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## **"Who is Monitoring the Monitor? The Influence of Ownership Networks and Organizational Transparency on Long-Term Resource Commitment in Russian Listed Firms"**

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This empirical study examines the effects of ownership networks and organizational transparency on long-term resource commitments of large Russian firms. Building on resource dependence and agency theories, we argue that ownership networks may compensate for the lack of institutional structures in emerging economies and provide the necessary resources or accountability to enable firm growth through long-term commitments of capital. We use a unique panel dataset of Russian listed firms complemented by information about firms' transparency and disclosure practices, major owners, and memberships in a leading industry association. These data allow us to analyze the network of ownership and association ties to Russian oligarchs and to the state. We find that a firm's position in an ownership network and its corporate governance practices in terms of transparency and disclosure are positively associated with long-term investment. We also find that ownership network positions and transparency practices significantly interact: firms in peripheral network positions tend to benefit more from improvements in their transparency and disclosure practices. However, this interaction depends on the type of ownership. To further analyze this, we compare different types of network ties: single or multiple controlling owners, state, conglomerate, and industry association ties allow us to distinguish the types of resources or oversight that might be available through the network. We find that firms with one single controlling oligarch owner, conglomerate owner, or industry association ties particularly benefit from transparency practices in committing to long-term investment. We interpret these findings through reference to resource dependence and agency theories.

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This empirical study examines the effects of ownership networks and organizational transparency on long-term resource commitments of large Russian firms. Building on resource dependence and agency theories, we argue that ownership networks may compensate for the lack of institutional structures in emerging economies and provide the necessary resources or accountability to enable firm growth through long-term commitments of capital. We use a unique panel dataset of Russian listed firms complemented by information about firms' transparency and disclosure practices, major owners, and memberships in a leading industry association. These data allow us to analyze the network of ownership and association ties to Russian oligarchs and to the state. We find that a firm's position in an ownership network and its corporate governance practices in terms of transparency and disclosure are positively associated with long-term investment. We also find that ownership network positions and transparency practices significantly interact: firms in peripheral network positions tend to benefit more from improvements in their transparency and disclosure practices. However, this interaction depends on the type of ownership. To further analyze this, we compare different types of network ties: single or multiple controlling owners, state, conglomerate, and industry association ties allow us to distinguish the types of resources or oversight that might be available through the network. We find that firms with one single controlling oligarch owner, conglomerate owner, or industry association ties particularly benefit from transparency practices in committing to long-term investment. We interpret these findings through reference to resource dependence and agency theories.

**Keywords:** networks, governance, resource dependence theory, agency theory, investment

## **INTRODUCTION**

The Russian economy has a dichotomous structure. It is controlled by the state, on one hand, and by a handful of Russian billionaires or "oligarchs," on the other hand. These parties can be immensely powerful and either make economic and political resources available for firms, or

extract valuable resources out of firms (Okhmatovsky, 2010). In this paper, we investigate the determinants of Russian listed firms' long-term commitments of capital – fixed investments.

Investment is critical for long-term performance of firms as it boosts productivity, enables growth, and thereby improves performance and profits. As a result, investments may lead to increases in the firm's share price subsequently expanding shareholder value. Fixed investments thus reflect the ability of the firm to invest in long-term growth and performance. However, governance arrangements, such as ownership structure and transparency practices, may influence the firm's access to financial, knowledge, and political resources, and its vulnerability to the tunneling of resources out of the firm by powerful organizational agents (Faccio, 2006; Frye and Iwasaki, 2011). In this paper, we explore the conditions under which either resource provision or expropriation is likely to happen. We argue that highlighting these organizational strategies in an emerging economy institutional environment is appropriate because of greater variation in organizational practices and the relevance of the emerging economy context for institutional research per se.

We approach the relationships between governance and long-term resource commitment from two theoretical perspectives. Resource-dependence theory (Pfeffer and Salancik, 1978 and 2003; Boyd, 1990; Hillman et al., 2009) suggests that firms are constrained by their environmental conditions and tend to act to relax these constraints and get access to vital resources such as finance, expertise, advice, and inputs (Burt, 1980; Provan et al., 1980; Boyd, 1990; Casciaro et al., 2005). Agency theory is based on the recognition that the separation of ownership and control of the firm with professional managers leads to a principal-agent problem whereby agents (managers) do not always act in the best interest of their principals

(shareholders), because monitoring is incomplete and managers have discretion to maximize their own private gains (Berle and Mean, 1932; Fama and Jensen, 1983).

A slightly different perspective of agency theory, and one particularly relevant for emerging economies, is the principal-principal agency (PPA) model of corporate governance (Classens et al, 2000; Dharwadkar et al., 2000; Young et al., 2008). Principal-principal conflicts between controlling shareholders and minority shareholders result from concentrated ownership, extensive family ownership and control, conglomerate structures, and weak legal protection of minority shareholders (Young et al., 2008). In particular, concentrated ownership, the predominant ownership structure in Russia and other emerging economies, combined with weak external governance mechanisms, results in more frequent conflicts between controlling shareholders and other shareholders (Morck et al., 2005). These conflicts are created by the controlling shareholder's access to decisions concerning dividends, investments, and appointments, or even sales of assets and collusion with top management that generate opportunities for private gains and thus expropriation of minority shareholders.

Within the broader institutions-based view of the firm (Ahuja, 2011), we integrate the PPA theory with Resource-Dependence Theory (RDT) by building on Hillman's work (2003, 2004 and 2009). In particular, we suggest that owners that are powerful enough to bring in resources to a firm may also be powerful enough to redirect resources away from the firm. Thus, although powerful owners may increase efficiency of decision making by monitoring the top managers, the benefits may be more than offset by the costs of expropriation through their ability to generate private gains or engage in collusion with top managers. However, these tendencies can be countered by firms' commitment to corporate governance practices in terms of

transparency and disclosure (Patel et al., 2002; Bushman et al., 2003; Berglöf et al, 2005; Hermalin and Weisbach, 2007; Roohani et al., 2009). When firms have instituted thorough and transparent reporting practices, it is more difficult for powerful managers or owners to draw private benefits. Moreover, transparent governance facilitates acquisition of resources from other external investors or lenders. Transparency thus mitigates agency costs, including principal-principal agency costs and, as a consequence, alleviates resource constraints.

We adopt the novel network perspective of ownership to examine the effects of owners' connectivity to one another and to the state (Guthrie et al., 2012). More connected controlling owners may provide more relevant resources to the firm, such as information about and finance for investment opportunities. On the other hand, more connected owners may be particularly powerful and prone to expropriation. However, powerful owners may potentially be monitored by other large shareholders, thus reducing the potential downsides of ownership networks.

We test these ideas with a unique panel dataset of ninety large Russian listed firms. We combine accounting data of these firms with longitudinal information about their transparency and disclosure practices collected by Standard & Poor's. These panel data are complemented by cross-sectional information about controlling oligarch ownership, state ownership, conglomerate ownership, stock-market listing, and industry association ties of firms, which we use to construct our ownership network measures. We estimate error-correction panel models explaining fixed investments of firms over the period 2000-2010, focusing on the moderating effects of ownership network positions and ownership structures on the impact of transparency and disclosure on investment.

