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Legal Weakness, Investment Risks, and Distressed Acquisitions: Evidence from Russian Regions^{*}

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Abstract: This paper traces the survival status of 93,260 Russian business firms in the period of 2007–2019 and empirically examines the determinants of the acquisition of financially distressed companies (i.e., distressed acquisitions). We found that, of 93,260 firms, 50,743 failed in management, and among these distressed firms, 10,110 were rescued by acquisition during the observation period. Our empirical results indicate that, in Russian regions, the weakness of the legal system tends to increase the probability of distressed acquisitions, while other socioeconomic risks negatively affect it. These tendencies are common in most industries and regions. It is also revealed that, in the most developed area, monotown enterprises are more likely to be bailed out by acquisition after management failure than other firms, but it is not always true for the whole nation.

Keywords: legal weakness, investment risk, financial distress, distressed acquisitions, Russia

JEL Classifications: C35, D02, D22, E02, G34, K20, L22

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1 Introduction

The days when Russia attracted the attention of investors around the world as a fast-growing emerging market are now long gone. Citizens and companies in the country have had to endure a series of hardships, beginning with the Lehman shock of 2008 and continuing with the COVID-19 pandemic crisis. Contrary to the initial expectation of the International Monetary Fund (IMF) and the Federal Government of Russia, the negative impact of the new coronavirus infection on the Russian economy was not comparable to that of the 2008 global financial crisis,¹ but the real GDP growth rate in 2020 has sunk to minus 3% anyway, undoubtedly increasing the economic difficulties in the country more than ever in the last two decades.

The dynamics of firm entry and exit well reflect the painful path of the Russian economy. In fact, as shown in **Figure 1**, the firm entry rate has recorded a long slump after the 2008 crisis until the end of 2020. During the same period, the firm exit rate continued to rise steadily. To make matters worse, since 2016, the exit rate has almost always been higher than the entry rate; as a result, according to the Federal State Statistic Service (Rosstat), the total number of business companies and organizations declined from 4,507,000 in January 2007 to 3,827,000 in January 2020, meaning that a net of 15.1% of Russian firms were lost during these 14 years. Even with accounting for the trend of an aging population, there is no doubt that the vitality of the Russian business sector has been seriously impaired.

Russia is known as a country of active mergers and acquisitions. In this country, hostile takeovers frequently occur, and many Russian managers are frightened by the risk (Frye, 2017). As reported later, however, mergers and acquisitions (M&A) are also intensively used to rescue companies that have fallen into financial distress. When the legal system is unreliable, so-called “distressed acquisitions” are used as an alternative to the legal treatment of debts and assets of failed companies; therefore, the opportunity cost of company liquidation in accordance with the law is higher than that of acquisition. Actually, Iwasaki et al. (2021) demonstrated that the quality and enforcement of insolvency laws are negatively associated with the probability of distressed acquisitions in European emerging markets. In this sense, distressed acquisitions in Russia were likely to function as a complementary mechanism to the

¹ In June 2020, the IMF projected Russia’s real GDP growth rate in 2020 to be -6.6% (IMF, 2020), while the Russian Ministry of Economic Development forecasted a growth rate of -5% for the same year (<https://economy.gov.ru/>).

weaknesses of the legal system in the period of economic transition. However, in light of the above-mentioned facts about company demographics, there may be significant changes in the role of distressed acquisitions in recent years.

In this paper, using a large dataset of business firms in the period of 2007–2019, we attempt to estimate the frequency of acquisitions of financially distressed companies and grasp its time trend. Furthermore, following the empirical strategy of Iwasaki et al. (2021), we empirically examine the determinants of distressed acquisitions with a special focus on the initial conditions of Russian regions including not only the quality of the legal system but also socioeconomic investment risks and the socialist legacy—monotowns (*monogorody*). For reasons we will discuss later, we expect the latter two factors to have as much influence on the acquisitions of failed firms in Russia as the former. Through empirical testing of this assumption, we provide new insights into the literature.

Of 93,260 Russian firms, we found 50,743 to be financially distressed, and among these failed firms, 10,110 were bailed out by acquisition in the period of 2007–2019. We also found that the share of distressed acquisitions of failed firms fell sharply during the observation period. Our empirical results indicate that, in Russian regions, the weakness of the legal system tends to increase the probability of distressed acquisitions, while other socioeconomic risks negatively affect it. It was also revealed that, in the most developed areas, monotown enterprises are more likely to be rescued by acquisition after management failure than other firms; however, this is not always true for the entire federation and other regions. Based on the empirical evidence obtained from this study, we maintain that, in Russia, distressed acquisitions are ceasing to serve a complementary function to the legal system, mainly because of recent improvements in formal business regulation and practice, as well as the sharp increase of investment risks associated with the economic hardships over the past decade.

The remainder of the paper is organized as follows. The next section develops hypotheses to test in this paper. Section 3 describes the data and empirical methodology. Section 4 reports the results. Section 5 summarizes the major findings and concludes the paper.

2 Hypothesis Development

In this section, based on the historical developments and present-day situation in Russia, we present our hypotheses about the impact of the weakness of the legal system, socioeconomic investment risks, and the existence of so-called monotowns (one-company town) on the probability of the distressed acquisitions of Russian firms.

In Russia, economic and commercial disputes among business entities, including disputes between creditors and debtors in the event of corporate bankruptcies, are handled in commercial courts known as arbitration courts. Currently, the arbitration courts are structured in four levels: Trial courts are organized along the lines of the Russian federation (regions) as the courts of first instance. At the second and third levels, there are arbitration courts of appeal and courts of cassation appeal, respectively. Finally, the Supreme Court of the Russian Federation is the court of supervisory appeal (www.arbit.ru).

Noncommercial disputes such as criminal cases are handled by general courts, known as courts of general jurisdictions. Businesspeople have evaluated the effectiveness of arbitration courts more positively than that of the general courts (Frye, 2017; Titaev, 2012; Hendley et al., 2000). Arbitration courts are known to have relatively more financial and administrative independence than general courts (Bocharov and Titaev, 2018).

Nonetheless, the problems associated with Russia's weak legal/judicial system, such as the length of trial processes, high attorney fees, and the corruption of judges, also apply to the arbitration courts (Burger, 2004). Informal intervention by politicians exacerbates the situation, as commercial courts have been subject to political influence. (Gustafsson, 2013; Lambert-Mogiliansky et al., 2006). These problems have significantly increased the opportunity cost of using the arbitration court (Burger, 2004; Burger and Gitau, 2010). Despite major reform in 2014, the assessment of Russia's system of arbitration has not been favorable (Oda, 2019).

As mentioned in the Introduction, distressed acquisitions can be an effective means of avoiding dispute resolution in an arbitration court, or at least minimizing court or third-party interventions (Iwasaki et al., 2021). It has been shown that, in East Asia, stronger creditor rights and a better judicial system increase the likelihood of bankruptcy filings in resolving corporate distress in a country (Claessens et al., 2003), and that both strong creditor and shareholder rights increase the use of bankruptcy

relative to acquisition as a mechanism for resolving financial distress (Dahiya and Klapper, 2007).

Furthermore, it is costly not only to liquidate a company through bankruptcy procedure but also to establish a new company, which comes with both formal and informal institutional barriers in Russia (Aidis and Adachi, 2007; Iwasaki et al., 2016). While there has been improvement, as shown in the World Bank's Doing Business indicators, substantial requirements must still be satisfied to start a business in Russia, such as dealing with construction permits, registering property, and other regulations that can be cumbersome (World Bank, 2007, 2020). In addition, creating and maintaining necessary personal connections with local influential people are indispensable for doing business in Russia (Ledeneva, 2013; Yakovlev and Ivanov, 2021). This initial investment could prove large and costly.

Therefore, it could be conjectured that investors will opt for a distressed acquisition when the opportunity cost of liquidating a bankrupt company in accordance with the rules and practices under Russia's legal system exceeds that of a corporate acquisition. In other words, the weaker the functioning of the legal institutions, the costlier firm bankruptcy and the liquidation of assets would be, hence the stronger the incentive for favoring distressed acquisitions. Therefore, we anticipate the following.

Hypothesis H1: *Legal weakness is positively associated with the probability of distressed acquisitions.*

The acquisition of a bankrupt company is a pure investment activity. As long as this is the case, the likelihood of distressed acquisition, like any other investment activity, will be largely dependent on the predictability of future cost recovery. That is, the probability of a distressed acquisition can be greatly affected by the investment risks in an overall business environment.

In Russia, there are various socioeconomic risks that obscure the predictability of corporate investment. Risks associated with the country's economic, financial, political, and social conditions create uncertainties that can be as detrimental as the weak legal system in terms of their impact on the investment climate. To begin with, the intensity of economic fluctuations peculiar to emerging markets casts a shadow on the outlook for regional economic development. The underdevelopment of local financial institutions impairs the certainty of financing. Reliance on bank loans to finance investment needs by companies has been low, and the financial system has not

been a strong boost to economic growth (Sutela, 2009; Kirdina and Vernikov, 2013; Mirkin et al., 2013). Factors such as organized crime, political corruption, and the unreliability of administrative organizations undermine growth and enhance risks (Varese, 2001; Volkov, 2002; Holmes, 2008; Kosals and Maksimova, 2015); they also have a negative impact on investor sentiment (Ledeneva, 2006; Pomeranz and Rojansky, 2016). As an illustration, according to recent government surveys, around 80 percent of businesspeople regard doing business in Russia as a risky undertaking: They fear arbitrary criminal investigations and worry about the predatory nature of the state against private business, making them cautious about investing in business expansion (Dumes, 2019; Moscow Times, 2021; Alekhina, 2021; Kornia, 2020).

The higher the investment risks related to economics, finance, crime, politics, and administration, as described above, the less the future potential of a business plan to reconstruct bankrupt companies by daringly acquiring distressed firms. In such an environment, the liquidation of financially distressed firms would make more sense than the distressed acquisition of those firms. Therefore, contrary to the impact of the weakness of the legal/judicial system on the probability of distressed acquisition hypothesized above, these socioeconomic risks would induce investors-stakeholders to decide to liquidate rather than put up a company for distressed acquisitions. From the forgoing discussion, we present the following hypothesis.

