

**Does the Origin of the Firm Matter? Regional Determinants of Acquisition Strategies in Emerging Countries: Some Empirical Evidence from Russia**

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## **Does the Origin of the Firm Matter? Regional Determinants of Acquisition Strategies in Emerging Countries: Some Empirical Evidence from Russia**

We aim at deepening the existing understanding of the antecedents of acquisitions by emerging market firms by providing a multi-layered analysis of the firm, industry, and region level determinants of acquisition behavior. Based on a sample of 1500 of medium-sized and large firms in different regions of Russia, we examine what drives firms with little prior experience or capabilities to engage in acquisitions domestically and abroad. Consistent with prior research, we confirm that firm size, slack, and low overall industry growth increase a firm's likelihood to engage in acquisitions. As novel findings we show that the subnational region a firm is embedded in – in particular its institutional context – plays a major role in its acquisition behavior. We find that the level of corruption in a region is positively related with acquisition-making. The influence of corruption as a driver of acquisitions, however, decreases with the strength of the rule-of-law.

## INTRODUCTION

While there has been an increasing interest in the acquisitions of firms from emerging market multinationals (e.g. Aybar & Ficici, 2009; Gubbi, Aulakh, Ray, Sarkar, & Chittoor, 2010; Kumar, 2009), the interest has been mainly driven by a few of the most visible and successful examples in the computer (Lenovo's acquisition of IBM's PC business), automobile (Tata's acquisition of Jaguar and Geely's acquisition of Volvo), and steel industries (Mittal's acquisition of Arcelor) and the predominant focus has been on performance. Not only giant firms, however, have experienced transformation – also the less glamorous firms have undergone change and grown. While many of these firms started growing organically, as one chief executive of an emerging-market company argued: *“There comes a point when there are only so many goods a company can produce and organic growth begins to slow. To grow, they have to become more acquisitive”* (cited by Oakley, June 7, 2011, FT.com). But it is still unclear what drives acquisition patterns in emerging markets – are they solely a result of firm-level characteristics and limits to organic growth, or is the external environment within which these firms are embedded more important?

Therefore, this paper aims at providing insights into the drivers of the acquisition strategy of emerging market firms. Going beyond the analysis of the industry environment of the firm, we highlight the role of the region firms are located in and in particular its institutional context. While both formal and informal institutions define the rules of the game that determine economic outcomes (North, 1994), emerging markets are often characterized by formal institutional voids (Khanna & Palepu, 1997). In these countries corruption forms a key facet of the institutional environment. Nevertheless, we know very little to what degree corrupt practices influence a firm's growth strategy and whether such practices can function as an informal institution that can

foster acquisition making when an inadequate rule of law would otherwise lead to high uncertainties and undermine these market transactions.

In general, scholars have tended to overlook the role of subnational regions for corporate strategy and performance consequences in emerging countries. Recently, Chan *et al.* (2010) point out that not only the subnational region is significant in explaining the performance of foreign affiliates, but also that the relevance of the subnational region is stronger in emerging countries (in their study, China) than in developed countries (United States). Especially the within-country variation in institutional development can be expected to be of importance for business activities in general and acquisition making in particular. While politicians on the national level are most often responsible for passing laws, these laws are then usually executed locally, possibly giving municipal or regional bureaucrats, judges, or politicians large discretionary power. In this respect, emerging markets are particularly affected since rules and processes are less accurately codified, leaving room for interpretation and informal rule-making.

Based on a sample of 1500 firms that cover medium-sized and large firms in different regions of Russia over the period 2001-2008, we examine why and how firms with small prior capabilities engage in acquisitions. Due to the different market system during the former Soviet Union period these firms had, on average, very little acquisition experience. Also, the transition from a planned to a market economy has led to strong and, up to now, persistent disparities in the economic and institutional development within the country. As a result, studying Russia provides us with a natural setting for investigating the impact of institutions on strategy making, while allowing for keeping all other country specificities, such as the national cultural or national historical context, constant.

Similarly to Arikan and McGahan (2010), Elango and Pattnaik (2011), or Marquis and Huang (2010), we therefore have a clean starting point for acquisition capability development. However, compared to Arikan and McGahan (2010), which follow the capability development of relatively small firms in the US, or Marquis and Huang (2010) that analyze the relevance of differences in the institutional conditions within the United States on the acquisition activity in the banking industry, we have companies of multiple different sizes and industries as well as a unique emerging market context. We therefore contribute to a small, but growing parallel stream of literature on emerging market firms' acquisitions by providing a multi-layered analysis of the firm, industry, and region level determinants of their acquisition behavior (Elango & Pattnaik, 2011; Lin, Peng, Yang, & Sun, 2009). In this literature, Lin *et al.* (2009) show that learning and the embeddedness in interfirm networks as antecedents of acquisitions is of larger importance in China than in the US, stressing that country differences may matter for acquisition strategy making. Also, Elango and Pattnaik (2011), using a sample of Indian firms, examine the role of capabilities and experience in the decision to engage in cross-border acquisitions.

While our main focus is on the relevance of the regional context in general and corruption in particular on the individual acquisition decision, we differentiate, for the first time to our knowledge, empirically the antecedents of individual acquisitions and streams of acquisitions. It is indeed not clear whether the reasons of individual acquisitions can be generalized to motives that lead a firm to become a serial acquirer. This distinction is important to make, however, because when examining the antecedents of acquisitions at the level of an individual acquisition, the motives tend to be situation or acquisition specific. In contrast, when examining the antecedents of a firm's stream of acquisitions, they tend to be more related to the acquiring firm itself; its ambition, strategic choices and governance (Chatterjee & Hambrick, 2007; Wright,

Kroll, Lado, & van Ness, 2002). We also examine when a firm acquires a target firm in the same or a different industry in its acquisition portfolio, and whether the acquisitions are of domestic or cross-border nature, in order to gain deeper insights into acquisition making decisions.

In line with our objective of carrying out a multi-layered analysis of acquisition antecedents we apply, as another empirical contribution, a variance decomposition analysis to estimate the relative importance of the three different levels of analysis, the firm, industry, and region-level, for explaining variation in acquisition behavior. We then use, as standard in the literature, bivariate and multinomial logit regressions to test our specific hypotheses.

Consistent with prior research we find that firm size, slack, and low overall industry growth increase a firm's likelihood to engage in acquisitions. As novel findings we show that the subnational region a firm is embedded in plays a major role in its acquisition behavior. Corruption in a region supports acquisition behavior. The relevance of corruption as an informal institutional mechanism, however, tends to decrease with the strength of the rule-of-law.

## **THEORY AND HYPOTHESES**

Prior research on the strategies of emerging market firms has tended to build on four main streams of theory development, institutional theory, transaction cost theory, resource-based view, and agency theory (e.g. Hoskisson, Eden, Lau, & Wright, 2000; Wright, Filatotchev, Hoskisson, & Peng, 2005). Institutional theory has been the most dominant of these perspectives due to its ability to explain the roles of the different institutional conditions that the emerging market firms face in their home and host countries and how the institutional context either helps or hinders their international expansion (e.g. Douma, George, & Kabir, 2006; Meyer & Nguyen, 2005; Wright et al., 2005). Transaction cost theory has been used to explain whether it is more optimal

for the emerging market firms to internalize some activities, for example, by creating business groups, or to use a more focused strategy (Demirbag, Glaister, & Tatoglu, 2007; Hoskisson et al., 2000). The resource-based view can be used to explain the characteristics of the strategies of emerging market firms based on their resource or asset positions and special capabilities that they possess (e.g. Peng, 2001). Special resources or capabilities, e.g. efficient factories for low cost production complemented with the availability of low-cost labor or an easy access to key raw materials could provide a firm an advantage against other emerging market firms or developed market firms, enabling it to successfully expand internationally. Finally, agency theory has been used to explain how different governance characteristics of emerging market firms may affect their behaviors. Such governance characteristics could relate to state-ownership or, for example, business group structure (Douma et al., 2006; Filatotchev & Wright, 2011).