In the following section we introduce the theoretical framework where we integrate principal-principal agency theory with resource dependence theory and develop a set of novel hypotheses about the roles of business networks and transparency of governance in determining long-term resource commitments. The third section introduces the unique panel dataset of Russian listed firms. Regression analyses are presented in the fourth section, and the final section summarizes the key results and discusses their implications.

## **THEORETICAL FRAMEWORK**

### *Resource-Dependence Theory and Principal–Principal Agency Theory*

Firms are embedded in a range of relationships with other organizational actors (Granovetter, 1985). Virtually all organizational outcomes are based on interdependent causes or agents (Pfeffer and Salancik, 1978). This interdependence creates ties between organizations so that they become part of a network. Organizations can be tied to each other through many types of connections such as exchanges of information, materials, financial resources, legal contracts, ownership, control, and services. Some network ties provide salient and trusted information that may affect behavior (Brass et al., 2004) leading to imitation between organizations (DiMaggio and Powell, 1983; Levitt and March, 1988). We consider ownership networks where firms may be connected to different types of owners, and owners may be connected to each other or a major industry association.

A firm's reaction to others in the network is partly determined by the extent to which the organization depends on certain types of resource exchanges for its operation (Pfeffer and Salancik, 1978). Resource availability strongly influences firms' ability to gain legitimacy and

therefore facilitates network development. The dependence of one organization on another is also determined by the concentration of resource control by one or few organizations and the importance of this resource to the focal organization.

Resource-Dependence Theory (RDT) has been used to explain such corporate governance mechanisms as corporate boards, because boards provide organizations with resources (Boyd, 1990; Dalton et al. 1999, Hillman and Dalziel, 2003; Hillman et al., 2004). Gulati (1999) relies on a resource-dependence framework to examine network resources and alliance formation. Other contexts in which resource dependence theory has been applied include mergers and acquisitions, joint ventures, alliances, political activity and executive succession.

To the best of our knowledge, our study is the first to examine how ownership networks impact investments through corporate governance practices. We focus on investment rather than profitability measures, because this allows us to assess whether the controlling owners are re-investing their gains in long-term assets or taking them out as cash or dividends. These two alternatives have drastically different implications for firm growth and for the dynamism of the economy. Since the firms in Russia are generally under-invested (Dzarasov, 2009), it is important to understand the impact on investment of better governance. Moreover, in the Russian context, profitability as proxied by accounting profits can often be arbitrary as firms are manipulating accounts to minimize their accounting profits to avoid corporate taxes. Investment, on the other hand, is a more reliable measure with higher expected explanatory power.

*An Integrated Framework of Ownership Networks, Transparency and Disclosure Practices, and Long-Term Resource Commitments*

Our context of ownership networks is aligned with Hillman and Dalziel's (2003) focus on boards of directors in that both controlling owners and boards of directors can influence the behavior of top managers because of the resources they make available (e.g., financial, managerial advice, political power) or because they impact agency costs. Thus, resource provision and agency costs are likely to be central in understanding the implications of both boards and controlling shareholders.

However, our context of controlling owners in an emerging economy differs fundamentally from boards of directors in that the relevant agency costs arise from, and are monitored by, different parties. In an institutionally weak emerging economy, it is possible that controlling shareholders take a very active role within the firm's strategy and management. For example, the majority shareholder Khodorkovsky, prior to his imprisonment, directly influenced the strategies of Yukos, transforming it from an under-performing collection of assets to one of the largest Russian oil companies at the time (Rigi, 2005). In this way, oligarch shareholders can use the company as a vehicle to pursue their own political or financial interests (Morck et al., 2005). However, it is not necessarily the case that they serve the interests of all shareholders – in fact there is considerable evidence that in such conditions minority shareholders' value is at risk of being expropriated (Black, 2001; Boone and Rodionov, 2002; Dyck, 2003; Guriev and Rachinsky, 2005; Adachi, 2009). Thus, concentrated ownership can lead to inefficiencies caused by principal-principal conflicts of interest (Young et al., 2008).

In weak institutional and governance environments, controlling shareholders can thus do one or both of two things: They can provide their firms with valuable resources such as finance or political connections. They can also expropriate value from their firms through unproductive or

unfair dividend policies, special (wasteful) investments and activities, feather-nesting, or empire building. However, the firms' positions in ownership networks can enhance, aggravate, or mitigate these resource-dependence and agency issues.

A firm's position in the ownership network has implications for both resource dependence and agency costs. First, well-connected controlling owners can provide more or higher-quality resources. Thus, if the focal firm's controlling owners are connected to a wider network of firms through their other shareholdings, they are likely to be able to act as information and resource conduits to the focal firm. Better informed and resource rich firms are better positioned to make productive long-term resource commitments through fixed investment.

Second, controlling shareholders can attempt to extract value from the company to their own advantage, thus depleting the company from resources that could be committed to productive long-term investments. This argument reflects the principal–principal agency cost of powerful individual (oligarch) owners: who will monitor the monitor? Indeed, there is evidence (Pagano and Roëll, 1998; Faccio et al., 2001; Faccio and Lang, 2002; Maury and Pajuste, 2005) that multiple large shareholders can monitor each other's attempts to derive private benefits from their companies. As a result, the agency costs can be mitigated by a position in the ownership network that affords the company multiple large shareholders (blockholders), reducing value-extraction and enhancing the conditions for long-term resource commitments.

Similarly, conglomerate structures can influence resource dependence and agency issues of the firm. Russian oligarchs tend to control firms in different industries and often run them as business groups or conglomerates. For example, Mr. Yevtushenkov, who controls most of his companies through the holding company Sistema, has controlling interests in about ten leading

listed firms, from energy, oil and gas to telecommunications and chemicals. Many such conglomerates include banks, which is a remnant from post-privatization times when financing was scarce and best provided “in-house”.

Studies building on resource dependence theory (Buckley and Strange, 2011; Estrin et al., 2009) argue that business groups, such as oligarchic conglomerates, internalize market transactions, minimize transaction costs and transfer financial resources among firms and thus alleviate financing constraints on investment. These advantages may be more pronounced in Russia where external markets are inefficient (Wright et al., 2005). The internal markets associated with business groups in emerging markets reduce uncertainty and lower transaction costs. Conglomerate ownership can thus improve the availability of finance for investment.

In contrast, agency-theory based research has a more negative view that conglomerates suffer from agency and coordination problems due to their complex organizations, resulting in inefficiency and exploitation of minority shareholders (Morck et al., 2005). This perspective suggests that conglomerate ownership reduces financial efficiency and weakens the ability of firms to make long-term investments (Khanna and Yafeh, 2007).