Hypothesis H2: *Socioeconomic investment risks are negatively associated with the probability of distressed acquisitions.*

In order to fully grasp the Russian economy, one of the inevitable issues to consider is the monotowns located throughout the country. Monotowns are urban settlements established around a single industry or a core company. They emerged more intentionally, rather than spontaneously, as a result of the Soviet government's industrial allocation policy during the socialist era. The rationale was the policy of economic development of isolated but resource-rich locations and spatial division of labor, with strategic and political logic during the Soviet period (World Bank, 2010; Uskova, 2012). Following the fall of the Soviet Union, Russia's monotowns, which have their own difficulties, remain key to the Russian economy (Knox, 2016; Zubarevich, 2011; Commander, 2018). As will be described below, the Russian

Federation government issued an order in 2014 to designate more than 300 municipalities as monotowns.²

A typical Russian monotown is located in a remote area and has a single core company with high concentrations of employers that basically are responsible for the local services supporting the lives of workers and their families. A corporate bankruptcy in such a monotown can have a tremendous adverse effect on the lives of the citizens. Therefore, it has been pointed out that monotowns are more likely than other areas to receive political protection and policy support (World Bank, 2010; Crowley, 2016; Nesterov, 2019; TASS, 2016).

Given the possible social disruption and shocks that failure and closure of the business would cause, it could be conjectured that not only the bankruptcy of a company located in a monotown is less likely to occur, but even if it did, it is also likely that the company would be bailed out by acquisition in order to minimize the detrimental impact on the entire socioeconomic wellbeing of the monotown. Therefore, we make the following prediction.

Hypothesis H3: *The probability of distressed acquisitions of firms located in monotowns is higher than that in other places.*

Russia, the world's largest country, is composed of over 80 constituent subjects of the federation. There are regional differences in socioeconomic conditions; therefore, the investment climate, including the legal system, is quite diverse. In what follows, we will conduct statistical and quantitative analyses to empirically test our three hypotheses.

3 Data and Empirical Methodology

To empirically test the three hypotheses proposed in the previous section, we utilize a large dataset of Russian firms. The dataset contains firm-level variables extracted from the Orbis database of Bureau van Dijk (BvD)³ and region-level variables constructed that refer to information on regional investment conditions provided by the rating

² The government order in 2014 originally listed 313. After several amendments, the current 2020 version lists 334.

³ Orbis is one of the largest company databases, covering more than 300 million companies worldwide. For details of the database, see BvD's website: <https://webhelp.bvdep.com>.

agency Expert RA and a decree of the Federal Government concerning monotowns in Russia.

In the Orbis database, we identified a total of 93,260 Russian business firms that satisfy the next three conditions: (a) they were operating at the end of 2006, (b) their survival status is traceable until the end of 2019, and (c) their location is identifiable at the city/town level. In respect to survival status, we categorized each entry firm as either (A) a company that maintained operations through the observed period without financial distress (i.e., survivors), (B) a company that was “bankrupted,” “liquidated,” or “dissolved” without any subsequent legal status change before the end of the observed period, (C) a company that became “dormant” during the observed period, or (D) a company that became “dormant,” “bankrupt,” “liquidated,” or “dissolved” with a subsequent legal status change to “merged/taken over” within the observed period. We classified firms that fall into category D as distressed acquisitions.⁴

Concerning the location of the companies, the sample firms are registered in 882 cities/towns of 81 federal constituent entities (i.e., republics, territories, regions, autonomous areas, or federal cities). We confirmed that their distribution by location at the level of federal constituent entities is almost consistent with the official statistics of the numbers of firms and organizations at the end of 2006 (Rosstat, 2007), except for a somewhat higher percentage of firms in Moscow (35.1% in the sample as opposed to 23.1% in the official statistics).

Figure 2 shows the survival status of sample firms at the end of 2019. Of 93,230 firms, 50,743 or 54.4% failed during the 13 years starting in 2007. Additionally, 38,774, or 76.4% of distressed companies, disappeared following legal proceedings; and 1859, or 3.7% of failed firms, were found to be dormant. The remaining 10,110, or 19.9%, were rescued by acquisition. According to **Figure 3**, firm failure began to increase markedly in 2008, the year of the global financial crisis, and peaked in 2015, one year after Russia's annexation of Crimea in 2014. In the following two years, the number of failed firms remained high, finally settling below 3,000 in 2018–19. It is noteworthy that, during the observation period, the share of distressed acquisitions in failed firms showed a marked downward trend from 75.8% in 2007 to 6.7% in 2019.

⁴ Following the precedent of Iwasaki et al. (2021), firms whose status had changed to “merged/taken over” without any notification of management failure in the preceding period are not included in the dataset because these cases may contain peaceful or hostile takeovers of good performing firms that were not triggered by the financial distress of the acquired company.

In other words, distressed acquisitions have lost much of their role as a means of dealing with the management failure of Russian companies over the past decade.

Table 1 exhibits the survival status of 93,260 companies and share of distressed acquisitions in failed firms by sector and federal district.⁵ Among five industry sectors, the share of distressed acquisitions is highest in financial services (22.8%), followed by nonfinancial services (22.0%). The other three sectors show a ratio lower by about 5–6% than that of the former two industries. Of eight federal districts, the share of distressed acquisitions in the Central Federal District is the highest, at 22.3%, followed by 20.2% in the Volga Federal District and 19.9% in the Southern Federal District. The ratios in the other five districts range between 14.2% and 16.9%. At the same time, **Table 2** and **Figure 4** demonstrate that both the failure rate and share of distressed acquisitions greatly vary within each federal district, suggesting that the factors at the level of federal constituent entities may significantly influence the destiny of Russian companies, as we argued in the previous section.

As key variables for testing the hypotheses, we constructed eight region-level variables. The first six variables originated in the Expert rating of investment risks in Russian regions from the perspective of the legal system, economy, finance, crime, politics, and administration, in which federal constituent entities are ordered from 1 (best) to 83 (worst). The regional rating of the legal system is used to test Hypothesis H1, while the other five ratings examine Hypothesis H2. In order to estimate the overall effect of the socioeconomic risk on distressed acquisitions, we also employ the first principal component score of the five ratings from economy to administration as a comprehensive index of the socioeconomic risk in Russian regions.⁶

To test Hypothesis H3, we use a dummy variable for firms located in a monotown as the eighth region-level variable. *Monotowns* are defined as single-industry municipalities designated in the government decree of July 29, 2014, which lists a total of 334 cities/towns subject to the special attention of the federal government from the viewpoint of regional development policy. The variable gives a value of 1 to firms located in one of these 334 municipalities. We found that, of 93,260 sample firms, 5,383, or 5.8%, are registered in these monotowns.

⁵ **Appendix Table A1** shows the survival status and share of distressed acquisitions by federal constituent entity.

⁶ The estimation results of the principal component analysis of the five variables are reported in **Appendix Table A2**.

To estimate the eight region-level variables, we follow the empirical methodology adopted in Iwasaki et al. (2021). Specifically, we estimate a model that regards the decision to acquire a distressed firm to be the result of a dichotomous choice: to rescue a distressed firm by acquisition, or not to. The literature argues that this dichotomization may cause a heterogeneity bias problem. In addition, the decision to acquire a distressed firm gives rise to a self-selection problem (Van de Ven and Van Praag, 1981). Our model deals with these two econometric issues by employing the Heckman two-step procedure, which allows us to estimate equations of the selection model and the outcome model simultaneously. More concretely, we estimate the next set of equations:

$$\text{Distress model: } Pr(D_i = 1|Z_{ij}) = \mu + \alpha Z_{ij} + \varepsilon_i, \quad (1)$$

$$\text{Acquisition model: } Pr(A_i = 1|W_{ij}) = \eta + \beta W_{ij} + \lambda_i + \epsilon_i, \quad (2)$$

where, in Equation (1), D_i is the dichotomous variable that assigns a value of 1 to firms distressed during the observation period of 2007–2019, and Z_{ij} is a set of variables that affect the probability of financial distress of the i -th firm in the j -th region. Meanwhile, in Equation (2), A_i is the dichotomous variable, which equals 1 if a distressed firm is acquired and 0 otherwise, for each i -th distressed firm; W_{ij} is a set of variables that influence the decision to acquire the i -th firm; factor λ_i is obtained from the first-stage estimation and controls for sample selection bias; μ and η are constant terms; and ε_i and ϵ_i represent error terms that satisfy the following condition:

$$\begin{pmatrix} \varepsilon_i \\ \epsilon_i \end{pmatrix} \sim i. i. d. \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_\varepsilon^2 & \rho_{\varepsilon\epsilon} \\ \rho_{\varepsilon\epsilon} & \sigma_\epsilon^2 \end{pmatrix} \right). \quad (3)$$

In order to obtain unbiased estimates of the region-level variables, both Equations (1) and (2) include on the right-hand side a rich set of variables that capture firm-level characteristics and industry fixed effects. Firm-level control variables are selected in accordance with the estimation results in Iwasaki and Kim (2020) and Iwasaki et al. (2021). To be specific, both distress and acquisition models control for the legal form of incorporation, ownership structure, financial performance, listing on the stock market, fund-raising capacity, firm size/age, and business network/diversification. The distress model additionally controls for managerial discretion and the corporate governance system to take account of the capability of managers, board directors, and auditors to avoid financial distress of their company. Industry fixed effects are also controlled for at the NACE division level.

Consistent with Iwasaki and Kim (2020) and Iwasaki et al. (2021), all region-level variables and firm-level control variables take a value in 2006 to assess the predictive power of the initial conditions that is the empirical focus in this study. This approach enables us to avoid or significantly mitigate the issue of potential endogeneity. **Table 3** lists the name, definition, and descriptive statistics of the independent variables.⁷

As Equation (3) indicates, the Heckman two-step model assumes that the error terms of Equations (1) and (2) are normally distributed with zero mean and variance δ^2 and are correlated with each other. We test the null hypothesis that $\rho = 0$ by a likelihood-ratio test, which compares the log likelihood of the full model with the sum of the log likelihoods for the selection and outcome models. Rejection of the null hypothesis means that the estimators are not biased by a self-selection problem (Annunziata et al., 2019). In the estimation results, we report the Chi-squared statistic of the LR test of independence of equations in addition to the result of a Wald test of the null hypothesis that all coefficients are zero.

4 Results

Table 4 shows a univariate comparison between sample firms that fall into the category of bankruptcy/liquidation/dissolution and those in the category of distressed acquisition using the variables introduced in the estimation of the acquisition model. From this table, we confirm that there exists a statistically significant difference between the two categories of distressed companies in 21 of 23 variables. The test results of the variables from legal weakness to comprehensive socioeconomic risk are consistent with Hypotheses H1 and H2, while that of the variable of location in a monotown does not support Hypothesis H3.

Moreover, the test results of firm-level control variables suggest that, as compared with bankrupted, liquidated, or dissolved firms, companies bailed out by acquisition after financial distress tend to be less likely to adopt a joint-stock company but more frequently a limited-liability company as their legal form of incorporation. They are also more likely to include more large shareholders, foreign investors, and the state in their ownership; to have better records in firm performance and fund-raising capabilities; to have larger assets and be younger in the years of operation; and to be more diversified.

⁷ **Appendix Table A3** displays correlation matrix of the independent variables.

