generally difficult to find exogenous factors or natural experiments with which to identify the relationships being examined (Wintoki et al. 2012). First, there is an issue of *reverse causality*. A fast-growing firm, for example, may adopt better TD practices in order to ensure access to external financing at a lower cost. These growth opportunities will be reflected in the firm valuation, inducing a positive correlation with TD. However, it seems unlikely that such reverse causality between investment and TD scores would exist. Would firms try to influence the S&P

agency in order to get a higher TD score *through an increase in investment*? This seems rather cumbersome since there are other direct ways of improving the score, such as publicly disclosing more information. If I use another proxy for corporate governance, such as board composition, reverse causality is more obvious because the board composition is, ultimately, the firm's decision and not that of an external institution.

Endogeneity might also arise due to *omitted variables* that serve as pre-determinants for differences in sales, assets, or gross cash-flows, which, in turn, are shown to be correlated with investment. Since I use panel data techniques with fixed effects and lagged dependent variables, they address omitted variables bias for time-invariant variables, e.g., industry, region, and legal characteristics.

Another potential concern is *selection bias*. The firms in the sample were selected by S&P according to their size and liquidity. In 2009, the number amounted to 90 firms, 76 of which were included in a 2008 study. The liquidity of stocks is generally positively correlated with firm size, but there are exceptions, especially in cases of minor free float. There are more than 300 public companies in Russia, and the S&P sample may not be representative of all Russia's public companies. On the one hand, the sampling method is likely to cause an upward bias in assessments of the transparency of the entire population of public Russian companies because larger companies tend to be more transparent than smaller ones. On the other hand, since the companies included in the sample account for 80 % of the cumulative market capitalisation of the Russian stock market, they represent a majority of the Russian economy in terms of assets and operations. Russian small and medium-sized enterprises (SMEs) have different priorities. They, like SMEs in developed countries, are operating in situations where there is less need for transparency. The costs of transparency and disclosure are quite high, requiring additional accounting and IT expenses; they can therefore be an obstacle to pursuing good governance standards. Nonetheless, I provide robustness tests to address possible endogeneity concerns in the following section.

5.2. Dynamic panel data techniques

The dynamic panel data estimator (Arellano/Bond 1991) incorporates the dynamic nature of governance relationships to provide a valid and powerful instrument that controls for causality, unobserved heterogeneity, and simultaneity (Wintoki et al. 2012). The use of a GMM estimator is also strictly required where the lagged dependent variable introduces Nickell's bias (Arellano 2003).

The dynamic modelling approach has been used in other areas of finance and economics where the structure of the problem suggests a dynamic relationship between the dependent and independent variables (Driver/Guedes 2012; Bond/Meghir 1994; Whited/Wu 2006). Here, I use difference GMM (Table 6) and

system GMM (Table 7) with collapsed instruments (Roodman 2009). I make a small sample adjustment and report t-statistics and the Wald chi-squared test. I also report robust standard errors that are consistent with panel-specific autocorrelation and heteroscedasticity. GMM estimation should, in principle, be able to correct for the biases arising from simultaneity and the presence of correlated effects and simultaneity.

In Table 6, I report the results of the specification tests—the AR(1) and AR(2) first-order and second-order serial order correlation tests. The AR(2) test yields a p-value range of $0.1 - 0.3$ in models (2)-(5), which means that I cannot reject the null hypothesis of no second-order serial correlation.

Table 6: **Investment and Corporate Governance, Difference GMM**

	Dependent Variable: Investment, first difference Δi_{it}				
	(1)	(2)	(3)	(4)	(5)
Governance, Δg_{it}	0.276***	0.141	0.317*	0.288***	-0.496**
	(0.099)	(0.173)	(0.170)	(0.108)	(0.227)
Investment, $\Delta i_{i,t-1}$	-0.660***	-0.652***	-0.557***	-0.637***	-0.621***
	(0.105)	(0.115)	(0.096)	(0.109)	(0.106)
Sales, Δs_{it}	0.667***	0.911***	0.994***	0.667***	0.842***
	(0.215)	(0.212)	(0.331)	(0.222)	(0.219)
ect, $(i_{i,t-2} - s_{i,t-2})$	-0.834***	-0.918***	-0.832***	-0.849***	-0.826***
	(0.118)	(0.130)	(0.114)	(0.131)	(0.129)
Gross Cash-Flow, $\Delta gcf_{i,t-1}$		0.189**	0.063		
		(0.077)	(0.091)		
Tobin's Q, $\Delta q_{i,t-1}$			0.058		
			(0.080)		
$Debt_{it}$				0.023**	0.025**
				(0.010)	(0.010)
Fin Constraints$_{i,t-1}$					-0.049
					(0.084)
Fin Constraints$_{i,t-1}$* Δg_{it}					0.934***
					(0.273)
Time dummies	Yes	Yes	Yes	Yes	Yes
AR(1)	-2.3	-2.1	-1.9	-2.5	-2.8
AR(1) p-value	0.022	0.003	0.058	0.014	0.005
AR(2)	-2.5	-1.0	-1.1	-2.3	-1.6
AR(2) p-value	0.012	0.330	0.267	0.023	0.100
Hansen	22.7	29.6	36.8	26.9	40.7
Hansen p-value	0.202	0.199	0.217	0.362	0.272
N	218	208	136	216	216
Number of instruments	29	36	43	37	50