Firm-state interactions also play a crucial role in many emerging economies in determining corporate behavior and outcomes (Okhmatovskiy, 2010; Okhmatovskiy and David, 2011; Hillman et al., 2004). Firms can provide state actors with inside business information, financial resources (corporate taxes, campaign and charity finance), and political support (voting and support of policies and regulations). In exchange, state can help firms enhance their rights and competitive positions. State connections may allow firms to influence regulatory policies (Hillman et al., 2004), enhance legitimacy (Baum and Oliver, 1991) and facilitate access to

resources controlled by the state (Xin and Pearce, 1996). State-connected firms may also benefit from preferential treatment (Johnson and Mitton, 2003) and receive exclusive information regarding policies (Lester et al., 2008). Empirical studies provide evidence that ties to the state indeed enhance performance (Fishan, 2001; Johnson and Mitton, 2003; Siegel, 2007).

However, from an agency perspective, being controlled by the state may have negative effects on investment. Whereas the power of individual owners can be mitigated by other owners thus reducing the concern of expropriation, the power of the state may be too strong for any individual or group of other owners to counterbalance. Thus, with an overpowering state as the major shareholder, other owners may be less likely to provide resources for the firm in fear of expropriation by the state, and as a result, the firm's capability for long-term resource commitments to investment may be limited (Faccio et al., 2001; Faccio, 2006).

Finally, collective industry organizations and associations are another form of achieving concentration over resources (Leiponen, 2008). Recent research shows that membership in a business association is positively related to firm's propensity to invest in capital assets (Pyle, 2009). We examine the effects of membership in the most developed and influential business association in Russia – the Russian Union of Industrialists and Entrepreneurs (RUIE). RUIE first developed as a powerful alliance of Soviet-era enterprise directors that in the initial stages of the reform era lobbied for the retention of price controls and state subsidies, and limits on foreign investment (McFaul, 1993; Hanson and Teague, 2005). By the mid- 1990s, it had begun to adopt a more pro-market orientation, and currently it acts as a lobby representing the interests of large firms owned by oligarchs. This relationship is mutually beneficial since policy

makers need the information that pressure groups such as influential oligarchs provide in order to keep in touch with their firms, to know where policy measures need to be adopted, and to determine whether planned policies have sufficient support. Hence, industry associations may enhance personal ties when lobbying state officials (Frye, 2002) and contribute to political stability (Hanson and Teague, 2005).

Industry associations also provide lobbying members and participating managers or owners access to people and information. Firms may accrue benefits in terms of privileged access to inputs, advice, expertise, or other forms of power. These benefits should mitigate resource constraints in the operation of the firm. Although associations are unlikely themselves to develop powerful relationships over their members, having a major shareholder who is a member of the most powerful lobby may still be associated with principal-principal agency costs. Namely, owners who are members of RUIEs governing board are likely to be particularly powerful. Thus, although the RUIE board membership is likely to generate access to valuable resources, it may also signal the presence of a particularly powerful oligarch.

Having reviewed the key types of ownership networks, we next develop two novel hypotheses and consider how firms' other governance practices influence investments, and, in particular, interact with ownership and other networks. We are particularly interested in transparency and disclosure (T&D) practices, because these practices influence the ability of the firm's other stakeholders to monitor managers and owners.

Corporate transparency is a set of information, privacy, and business policies that improve corporate decision making and render the operations open for assessment by employees, stakeholders, shareholders, and the general public. Our research focuses on the narrower

aspect of governance which is transparency and disclosure. T&D practices are an important component of the corporate governance framework (OECD, 1999) and a leading indicator of corporate governance quality (Aksu and Kosedag, 2006). Beeks and Brown (2005) find that firms with higher corporate governance standards make more informative disclosures. Black et al. (2006) concluded that sophisticated governance indices do not predict better than the transparency and disclosure scores. Sadka (2004) suggests that publicly shared financial reporting directly increases productivity and GDP growth in 30 countries. T&D is particularly important in emerging markets such as Russia, where external capital is necessary to sustain growth, and the greatest agency problems center on asymmetric information and expropriation by majority shareholders (Aksu and Kosedag 2006). T&D data have been used in many scholarly studies in cross-country research (see, for example, La Porta et al, 1998; Hope, 2003).

An earlier study (Grosman, 2012) provided evidence that T&D practices directly influence investments. Grosman argued that these practices enhance both internal efficiency and prospects for external finance due to improved accountability. In terms of our framework here, we can interpret this argument in the light of the agency theory. Improved T&D practices enhance the ability of stakeholders to monitor and thus reduce agency costs.

Here we explore how T&D practices interact with firms' positions in ownership networks. We expect this to depend on whether networks primarily facilitate acquisition of resources or generate agency costs, including principal–principal conflicts.

When a firm's position in a specific network primarily yields resources, we expect T&D practices to be a substitute with ownership networks in enabling long-term investments, because firms

may already obtain many of the resources that they need, and advanced T&D is not necessary to acquire resources for long-term investments:

*H1: Connections in networks that primarily provide resources weaken (substitute for) the effects of transparency and disclosure practices on investments.*

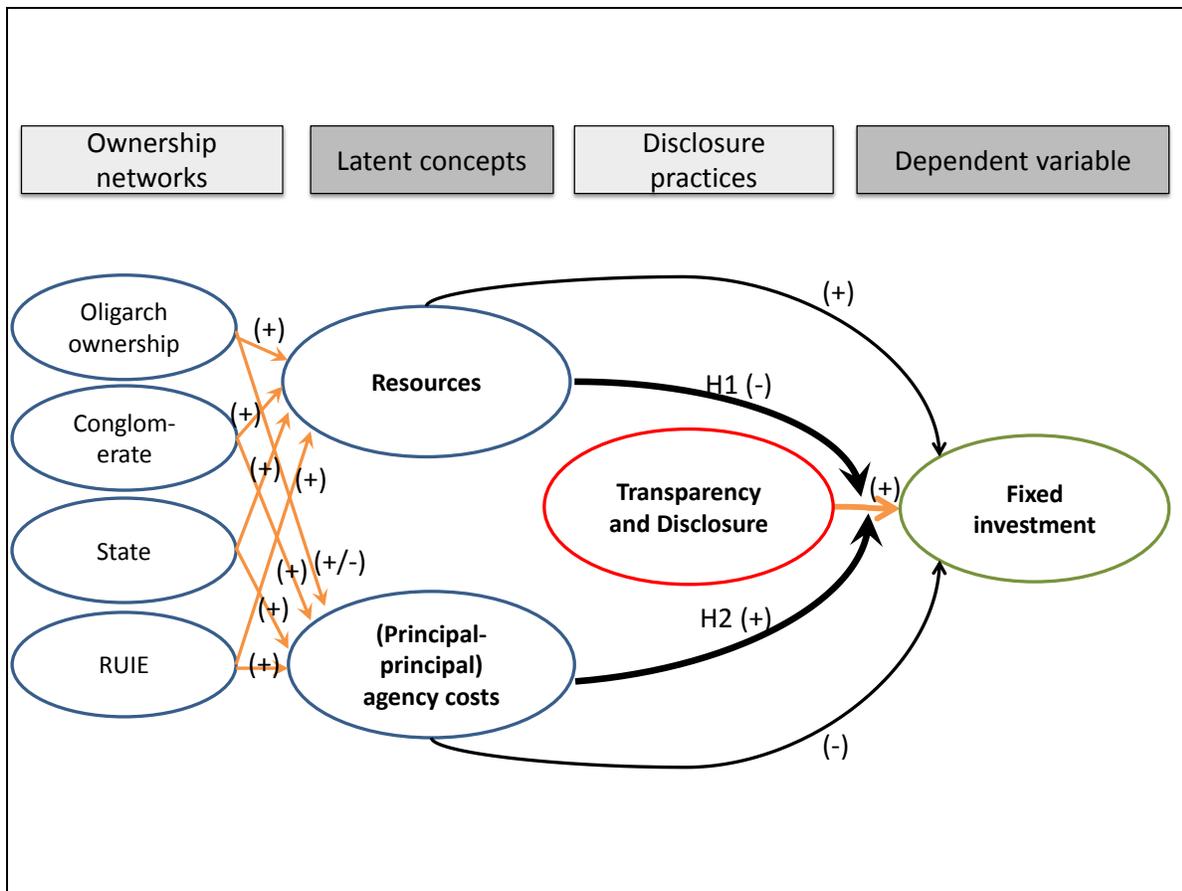
From the agency perspective, when firms' ownership network positions primarily generate agency costs, networks and T&D practices are hypothesized to be complements. In this case, T&D practices enhance monitoring that counteracts the agency conflicts created by ownership arrangements:

*H2: Connections in networks that primarily generate agency costs reinforce (complement) the effects of transparency and disclosure practices on investments.*

Conversely, ownership structures that *reduce* agency costs are substitutes with T&D practices, because they both enhance monitoring and thus accountability.

Our conceptual framework is summarized in Figure 1.

**Figure 1      Conceptual framework**



In a nutshell, our conceptual framework examines the interactions between ownership networks and T&D practices in influencing firms' investment performance. Ownership network positions are hypothesized to influence firms' resource dependence and (principal-principal) agency costs. Valuable resources and agency conflicts may have direct effects on investments (positive and negative effects, respectively), but we focus here on their moderating effects on the impact of transparency and disclosure on investments. As suggested by earlier research, T&D practices directly and positively influence investments. However, these practices are more valuable for firms that have weaker access to resources or particularly severe agency conflicts. First, if firms do not get access to information, finance, and inputs through their ownership connections, T&D are all the more important in drawing positive attention and improving the

reputation of the company, and thus enhancing access to such external resources. Second, T&D are also particularly important for firms suffering from principal-principal conflicts and other agency costs. T&D of relevant corporate information can substantially reduce the opportunities for expropriation, and force powerful owners to commit to productive long-term investments rather than private exploitation of company assets.

We examine four different aspects of ownership networks: connectivity of owners and firms in the two-mode oligarch-firm network; conglomerate ownership structures; state ownership; and major owners' (oligarchs') memberships in the RUIE industry association. Each of these may enhance resource access or influence agency costs experienced by the firm. Depending on their interaction with T&D practices, we determine whether they primarily increase resource access (negative moderating effect – substitution) or agency costs (positive moderating effect – complementarity).

## **DATA AND OPERATIONALIZATION**

We use a unique dataset that links Russian publicly-traded firms to oligarchs, indirectly to other firms, conglomerate companies, and state entities, and analyze how these network measures impact investments through their interactions with transparency and disclosure practices. The Russian context is ideal, because there is great variation across companies and across time in all the variables of interest.

Private Russian firms are predominantly controlled by one or two private individuals (oligarchs) or the state. In our sample we include about 100 wealthiest Russian private owners, each of them having a major stake in at least one publicly-listed firm. We collected data on Russian

firms publicly listed in Russia or abroad, and for each of these firms identified controlling shareholders, including federal government, regional government, politicians, and oligarchs.

Oligarch-owned firms are often structured as pyramids or through cross-shareholdings. In these structures, the oligarch achieves control of the constituent firms by a chain of ownership relations. We dissect this relationship until we reach the ultimate owner of operating assets. Another unusual practice is that an oligarch's shares are often held on his behalf by a nominee shareholder to secure the oligarch's corporate and financial anonymity. Therefore the oligarch's name does not appear on companies' share registrars or accounts. Our data are unique in that we use the data of the ultimate owners whom we identified through interviews with finance professionals close to the oligarchs' firms, media publications (*Forbes*, *Vedomosti*, *Expert*, *Finance*, and *Kommersant*) and governance-related associations.

### **Dependent variable**

*Investment* refers to annual capital expenditures by a firm. Capital expenditures are used by a company to acquire or upgrade physical assets such as equipment, property, or industrial buildings. We use the first difference of the natural logarithm of investment as the dependent variable, and also include the lagged investment term as an independent variable. The rationale for including the lagged investment term is the presence of adjustment costs of investment (Brown and Pedersen, 2009).

### **Independent Variables**

Our key explanatory variables include the *Transparency and Disclosure* score produced by S&P for ninety Russian companies consisting of three components - (1) ownership structure and shareholder rights, (2) financial and operational information, and (3) board and management

structure and process. The scoring accounts for information included in the three major sources of public information: annual reports, web-based disclosures, and public regulatory reporting available on web sites of companies, stock exchanges or regulatory authorities. According to the weighting system, public disclosure - regardless of the source through which it has been made - yields 80% of the maximum score on each point of the questionnaire. The remaining 20% of points are awarded if this information is present in the other two sources as well (10% each).

In our analyses, we explore two-mode inter-firm networks where firms are linked to each other through a major shareholder. For example, if shareholder A owns a controlling stake in company X and a controlling stake in company Y, then companies X and Y are connected to each other. Similarly, if owner B has a stake in firm X, then owners A and B are connected. We consider controlling shareholders that can be individuals (oligarchs) or the Russian state. We examine how firms' positions in this ownership network in 2005 affect their behavior.

The positioning of each firm within the network influences the information that is conveyed through the network (Lipparini and Lomi, 1999). We focus on simple measures of centrality because they have been found to be associated with performance enhancement and resource acquisition (Ahuja, 2000; Phelps, 2010). In our research, a central firm would be a firm that has the most connected owners, including the state or regional governments. Moreover, Russian ownership networks are relatively sparse, and more complex network measures are not very informative in this context (see figure 1 for the ownership network in 2005).

We project our two-mode network of connected firms and their owners into a one-mode network of connected firms. We calculate the normalized degree centrality of the one-mode

dichotomized network matrix, denoted here as *connectivity*. Degree centrality is the number of connections to other firms through the controlling owners of the focal firm. Normalized degree is the degree divided by the maximum possible degree expressed as a percentage.