Due to the unique nature of our sample, 1500 Russian firms operating in the different regions of Russia, the natural theoretical grounding also for our analyses is institutional theory and how the different institutional characteristics of the acquirers' home regions can explain their acquisition behavior. However, since we are interested in what causes a firm to engage in a series of acquisitions and grow to become a regionally, nationally, and eventually internationally influential firm, we also theorize how the different firm and industry level determinants could contribute to acquisition behavior. We build our argumentation on the firm level on the resource and capability-based views and on the industry level on the industrial organization theory.

While the prior research that compared the acquisition behavior of emerging market firms and developed market firms (China and the United States) demonstrated that networks, learning and institutional development drive acquisitions differently in developed and developing markets (Lin et al., 2009), we do not still yet know much about the determinants of acquisitions by

emerging market firms. We contribute to research on emerging market firms' acquisitions through an analysis of the determinants of acquisition behavior in Russian firms.

### **Firm-level determinants of acquisition behavior**

We use the resource-based view to explain firm-level determinants of acquisition behavior (Barney, 1991; Barney, 1988; Barney, Ketchen, & Wright, 2011). Recognizing that there are many studies that have already contributed to our understanding of effects of firm-level determinants of acquisition behavior (Haleblian et al., 2009), we focus here only on the most important determinants from the perspective of Russian firms. We use firm size as a proxy for all the different types of the resources that a firm has accumulated and the amount of liquid assets as a proxy for the financial resources available for acquisitions.

*Firm size.* There are multiple reasons to expect firm size to affect the likelihood of acquisitions (e.g. Haleblian et al., 2009; Healy, Palepu, & Ruback, 1992). Most importantly, larger firms differ in their resource availability. There is broad range of resources and capabilities that are needed for engaging in acquisition behavior. These include knowledge, ties to business partners, and ties to political decision-makers (Lin et al., 2009). Since large firms have a broader stock of managerial resources and capabilities, they are also able to dedicate more resources to acquisitions. Moreover, prior research has found that the size of a firm affects its ability to engage in politics and successfully gain clout among the political decision makers (Hillman, Keim, & Schuler, 2004; Oliver & Holzinger, 2008). In particular in Russia, good relationships with the national and local political decision-makers are needed in order for a firm to survive and prosper. Finally, larger firms also tend to have more bargaining power in the



negotiations with the owners of target firms, which can reduce the acquisition premium that is paid by the acquirer. Thus, summarizing the above arguments we hypothesize:

*Hypothesis 1: Size increases the propensity of firms to engage in acquisitions.*

*Financial slack.* A firm's internal financial resources are of particular relevance in the context of emerging countries where firms have to deal with capital market segmentation and large capital market imperfections. If a firm is based in a country which is poorly integrated into global financial markets, it cannot benefit from cheap external capital stemming from international investors ready to diversify their portfolios or from the higher liquidity available on the international financial markets. This lack of funding may raise the cost of external capital to prohibitively high levels (Errunza & Miller, 2000). Although many emerging countries have attempted capital liberalization, it has remained partial at best (Francis, Hasan, & Sun, 2008).

Moreover, firms in emerging markets have more difficulties for obtaining external finance due to information asymmetries between managers and capital providers. In their seminal paper Myers and Majluf (1984) show that information asymmetries can lead to underinvestment when a firm depends on external capital. These information gaps between managers and external capital providers are larger when the level of disclosure of information is low, business transactions are not transparent, or, for instance, property rights are not clearly defined like in emerging countries (Khanna & Palepu, 1997). In addition, weak creditor and shareholder rights, and a poor rule of law increase uncertainty and make capital providers even more wary of providing finance (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). Firms have therefore less ability to grow in general and to acquire other firms in particular. Internal financial resources permit to overcome these financial hurdles. In particular cash holdings are important since firms

can finance investments even when current period cash-flows are low. Liquidity thus serves as a buffer (Harford, 1999). Therefore, acquisitions are more likely to be carried out when a firm has higher liquidity. Hence, we hypothesize:

*Hypothesis 2: Financial slack increases the propensity of firms to engage in acquisitions.*

### **Industry-level determinants of acquisition behavior**

The role of the external environment in the acquisition decisions of firms has traditionally been studied through the lenses of the industrial organization theory (e.g. Bain, 1959; Bain, 1968; Porter, 1981; Ravenscraft & Scherer, 1987). It is well-established that competitive context is related to the propensity of firms to engage in boundary spanning decisions, such as acquisitions and divestitures (e.g. Hopkins, 1991; Ravenscraft & Scherer, 1987). The existing research has also shown that the industry context in general matters for acquisition behavior in particular in connection with acquisition waves (Andrade, Mitchell, & Stafford, 2001; Harford, 2005; McNamara, Haleblan, & Dykes, 2008; Rhodes-Kropf, Robinson, & Viswanathan, 2005; Rhodes-Kropf & Viswanathan, 2004). Based on these findings, we predict that there should be industry-specific determinants also for Russian firm's acquisition behavior.

*Industry concentration.* Industry concentration is one of the most commonly used measures of the competitiveness of an industry in the industrial organization theory. The basic argument regarding the relationship between industry concentration and acquisition behavior is that in concentrated industries firms are able to accumulate more extensive resources for expansion and acquisitions. On the other hand, concentration also reduces the availability of acquisition targets and the motives for further consolidation (Huyghebaert & Luybaert, 2010) when a fragmented industry provides the acquirer opportunities for further consolidation. Reducing the number of

firms in a fragmented industry should reduce competition and result into improved profitability (e.g. Yin & Shanley, 2008). Acknowledging the existence of these alternative explanations, we view the resource accumulation explanation more salient in the Russian context and hypothesize:

*Hypothesis 3: Industry concentration increases the propensity of firms to engage in acquisitions.*

*Industry growth rate.* The growth rate of the industry could be positively related with the likelihood of an acquisition. In fast-growing industries, mergers and acquisitions enable firms to benefit from the expanding market and number of business opportunities available (e.g. Anand & Delios, 2002). It could take too long for firms to build a strong position and be operational through organic growth, resulting in high foregone profits (e.g. Hennart & Park, 1993). Firms could engage in mergers and acquisitions in order to increase the speed to market entry and to reduce market uncertainty.

It is also well-established that acquisitions tend to aggregate on an industry level into acquisition waves (e.g. Haleblian et al., 2009; Hayward, 2002; McNamara et al., 2008; Shleifer & Vishny, 2003). According to the dominating competing neoclassical economics explanation, aggregate acquisition behavior is driven by industry level regulatory and economic shocks (Harford, 2005). While regulatory and economic shocks have a tendency to lead into merger and acquisition waves, they also tend to lead into periods of fast growth as exemplified, for example, by the emergence of mobile telephony and internet that resulted into the dot com boom.

On the other hand, high growth rates may also reduce the pressure of firms to engage in acquisitions in order to grow since growth targets can be met also through organic growth. For example, Kim, Haleblian, and Finkelstein (2011) found that when firms experienced low organic growth they seemed to become desperate to grow through acquisitions even to the extent that

they ended up paying higher premia for their acquisitions. Recognizing also the challenges associated with managing high growth and acquisitions simultaneously, we hypothesize that in the Russian context, high industry growth decreases the likelihood of acquisitions.

*Hypothesis 4: Industry growth decreases the propensity of firms to engage in acquisitions.*

### **Institutional determinants of acquisition behavior**

We conclude by hypothesizing on the effects of corruption on Russian firms' acquisition behavior. It is well established that investment in general and acquisition behaviors in particular are not only driven by firm-specific or industry determinants. They are also conditioned by the institutional contexts in which firms are embedded (Gubbi et al., 2010; Lin et al., 2009; Rodriguez, Uhlenbruck, & Eden, 2005; Wan & Hoskisson, 2003).