In this section, we examine whether the above results are replicable even when these 23 variables are estimated simultaneously in the multivariate regression setting described in the previous section.

4.1 Baseline estimation

The Heckman second-stage probit estimation results of the acquisition model using a total of 61,016 observations with all necessary independent variables are reported in **Table 5**. The first-stage estimation results of the distress model are shown in **Appendix Table A4**.⁸ As shown in the latter table, the distress model is estimated with the variable of location in a monotown in addition to a set of firm-level variables and industry fixed effects, taking into consideration the possibility that monotown enterprises may have a lower risk of financial distress than other firms due to subsidies and/or other protective measures of the government. In **Table 5**, the LR test of independence of equations rejects the null hypothesis that $\rho = 0$ at a 1% significance level in all seven models, thus, supporting the approach of employing the Heckman two-step procedure to estimate Equations (1) and (2).

In Model [1] of **Table 5**, the variable of legal weakness is estimated to be statistically significant and positive. This result implies that the weaker the legal system is in a region, the higher the probability of distressed acquisitions in line with Hypothesis H1 and the univariate test result in **Table 4**. Actually, the coefficient of legal weakness indicates that the likelihood that a distressed firm located in the region with the weakest legal system (ranked 83rd in the Expert rating) is bailed out by a merger with another company is 16.2% higher than in the region with the most reliable legal system (ranked 1st).

In contrast, the investment risk variables—except for the political one—show a significant and negative estimate in Models [2] to [6], suggesting that the probability a distressed firm will be rescued by acquisition is lower in regions with higher investment risks, which is consistent with Hypothesis H2 and the test results in **Table 4**. The impact of economic risk on distressed acquisitions is the largest, followed by that of criminal risk and financial risk. There is a notable gap in effect size between these three variables and the variable of administrative risk. The comprehensive

⁸ Dormant firms are totally excluded from the empirical analysis in this section because their final resolution outcome is not specified. For the sake of brevity, **Appendix Table A4** shows the first-stage estimation result of Model [1] of **Table 5** only. The same reporting policy applies to **Tables 6–8**.

socioeconomic risk in Model [7] also represents a significantly negative estimate, indicating that overall investment risk tends to strongly restrain the rescue of failed firms by acquisition.

It is noteworthy to point out, in this regard, that the statistical significance of legal weakness is much higher than that of the investment risk variable. In fact, the t -value of legal weakness is 8.37, while that of the risk variables ranges between -0.20 (political risk) and -6.99 (economic risk). This result suggests that, in Russia, the legal factor is extremely crucial for investors' decisions to acquire distressed firms or to abandon them.

In all seven models of **Table 5**, the variable of location in a monotown shows a positive estimate, which is in agreement with Hypothesis H3. Its statistical significance, however, does not reach even the 10% level. Accordingly, we judge that the hypothesis that companies located in monotowns are more likely to be acquired after failure as compared with firms in other places is not empirically supported. In addition, **Appendix Table A4** shows that the variable of location in a monotown in the distress model paired with Model [1] of **Table 5** is estimated with a negative coefficient as we expect, but, again, it is statistically insignificant. In other words, there is no difference in the frequency of firm failures and distressed acquisitions between single-industry municipalities and other places, if other conditions are held constant.

Estimates of the firm-level control variables provide additional insights into distressed acquisitions in Russia. More concretely, we found that a more open legal form of incorporation promotes the liquidation rather than the acquisition of distressed firms. In fact, according to Model [1] of **Table 5**, the probabilities of rescuing open joint-stock companies, closed joint-stock companies, and limited liability companies by acquisition after management failure are 24.7%, 16.5%, and 13.9% lower, respectively, than those of other more closed corporate forms (cooperatives, partnerships, etc.). As argued in Iwasaki and Kim (2020), this fact may be closely related to the differences in the transferability of ownership between different legal forms of incorporation.

Moreover, the estimation results in **Table 5** indicate that ownership by large shareholders, foreign investors, and regional governments is positively related to the probability of distressed acquisitions, while ownership by the federal government has no impact on it. The asymmetrical attitude between the central and local governments

toward failed companies is a fact worth emphasizing, as it is key to understanding the roles of each government in regional industrial policies.

Further, our baseline estimation also revealed that, in Russia, the better the financial performance of a company, the larger its size, the longer it has been in operation, and the more diversified its business, the higher its probability of being acquired after management failure. These findings suggest that potential firm value is quite an important element that determines whether a financially distressed company will continue to exist.⁹

4.2 Estimation by industry and region group

Next, we question whether the findings obtained from the baseline estimation are general across different industrial sectors and regional areas.

Table 6 represents the estimation results by industry. In this table, Models [3] to [8] show a statistically significant estimate of either the variable of legal weakness or comprehensive socioeconomic risk with a sign consistent with our predictions. Hence, it is proved that Hypotheses H1 and H2 well capture the reality of the mining, energy, and manufacturing; construction; and nonfinancial service industries in Russia. In contrast, these two variables are estimated to be insignificant in Models [1], [2], [9], and [10], suggesting that regional factors related to the legal system and other socioeconomic environments do not strongly affect the probability of acquisition of distressed firms in the primary and financial service industries. Further, the variable of location in a monotown is statistically insignificant in all models in **Table 6** and in the corresponding distress models in **Appendix Table A4** and, accordingly, does not support Hypothesis H3.

The estimation results by region group are reported in **Table 7**. Here, eight federal districts are classified into four groups, which take account of their similarity and heterogeneity of socioeconomic characteristics, as done in Iwasaki and Kumo (2020). From this table, we confirm that Hypotheses H1 and H2 well explain the likelihood of distressed acquisitions in three and two region groups, respectively. In other words, legal weakness is less likely to differentiate the probability to bail out failed firms by acquisition “within” the Volga and Ural Federal Districts. The same applies to the comprehensive socioeconomic risk in the case of the Southern and North Caucasus Federal Districts and the case of the Volga and Ural Federal Districts. Hypothesis H3

⁹ It is worth pointing out that the estimation results of the firm-level variables are mostly consistent with those for firms in European emerging markets (Iwasaki et al., 2021).

is supported with significant and positive estimates of the variable of location in a monotown in Models [1] and [2], which implies that, within the bounds of the Central and Northwestern Federal Districts, monotown companies are more likely to be rescued by acquisition after financial distress than their counterparts in other places. The paired distress model in **Appendix Table A4** shows that location in a monotown negatively affects the probability of failure of firms in the Central and Northwestern Federal Districts, which is in line with our expectation. These results indicate that monotown enterprises in the most-developed areas enjoy more favorable conditions—including state support—than those in the other areas to keep their existence.

Tables 6 and **7** also demonstrate that the firm-level characteristics that strongly affect the likelihood of distressed acquisitions greatly vary across industries and region groups. We found that large shareholding, financial performance, fund-raising capability, and firm size/age exert a significantly consistent impact in most industries and region groups, while the impacts of legal form of incorporation, state ownership, listing on the stock market, and business network/diversification are limited in specific sectors and region groups. The same observations apply to the estimation results of distress models in **Appendix Table A4**. In addition to the estimates of region-level variables, these results also provide insights for understanding the sectoral and regional heterogeneity of the Russian economy.

4.3 Estimation with focus on firms in monotowns

Finally, we reexamine our prediction regarding firms in monotowns using a series of extended models. As reported in the previous subsections, the variable of location in a monotown is estimated to be insignificant in every model except for those limited to firms in the Central and Northwestern Federal Districts. We argue that this is presumably due to the heterogeneity among monotown enterprises from the viewpoint of firm size and ownership structure, assuming that, in monotowns, companies with large assets or large numbers of employees or that are owned by the state are less likely to fail and more likely to be bailed out by acquisition—even after failure—as compared with small private firms.

To test the above assumption, we extend both the distress and acquisition models either (a) by adding an interacted variable between location in a monotown and asset size (i.e., the variable of firm size), (b) by replacing the variable of location in a monotown with a set of dummy variables that classify monotown companies into five categories in terms of total number of employees, or (c) by adding interacted variables

of location in a monotown with federal state ownership and regional state ownership and estimating these newly introduced variables in the right-hand side of regression equations using all available observations.

The results are shown in **Table 8** and the three columns farthest right in **Appendix Table A4**. Despite analytical considerations of firm size and ownership, we did not find evidence to support our prediction. In fact, neither the interacted variable of location in a monotown with asset size nor that with state ownership nor the five pairs of dummy variables for firms with different employment scales show a significant estimate in the extended models. Judging from these supplemental estimation results as well as the findings reported in the previous subsections, we conjecture that, in general, the government both in central and regional levels does not provide any effective policy treatments specific to single-industry municipalities for keeping their companies alive.

5 Conclusions

In this paper, using a dataset of 93,260 firms, we traced the survival status of Russian business companies in the period of 2007–2019 and empirically examined the determinants of distressed acquisitions. We found that, of 93,260 firms, 50,743, or 54.4%, were financially distressed, and 10,110, or 19.9%, of failed firms were rescued by acquisition during the observation period. The empirical results reported in the previous section indicate that, in Russian regions, the weakness of the legal system is positively associated with the probability of distressed acquisitions, while the socioeconomic risks are negatively related to it. These tendencies are common in most industries and regions. It is also revealed that, in the Central and Northwestern Federal Districts, monotown enterprises are more likely to be bailed out by acquisition after management failure than are other firms within the area. However, it is not always true for the whole federation and other regions.

There is a belief that Russian investors and companies intensively acquire distressed firms in the background of an ineffective legal system for bankruptcy and the liquidation of company assets. However, our data exposed that the frequency of distressed acquisitions was remarkably lower during the observation period, indicating that bailout by acquisition is not a popular means of rescuing failed firms in Russia today. The empirical evidence obtained from this study infers that the improvement

of the regional arbitrary courts or worsening socioeconomic risks have created the situation observed in the data.

In this regard, we cannot exclude the possibility that the above contradictory developments have proceeded in parallel in recent years. Actually, according to the World Bank's assessment of regulatory practices, Russia's ranking has leaped from 106th among 178 countries in 2007 to 28th among 190 countries in 2019 (World Bank, 2007, 2020). As pointed out in Iwasaki (2018), this indicates that the formal business regulation and practice have progressed significantly in this country. At the same time, the retreat of democracy under the Putin authoritarian regime, the economic stagnation against the backdrop of the global financial crisis, the sanctions imposed by the Western countries, and the slump in world oil prices as well as the spread of organized crime and corruption are also obvious facts that have greatly increased the investment risks in Russia, resulting in a sharp increase of firm exits and a slump of firm entries in recent years, as shown in **Figure 1**. It is likely that such developments significantly impact investors' decision making regarding the treatment of firms after failure.