*Number of owners* represents the number of a firm's controlling owners in 2005. There are about a quarter of all firms with multiple controlling owners (mostly two). There are only 11 firms with three owners, and two with more than three controlling owners. 23 firms are controlled by the state and one oligarch. We assume more than one controlling owner improves monitoring and reduces opportunities for value extraction.

To further analyze ownership ties, we distinguish firms that are controlled by the *state* or through *conglomerate* structures. All ownership data are for the year 2005. About half of the firms are part of vertical and/or horizontal conglomerates. They can also be part of a portfolio of unrelated firms an oligarch acquired over time. Additionally, we determine if a firm is owned by a member of the board of the main business association, Russian Union of Industrialists and Entrepreneurs, or *RUIE*.

Our main control variables include Sales and EBIT margin. *Sales* are the annual net turnover from firms' financial statements. These data are collected from Compustat Global. We use the sales variable to control for firm size. EBIT stands for "Earnings Before Interest and Taxes" in financial statements and it is collected from Compustat Global. *EBIT margin* is the ratio of EBIT to Sales. We use EBIT margin to control for firms' profitability and efficiency.

## **EMPIRICAL ANALYSES**

Our ownership and business association membership data are cross-sectional for 2005 only, whereas the accounting and transparency and disclosure data span the years 2000-2010. We utilize these data in a dynamic model of investment, where we assess the moderating effects of ownership networks. We use an error-correction model that is estimated in differences (Bond et al., 1997; Mairesse et al., 1999; Bond et al., 2003; Becker and Hall, 2008):

$$(1) \quad \Delta \ln(\text{investment}_{it}) = \beta_0 + \beta_1 * [\ln(\text{investment}_{i,t-1}) - \ln(\text{sales}_{i,t-1})] + \beta_2 * \Delta \ln(\text{sales}_{it}) + \beta_3 * \Delta \ln(\text{investment}_{i,t-1}) + \beta_4 * \Delta \ln(T\&D_{it}) * \mathbf{X}_i + \delta_t + \mu_i + \varepsilon_{it}$$

where  $\Delta$  refers to differences in variables;  $\ln(\text{investment})$  is the natural logarithm of fixed investments;  $\ln(\text{sales})$  is the natural logarithm of sales revenue;  $\ln(T\&D)$  is the natural logarithm of the transparency and disclosure score,  $\delta_t$  are time dummies, and  $\mu_i$  are time-invariant unobserved firm-level characteristics (fixed effects). The lagged difference between  $\ln(\text{investments})$  and  $\ln(\text{sales})$  is the error-correction term (*ect*), standard in investment models.

To estimate the moderating effects of the time-invariant ownership variables, we interact the T&D variable with a set of dummies  $\mathbf{X}$  that represent the different combinations of ownership arrangements and network centrality. This amounts to estimating the interaction between T&D and ownership variables, but because of high correlations between the relevant variables, we operationalize the interactions through their mutually excluding combinations instead.

We apply fixed effects and dynamic GMM estimators (Arellano and Bond, 1991; Arellano and Bover, 1995; and Blundell and Bond, 1998) to estimate the relationship between T&D score, ownership and investment. The dynamic panel GMM estimators incorporate the dynamic nature of transparency-ownership-investment relationships to instrument for unobserved

heterogeneity and simultaneity (Wintoki et al, 2012). The use of the GMM estimator is also required where the lagged dependent variable introduces bias (Nickell, 1981; Arellano, 2003).

The dynamic modeling approach has been used in other areas of finance and economics. Examples include governance and R&D (Driver and Guides, 2012), external finance constraints and investment (Whited and Wu, 2006), internal finance and investment (Bond and Meghir, 1994), economic growth convergence (Caselli et al., 1996), labor demand estimation (Blundell and Bond, 1998) and economic growth (Beck et al., 2000).

However, the dynamic panel estimation methodology has its limitations. It relies on using the firm's history (lags of dependent and independent variables) for identification. Thus, there is a potential problem with weak instruments, which becomes greater as the number of lags of the instrumental variables increases. This represents an empirical trade-off. Increasing the instruments' lag length makes them more exogenous, but may also make them weaker. We limit the number of instruments by using the 'collapse' option as in Roodman (2009) which creates one instrument for each variable and lag distance, rather than one for each time period, variable, and lag distance. This option effectively constrains all of the yearly moment conditions to be the same. Moreover, using the 'collapse' option significantly increases the power of the Hansen test of over-identification.

Table 1 presents the descriptive statistics of all estimation variables and table 2 their pairwise correlations.

**Table 1** Descriptive statistics

Variable	Obs	Mean	Median	ST&D. Dev.	Min	Max
<b>Accounting measures</b>						
Capital investment, EURm	1284	347.4	56.8	1377.3	0.0	27073.3
Sales, EURm	1464	2064.1	485.7	6615.3	0.0	88127.8
EBIT margin, %	1452	-1%	11%	248%	-7330%	99%
<b>Governance Measure</b>						
T&D score	559	49%	51%	17%	0%	85%
<b>Network Measures</b>						
Connectivity	1518	22.04	8.19	21.68	0	52.16
Number of owners	1518	1.35	1.00	0.69	0	5
State ownership	1542	0.54	1.00	0.50	0	1
Conglomerate ownership	1531	0.46	0.00	0.50	0	1
RUIE membership	1555	0.35	0.00	0.48	0	1

**Table 2** Pairwise correlations

Variable	1	2	3	4	5	6	7	8
1. Investment	1.00							
2. Sales	0.88***	1.00						
3. EBIT Margin	0.02	0.02	1.00					
4. T&D score	0.19***	0.22***	0.04	1.00				
5. Connectivity of owners	0.07***	0.02	0.01	-0.02	1.00			
6. Number of owners	0.07***	0.15***	-0.08***	-0.05	0.03	1.00		
7. State ownership	0.12***	0.09***	0.01	-0.01	0.78***	-0.13***	1.00	
8. Conglomerate Ownership	-0.05*	0.02	-0.03	0.03	-0.45***	0.28***	-0.41***	1.00
9. RUIE membership	0.13***	0.20***	-0.04	0.02	-0.24***	0.32***	-0.25***	0.61***

Notes: Star levels \*p<0.10, \*\*p<0.05, \*\*\*p<0.01.