In a recent paper, Lin, Peng, Yang, and Sun (2009) carried out a comparative analysis of the antecedents of mergers and acquisitions in the United States and in China. They examined how the embeddedness in networks and learning dynamics played out differently in the mergers and acquisitions strategies of firms in different institutional contexts. We focus on the institutional differences across different regions in Russia similarly to Marquis and Huang (2010) who analyzed differences in the institutional conditions of the different states in the United States on the acquisition activity in the banking industry.

Institutions can be defined as the "humanly devised constraints that structure human interactions" (North, 1994) forming both the formal and informal "rules of the game" that determine economic outcomes. Ostrom (2005: 18) defines rules as "shared understandings by participants about enforced prescriptions concerning what actions (or outcomes) are required, prohibited, or permitted". The sociological perspective of institutions distinguishes institutions

into rule-based, normative, and cultural-cognitive institutions (Scott, 1995). While regulatory institutions refer to formally codified, enacted, and enforced laws, normative and cultural-cognitive institutions refer to informal rules. Normative institutions manifest themselves in standards or commercial conventions, while cognitive ones relate to the beliefs about expected standards of behavior, typically learned through social interactions.

While informal rules are not codified, they are accepted as legitimate and rules in force. In contrast, formal institutions set the formal rules of the game, particularly concerning property rights. Property rights related rules are particularly important since “what are traded on the market are not, as it is often supposed by economists, physical entities but the rights to perform certain actions” (Coase, 1992). If property rights are not well secured, expropriation by the government or appropriation by rivals may result (Williamson, 1991), inhibiting firms from investments in assets in general and acquisitions in particular. The economic literature on the topic has found evidence that strong property rights regimes enhance investment (Acemoglu & Johnson, 2005; Barro, 2000). The security of property rights not only affects the size of investments, but also the efficiency of input allocation (Knack & Keefer, 1995).

The literature has largely omitted the role of informal institutions in this context. Levitsky and Helmke (2004) cite Della Porta and Vannucci (1999: 15) that “*In postwar Italy, for example, norms of corruption were more powerful than the laws of the state: the latter could be violated with impunity, while anyone who challenged the conventions of the illicit market would meet with certain punishment.*” Hence, informal institutions can provide stability (when the rule of law is not functioning properly), encouraging investments in general or acquisitions in particular. Corruption can function as an informal institution if it is rooted in “widely shared expectations among citizens and public officials” (Levitsky & Helmke, 2004: 351), or when it reinforces the

state's administrative hierarchies (Darden, 2008). In the latter case, corruption can be understood as the fulfillment of an informal contract, instead of its violation. Darden points at two cases: when grafts and embezzlements are accepted as second salaries, and when leaders can use them to exert informal pressure on their subordinates.

Corruption can be defined as government corruption, referring to the abuse (or misuse) of public power for private benefits (Tanzi, 1998; Uhlenbruck, Meyer, & Hitt, 2003), either by bureaucrats or by politicians (Tanzi, 1998). Corruption occurs when there is a demand for a certain product and a public official can restrict the amount of the good sold, such as permits, or if he cannot restrict it, he can delay issuance of these grants or impose additional requirements (Shleifer & Vishny, 1993). The existence and patterns of corruption are hence determined by the demand and supply of corrupt activities.

Although corruption is in general associated with economic costs, the costs depend in particular on the pervasiveness and arbitrariness of corruption (Doh, Rodriguez, Uhlenbruck, Collins, & Eden, 2003). The more pervasive, hence the higher the likelihood to encounter corruption in normal interactions with state officials, the higher the costs. Also, the more arbitrary or the more ambiguity in getting what was agreed on, the higher the costs. If, however, corruption is pervasive and non-arbitrary it can, under certain conditions, also lead to a well structured and stable corruption regime. It makes business activities possible where otherwise risks would have been too large. For instance, corruption can smoothen the process if there are government-imposed rigidities (Leff, 1964). Corruption can also help firms internalize uncertain environments (Doh et al., 2003; Rodriguez et al., 2005).

In the context of the market for corporate control, uncertainty concerning ambiguous or missing laws affecting acquisitions can be reduced. Moreover, private access to public officials can ease access to information on asset ownership rights and tax liabilities. Also, private access to the political and judicial system can help reduce the risk of expropriation at a later stage. Hence, an institutional environment characterized by an intermingling of economic and political elites supports expansionary strategies such as acquisitions. In this context acquisitions represent not only devices for increasing the competitiveness of firms, but also tools to raise the size of a business and hence the base for rent extraction by owners. Thus, we hypothesize:

*Hypothesis 5: Corruption increases the propensity of firms to engage in acquisitions.*

Systematic corruption, which is rooted in shared expectations of citizens and government officials, or which even serves as a state-building mechanism, can create stability, reduce uncertainty and make firms acquire. Hence, corrupt practices are more than an indicator of formal institutional voids (e.g. Khanna & Palepu, 1997); they can form informal institutions. It has been recognized that formal and informal institutions are interdependent. When the rule of law is strong, formal rules are of large relevance (Ostrom, 2005). However, it can also happen that formal institutions are weak and no informal institutions are binding which would lead to instability in the system (Levitsky & Helmke, 2004). Therefore, when formal institutions are poorly developed, informal institutions can help to create stability and work as substitutes. Corruption can thus be of help to deal with cumbersome regulations, or create certainty in the

uncertain market for corporate control. We argue that the effect of corruption is negatively moderated by the strength of the rule of law in the home region of the acquiring firm.

*Hypothesis 6: The effect of corruption is weakened by the strength of the rule-of-law.*

## **SAMPLE, METHODS, AND MEASURES**

*Sample.* For the empirical analysis we used two firm-level databases called Zephir and Ruslana that are both provided by Bureau Van Dijk. Zephir records M&As around the world. It relies on several different sources, including stock exchange commissions, trade publications, law firms, surveys of investment banks, and so forth. Using Zephir, we identified Russian firms that have acquired target firms at home and abroad. Ruslana contains information on the financial statements of the universe of firms located in Russia in the primary commodity, manufacturing and service industries, including both private and public firms. Thus, Ruslana provided us also with a group of non-acquiring firms.

We selected a sample of acquiring and non-acquiring medium- and large-sized firms from Ruslana for the period 2001-2008 omitting micro and small-sized firms due to problems in the reliability of accounting data and acquisition reporting. Using the official EU definition we hence only included firms that have at least 10 million Euro of turnover. Our final sample that has exhaustive information on the explanatory variables available consists of 1500 firms. We limited our analysis to acquisitions where more than 50% of the equity of a target firm was acquired in order to ensure that the acquirer could actually influence the target firm's strategic decisions. We also omit transactions reflecting internal restructurings, e.g. state ownership transfers, since their motives could differ from determinants that drive standard acquisitions.



In our sample, there were more than 350 acquirers. Over time, the number of acquisitions has grown. There was an annual average of 21 deals over the period 2001-2004, but already 44 from 2005-2008. On average 40% of all acquisitions in our sample are of a horizontal nature (at a 4-digit industry level; NACE Revision 1.1). About 40% of all deals took place within manufacturing industries. Around 7% of the deals involved acquirers from the natural resource industry. Overall, acquisition sequences are an increasingly important phenomenon on the Russian market for corporate control. Of the 350 acquirers, 155 acquired at least two firms, while 56 acquired at least four firms. Some of the firms had up to 31 over the studied period. This indicates that once a Russian firm decides to acquire momentum can lead into multiple acquisitions. Cross-border acquisitions by Russian firms are still quite infrequent, however. In total, 110 cross-border acquisitions by 61 firms are included in our sample. The share of cross-border acquisitions is on average 12%. However, there is also an increase in international deals over time. The annual average of deals increased from 7 during 2001-2004 to 21 during 2005-2008. Note that deals with targets in offshore financial centers, such as Cyprus, were excluded.