Furthermore, contrary to the long academic debates and firm faith among a group of experts about the political and economic importance of monotown enterprises, our empirical evidence intimates the policy neutrality of the Russian government toward single-industry municipalities. In other words, from 2007 to 2019, companies in monotowns—regardless of their size and ownership structure—did not enjoy a higher chance of survival and rescue by acquisition as compared with their counterparts located in other cities and towns, *ceteris paribus*. This result implies that, thanks to progress in the economic transition and the accompanying major transformation of the industrial structure, Russia might have overcome the negative legacy of socialism to some extent. Perhaps it is time to reconsider the established conviction about monotowns in the country.

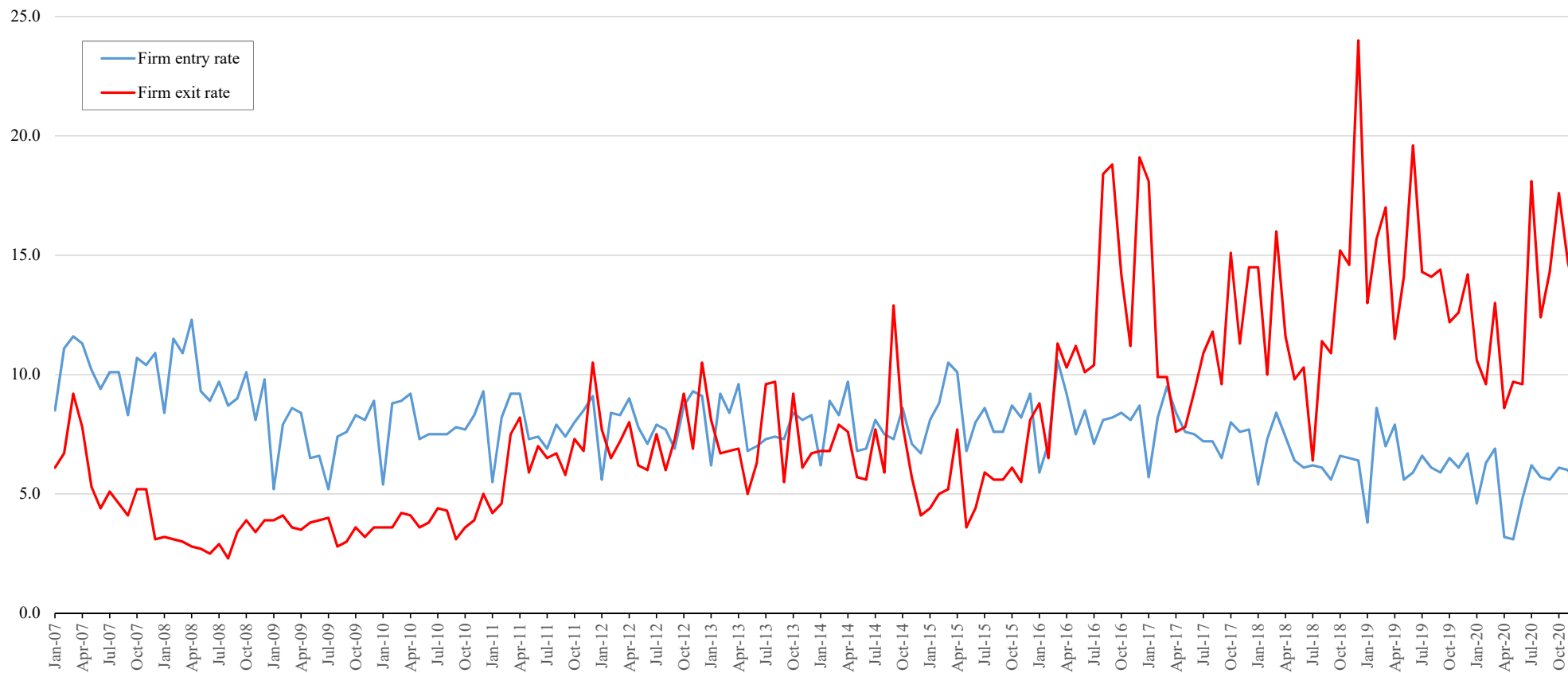
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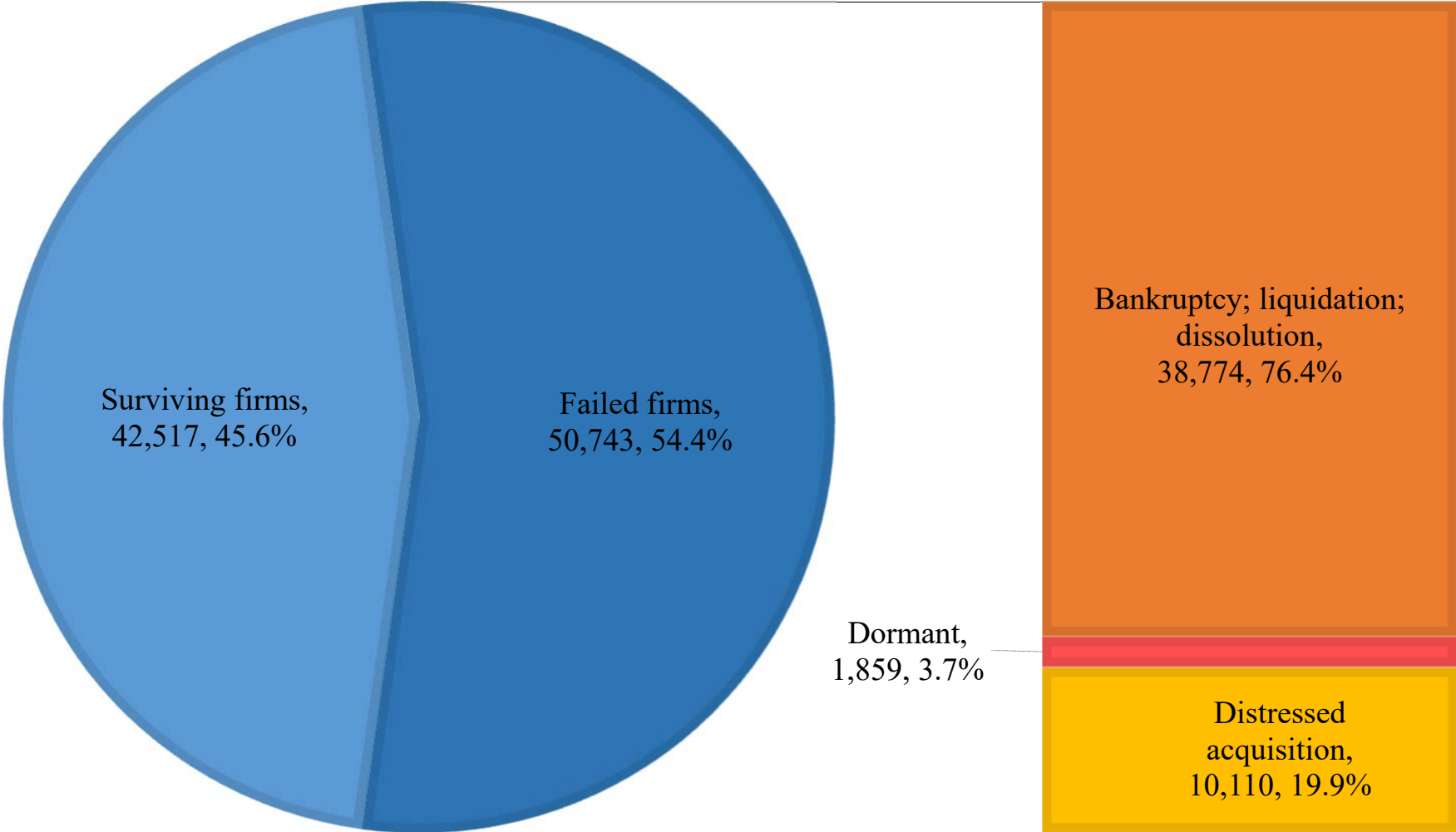
Figure 1. Dynamics of firm entry and exit in Russia: 2007–2020



Note: Firm entry and exit rates denote the numbers of newly established and liquidated firms per 1,000 organizations, respectively.

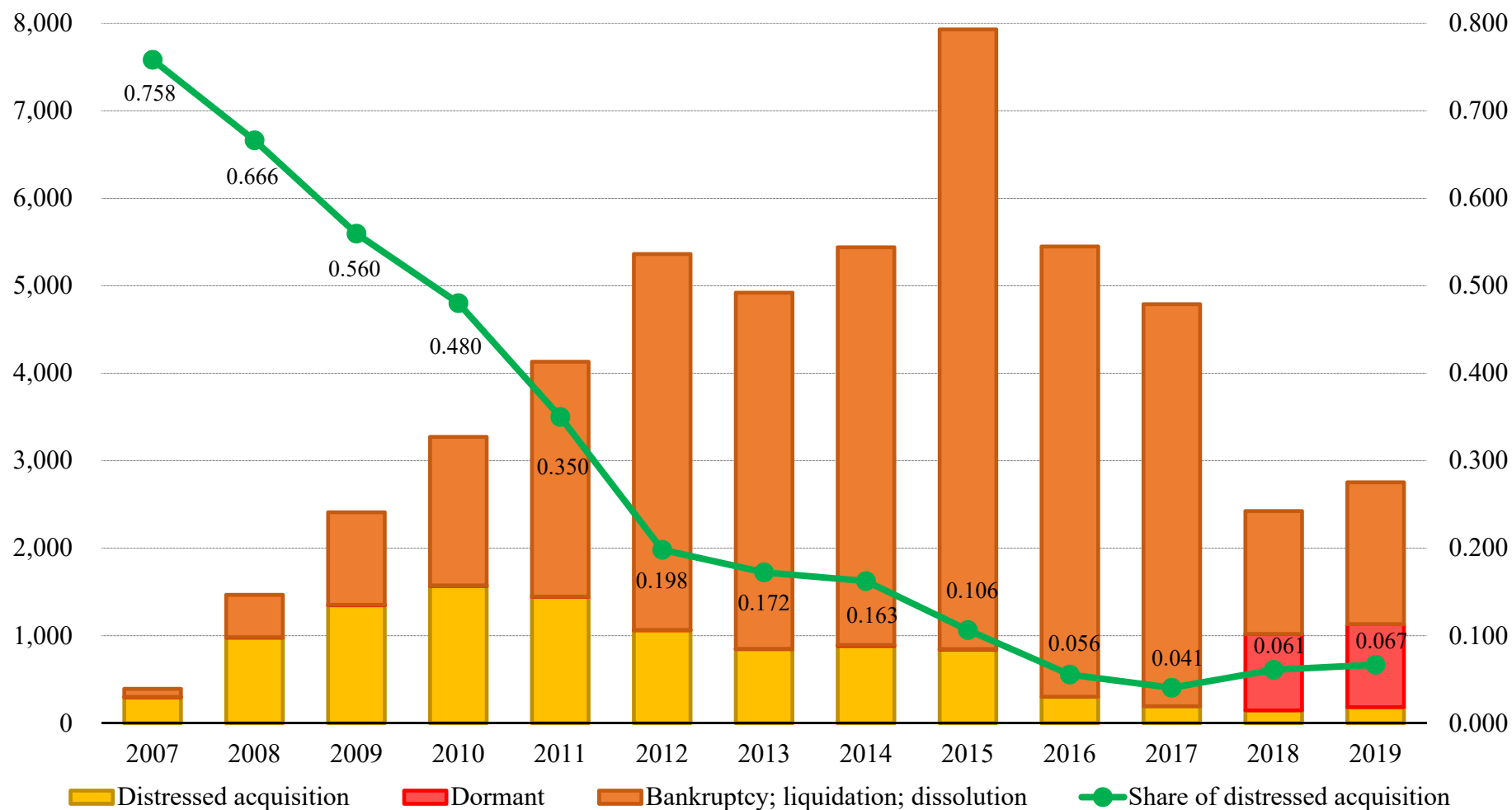
Source: Russian Federal State Statistics Service (<http://www.gks.ru/>)