**Table 3: Governance, investment and network position**

	Fixed effects	GMM differences	GMM system
	Coeff. (se)	Coeff. (se)	Coeff. (se)
$\Delta Investment_{i,t-1}$	0.296** (0.110)	0.249** (0.080)	0.632*** (0.130)
$\Delta Sales_{i,t}$	0.946*** (0.160)	1.036*** (0.230)	0.924*** (0.250)
$\Delta Sales_{i,t-1}$	-0.171 (0.180)	-0.196 (0.180)	-0.449 (0.270)
<i>ect</i> ( $Investment_{i,t-1} - Sales_{i,t-1}$ )	-0.772 (0.100)	-1.113*** (0.110)	-1.278*** (0.150)
T&D Score*central firms	0.11 (0.100)	0.148 (0.190)	-0.198 (0.340)
T&D Score*peripheral firms	0.262** (0.080)	0.205* (0.090)	0.156 (0.140)
constant	-1.750*** (0.210)		-2.830*** (0.350)
R <sup>2</sup>	0.417		
Residual degrees of freedom	79	69	79
N	298	218	298
Hansen test		34.3	42.1
Hansen (p)		0.2	0.2
AR(1)		-1.5	-1.8
AR(2)		-1.1	1.4

Notes: star levels + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

“Central firms” variable equals 1 if firm’s 2005 connectivity is greater than the mean and 0 otherwise. “Peripheral firms” variable equals 1 if firm’s 2005 connectivity is greater than the mean and 0 otherwise. “ect” stands for “error correction term”. All variables are logged, except dummies and ect. All standard errors are White’s robust errors controlling for heteroscedasticity and panel-specific autocorrelation. The difference GMM estimator uses a system consisting of first-differenced equations. 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.

These results in Table 3 suggest that ownership connections moderate the effects of transparency on investment. We split the connectivity variable at the mean and estimate the effect of T&D separately for highly-connected firms and little-connected firms. T&D score is

positive and statistically significant only for little-connected firms. Additionally, the control variables of lagged investment, lagged sales, and error-correction term are highly significant.

We produce a Hansen test of over-identification. Since the dynamic panel GMM estimator uses multiple lags as instruments, our system may be over-identified and therefore we make a test of over-identification. The Hansen test yields a J-statistic which is Chi-square distributed under the null hypothesis of the validity of our instruments. The results in Table 3 reveal a J-statistic with a p-value of 0.2 and as such, we cannot reject the hypothesis that our instruments are valid. Taken together, the specification tests provide empirical verification for our argument that our independent variables are indeed exogenous with respect to investment.

In table 4 we examine the interaction of T&D scores with mutually excluding combinations of a single vs. multiple controlling owners, state ownership, and conglomerate ties. We expect the agency costs to be the highest for the combination (1,1,1) where all the ownership arrangements are present: single controlling shareholder, state ownership, and conglomerate structure. The combination (1,0,1) implies that there is a single controlling owner, no state ownership, and conglomerate structure, whereas the combination (0,1,1) refers to the combination of multiple controlling owners, state ownership and conglomerate ties. Combinations (1,0,0), (0,1,0) and (0,0,1) describe organizations with only one of these sources of agency costs present. Preliminary results in table 4 suggest that the coefficient of T&D is positive and significant for firms with more than one of these agency factors present. In other words, T&D matters more for firms with agency “hazards.”

**Table 4. Investment, governance, state and ownership interactions**

	Fixed effects	GMM differences	GMM system
	Coeff./ (se)	Coeff./ (se)	Coeff. / (se)
$\Delta Investment_{i,t-1}$	0.284* (0.120)	0.249* (0.100)	0.343** (0.130)
$\Delta Sales_{i,t}$	0.944*** (0.160)	0.952*** (0.200)	0.805*** (0.230)
$\Delta Sales_{i,t-1}$	-0.174 (0.190)	-0.218 (0.200)	-0.151 (0.210)
<i>ect</i> ( $Investment_{i,t-1} - Sales_{i,t-1}$ )	-0.751*** (0.100)	-1.007*** (0.110)	-0.745*** (0.120)
T&D*(1,1,1)	0.574* (0.260)	0.513+ (0.280)	0.674** (0.240)
T&D*(1,1,0)	0.288 (0.180)	0.64 (0.390)	-0.234 (0.250)
T&D*(1,0,1)	0.160** (0.050)	0.153* (0.070)	-0.057 (0.100)
T&D*(0,1,1)	0.807+ (0.420)	0.486 (0.620)	1.093** (0.390)
T&D*(1,0,0)	-0.376 (1.270)	-0.498 (1.850)	-3.866+ (2.140)
T&D*(0,1,0)	-0.05 (0.100)	0.01 (0.190)	0.185 (0.210)
T&D*(0,0,1)	0.288 (0.190)	0.161 (0.130)	0.473** (0.170)
T&D*(0,0,0)	0.055 (0.240)	-0.105 (0.250)	1.367*** (0.370)
constant	-1.696*** (0.220)		-1.632*** (0.280)
R <sup>2</sup>	0.424		
df residual	79	69	79
N	298	218	298
Hansen test		52.5	60.4
Hansen(p)		0.6	0.7
AR(1)		-2.1	-2.4
AR(2)		-0.8	0.3

Notes: star levels + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. "Central firms" variable equals 1 if firm's 2005 connectivity is greater than the mean and 0 otherwise. "Peripheral firms" variable equals 1 if firm's 2005 connectivity is greater than the mean and 0 otherwise. "ect" stands for "error correction term". All variables are logged, except dummies and ect. All standard errors are White's robust errors controlling for heteroscedasticity and panel-specific autocorrelation. The difference GMM estimator uses a system consisting of first-differenced equations. 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.

**Table 5. Investment, governance, RUIE association and ownership interactions**

	Fixed effects	GMM differences	GMM system
	Coeff. / (se)	Coeff. / (se)	Coeff./ (se)
$\Delta Investment_{i,t-1}$	0.315** (0.110)	0.260** (0.080)	0.510*** (0.140)
$\Delta Sales_{i,t}$	0.941*** (0.160)	1.057*** (0.220)	0.833** (0.250)
$\Delta Sales_{i,t-1}$	-0.197 (0.180)	-0.155 (0.190)	-0.268 (0.240)
<i>ect</i> ( $Investment_{i,t-1} - Sales_{i,t-1}$ )	-0.773*** (0.100)	-1.114*** (0.110)	-0.989*** (0.160)
T&D*(1,1,1)	0.226** (0.080)	0.214** (0.070)	0.114 (0.090)
T&D*(1,1,0)	1.003*** (0.180)	1.680*** (0.190)	1.345*** (0.330)
T&D*(1,0,1)	0.069 (0.390)	-0.378 (0.590)	0.073 (0.640)
T&D*(0,1,1)	0.453** (0.130)	0.179+ (0.090)	0.679** (0.220)
T&D*(1,0,0)	0.233 (0.170)	0.41 (0.370)	-0.438 (0.320)
T&D*(0,1,0)	-0.119 (0.090)	0.073 (0.220)	0.158 (0.190)
T&D*(0,0,1)	-1.277*** (0.090)	-1.282*** (0.090)	-1.434*** (0.230)
T&D*(0,0,0)	0.28 (0.390)	-0.337 (0.490)	1.804*** (0.510)
constant	-1.747*** (0.220)		-2.200*** (0.380)
R <sup>2</sup>	0.429		
df residual	79	69	79
N	298	218	298
Hansen test		50.1	53.7
Hansen(p)		0.7	0.9
AR(1)		-1.8	-2.1
AR(2)		-1	0.7

Notes: star levels + p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001. "Central firms" variable equals 1 if firm's 2005 connectivity is greater than the mean and 0 otherwise. "Peripheral firms" variable equals 1 if firm's 2005 connectivity is greater than the mean and 0 otherwise. "ect" stands for "error correction term". All variables are logged, except dummies and ect. All standard errors are White's robust errors controlling for heteroscedasticity and panel-specific autocorrelation. The difference GMM estimator uses a system consisting of first-differenced equations. 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.