*Methods.* We started our empirical investigation by carrying out variance decomposition analysis. It allowed us to estimate the relative importance of the three different levels of analysis, the firm, industry, and region-level for explaining acquisition behavior. The outcome variable takes the value 1 if the firm  $i$  in region  $j$  and industry  $k$  decides to acquire (and otherwise zero). Overall, we obtained two different types of results: We decomposed the variance on both the original logit scale and using a probability metric. The latter method had the advantage that the outcome can be compared with variance components for linear models (Wright *et al.*, 2005). See the appendix for details.

Then we proceeded to the multiple regression analyses for testing our specific hypotheses. Our main dependent variable is the acquisition behavior of Russian firms. We first examined the determinants of whether a firm engages in acquisitions or not. In the second step we analyzed acquisition behavior of the firm through the lenses of its stream of acquisitions. Hence, we investigated whether a firm was an infrequent or serial acquirer, and, in more detail, whether the firm acquired a target firm in the same industry or not, and whether these acquisitions were carried out domestically or internationally.

For the decision to engage in acquisitions we estimated logit models where the dependent variable is a binary variable which takes the value one if a firm has acquired at least one other company in a given year, and otherwise zero. All explanatory variables were lagged by one year since the decision to invest was taken before the acquisition was completed. This also allowed us to avoid reverse causality. In all estimations, we included year dummies to account for time effects. We also adjusted the standard errors for parent firm clustering.

In order to examine the patterns of acquisition behavior, we estimated three separate multinomial logit models. We split the period of analysis, 2001-2008, into two sub-periods, 2001-2004 and 2005-2008. For each sub-period we measured if a firm in at least one year carried out either a horizontal and/or non-horizontal acquisition, engaged in a domestic and/or cross-border acquisition, or carried out infrequent or multiple acquisitions. We used this multiple year set-up to evaluate merger and acquisitions streams. The firm-level explanatory variables are from 2000 and 2004 respectively in order to lag the explanatory variables by one period. Note that we included a dummy for the second time period in the regressions. As before, we adjusted the standard errors for parent firm clustering.

In the regression analysis we examined firm, industry and region-level determinants of acquisition behavior. We tested our hypotheses corresponding to these levels of aggregation. We will next discuss how we defined our independent and control variables on these three levels.

*Firm-level analysis.* At the firm level (source: Ruslana), our first independent variable is the size of the firm (variable *Size*) measured as the natural logarithm of the sales revenue of the firm. To capture the financial slack of a company we include the liquidity ratio of the firm (variable *Liquidity Ratio*) in the regressions. It is constructed by taking the ratio of the difference between current assets and inventories to current liabilities. Due to potential outliers we trim the measure at both ends, cutting off the largest and smallest two percent and transform it with a natural logarithm. We control for other firm-level parameters found to affect acquisition behavior in prior research. We first add the earnings before interest and taxes (EBIT) normalized with the total assets of a firm as a measure for a firm's performance (variable *Return on Asset*). More profitable firms are expected to have more free cash flows available that can be used for acquisition making. High profitability may also reflect the strong ownership advantages that the firm possesses. Moreover, we account for the idiosyncratic nature of the assets of a firm by including the ratio of its intangible assets over total assets (variable *Technology Intensity*). Firms with a larger ratio are expected to be more likely to acquire due to the difficulty to carry out arms-length transactions on the market. As another firm-level variable, the age of the firm (variable *Firm Age*), which is measured as the number of years a firm is in business transformed with a natural logarithm, is included. Older firms are expected to have gained more organizational knowledge. However, in the Russian context, older firms have often been formed within the Soviet period and are therefore subject to stronger organizational rigidities affecting

the type of strategic actions they take. Finally, given the importance of the state in Russia, we control for state-ownership (variable *State-owned Firm*).

*Industry-level analysis.* At the industry level (Source: Ruslana), we examine the importance of two independent variables. The industry concentration is captured by the *Herfindahl-Hirschmann Index*. Firms' market shares (at a 4 industry digit; NACE Revision 1.1) are squared and then summed up for each industry. In order to test our hypothesis on industry growth, we determine the (log) value of the industry growth rate (variable *Industry Growth*). As industry-level controls, we use the average value of profitability in the industry (variable *Industry Profitability*). We also include a vector of industry dummies (five categories based on NACE Revision 1.1) in order to control for permanent unobserved differences across industries (e.g., industry regulation, technological spillovers). This includes a dummy for the natural resource industry. Natural resources are of large importance in the Russian economy. Results for industry dummies are not reported. Note that as a robustness check only we also estimate the impact of the variable *Industry Size* (log value of total industry sales) on the acquisition behavior of a firm since this variable is highly correlated with firm size.

*Region-level analysis.* Finally, at the region level, our independent variables are *Regional Corruption* and *Strength of the rule-of-law*. The variable *Regional Corruption* (Source: Carnegie Center, Moscow) is based on a rating given by local experts that analyze the interdependencies between economic and political elites and the occurrence of corruption scandals within a region.<sup>1</sup>

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<sup>1</sup> One main assumption is that the corruption regimes across Russian regions feature institutionalized corruption. Hence, corrupt practices are not random and the effectiveness of these transactions is not ambiguous. However, Doh *et al.* (2003) gives Russia a high score not only in the dimension pervasiveness, but also arbitrariness. But their classification of Russia is based on survey information from 1998. Since Putin took over power in 2000 the political system has changed and been stabilized. The situation seems to be closer to Communist party rule before the collapse of the Soviet Union in terms of arbitrariness, used as an example of pervasive and non-arbitrary corruption by, for instance, Shleifer and Vishny (1993), than the situation of the 1990s. We assume that this is the case over all regions since *Edinaia Rossia*, the party of both Putin and Medvedev has been strong in all regions over the years. Replacement of heads in the regions, which could have led to a disruption of corruption regimes, happened infrequently over this time period. Moreover, although the Russian government has declared the combat of corruption as a

The measure is based on a score between 0 and 5, which we rescale to obtain a measure ranged between 0 (low corruption) and 1 (high corruption).<sup>2</sup> We measure *Strength of the rule-of-law* (Source: expert.ru) as a proxy of the quality of the rule of law in a region. It measures the effectiveness of laws, in particular related to the conditions to invest in different industries. Different items of relevance are gathered and then weighted by experts of Expert.ru, which then leads to a ranking of the Russian regions. Our measure is this ranking, where the region with the strongest rule-of-law is placed 1.

We control for several other characteristics of the regions (source: Rosstat): *Regional GDP* measures the regional gross product. *Regional GDP per Capita* measures the level of market development and can be considered as a proxy for the capabilities in a region. Both variables are expected to have a positive impact on a firm's acquisition activities. We also take into account the growth in regional gross product (*Regional GDP Growth*), the intensity of Research and Development (variable *Regional R&D intensity*) as a proxy for a region's overall level of capabilities, and international trade intensity at the regional level (variable *Regional Trade Intensity*). The two latter variables are constructed as the amount of R&D spending and the sum of exports and imports as a share of the gross regional product respectively.

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major policy goal, there is both anecdotal and statistical evidence that the level of corruption has not decreased (Source: Transparency International). Russia, in general, is a relatively corrupt country, ranking 154th out of 178 on the Transparency International Index on corruption.

<sup>2</sup> Due to data restriction, for corruption we use a time-invariant measure which is based on the average for the years 2000-2004, and which we apply over the whole estimation period.