Notes: * p<0.10, ** p<0.05, *** p<0.01. All variables are logged, except Fin Constraints. All standard errors are Whites robust errors controlling for heteroscedasticity and panel-specific autocorrelation. The difference GMM estimator uses a system consisting of first-differenced

equations. We use the collapse option of xtabond2 as in Roodman (2009) to avoid instrument proliferation and a small sample adjustment to correct for small number of observations. We conservatively assume that all variables are endogenous. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over- identification is under the null that all instruments are valid.

Table 7: Investment and Corporate Governance, System GMM

	Dependent Variable: Investment, first difference Δi_{it}				
	(1)	(2)	(3)	(4)	(5)
Governance, Δg_{it}	0.329***	0.154	0.352**	0.323***	-0.311
	(0.109)	(0.141)	(0.139)	(0.106)	(0.241)
Investment, $\Delta i_{i,t-1}$	-0.519***	-0.405***	-0.461***	-0.515***	-0.473***
	(0.126)	(0.105)	(0.086)	(0.134)	(0.131)
Sales, Δs_{it}	0.187	0.594**	0.381	0.178	0.289
	(0.305)	(0.230)	(0.331)	(0.312)	(0.295)
ect, $(i_{i,t-2} - s_{i,t-2})$	-0.403***	-0.497***	-0.370***	-0.437***	-0.429***
	(0.105)	(0.090)	(0.086)	(0.103)	(0.101)
Gross Cash-Flow, $\Delta gcf_{i,t-1}$		0.188***	0.133		
		(0.067)	(0.089)		
Tobin's Q, $\Delta q_{i,t-1}$			0.246***		
			(0.056)		
$Debt_{it}$				0.024**	0.022**
				(0.011)	(0.011)
$Fin\ Constraints_{i,t-1}$					-0.294**
					(0.121)
$Fin\ Constraints_{i,t-1} * \Delta g_{it}$					0.828***
					(0.286)
Constant	-1.092***	-1.158***	-0.823***	-1.272***	-1.196***
	(0.230)	(0.194)	(0.199)	(0.214)	(0.203)
Time dummies	Yes	Yes	Yes	Yes	Yes
AR(1)	-1.8	-2.6	-1.4	-1.7	-2.0
AR(1) p-value	0.078	0.009	0.164	0.081	0.046
AR(2)	-2.8	-1.9	-2.6	-2.8	-2.0
AR(2) p-value	0.006	0.063	0.010	0.006	0.041
Hansen	31.4	39.0	44.7	36.9	42.8
Hansen p-value	0.088	0.102	0.179	0.180	0.481
N	297	281	198	295	295
Number of instruments	34	42	50	43	58

Notes: * p<0.10, ** p<0.05, *** p<0.01. All variables are logged, except Fin Constraints. All standard errors are Whites robust errors controlling for heteroscedasticity and panel-specific autocorrelation. The system GMM estimator requires carrying out GMM estimation using a

stacked system consisting of both first-differenced and level equations. We use the collapse option of xtabond2 as in Roodman (2009) to avoid instrument proliferation and a small sample adjustment to correct for small number of observations. We conservatively assume that all variables are endogenous. AR(1) and AR(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over- identification is under the null that all instruments are valid.

The Hansen tests in Tables 6 and 7 reveal a J-statistic with a p-value in the range of $0.1 - 0.5$, meaning I cannot reject the hypothesis that my instruments are valid. I tested also for the exogeneity of a subset of my instruments in GMM using difference-in-Hansen test of exogeneity (not reported), which is a test of the exogeneity of a subset of instruments[6]. The results showed that I cannot reject the hypothesis that the additional subset of instruments used in the GMM estimates is indeed exogenous. Taken together, the specification tests provide empirical verification for the argument that the instruments for TD are exogenous with respect to investment.

All models save for model (2) in Table 6 and models (1), (3), and (4) in Table 7 show that governance is significant and positive for investment. Model (5) in Table 7 provides support for Hypothesis 2; the interaction term between financing constraints and governance is positive and significant, meaning that firms classified as financially constrained benefit from better governance. Both gross cash flow and Tobin's Q are positive and significant for investment, providing support for the findings in the classical investment literature.

6. Conclusion

This paper contributes to the governance and financing constraints literature by examining how transparency and disclosure scores directly influence investments or alleviate financing constraints on investment. I explore these mechanisms in the unique and dynamic setting of Russia during a period marked by significant political events (Vladimir Putin's presidential election). Using a sample of the largest Russian firms surveyed by S&P on their transparency and disclosure practices, complemented by self-collected data on ultimate ownership, I provide evidence for heterogeneity in firm investment behaviour by main owner categories.