Figure 2. Survival status of 93,260 Russian firms at the end of 2019



Source : Bureau van Dijk (BvD) Orbis database (<https://webhelp.bvdep.com>)

Figure 3. Dynamics of firm failure and distressed acquisitions in Russia during the period from 2007 to 2019



Note : The left axis is the number of failed firms, while the right axis is the share of distressed acquisitions in failed firms.

Table 1. Survival status of 93,260 firms and share of distressed acquisitions in failed firms in Russia by sector and federal district, 2007–2019

	Number of firms operating at the end of 2006 (N)	Number of surviving firms (survivors) by the end of 2019 (A)	Number of failed firms by the end of 2019				Failure rate (F/N)	Share of distressed acquisitions in failed firms (D/F)
			Total failed firms (F=B+C+D)	Bankruptcy, liquidation, dissolution (B)	Dormant (C)	Distressed acquisition (D)		
All firms	93,260	42,517	50,743	38,774	1,859	10,110	0.544	0.199
Breakdown by sector (NACE Rev. 2 section)								
Agriculture, forestry, and fishing (Section A)	6,114	3,414	2,700	2,192	48	460	0.442	0.170
Mining, energy, and manufacturing (Sections B–E)	23,176	12,626	10,550	8,397	308	1,845	0.455	0.175
Construction (Section F)	13,144	5,054	8,090	6,445	297	1,348	0.615	0.167
Nonfinancial services (Sections G–J, L–S)	50,451	21,280	29,171	21,568	1,199	6,404	0.578	0.220
Financial services (Section K)	375	143	232	172	7	53	0.619	0.228
Breakdown by federal district								
Central Federal District	46,485	20,670	25,815	18,968	1,082	5,765	0.555	0.223
Northwestern Federal District	9,493	4,603	4,890	4,048	149	693	0.515	0.142
Southern Federal District	5,614	2,764	2,850	2,168	114	568	0.508	0.199
North Caucasus Federal District	1,303	716	587	486	15	86	0.450	0.147
Volga Federal District	12,678	5,892	6,786	5,224	188	1,374	0.535	0.202
Ural Federal District	6,394	2,948	3,446	2,768	97	581	0.539	0.169
Siberian Federal District	8,035	3,272	4,763	3,832	145	786	0.593	0.165
Far East Federal District	3,258	1,652	1,606	1,280	69	257	0.493	0.160

Source : Bureau van Dijk (BvD) Orbis database (<https://webhelp.bvdep.com>)

Table 2. Failure rate and share of distressed acquisitions in failed firms in Russia by federal district, 2007–2019

	Number of regions	Failure rate						Share of distressed acquisitions in failed firms					
		Mean	S.D.	Median ^a (Region)	Max. ^b (Region)	Min. ^b (Region)	Coefficient of variation	Mean	S.D.	Median ^a (Region)	Max. ^b (Region)	Min. ^b (Region)	Coefficient of variation
All regions	81	0.514	0.072	0.512 (Khabarovsk Territory, Republic of Karelia)	0.803 (Republic of Altai)	0.341 (Republic of Daghestan)	0.141	0.163	0.062	0.161 (Republic of Mari El)	0.333 (Nenets Autonomous Area)	0.000 (Chukotka Autonomous Area, Jewish Autonomous Region, Republic of Tuva)	0.379
Central Federal District	18	0.505	0.054	0.490 (Lipetsk Region, Smolensk Region)	0.601 (Tambov Region)	0.412 (Kaluga Region)	0.107	0.166	0.040	0.160 (Ryazan Region, Vladimir Region)	0.243 (Bryansk Region)	0.112 (Tambov Region)	0.241
Northwestern Federal District	11	0.483	0.048	0.462 (Arkhangelsk Region)	0.543 (Vologda Region)	0.409 (Novgorod Region)	0.100	0.179	0.058	0.167 (Arkhangelsk Region, Novgorod Region)	0.333 (Nenets Autonomous Area)	0.118 (St. Petersburg Federal City)	0.326
Southern Federal District	6	0.543	0.096	0.533 (Rostov Region)	0.676 (Republic of Kalmykia)	0.432 (Republic of Adygeya)	0.177	0.192	0.072	0.198 (Krasnodar Territory, Rostov Region)	0.304 (Republic of Kalmykia)	0.094 (Republic of Adygeya)	0.378
North Caucasus Federal District	5	0.446	0.066	0.459 (Stavropol Territory)	0.517 (Kabardino–Balkarian Republic)	0.341 (Republic of Daghestan)	0.149	0.143	0.033	0.149 (Stavropol Territory)	0.174 (Kabardino–Balkarian Republic)	0.098 (Karachayevo– Circassian Republic)	0.233
Volga Federal District	14	0.532	0.053	0.525 (Penza Region, Republic of Mordovia)	0.615 (Republic of Udmurtia)	0.401 (Chuvash Republic)	0.100	0.189	0.058	0.164 (Chuvash Republic, Perm Territory)	0.281 (Ulyanovsk Region)	0.118 (Republic of Udmurtia)	0.307
Ural Federal District	6	0.531	0.042	0.537 (Chelyabinsk Region, Yamal–Nenets Autonomous Area)	0.569 (Tyumen Region)	0.452 (Khanty–Mansi Autonomous Area– Yugra)	0.080	0.158	0.032	0.158 (Tyumen Region, Yamal–Nenets Autonomous Area)	0.196 (Sverdlovsk Region)	0.113 (Kurgan Region)	0.203
Siberian Federal District	10	0.590	0.092	0.579 (Altai Territory, Irkutsk Region)	0.803 (Republic of Altai)	0.478 (Republic of Tuva)	0.156	0.148	0.072	0.143 (Novosibirsk Region, Tomsk Region)	0.254 (Republic of Altai)	0.000 (Republic of Tuva)	0.485
Far East Federal District	11	0.474	0.063	0.494 (Primorsky Territory)	0.567 (Kamchatka Territory)	0.346 (Jewish Autonomous Region)	0.133	0.116	0.083	0.097 (Zabaikalsk Territory)	0.254 (Sakhalin Region)	0.000 (Chukotka Autonomous Area, Jewish Autonomous Region)	0.720

Notes: Data is not available for the Republic of Ingushetia and the Chechen Republic due to the lack of firm-level observations.

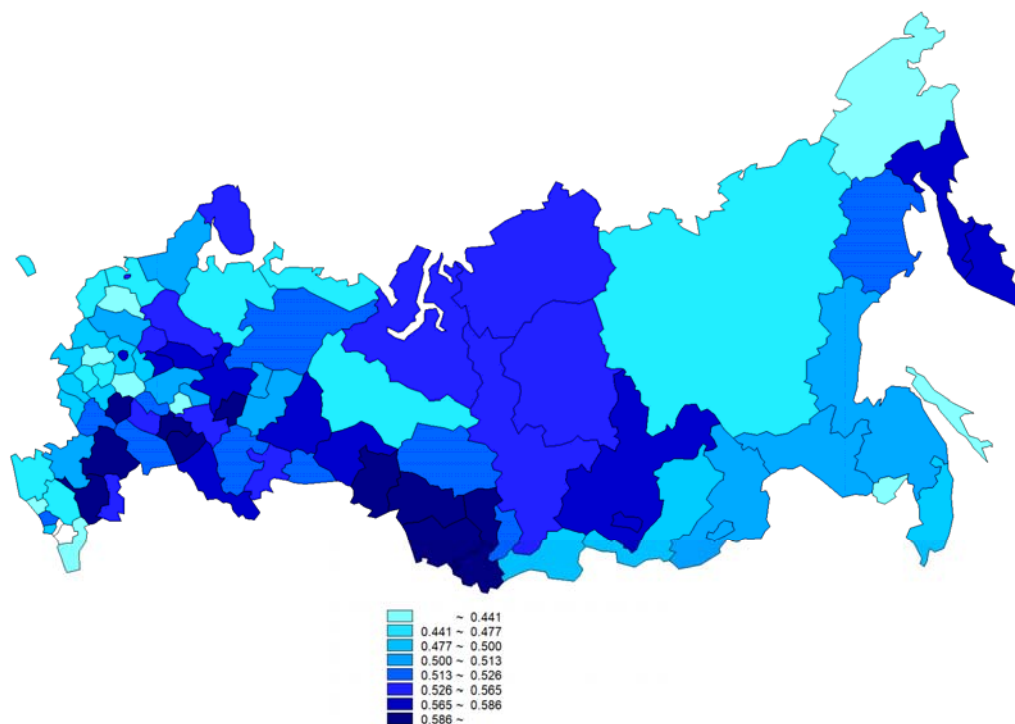
^a If two regions are mentioned in parentheses, it denotes that these regions share a median value or the median value is computed using their rates.

^b If two or more regions are mentioned in parentheses, it denotes that these regions share the same rate.