## RESULTS

As the first step of our analyses we ran a variance decomposition analysis in order to examine how much of the variance in the acquisition behavior is accounted for by the different levels of aggregation (company, industry, and region).<sup>3</sup>

[INSERT TABLE 1 AROUND HERE]

As expected on the basis of prior research, we find that firm heterogeneity explains the largest part of the variance in mergers and acquisitions. It accounts for 49% on the logit scale (or 63% on the probability scale) of the total variance explained. We also observe that industries and regions matter. They represent respectively 27% (22%) and 23% (15%) of the variance explained. Hence, although the regions matter less than industries, the difference is not large. This would suggest that omitting the sub-national location of a firm would lead to a misguided understanding of acquisition patterns. In the Russian context, the importance of the regional dimension can be explained by the low mobility of labor and the lack of an efficient transportation infrastructure that would connect the different regions.

When segmenting the sample period 2001-2008 into the two sub-periods 2001-2004 and 2005-2008 we find some evidence that in the later period firm-level heterogeneity plays a larger role for explaining the variance of firm acquisition behavior than in the earlier period. Firms would seem to start differentiating themselves from their peers in the second stage, possibly due to increasing competition and the necessity to develop firm-specific competitive advantages.

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<sup>3</sup> In general, since the variance in logit estimations is always fixed to  $\pi^2/3$  on the first level, the level of explained variance in the estimation of binary dependent variables is generally lower than when using OLS for continuous dependent variables – in our case we also observe a low explained variance.

As the next step, we focused on the determinants of acquisition behavior. Due to the high correlation firm size and industry, on the one hand, and regional GDP and regional GDP per capita, on the other hand, we only include these variables in separate regressions. We first examine the determinants of acquisition making in general, before turning to the three multinomial logit regressions. The results of our regression analyses are shown in Table 2.

[INSERT TABLE 2 AROUND HERE]

On the firm level we find support for our hypotheses that firm-level resources matter among Russian acquirers. Firm size increases the propensity of firms to engage in acquisitions (Hypothesis 1). We also validate the Hypothesis 2, according to which financial slack increases the propensity of firms to engage in acquisitions. As shown in Table 2, Models 1-6, these findings are very robust across the different regressions specifications. Thus, consistent with prior research on developed market firms, size and financial resources represent important determinants of acquisition behavior also among emerging market firms.

Our control variables provide further insights into the firm-specific determinants of acquisitions. Intangibility of assets and state ownership are both insignificant, suggesting that they have no relevance for acquisition making, or have ambiguous effects on different types of acquisitions. As expected, *Firm Age* has a positive sign and is robustly significantly different from zero. The longevity of the firm could matter, for instance, due to accumulated experience and capabilities, existence of relationships built over time with the different stakeholders operating in the industry, or a higher legitimacy and perceived reliability that could facilitate the access to resources.

In contrast to the firm level analysis, we find somewhat weaker support for our two industry level hypotheses. Contrary to our prediction in Hypothesis 3, industry concentration has an insignificant effect. This could be explained by the two competing lines of reasoning that we provided when setting up our hypothesis. The positive forces could be outweighed by negative ones. Nevertheless, in Table 2, Models 3-6 provide support for the hypothesis 4. Lower industry growth seems to induce more acquisition activity also among Russian firms.

On the regional level we find evidence that the socio-economic institutional environment is a strong predictor of the acquisition behavior of firms. In support of our Hypothesis 5, we find that higher corruption in a region indeed is a strong predictor of acquisition activity. Hence, an environment characterized by an intermingling of economic and political elites supports expansionary strategies such as acquisitions. As highlighted in the theory section this outcome needs to be considered in the context of an emerging economy, where legal frameworks for acquisitions are poorly developed and the rule of law is insufficient (Radygin, 2010).

Finally, we predicted the role of corruption to rise with a decreasing reliability of a region's rule-of-law (Hypothesis 6). Therefore, in particular in a regional environment where formal institutions do not manage to provide a stable and reliable business framework, corrupt practices are expected to be ways of reducing resulting uncertainties, accepted by managers, bureaucrats, politicians, and lawyers. These informal rules then structure business dealings. We tested this effect by entering an interaction term between the legal risks in a region and its level of corruption (Table 2, Model 6). As predicted, this interaction effect is positive and provides support for Hypothesis 6.



Overall, we find support for our hypotheses with the exception of our hypothesis on industry concentration (Hypothesis 3). In particular, a firm's resource endowment and the socio-institutional regime of a region seem to matter for acquisition activities. To obtain more detailed insights into the causal relationship between our variables of interest and acquisition behavior, we further examined the explanatory power of our independent variables for different types of acquisition patterns. We examined whether a firm was an infrequent acquirer or a serial acquirer that engaged in multiple acquisitions (our threshold of determining this was 4 acquisitions consistent with prior research). Moreover, we examined whether a firm acquired its target firm in the same industry and/or from different industries and whether these acquisitions were domestic or cross-border acquisitions. The results of these further analyses are shown in Table 3.

[INSERT TABLE 3 AROUND HERE]

As shown in Table 3, our results remain consistent and no differentiating patterns can be detected with our main measures of a firm's resources (firm size or liquidity) across the different types of acquisition patterns. Of the firm-level control variables, the results regarding *Firm Age* differ across the different types of acquisition behaviors. It is only significant for domestic acquisitions and for non-horizontal ones. Thus, firms that have obtained a long experience of working within one industry would appear to be more confident in taking the risk of venturing into a new industry. Moreover, the local network that firms have developed over time would only seem to matter for domestic acquisitions. As another interesting finding regarding the firm-level control variables, *State ownership* is related to the likelihood that a firm acquires abroad. Thus, it would seem that political relations through state ownership may help firms in their endeavors to obtain government support for ventures abroad.

Our analysis of the different types of acquisition behaviors also confirms the robustness of our results regarding industry-level determinants. With respect to the regional level variables, we find that strength of the rule-of-law of an acquirer's home region matters for cross-border acquisitions, but not for the decision to acquire domestically. We find this finding quite intuitively appealing. The lower the strength of the rule of law in a particular region, the more likely a firm will seek to invest abroad.

When we then interact the level of corruption with legal risks for the different acquisition patterns in order to capture the substitutive effect of informal institutions, we notice that the interaction effect is of relevance for all other acquisition decisions, but not in connection with cross-border acquisitions. Hence, the substitutive role of informal institutions no longer holds in this case, suggesting that capital flight might indeed be of relevance.

Overall, the level of corruption influences not only domestic, but also cross-border acquisitions. The largest share of the cross-border acquisitions in our sample took place in countries that form part of the Commonwealth of Independent States (CIS) (around 45%).<sup>4</sup> These countries have similar institutional settings – in terms of the formal as well as the informal institutional environments. The similarity of the home context would seem to provide a competitive advantage for Russian firms, causing them to seek investments in those countries. For instance, Russian firms may possess a higher capacity to identify the key local political actors and better understand their preferences in CIS (e.g. Holburn & Zelner, 2010) or be more able to adapt their political strategies to the local context.

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<sup>4</sup> CIS countries include Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Uzbekistan and Ukraine.

Finally, we were surprised to note that the international trade intensity has the opposite effect on the likelihood to engage in international acquisitions than on all other aspects of acquisition behavior. While international trade in a region may help Russian companies to participate in the international market of corporate control, the activity of international entrants may also preempt some of the business opportunities before local firms are able to build their own international expansion capabilities.

## **DISCUSSION AND CONCLUSIONS**

### **Contributions to Theory and Research**

*Acquisitions by Emerging Market Firms.* We contribute to the recent research on the antecedents and consequences of acquisitions by emerging market firms (Aybar & Ficici, 2009; Elango & Pattnaik, 2011; Gubbi et al., 2010; Kumar, 2009; Lin et al., 2009). This research has contributed to highlighting the importance of the phenomenon and in starting the debate whether emerging market firms outperform developed market firms in their acquisition performance. In order to go beyond the question and the endogeneity concerns associated with it, we focused on the antecedents of emerging market firms' acquisition behavior.