I found governance to be a significant and positive factor for investment, using both fixed effects and GMM estimators. This result contributes to the previous literature that introduces the corporate governance framework into investment-cash flow sensitivity in Russia (Grosman/Leiponen 2018; Perotti/Gelfer 2001; Sprenger/Lazareva 2021) and in an international context (Francis et al. 2013;

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6 GMM estimator makes an additional assumption that any correlation between the endogenous variables and the unobserved (fixed) effect is constant over time; this assumption can be tested directly using a difference-in-Hansen test of exogeneity.

Kang et al., 2006; Lu/Wang 2015; Mueller/Peev 2007; Pawlina/Renneboog 2005; Pindado et al. 2011). This literature generally finds a positive effect of various corporate governance measures (mainly ownership) on investment[7].

I then analysed the difference between SOEs and oligarch-controlled firms in relation to the effect of transparency on investment. This contributes to the literature on investment that studies owner heterogeneity in Austria (Gugler, 2003), China (Cull et al. 2015), and other institutional contexts (Gugler/Peev 2010). I found that greater transparency and disclosure is a positive factor for investment in SOEs, but that internal cash flow is insignificant for investment, which is generally in line with the literature (Cull et al. 2015). I found that governance does not significantly affect investments in firms controlled by oligarchs. Hence, private ownership concentration might replace good governance. But I also found that the relationship between governance and investment might be *nonlinear* for oligarch-controlled firms. Specifically, I found that a quadratic term of governance significantly impacts investments in oligarch-controlled firms. This suggests that TD matters for oligarch-owned firms when they are dramatically improving their levels of transparency, and that beyond a certain threshold, the relationship between TD and investment becomes significantly positive.

I found that corporate governance matters and has a positive impact on investments for firms that are *a priori* constrained, contributing to the set of literature that follows a similar methodology for defining financial constraints (Bond/Meghir 1994; Fazzari et al. 1988; Goergen/Renneboog 2001; Angelopoulou/Gibson 2009). This is an important finding in light of the recent survey evidence that access to finance is the major constraint for investment in Russia (Aukutsionek 2020). Debt had a significant and positive influence on investment, which might mean that firms that raised additional debt were subject to more scrutiny from banks and were applying better governance rules to maximise the use of additional cash flows in investment projects.

Following the introduction of corporate governance policies in 2002–2009, Russian companies have seen gradual improvements in their governance standards during 2010–2012. Firstly, more companies are listed on stock exchanges, with better governance structure being a condition for going public. Secondly, the Russian government has put emphasis on improving corporate governance in SOEs, in particular on appointing independent board directors (Deloitte 2012). That being said, the recent unfavourable market conditions of the international financial markets has meant that they have exerted less pressure on Russian companies. Further, the government program focused on improving governance in SOEs has slowed down and even, in 2014–2015, partially reversed as the government resumed the appointment of government officials on SOE boards (Deloitte 2016). Stricter requirements around corporate governance, such as

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7 Lu and Wang (2015) find a negative effect of board independence on capital investment.

the 'comply-or-explain' framework and new listing rules, were introduced in 2014 to increase the effectiveness of corporate governance practices. Oligarch-controlled firms made more significant improvements than SOEs in the years following the introduction of corporate governance practices, which is in line with their desire to access global financial markets. For instance, the share of independent directors in oligarch-owned firms was 38 %, up from 27 % in 2006; this contrasts with SOEs whose boards are only 20 % independent (Deloitte 2016). In international terms, the board structures of Russian companies continue to lag behind the standards adopted by international corporations. This evidence suggests the importance of corporate governance in Russia and the validity of my findings. A lack of transparency is not a problem for Russia alone, being a feature of SOEs the world over. Governments use a variety of reporting mechanisms and incentives to increase information about SOEs. SOEs perform better in countries where they rely on centralised monitoring agencies than in countries where ministries monitor SOEs in their relevant industries. SOE holdings are particularly efficient in Asia, such as SASAC in China or Temasek in Singapore. To improve internal efficiency and limit corruption, governments in some countries have introduced strict control on investment decisions. For example, Mexico's Pemex, one of the largest SOEs in the world, must receive approval of its major investments from the Ministry of Finance (Musacchio/Pineda Ayerbe 2019). The Russian corporate governance code has been drawn up with reference to the UK and European models, and because many Russian companies are listed on the London Stock Exchange, the governance regulations and norms in these markets continue to positively affect such Russian companies.

Country characteristics strongly influence (i) which aspects of governance predict a particular firm outcome, and (ii) in which firms this association is found (Black et al. 2012). Although my findings apply to the Russian context, where state-owned companies make up 62 % of the value of the stock market, future research could be extended to other state-capitalist countries, such as China and Brazil, where state-owned companies represent 80 % and 38 % respectively (Wooldridge 2012). With this study, I provide evidence that improved transparency and disclosure has a positive impact on emerging markets' firm investment, especially for those firms that are controlled by the government or are financially constrained.

Acknowledgments

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