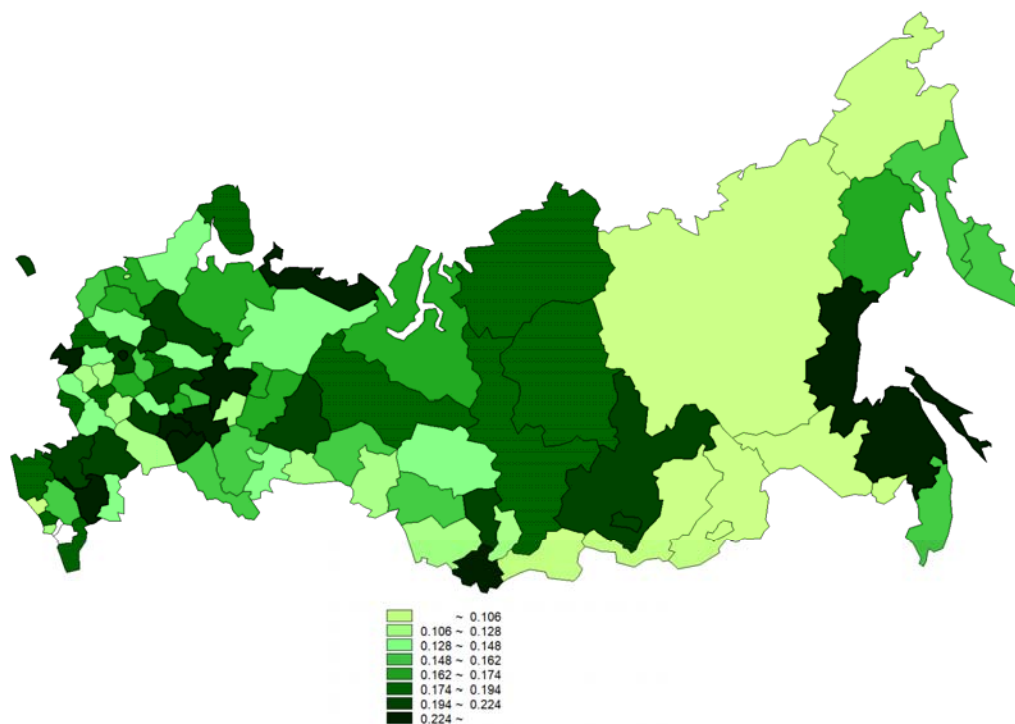
Source: Authors' computations based on Appendix Table A1

Figure 4. Regional distribution of failure rate and share of distressed acquisitions in failed firms during the period of 2007–2019

(a) Failure rate^a



(b) Share of distressed acquisitions in failed firms^b



Source : Authors' illustrations based on Appendix Table A1

Table 3. Definitions and descriptive statistics of independent variables used in the empirical analysis

Variable name	Definition	Descriptive statistics ^a		
		Mean	S.D.	Median
Region-level variables				
Legal weakness	Expert region rating of investment risk in the legal system	52.476	28.347	58
Economic risk	Expert region rating of investment risk in the economy	22.140	23.467	14
Financial risk	Expert region rating of investment risk in finance	19.556	22.284	7
Criminal risk	Expert region rating of investment risk in crime	35.313	22.833	32
Political risk	Expert region rating of investment risk in politics	48.608	19.343	58
Administrative risk	Expert region rating of investment risk in administration	26.363	22.157	17
Comprehensive socioeconomic risk	First principal component score of the variables from economic risk to administrative risk ^b	0.004	1.553	-0.295
Location in a monotown	Dummy for firms located in a monotown	0.058	0.233	0
Firm-level control variables				
Open joint-stock company	Dummy variable for open (public) joint-stock companies (OAO)	0.104	0.306	0
Closed joint-stock company	Dummy variable for closed (private) joint-stock companies (ZAO)	0.142	0.350	0
Limited liability company	Dummy variable for limited liability companies (OOO)	0.678	0.467	1
Large shareholding	Dummy for firms with a dominant and/or block shareholder(s)	0.905	0.293	1
Foreign ownership	Dummy for ultimate ownership of foreign investors	0.009	0.095	0
Federal state ownership	Dummy for ultimate ownership of the Russian federal government	0.019	0.137	0
Regional state ownership	Dummy for ultimate ownership of Russian regional governments	0.032	0.175	0
Managerial discretion	BvD independent indicator (0: D; 1: C; 2: C+; 3: B-; 4: B; 5: B+; 6: A-; 7: A; 8: A+) ^c	3.440	3.646	0
Board size	Number of recorded members of the board of directors	1.491	1.856	1
International audit firm	Dummy for firms that employ an international audit firm as an external auditor	0.001	0.026	0
Large Russian audit firm	Dummy for firms that employ a large Russian audit firm as an external auditor	0.001	0.032	0
Local Russian audit firm	Dummy for firms that employ a local Russian audit firm/auditor as an external auditor	0.007	0.082	0
ROA	Return on total assets (%) ^d	10.475	20.250	5.960
Gross margin	Gross margin (%) ^e	13.465	18.617	9.740
Listing on the stock market	Dummy variable for listed companies	0.007	0.081	0
Gearing	Gearing (%) ^f	74.962	163.246	2.000
Firm size	Natural logarithm of total assets	10.070	1.681	10.028
Firm age	Natural logarithm of years in operation	1.873	0.783	1.946
Business network	Number of subsidiaries	0.661	3.172	0
Business diversification	Number of operating industries according to the NACE Rev 2 secondary codes	6.804	3.763	7

Notes: The independent variables capture the region-wide and firm-level initial conditions in 2006 for firm failures and distressed acquisitions observed during the period of 2007–2019. The correlation matrix of the variables is reported in Appendix Table A3.

^a Computed using firm-level data

^b Appendix Table A2 reports the estimation results of the principal component analysis.

^c Class A: Definition—Attached to any company with known recorded shareholders, none of which have more than 25% of direct or total ownership [A+: Companies with 6 or more identified shareholders (of any type) whose ownership percentage is known; A: Same as above, but includes companies with 4 or 5 identified shareholders; A-: Same as above, but includes companies with 1 to 3 identified shareholders]. Class B: Definition—Attached to any company with a known recorded shareholder, none of which has an ownership percentage (direct, total, or calculated total) over 50%, but which has one or more shareholders with an ownership percentage above 25%. The further qualifications of B+, B, and B- are assigned according to the same criteria relating to the number of recorded shareholders as for indicator A. Class C: Definition—Attached to any company with a recorded shareholder with total or a calculated total ownership over 50%. The qualification C+ is attributed to C companies in which the summation of the direct ownership percentage (all categories of shareholders included) is 50.01% or higher. Indeed, this means that the company surely does not qualify under Independent Indicator D (since it cannot have an unknown direct shareholder with 50.01% or higher). Class D: Definition—This is allocated to any company with a recorded shareholder with direct ownership of over 50% (quotation from the BvD Orbis database website manual).

^d Computed using the following formula: (profit before tax/total assets) × 100

^e Computed using the following formula: (gross profit/operating revenue) × 100

^f Computed using the following formula: ((non-current liabilities + loans) / shareholders' funds) × 100

Source: Authors' compilation and estimation. Region-level data—from legal weakness to administrative risk—was obtained from the website of the rating agency Expert RA (<http://www.raexpert.ru/ratings/regions/2006>). Firms located in company towns are specified by the authors in reference to Government Decree No. 1398-г of July 29, 2014 "On the list of single-industry municipalities of the Russian Federation (monotowns)" (Распоряжение от 29 июля 2014 года И 1398-р «О перечне монопрофильных муниципальных образований Российской Федерации (моногородов)»). Firm-level raw data was extracted from the Bureau van Dijk (BvD) Orbis database. For details of the database and data, see the BvD website: <https://webhelp.bvdep.com>.

Table 4. Univariate comparison of distressed companies with different survival statuses

Variable name	Survival status at the end of 2019				Univariate comparison between bankruptcy/liquidation/dissolution and distressed acquisition	
	Bankruptcy, liquidation, dissolution		Distressed acquisition		Test for equality of means (<i>t</i>) or test for equality of proportions (<i>z</i>)	Wilcoxon rank-sum test (<i>z</i>)
	Mean	Median	Mean	Median		
Region-level variables						
Legal weakness	52.588	58	57.848	70	-16.666 ***	-17.703 ***
Economic risk	22.171	13	18.653	6	13.466 ***	16.278 ***
Financial risk	19.746	7	16.847	4	11.700 ***	15.681 ***
Criminal risk	35.666	33	32.458	17	12.524 ***	14.534 ***
Political risk	48.964	58	49.602	58	-3.021 ***	-3.790 ***
Administrative risk	26.881	17	24.786	17	8.476 ***	5.117 ***
Comprehensive socioeconomic risk	0.028	-0.295	-0.229	-1.022	14.677 ***	16.833 ***
Location in a monotown	0.060	0	0.048	0	4.446 ***	4.446 ***
Firm-level control variables						
Open joint-stock company	0.083	0	0.047	0	12.365 ***	12.365 ***
Closed joint-stock company	0.125	0	0.115	0	2.597 ***	2.597 ***
Limited liability company	0.736	1	0.769	1	-6.870 ***	-6.870 ***
Large shareholding	0.797	1	0.964	1	-39.891 ***	-39.891 ***
Foreign ownership	0.005	0	0.014	0	-9.858 ***	-9.858 ***
Federal state ownership	0.011	0	0.020	0	-6.991 ***	-6.991 ***
Regional state ownership	0.019	0	0.041	0	-12.908 ***	-12.908 ***
ROA	7.150	4	9.250	5	-9.378 ***	-11.063 ***
Gross margin	10.997	7.160	13.187	8.210	-10.304 ***	-9.737 ***
Listing on the stock market	0.003	0.000	0.002	0.000	1.171	1.171
Gearing	90.004	1.120	71.035	0.040	8.211 ***	10.742 ***
Firm size	9.897	9.905	10.051	9.999	-8.154 ***	-6.428 ***
Firm age	1.696	2	1.577	2	13.533 ***	13.715 ***
Business network	0.372	0	0.341	0	1.201	-0.313
Business diversification	6.800	7	7.155	8	-8.569 ***	-8.960 ***

Notes: *** and * denote statistical significance at the 1% and 10% levels, respectively. Table 3 provides definitions and descriptive statistics of variables.