To our knowledge, there are only two recent papers that have taken a relatively similar approach that we took in our analyses. Lin *et al.* (2009) found that learning and the embeddedness in interfirm networks as a driver of acquisitions play a larger role for acquisition-making in China than in the US. Elango and Pattnaik (2011) studied 175 international acquisitions by Indian firms during 2000-2006 in order to understand how emerging market firms develop competencies that are required for the internationalization of firms. We deepen the

existing understanding of the antecedents of acquisitions by emerging market firms further by providing a multi-layered analysis of the firm, industry, and region level determinants of acquisition behavior.

Contrary to Elango and Pattnaik's (2011) results on the negative effects of relative market power and consistent with the other acquisition literature (Haleblian et al., 2009), we find that firm size increases a firm's propensity to engage in acquisitions. Moreover, our results are consistent with Iyer and Miller's (2008) findings on the effects of financial slack on acquisitions by developed market firms. Finally, in line with the results of Kim, Haleblian, and Finkelstein (2011), we find support for the possible existence of growth desperation in our sample.

*Institutional context.* The most novel and to some extent also the most interesting findings of our study are, however, related to the role of the regional variables and their effects on Russian firms' acquisition behavior. Based on variance decomposition analysis, we find that the home region of the firm plays a major role in its acquisition behavior. One explanation for this could be that different regions have specializations in different kinds of firms and industries. This specialization effect, however, would be included in the variance explained on the firm and industry levels of analysis. Another explanation could be that, since the firms that we study are still at such an early stage on their paths to become serial acquirers, the influences that these firms get from their (region and industry) environment play a more important role than in connection with developed market firms. These are driven more by their own historical capability accumulation. As illustrated in Figure 1, one could hypothesize the role of the regional and industry level antecedents to play a larger role at the beginning of such an evolutionary path before the firms have had the possibility to accumulate firm-specific capabilities for themselves.

[INSERT FIGURE 1 AROUND HERE]

When analyzing the region-level determinants of acquisition behavior further through multiple regression analysis, we find a very strong effect between the level of corruption in a region and the tendency of firms to engage in acquisition behavior. This provides support for the institutional theory prediction that the socio-institutional context plays an important role in firms' acquisition behavior (Lin et al., 2009; Marquis & Huang, 2010). One could suggest several possible reasons why the corruption in a firm's home region would be associated with higher acquisition behavior.

One possibility would be that it enables higher profitability for the firms engaging in corrupt practices as they may be able to avoid some constraints that other firms face. Even if this was the case, we control for the firm-level slack separately in our analyses. If corruption would lead to on average higher profitability for firms in the more corrupt regions, our measure of slack should be able to control for the effect already on the firm-level. Thus, it is unlikely that higher profitability is the driver of our results regarding corruption.

Another possibility would be that being engaged in corrupt practices in their home contexts provides firms with stability that then enables them to engage in acquisitions. Without a strong rule-of-law framework around them, successful firms in regions with the highest rates of corruption learn to establish strong confidential relationships with the key stakeholders around them. This kind of informal institution provides them a compensating security network and helps reduce the external uncertainty that could otherwise always threaten the existence of the firm without strong, enforceable laws and regulations to rely on. Having such higher security would then enable firms from the regions with higher corruption to more safely engage in acquisitions.

A third possible explanation would be that firms from regions with higher levels of corruption develop distinctive capabilities to deal with corruption and as they expand outside their regions through acquisitions they are better able to deal with uncertain environments. For a firm originating from regions with lower levels of corruption it would be probably harder to expand to a region with higher levels of corruption than vice versa. Supporting this line of reasoning, Holburn and Zelner (2010) found that firms can develop political capabilities on the basis of their home country conditions that can then also help them to expand abroad to countries characterized by similar kinds of conditions.

Finally, the higher likelihood to acquire when there is higher corruption or poorer rule of law could also be a result of criminal activities, in particular raiders that force firm owners to sell their assets to them. They could corrupt bureaucrats, including the police, and judges in order to make these activities seem legal. Forced takeovers were a frequent phenomenon in Russia in particular in the 1990s. However, when entering as a control the level of regional criminal risk (Source: Expert.ru) – not reported in the tables – this variable takes on a negative sign. Hence, the larger the criminal risk (including economic, but also organized or petty crime) in a region, the less likely are acquisitions to happen.

As a whole we contribute to an improved understanding of the role of the institutional context for acquisition behavior. Our findings parallel the findings made by Peng (2003) who argued that the transition from a previously planned to a market based economy might explain the relevance of networks as opposed to formal rules. He models transition as a two phase process. The earlier stages feature weak institutions and rely on relationship-based transactions and bureaucratic rule. During the later ones the formal institutional environment improves and firms can rely on established formal rules.

## **Directions for Future Research**

While our findings provide interesting new insights into the behaviors of emerging market firms, they would also seem to raise additional questions for future research. In particular, the strong role of the region raises interesting questions regarding the role of the initial resource and capability endowments of firms and how they over time become firm-specific histories of capability accumulation. This would be an important process to study further in connection with similar institutional transitions where firms start developing capabilities on a relatively “clean sheet”. Possible questions for such future research would include: At what point firm-level characteristics start explaining the observed acquisition behavior? How long does it take before the role of regional determinants of acquisition behavior diminishes?

Another set of key questions for future research relates to the role of corruption in emerging economies. While we identified four alternative reasons why corruption would affect a firm’s acquisition behavior, our data on Russian firms provides some evidence that the effect is most likely to be driven by the increasing stability that corruption provides for the home context and the distinctive capabilities that firms develop to deal with corruption. Future research would be needed to develop a deeper understanding of the reasons.

Finally, in contrast to most of the prior studies on emerging market multinationals that have focused on China and India our study is focused on Russian firms. While this has the benefit of extending the existing research to cover also other home country contexts, it also raises issues of generalizability. In particular, our key finding relating to corruption may be to some extent Russia-specific because the salience and nature of corruption tend to differ in a significant manner across the countries commonly categorized as emerging markets.

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**Table 1: Variance decomposition analysis**

Logit Scale					Predicted values - Probability scale	
Variance component	Chi-squared test (p-value)	Share of explained variance	Share of total variance	Share of explained variance	Share of total variance	
<b>2001-2008 yearly</b>						
Firm	0.85 2059 (<0.001)	49%	17%	63%	7%	
Region	0.40 396 (<0.001)	23%	8%	15%	2%	
Industry	0.47 305 (<0.001)	27%	9%	22%	3%	
<i>Overall prevalence*</i>					6%	
<b>2001-2004 yearly</b>						
Firm	0.72 606 (>0.500)	45%	15%	63%	5%	
Region	0.52 176 (<0.001)	33%	11%	21%	2%	
Industry	0.35 345 (<0.001)	22%	7%	16%	1%	
<i>Overall prevalence*</i>					3%	
<b>2005-2008 yearly</b>						
Firm	0.94 1582 (<0.001)	52%	18%	63%	9%	
Region	0.41 281 (<0.001)	23%	8%	16%	2%	
Industry	0.45 257 (<0.001)	25%	9%	21%	3%	
<i>Overall prevalence*</i>					8%	

\* Overall prevalence only available for the probability scale

**Figure 1:** *The relevance of firm specific characteristics over time. The boxes marked with lighter color represent weaker influences on acquisition behavior than the boxes marked with darker color*