In table 5 we explore the interactions of T&D with the number of controlling owners, RUIE membership, and conglomerate structures. Again, the combination (1,1,1) implies there is a single controlling owner that is also a member of the RUIE board, and the company is associated with a conglomerate structure. We interpret RUIE membership to imply that the controlling oligarch is an exceptionally powerful individual in the Russian economy. Again we find that the combinations where multiple of these agency hazards are present tend to positively interact with T&D, whereas combinations where only one or none of the agency cost drivers are present do not significantly interact with T&D. Again, we suggest that the results, overall, are aligned with the argument that T&D practices are particularly relevant for firms that are associated with other organizational features that generate agency or principal-principal conflicts, if the firms want to be able to commit to productive investments. However, the main exception is the coefficient for the combination (0,0,0) using the GMM system estimation method. This needs to be investigated in more detail, but we suspect that this is because of small numbers of observations. This coefficient is not aligned with the other two estimation methods, fixed effects and GMM differenced approach.

In summary, the regression results generate tentative support for our hypotheses. In H1 we expected to find that if the ownership network and other organizational features primarily generate resources for the company to facilitate investment, then there would be a negative interaction with T&D, because these practices would be redundant in acquiring resources for investment. We found that ownerships network connectivity may primarily operate in this way. T&D only matters for firms that are not well connected through oligarch connections. In H2 we hypothesized that organizational features that primarily cause agency costs would positively

interact with T&D in predicting investments. We found that firms with state ownership, RUIE-connected oligarch owner, conglomerate structure, or only a single controlling owner who would be difficult to monitor by minority shareholders significantly benefited from T&D practices in committing to investments. We argue that these organizational characteristics primarily represent agency hazards for the firms, and if firms actually want to commit to long-term investments, they significantly benefit from practices of transparency and disclosure.

### **CONCLUSION, IMPLICATIONS, AND FURTHER RESEARCH**

Although concentrated ownership is one of the most important governance mechanisms of large firms in emerging economies, these firms are often controlled by the state (e.g. China) or families (e.g. Indonesia, South Korea, Taiwan and Thailand) rather than by oligarchs. The unique oligarchic network structures in Russia may be filling the institutional vacuum left by the collapsed communist economy, ensuring access to requisite resources for investments and improving assets productivity. Moreover, states in emerging economies tend to exercise control over the economy through involvement in the governance of firms in 'strategic' industries, and provide political support and preferential treatment. This politically motivated intervention is likely to affect firm performance and long-term investment. Whilst government involvement in corporate governance is an important aspect of business-government relationship, particularly in emerging economies, it has received limited attention in the management literature (Okhmatovskiy, 2010).

We examine the implications of heterogeneity of such ownership network ties that enhance, diminish or compensate for other governance practices in determining investment. Some

network connections are substitute mechanisms for the governance practices related to transparency and disclosure (T&D) because they also improve accountability and thereby support investment. Other organizational arrangements might complement these governance practices because they generate agency conflicts. We expect the mechanisms through which ownership networks influence investment to depend on whether ownership arrangements have implications for resource acquisition or agency costs.

To our knowledge, this is the first study to bring together the analysis of ownership networks and internal corporate governance and their impact on firms' strategic long-term resource commitments. We view ownership and other networks from resource-dependence and agency perspectives and examine how these arrangements interact with governance practices related to T&D. We argue that ownership arrangements can reflect either resource benefits or agency costs, depending on the type of ownership.

We find that external ownership connections and connections to an industry association moderate the impact of T&D practices on investment. We argue that more advanced T&D practices support investments because, by improving accountability, they tend to improve internal efficiency and decision-making processes of firms and, as a consequence, make more external resources available to the firm. Ownership networks moderate the impact of T&D practices because they may substitute for or complement these practices, depending on whether resource constraints or agency costs are the primary drivers of the connections.

Our preliminary empirical results strongly indicate that ownership and governance practices interact. We find that firms with poorly connected owners significantly benefit from T&D, because T&D compensates for the lack of resources acquired externally. We also find that firms

with one single controlling owner, state ownership, or conglomerate structures gain more benefits from T&D practices in committing to long-term investments. We suggest that these characteristics reflect high agency costs, because in the weak institutional environment of Russia the controlling owner, the state, or a conglomerate arrangement can potentially be used to expropriate value from the firm, and small-holders may not be powerful enough to prevent this. As a result, the controlling owner might extract value rather than reinvest in productive assets. However, T&D practices can counteract this tendency and credibly commit the firm to productive long-term investments.

Finally, we also found that oligarch owners' memberships in the board of the main Russian industry association RUIE complement the effects of transparency and disclosure on commitments to investment. We interpret this effect in terms of the power of the individual involved. Being invited into the board appears to be a signal of exceptionally powerful and well-connected individual, which may facilitate resource acquisition for the firms they own, but pose an unusually strong risk of expropriation, too. Our results suggest that this risk outweighs the resource benefits.

Our study is based on empirical analyses of a unique, purpose-built firm-level dataset of large Russian firms. Nevertheless, as is usually the case in weaker institutional environments, the data availability and quality present some problems. First, the T&D scores are longitudinal but only available for 90 firms. Second, the ownership and membership data are extremely costly to retrieve, and older data are simply not available. As a result, the network measures are only available for a cross-section, and our panel analyses which include network measures are limited to interactions specifications.