Table 5. Determinants of distressed acquisition: Baseline estimation

Model	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Region-level variables							
Legal weakness	0.00198 *** (0.0002)						
Economic risk		-0.00171 *** (0.0002)					
Financial risk			-0.00115 *** (0.0002)				
Criminal risk				-0.00145 *** (0.0002)			
Political risk					-0.00005 (0.0003)		
Administrative risk						-0.00096 *** (0.0002)	
Comprehensive socioeconomic risk							-0.02514 *** (0.0036)
Location in a monotown	0.01829 (0.0274)	0.03243 (0.0271)	0.02917 (0.0271)	0.02555 (0.0273)	0.01278 (0.0271)	0.01606 (0.0269)	0.03385 (0.0270)
Firm-level control variables							
Open joint-stock company	-0.24660 *** (0.0424)	-0.23553 *** (0.0408)	-0.23324 *** (0.0407)	-0.24092 *** (0.0416)	-0.24159 *** (0.0415)	-0.23686 *** (0.0410)	-0.23109 *** (0.0405)
Closed joint-stock company	-0.16513 *** (0.0372)	-0.16556 *** (0.0364)	-0.16420 *** (0.0363)	-0.16245 *** (0.0367)	-0.16382 *** (0.0366)	-0.16516 *** (0.0363)	-0.16453 *** (0.0362)
Limited liability company	-0.13906 *** (0.0344)	-0.14255 *** (0.0337)	-0.14178 *** (0.0336)	-0.14048 *** (0.0341)	-0.14450 *** (0.0339)	-0.14475 *** (0.0337)	-0.14109 *** (0.0336)
Large shareholding	1.91185 *** (0.0703)	1.91723 *** (0.0685)	1.92048 *** (0.0684)	1.91587 *** (0.0694)	1.92310 *** (0.0689)	1.92302 *** (0.0685)	1.91852 *** (0.0683)
Foreign ownership	0.25009 *** (0.0654)	0.24011 *** (0.0641)	0.23990 *** (0.0640)	0.24344 *** (0.0647)	0.24294 *** (0.0644)	0.24092 *** (0.0641)	0.23867 *** (0.0639)
Federal state ownership	0.00924 (0.0492)	-0.00312 (0.0476)	-0.00918 (0.0473)	-0.00511 (0.0482)	-0.01269 (0.0477)	-0.01351 (0.0474)	-0.00674 (0.0473)
Regional state ownership	0.17223 *** (0.0469)	0.16011 *** (0.0448)	0.15293 *** (0.0445)	0.15949 *** (0.0456)	0.15280 *** (0.0452)	0.15137 *** (0.0447)	0.15514 *** (0.0444)
ROA	0.00571 *** (0.0004)	0.00577 *** (0.0004)	0.00573 *** (0.0004)	0.00573 *** (0.0004)	0.00570 *** (0.0004)	0.00572 *** (0.0004)	0.00577 *** (0.0004)
Gross margin	0.00280 *** (0.0004)	0.00284 *** (0.0004)	0.00283 *** (0.0004)	0.00286 *** (0.0004)	0.00283 *** (0.0004)	0.00285 *** (0.0004)	0.00285 *** (0.0004)
Listing on the stock market	-0.14726 (0.1013)	-0.15046 (0.0982)	-0.15374 (0.0979)	-0.15843 (0.0999)	-0.15228 (0.0988)	-0.15458 (0.0981)	-0.15575 (0.0978)
Gearing	-0.00037 *** (0.00004)	-0.00037 *** (0.00004)	-0.00037 *** (0.00004)	-0.00037 *** (0.00004)	-0.00038 *** (0.00004)	-0.00037 *** (0.00004)	-0.00036 *** (0.00004)
Firm size	0.09235 *** (0.0049)	0.09125 *** (0.0048)	0.09063 *** (0.0048)	0.09208 *** (0.0048)	0.09125 *** (0.0048)	0.09099 *** (0.0048)	0.09094 *** (0.0048)
Firm age	0.20327 *** (0.0180)	0.21038 *** (0.0163)	0.20995 *** (0.0163)	0.20474 *** (0.0173)	0.20562 *** (0.0171)	0.20791 *** (0.0167)	0.21128 *** (0.0161)
Business network	-0.00164 (0.0044)	-0.00065 (0.0042)	-0.00006 (0.0042)	-0.00099 (0.0043)	-0.00073 (0.0042)	-0.00025 (0.0042)	-0.00004 (0.0041)
Business diversification	0.00269 (0.0018)	0.00408 ** (0.0017)	0.00445 ** (0.0018)	0.00434 ** (0.0018)	0.00558 *** (0.0018)	0.00487 *** (0.0018)	0.00363 ** (0.0017)
NACE division-level fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	61016	61016	61016	61016	61016	61016	61016
Censored observations	27033	27033	27033	27033	27033	27033	27033
Uncensored observations	33983	33983	33983	33983	33983	33983	33983
Log likelihood	-51590.930	-51618.700	-51637.340	-51627.970	-51649.790	-51640.540	-51619.930
Wald test (χ^2)	3195.210 ***	3228.010 ***	3149.830 ***	3103.990 ***	3036.350 ***	3120.450 ***	3246.330 ***
ρ	-0.921	-0.934	-0.935	-0.927	-0.931	-0.934	-0.936
LR test (χ^2)	29.54 ***	36.98 ***	37.04 ***	32.90 ***	34.95 ***	35.57 ***	37.07 ***

Notes: This table contains estimation results of a Heckman probit model with a sample selection of the determinants of distressed acquisition. The coefficient of the constant term is omitted from the table. The estimation results of the first stage are reported in Appendix Table A4. Table 3 provides detailed definitions and descriptive statistics of the independent variables used in the estimation. Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all coefficients are zero. The LR test of independence of equations examines the null hypothesis that $\rho = 0$. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Determinants of distressed acquisition: Estimation by industry

Target industry	Agriculture, forestry, and fishing (Section A)		Mining, energy, and manufacturing (Sections B–E)		Construction (Section F)		Nonfinancial services (Sections G–J, L–S)		Financial services (Section K)	
Model	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Region-level variables										
Legal weakness	0.00057 (0.0017)		0.00098 ** (0.0005)		0.00222 *** (0.0005)		0.00206 *** (0.0002)		0.00101 (0.0058)	
Comprehensive socioeconomic risk		-0.04486 (0.0361)		-0.01540 * (0.0090)		-0.01849 ** (0.0085)		-0.02803 *** (0.0040)		-0.01159 (0.0443)
Location in a monotown	0.07126 (0.2437)	0.16234 (0.2661)	0.01037 (0.0534)	0.02231 (0.0535)	0.04159 (0.0707)	0.04295 (0.0696)	0.00892 (0.0361)	0.02695 (0.0359)	-0.44675 (0.6380)	-0.10826 (0.2525)
Firm-level control variables										
Open joint-stock company	0.09041 (0.1490)	0.10148 (0.1554)	-0.08047 (0.1005)	-0.07320 (0.0987)	-0.25968 ** (0.1236)	-0.23454 * (0.1202)	-0.37066 *** (0.0619)	-0.36128 *** (0.0608)	-0.19764 (0.9742)	0.01341 (0.3456)
Closed joint-stock company	0.18554 (0.2106)	0.21321 (0.2208)	0.00699 (0.0960)	0.00864 (0.0951)	-0.18165 (0.1232)	-0.16929 (0.1199)	-0.34792 *** (0.0540)	-0.35270 *** (0.0534)	0.45080 (0.3661)	0.18510 (0.1703)
Limited liability company	0.23238 (0.1943)	0.26142 (0.2032)	0.08625 (0.0793)	0.08599 (0.0787)	-0.12659 (0.1167)	-0.11991 (0.1140)	-0.35110 *** (0.0504)	-0.35600 *** (0.0499)		
Large shareholding	2.17445 *** (0.3794)	2.13389 *** (0.4174)	1.80512 *** (0.1583)	1.80382 *** (0.1561)	1.73764 *** (0.1692)	1.75044 *** (0.1669)	1.94858 *** (0.1012)	1.94549 *** (0.1007)	-0.29545 *** (0.4769)	-0.22029 (0.3806)
Foreign ownership	0.28323 (0.3726)	0.30785 (0.3830)	0.27130 ** (0.1171)	0.26736 ** (0.1160)	0.38907 (0.3175)	0.35767 (0.3141)	0.19187 ** (0.0852)	0.18662 ** (0.0847)	0.44530 (0.6905)	0.22420 (0.3234)
Federal state ownership	0.04102 (0.3029)	0.09134 (0.3223)	0.02433 (0.0970)	0.02033 (0.0957)	0.23960 * (0.1455)	0.22198 (0.1418)	-0.03079 (0.0710)	-0.04003 (0.0703)	-0.14695 (0.5199)	-0.18319 (0.5248)
Regional state ownership	-0.16468 (0.1889)	-0.12323 (0.2018)	0.18636 ** (0.0825)	0.17994 ** (0.0815)	0.27579 ** (0.1254)	0.27211 ** (0.1218)	0.06372 (0.0620)	0.05797 (0.0609)		
ROA	0.00615 * (0.0032)	0.00591 * (0.0034)	0.00524 *** (0.0010)	0.00526 *** (0.0010)	0.00448 *** (0.0009)	0.00450 *** (0.0009)	0.00634 *** (0.0004)	0.00637 *** (0.0004)	-0.00018 (0.0127)	-0.00018 (0.0051)
Gross margin	0.00795 *** (0.0027)	0.00797 *** (0.0028)	0.00491 *** (0.0010)	0.00487 *** (0.0010)	0.00400 *** (0.0011)	0.00420 *** (0.0011)	0.00093 * (0.0005)	0.00098 ** (0.0005)	-0.01752 * (0.0096)	-0.00752 * (0.0045)
Listing on the stock market	-0.42780 (0.3207)	-0.45297 (0.6698)	-0.02189 (0.1384)	-0.02478 (0.1371)	-0.26178 (0.7570)	-0.24347 (0.6087)	0.64547 ** (0.3069)	0.60023 ** (0.3008)	-0.79932 (1.7000)	0.15346 (0.8918)
Gearing	-0.00058 ** (0.0003)	-0.00056 * (0.0003)	-0.00065 *** (0.0001)	-0.00065 *** (0.0001)	-0.00033 *** (0.0001)	-0.00033 *** (0.0001)	-0.00029 *** (0.0000)	-0.00028 *** (0.0000)	0.00024 (0.0006)	0.00003 (0.0003)
Firm size	0.13214 *** (0.0321)	0.12727 *** (0.0347)	0.12394 *** (0.0146)	0.12310 *** (0.0145)	0.04421 *** (0.0116)	0.04430 *** (0.0113)	0.09226 *** (0.0059)	0.09122 *** (0.0058)	0.04283 (0.1103)	0.01490 (0.0450)
Firm age	0.12192 (0.0860)	0.10869 (0.0932)	0.11172 * (0.0576)	0.11344 ** (0.0567)	0.15537 *** (0.0382)	0.16570 *** (0.0360)	0.27317 *** (0.0144)	0.27576 *** (0.0138)	0.29052 (0.2734)	0.13277 (0.1084)
Business network	-0.06252 * (0.0377)	-0.06444 * (0.0385)	-0.01579 (0.0105)	-0.01502 (0.0103)	0.01686 (0.0116)	0.01824 (0.0111)	0.00544 (0.0055)	0.00627 (0.0054)	-0.04798 (0.0587)	-0.01875 (0.0230)
Business diversification	0.00319 (0.0078)	0.00279 (0.0081)	-0.00088 (0.0044)	-0.00080 (0.0043)	0.00295 (0.0049)	0.00418 (0.0048)	0.00330 (0.0022)	0.00479 ** (0.0022)	0.02511 (0.0491)	0.00916 (0.0181)
NACE division-level fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4047	4047	15825	15825	8616	8616	32375	32375	153	153
Censored observations	1277	1277	5417	5417	4636	4636	15633	15633	70	70
Uncensored observations	2770	2770	10408	10408	3980	3980	16742	16742	83	83
Log likelihood	-2812.211	-2811.224	-11974.980	-11975.770	-7746.378	-7756.246	-28643.650	-28663.380	-118.088	-89.640
Wald test (χ^2)	156.64 ***	147.33 ***	694.08 ***	704.22 ***	313.07 ***	293.35 ***	2204.72 ***	2180.83 ***	8.76	8.46
ρ	-0.773	-0.734	-0.871	-0.878	-0.927	-0.943	-0.961	-0.967	-0.955	-0.970
LR test (χ^2)	1.55	1.28	8.65 ***	9.14 ***	18.81 ***	20.68 ***	62.10 ***	69.86 ***	4.39 **	4.42 **