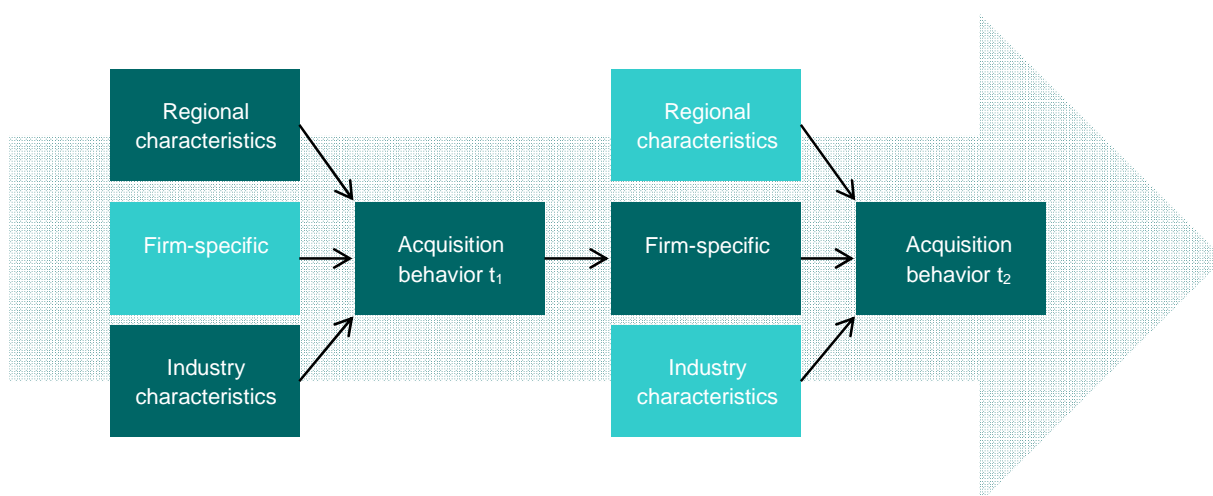


Table 2: Regression analysis results

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Return on Asset	-0.398 (0.583)	-0.614 (0.578)	-0.674 (0.584)	-0.679 (0.588)	-0.653 (0.584)	-0.654 (0.591)
(Log) Size	0.569*** (0.0508)	0.540*** (0.0575)	0.462*** (0.0553)	0.507*** (0.0661)	0.464*** (0.0552)	0.457*** (0.0559)
(Log) Liquidity Ratio	0.262*** (0.103)	0.264*** (0.0983)	0.226*** (0.101)	0.236*** (0.101)	0.226*** (0.100)	0.215*** (0.101)
(Log) Firm Age	0.167*** (0.0635)	0.0950 (0.0662)	0.198*** (0.0715)	0.206*** (0.0714)	0.197*** (0.0712)	0.206*** (0.0735)
Technology Intensity	2.002 (2.048)	1.754 (2.031)	1.255 (2.053)	1.408 (2.097)	1.553 (2.049)	1.227 (2.155)
State-owned Firm	-0.161 (0.151)	-0.159 (0.168)	-0.168 (0.176)	-0.172 (0.178)	-0.167 (0.175)	-0.200 (0.178)
Herfindahl-Hirschmann Index		0.559 (0.386)	0.289 (0.389)	0.483 (0.418)	0.268 (0.388)	0.282 (0.393)
Industry Profitability		0.176*** (0.0578)	0.129* (0.0740)	0.128* (0.0741)	0.129* (0.0736)	0.121 (0.0771)
(Log) Industry Growth		-0.0515 (0.0341)	-0.0706** (0.0345)	-0.0674* (0.0351)	-0.0690** (0.0345)	-0.0702** (0.0347)
Regional GDP Growth			-0.00857 (0.00803)	-0.00893 (0.00803)	-0.00664 (0.00788)	-0.00590 (0.00821)
Regional GDP			0.150** (0.0724)	0.139* (0.0732)		0.0961 (0.0705)
Regional R&D Intensity			0.116* (0.0644)	0.104 (0.0660)	0.148*** (0.0594)	0.0428 (0.0668)
Regional Trade Intensity			-0.258 (0.296)	-0.250 (0.297)	-0.268 (0.290)	-0.311 (0.300)
Regional Corruption			3.225*** (0.734)	3.116*** (0.726)	3.537*** (0.729)	-1.621 (1.451)
Strength of the Rule-of-law			0.0116*** (0.00311)	0.0116*** (0.00310)	0.0116*** (0.00320)	-0.0405*** (0.0139)
(Log) Industry Size				-0.113* (0.0684)		
Regional GDP per Capita					0.242* (0.124)	
Regional Corruption * Strength of the Rule-of-law						0.107*** (0.0281)
Constant	-9.936*** (0.585)	-9.408*** (0.682)	-11.90*** (0.853)	-10.20*** (0.986)	-11.78*** (1.207)	-8.973*** (1.053)
Observations	8000	8000	8000	8000	8000	8000
Loglikelihood	-1398	-1357	-1302	-1300	-1302	-1293
Pseudo R2	0.134	0.159	0.194	0.195	0.194	0.199

Robust standard errors in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

Estimations include year and industry dummies. Standard errors are adjusted for parent firm clustering.

Table 3: Type of acquisitions and acquirers

Variables	Horizontal	Non-Horizontal	Horiz. & Non-Horiz.	Domestic	International	Dom. & Inter.	Infrequent	Serial
	Acquisitions (1)	Acquisitions (2)	Acquisitions (3)	Acquisitions (4)	Acquisitions (5)	Acquisitions (6)	Acquirers (7)	Acquirers (8)
Return on Asset	-0.461 (1.274)	-0.0137 (0.789)	1.422 (1.544)	0.273 (0.654)	-1.693 (3.065)	-2.357 (2.042)	0.0402 (0.640)	-0.920 (1.658)
(Log) Size	0.579*** (0.121)	0.448*** (0.0993)	0.675*** (0.160)	0.468*** (0.0775)	0.640*** (0.255)	0.792*** (0.244)	0.441*** (0.0761)	0.943*** (0.202)
(Log) Liquidity Ratio	0.278 (0.252)	-0.201 (0.145)	0.551* (0.304)	0.234* (0.121)	0.762* (0.461)	1.543*** (0.353)	0.257** (0.122)	0.981*** (0.343)
(Log) Firm Age	0.0460 (0.128)	0.241** (0.0993)	0.232 (0.212)	0.216*** (0.0779)	0.219 (0.266)	0.219 (0.237)	0.237*** (0.0759)	-0.0809 (0.188)
Technology Intensity	9.105** (4.140)	-3.665 (6.029)	13.59* (7.955)	6.493* (3.746)	-27.30 (30.10)	-28.68 (46.05)	5.894 (3.774)	0.213 (17.60)
State-owned Firm	-0.677 (0.428)	0.447** (0.221)	-0.398 (0.593)	0.155 (0.192)	1.742*** (0.568)	-0.993 (0.777)	0.304 (0.187)	-0.666 (0.628)
Herfindahl-Hirschmann Index	-0.897 (1.169)	0.00501 (0.596)	1.369 (0.843)	0.424 (0.502)	-2.530 (1.792)	0.990 (1.090)	0.537 (0.489)	-0.182 (1.300)
(Log) Industry Size	-0.287* (0.159)	-0.00683 (0.105)	-0.323* (0.193)	-0.109 (0.0666)	-0.910*** (0.395)	-0.128 (0.369)	-0.145* (0.0977)	-0.241 (0.192)
Industry Profitability	2.633 (2.274)	0.431 (1.230)	-1.897 (2.081)	0.0887 (1.034)	-1.323 (2.585)	5.395*** (2.071)	0.256 (1.022)	0.752 (1.949)
(Log) Industry Growth	-0.0726 (0.115)	-0.0828 (0.0692)	0.255* (0.142)	-0.0668 (0.0632)	-0.0198 (0.143)	0.390*** (0.126)	-0.0681 (0.0619)	0.167 (0.117)
Regional GDP Growth	0.0451 (0.0683)	-0.0678* (0.0395)	0.138 (0.106)	-0.00323 (0.0322)	0.0802 (0.139)	0.0784 (0.226)	0.00273 (0.0310)	-0.0769 (0.134)
(Log) Regional GDP	0.0337 (0.219)	0.605*** (0.211)	0.0346 (0.343)	0.368** (0.142)	-0.131 (0.333)	0.413 (0.950)	0.312** (0.136)	0.426 (0.461)
Regional R&D Intensity	0.300*** (0.116)	-0.0114 (0.0727)	0.163 (0.202)	0.00163 (0.0617)	0.609*** (0.204)	0.0372 (0.304)	0.0206 (0.0801)	0.0958 (0.233)
Regional Trade Intensity	-0.0722 (0.409)	-1.944* (1.155)	-0.592 (1.007)	-1.733** (0.725)	0.366** (0.142)	-0.984 (1.241)	-1.091 (0.706)	-1.401 (1.526)
Regional Corruption	8.235*** (1.778)	1.903* (1.017)	4.075* (2.405)	2.058** (0.825)	9.049** (3.637)	4.360 (5.142)	2.259*** (0.843)	5.829** (2.556)
Strength of the Rule-of-law	0.00531 (0.00662)	0.00818* (0.00466)	0.0317** (0.0130)	0.00564 (0.00414)	0.0318*** (0.0114)	0.0627* (0.0326)	0.00754* (0.00425)	0.0229** (0.00913)
Time Period 2005-2008	0.226 (0.311)	0.711*** (0.217)	1.643*** (0.537)	0.757*** (0.184)	-0.0223 (0.636)	1.356** (0.651)	0.662*** (0.181)	1.841*** (0.543)
Constant	-12.03*** (1.976)	-13.18*** (1.556)	-16.13*** (2.699)	-10.29*** (1.126)	-15.04*** (2.920)	-25.01*** (4.326)	-10.02*** (1.123)	-20.03*** (2.654)
Observations	2277	2277	2277	2277	2277	2277	2277	2277
Log likelihood	-787.0	-787.0	-787.0	-754.3	-754.3	-754.3	-746.2	-746.2
Pseudo R2	0.200	0.200	0.200	0.230	0.230	0.230	0.207	0.207

Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. The base category for the multinomial logit regressions is no acquisition. Estimations include year and industry dummies. Standard errors are adjusted for parent firm clustering.

## Appendix 1: Variance Decomposition Analysis

We carry out a variance decomposition analysis to capture the relevance of the three different levels of analysis, the firm-, industry-, and region-level, for acquisition making.

Here, the outcome variable is  $y_{mijk}$ , taking on the value 1 if firm  $i$  in region  $j$  and industry  $k$  decides to acquire (otherwise zero). It has the conditional distribution

$$y_{mijk} \sim \text{Bernoulli} \left( \pi_{0ijk} \mid \beta_{ijk}, \theta_j, \mu_k \right)$$

The probability is conditional on a cross-classified nested set of random coefficients  $\left( \pi_{0ijk} \mid \beta_{ijk}, \theta_j, \mu_k \right)$ , while  $m$  refers to the  $1, \dots, M$  acquisition periods, nested within firms  $i=1, \dots, n_{ijk}$ , nested within cells cross-classified by  $j=1, \dots, J$  regions and  $k=1, \dots, K$  industries.

We estimate the following model (combined model)

$$\log \left( \frac{\pi_{0ijk}}{1 - \pi_{0ijk}} \right) = \alpha + \beta_{ijk} + \theta_j + \mu_k$$

At the lowest level of estimation the log-odds metric is used, but estimations at all other levels (firm, region, and industry) are linear estimations. The expected values of the random effects are  $E[\beta_{ijk}] = E[\theta_j] = E[\mu_k] = 0$  and the variances are  $\text{var}[\beta_{ijk}] = \sigma_\beta^2$ ,  $\text{var}[\theta_j] = \sigma_\theta^2$ , and  $\text{var}[\mu_k] = \sigma_\mu^2$ . It is assumed that the random effects across different levels and different clusters in the same level are not correlated (e.g., Guo and Zhao, 2000).

Using HLM7 software we obtain the fixed effect  $\alpha$ , the variances  $\sigma_\beta^2$ ,  $\sigma_\theta^2$ ,  $\sigma_\mu^2$ , and the variance components  $r_\beta^2$ ,  $r_\theta^2$ ,  $r_\mu^2$  for each random effect. This allows us to calculate the relative importance of each level for explaining the acquisition behaviour, hence the share of the total variance that each level (firm, region and industry) explains. Since calculations on the first level involve a logit transformation, we provide results first, on the logit scale, and, second, using a probability metric. For the latter we apply methods by Goldstein and Rasbash (1996) and Wright *et al.* (2005). This method has the advantage that the outcome can be compared with variance components for linear models (Wright *et al.*, 2005).

To obtain the explained variance on the logit scale, we take account of the fact that there is no variance component for level 1. In logit estimations it is always fixed to  $\pi^2/3 = 3.29$  – since both coefficients and error variance cannot be estimated at the same time. Following Snijders and Bosker (1999) we therefore calculate the intra-class correlation coefficients  $\rho$ , or variance explained by each level, as

$$\rho_\beta = \frac{r_\beta^2}{r_\beta^2 + r_\theta^2 + r_\mu^2 + 3.29}, \quad \rho_\theta = \frac{r_\theta^2}{r_\beta^2 + r_\theta^2 + r_\mu^2 + 3.29}, \quad \rho_\mu = \frac{r_\mu^2}{r_\beta^2 + r_\theta^2 + r_\mu^2 + 3.29}$$

To transform the explained variance to the probability scale we follow Goldstein and Rasbash (1996) and Wright *et al.* (2005). In a first step we use the estimated variance of the three random effects in the logit scale and the value of the intercept from the hierarchical logistic regression to simulate three sets of observations. We simulate 1000 region values, normally distributed with mean 0, and the variance of the regional random effect; 1000 industry values, normally distributed with mean 0, and the variance of the industry random effect; and 27,000 firm values, normally distributed with mean 0, and the variance of the firm random effect. We expand the region and industry datasets 27 times, and then randomly assign region and industry values to firms. Hence, in each region and industry

we have 27 firms.<sup>5</sup> In a second step we use these simulated values to calculate the predicted probabilities  $\hat{\pi}_{0ijk}$  of carrying out an acquisition per firm  $i$ :

$$\hat{\pi}_{0ijk} = \frac{\exp(\alpha + \beta_{ijk} + \theta_j + \mu_k)}{1 + \exp(\alpha + \beta_{ijk} + \theta_j + \mu_k)}.$$

In a third step we calculate the total variance and variance components of these predicted values. The total variance is calculated as a standard binary variance

$$\text{var}(\hat{\pi}_{0ijk}) = p(1-p), \text{ while } p = \frac{1}{n} \sum_{i=1}^n \hat{\pi}_{0ijk}.$$

The variance components of firm, region, and industry effects we obtain by estimating a two-level cross-classified model in HLM7 using the simulated values (firm, region, industry level). The intra-class correlation coefficients for the predicted values  $\rho_p$ , or variance explained by each level is then

$$\rho_{p\beta} = \frac{r_{p\beta}^2}{\text{var}(\hat{\pi}_{0ijk})}, \quad \rho_{p\theta} = \frac{r_{p\theta}^2}{\text{var}(\hat{\pi}_{0ijk})}, \quad \rho_{p\mu} = \frac{r_{p\mu}^2}{\text{var}(\hat{\pi}_{0ijk})}.$$

## References for the Appendix

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<sup>5</sup> In our sample we have 2298 observations, 1548 firms, 58 regions, 50 industries (NACE 2 digit classification). So we approximately keep the relations between firms and regions.