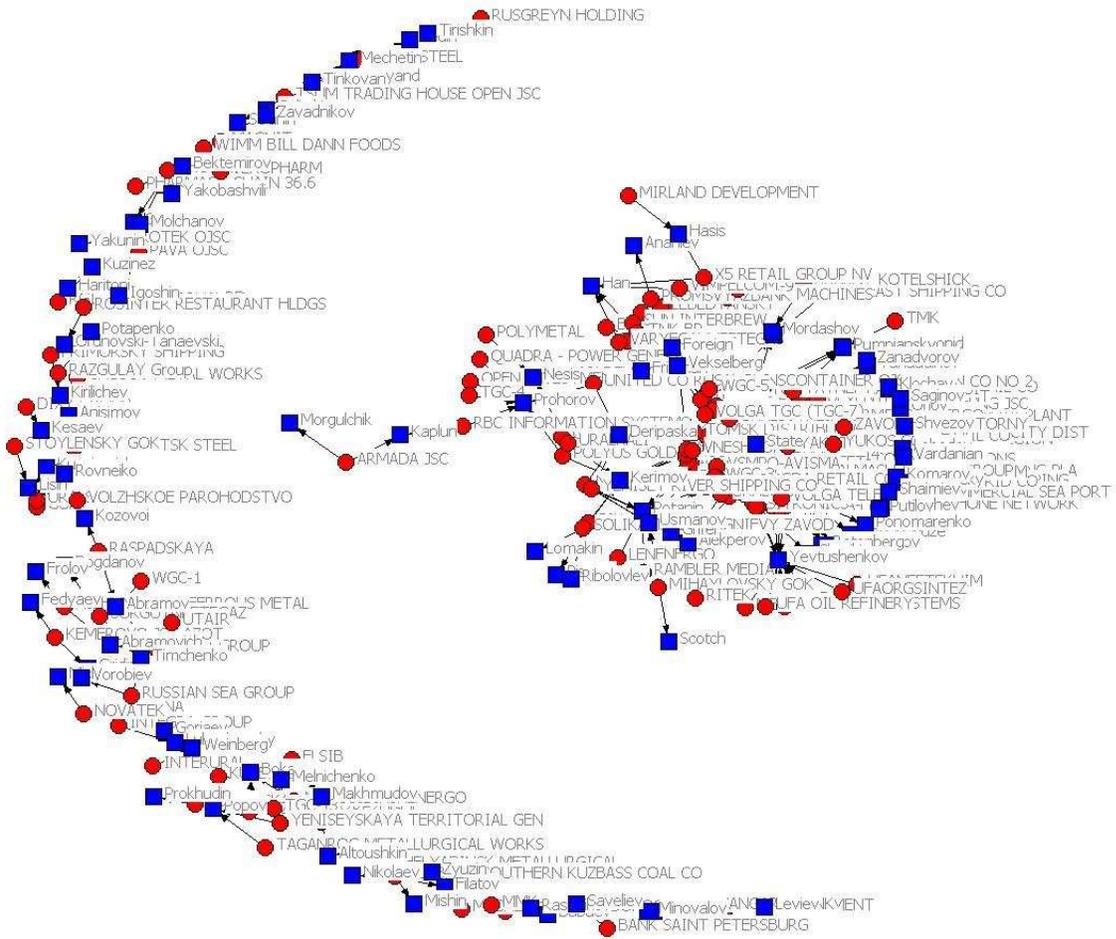
Nevertheless, our analyses generate some robust results that are consistent with our hypotheses. We control for unobserved heterogeneity, such as changes in the investment conditions during the period of study, that influence both ownership networks, governance practices, and investment, with generalized method of moments (GMM) estimator, using both system and difference GMM models. The GMM techniques are frequently used in the investment literature, and increasingly in the management literature on governance-performance relationship.

Our study contributes to the management literatures on resource-dependence theory, agency theory, corporate governance, networks, and emerging economies. It also generates implications for policymakers and investors choosing which firms to invest in, as better-networked and more transparent firms are likely to generate more growth through investments. It also has implications for managers and owners of firms operating in Russia or other emerging economies. For managers and owners of state-owned or conglomerate firms, the strategic focus might be to strengthen corporate governance to be better able to commit to productive investments, whereas for firms controlled by multiple oligarchs, maintaining ties with other “connected” oligarchs might prove a better tactic to increase investments and subsequent performance.

A natural extension of this study would be to devote more attention to the way business networks impact the board composition of Russian firms, for example by studying if CEOs or shareholders from these networks are more likely to sit on each other’s boards (board interlocks) and how this particular network-governance interaction impacts investment policy. One could also further explore the interactions between external networks and governance

practices by examining the impact of connectivity on the adoption of more stringent practices by the focal firm through contagion. It is possible that firms learn about corporate governance practices through their network connections. Finally, investigating the effects of ownership networks in other emerging or developed economies would be valuable to assess the generalizability of these results from Russia.

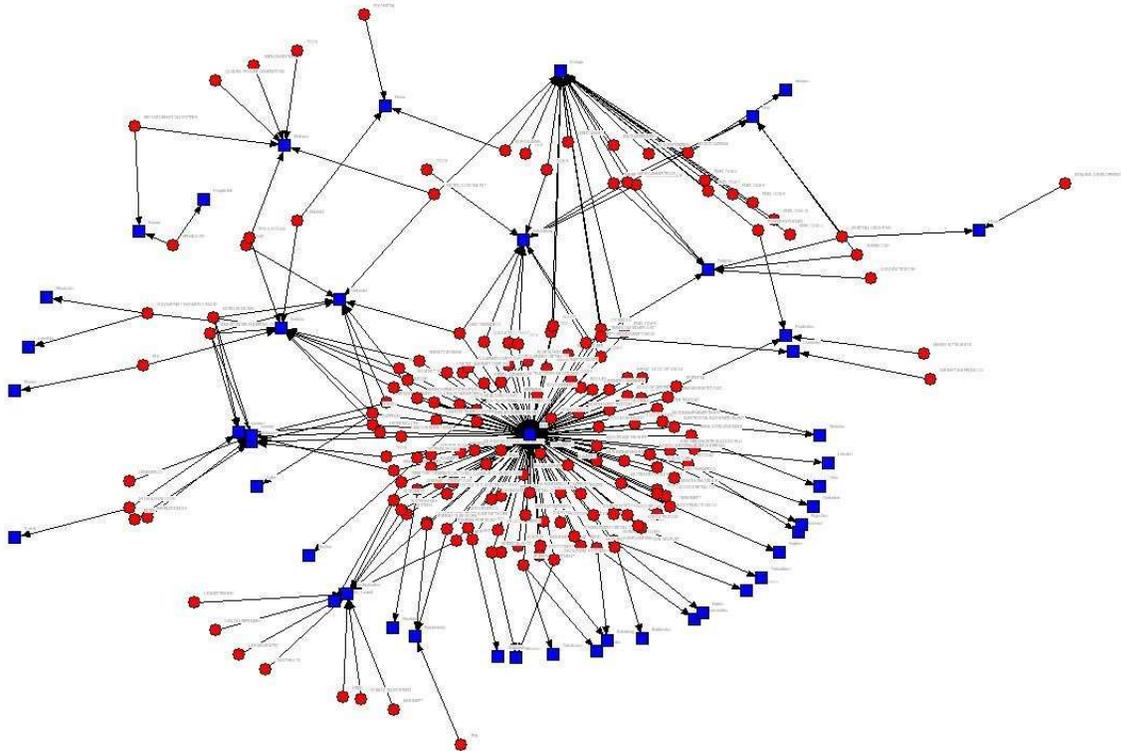
Figure 1. Diagram for the 2-mode firm-owner matrix<sup>1</sup>



<sup>1</sup> Owners are represented by (blue) squares, firms by (red) circles

**Figure 2. The state cluster (2-mode<sup>2</sup>) of the whole network**

This figure represents the firms connected through their ownership ties to the state (the state is at the centre of the cluster with the most connections).



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<sup>2</sup> Owners are represented by (blue) squares, firms by (red) circles

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