Notes: This table contains estimation results of a Heckman probit model with a sample selection of the determinants of distressed acquisition. The coefficient of the constant term is omitted from the table. The estimation results of the first stage are reported in Appendix Table A4. Table 3 provides detailed definitions and descriptive statistics of the independent variables used in the estimation. Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all coefficients are zero. The LR test of the independence of equations examines the null hypothesis that $\rho = 0$. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Determinants of distressed acquisition: Estimation by region group

Target region group	Central and Northwestern Federal Districts		Southern and North Caucasus Federal Districts		Volga and Ural Federal Districts		Siberian and Far East Federal Districts	
Model	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Region-level variables								
Legal weakness	0.00241 *** (0.0003)		0.00353 * (0.0021)		0.00019 (0.0004)		0.00338 *** (0.0013)	
Comprehensive socioeconomic risk		-0.03479 *** (0.0064)		-0.01881 (0.0233)		-0.01585 (0.0105)		-0.15466 *** (0.0352)
Location in a monotown	0.09197 * (0.0541)	0.12106 * (0.0654)	-0.40989 (0.3182)	-0.40245 (0.2997)	0.02994 (0.0355)	0.03029 (0.0358)	0.12031 (0.0866)	-0.13442 (0.1204)
Firm-level control variables								
Open joint-stock company	-0.24749 *** (0.0494)	-0.23734 *** (0.0481)	-1.13077 *** (0.3568)	-1.12023 *** (0.3136)	-0.08641 (0.0834)	-0.09131 (0.0846)	-0.67844 *** (0.1832)	-0.74650 *** (0.1833)
Closed joint-stock company	-0.09443 ** (0.0434)	-0.10435 ** (0.0425)	-1.01924 *** (0.3545)	-0.99474 *** (0.3070)	-0.20702 ** (0.0877)	-0.21653 ** (0.0895)	-0.44811 ** (0.1879)	-0.53084 *** (0.1918)
Limited liability company	-0.11997 *** (0.0414)	-0.12739 *** (0.0404)	-0.83141 *** (0.2961)	-0.82627 *** (0.2688)	-0.12081 (0.0806)	-0.12863 (0.0818)	-0.24691 (0.1613)	-0.32083 * (0.1666)
Large shareholding	1.84585 *** (0.0891)	1.84820 *** (0.0875)	1.44292 * (0.8738)	1.38246 ** (0.6423)	2.05614 *** (0.1402)	2.04829 *** (0.1409)	0.95244 *** (0.3185)	1.00766 *** (0.3365)
Foreign ownership	0.26887 *** (0.0759)	0.25952 *** (0.0747)	1.66055 (1.0272)	1.59247 (1.0342)	0.17893 (0.1555)	0.18398 (0.1569)	0.28883 (0.3271)	0.27633 (0.3358)
Federal state ownership	-0.03872 (0.0643)	-0.05903 (0.0624)	0.49735 ** (0.2539)	0.47384 * (0.2456)	-0.01340 (0.0951)	-0.00683 (0.0961)	0.30621 * (0.1766)	0.35967 ** (0.1804)
Regional state ownership	0.10589 * (0.0612)	0.08962 (0.0590)	0.20284 (0.2222)	0.17856 (0.2133)	0.12586 (0.0789)	0.13266 * (0.0797)	0.50721 ** (0.2087)	0.52725 *** (0.2031)
ROA	0.00572 *** (0.0005)	0.00574 *** (0.0005)	0.00040 (0.0039)	0.00021 (0.0030)	0.00607 *** (0.0008)	0.00603 *** (0.0008)	-0.00135 (0.0025)	-0.00103 (0.0025)
Gross margin	0.00316 *** (0.0005)	0.00321 *** (0.0005)	0.00333 (0.0034)	0.00307 (0.0029)	0.00290 *** (0.0009)	0.00290 *** (0.0009)	0.00208 (0.0016)	0.00204 (0.0017)
Listing on the stock market	-0.33462 ** (0.1502)	-0.32074 ** (0.1445)			-0.16589 (0.1616)	-0.16201 (0.1640)	-0.60122 (1.7422)	-0.61448 (1.8329)
Gearing	-0.00039 *** (0.0000)	-0.00038 *** (0.0000)	-0.00017 (0.0003)	-0.00016 (0.0002)	-0.00034 *** (0.0001)	-0.00034 *** (0.0001)	-0.00009 (0.0002)	-0.00010 (0.0002)
Firm size	0.08948 *** (0.0059)	0.08796 *** (0.0058)	0.06941 (0.0604)	0.06673 (0.0454)	0.08980 *** (0.0103)	0.09029 *** (0.0104)	0.08250 ** (0.0332)	0.09228 *** (0.0330)
Firm age	0.22283 *** (0.0195)	0.22842 *** (0.0182)	-0.21479 (0.1546)	-0.22505 ** (0.1023)	0.21457 *** (0.0250)	0.20957 *** (0.0261)	-0.29239 *** (0.0648)	-0.28548 *** (0.0706)
Business network	0.00299 (0.0052)	0.00409 (0.0050)	-0.06983 * (0.0392)	-0.06757 * (0.0383)	-0.00481 (0.0077)	-0.00579 (0.0078)	-0.04232 * (0.0220)	-0.04107 * (0.0227)
Business diversification	0.00202 (0.0023)	0.00382 * (0.0023)	-0.00034 (0.0095)	0.00030 (0.0093)	0.01035 *** (0.0035)	0.00985 *** (0.0036)	-0.00311 (0.0070)	0.00168 (0.0071)
NACE division-level fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	36,784	36784	4,687	4687	12608	12608	6937	6937
Censored observations	16,667	16667	1,846	1846	5434	5434	3086	3086
Uncensored observations	20,117	20117	2,841	2841	7174	7174	3851	3851
Log likelihood	-31182.860	-31218.810	-3732.617	-3734.357	-10525.980	-10524.890	-5750.198	-5739.482
Wald test (χ^2)	2080.62 ***	2021.01 ***	269.81 ***	266.55 ***	883.45 ***	870.90 ***	210.84 ***	222.98 ***
ρ	-0.927	-0.938	0.488	0.554	-0.983	-0.978	0.571	0.486
LR test (χ^2)	23.40 ***	27.61 ***	0.25	0.32	21.59 ***	20.78 ***	1.00	0.81

Notes : This table contains estimation results of a Heckman probit model with a sample selection of the determinants of distressed acquisition. The coefficient of the constant term is omitted from the table. The estimation results of the first stage are reported in Appendix Table A4. Table 3 provides detailed definitions and descriptive statistics of the independent variables used in the estimation. Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all coefficients are zero. The LR test of the independence of equations examines the null hypothesis that $\rho = 0$. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Determinants of distressed acquisition: Estimation with focus on firms in monotowns

Model	[1]	[2]	[3]	[4]	[5]	[6]
Region-level variables						
Legal weakness	0.00198 *** (0.0002)		0.00199 *** (0.0002)		0.00198 *** (0.0002)	
Comprehensive socioeconomic risk		-0.02518 *** (0.0036)		-0.02526 *** (0.0036)		-0.02516 *** (0.0036)
Location in a monotown	-0.03708 (0.1759)	-0.01515 (0.1723)			0.02237 (0.0289)	0.03888 (0.0284)
Location in a monotown × Firm size	0.00563 (0.0175)	0.00499 (0.0172)				
Firms with less than 500 employees in monotowns			0.01870 (0.0280)	0.03436 (0.0275)		
Firms with 500–999 employees in monotowns			0.02823 (0.1789)	0.04887 (0.1745)		
Firms with 1000–4999 employees in monotowns			-0.11115 (0.2916)	-0.09418 (0.2835)		
Firms with 5000–9999 employees in monotowns			-0.02575 (0.5278)	-0.02251 (0.5131)		
Firms with 10000 or more employees in monotowns			0.32429 (0.5963)	0.30971 (0.5952)		
Location in a monotown × Federal state ownership					-0.11880 (0.1844)	-0.11663 (0.1810)
Location in a monotown × Regional state ownership					-0.01972 (0.1022)	-0.03184 (0.1004)
Firm-level control variables						
Open joint-stock company	-0.24721 *** (0.0425)	-0.23167 *** (0.0405)	-0.24916 *** (0.0428)	-0.23328 *** (0.0408)	-0.24695 *** (0.0425)	-0.23136 *** (0.0406)
Closed joint-stock company	-0.16531 *** (0.0372)	-0.16471 *** (0.0362)	-0.16579 *** (0.0373)	-0.16515 *** (0.0363)	-0.16528 *** (0.0372)	-0.16465 *** (0.0362)
Limited liability company	-0.13909 *** (0.0344)	-0.14114 *** (0.0336)	-0.13926 *** (0.0345)	-0.14132 *** (0.0337)	-0.13902 *** (0.0344)	-0.14107 *** (0.0336)
Large shareholding	1.91161 *** (0.0703)	1.91832 *** (0.0683)	1.90964 *** (0.0707)	1.91681 *** (0.0686)	1.91156 *** (0.0704)	1.91841 *** (0.0683)
Foreign ownership	0.25036 *** (0.0654)	0.23896 *** (0.0639)	0.24940 *** (0.0656)	0.23815 *** (0.0641)	0.25030 *** (0.0654)	0.23881 *** (0.0639)
Federal state ownership	0.00933 (0.0493)	-0.00667 (0.0473)	0.01089 (0.0495)	-0.00536 (0.0475)	0.01583 (0.0502)	-0.00041 (0.0483)
Regional state ownership	0.17275 *** (0.0470)	0.15560 *** (0.0444)	0.17487 *** (0.0473)	0.15733 *** (0.0447)	0.17440 *** (0.0480)	0.15856 *** (0.0456)
ROA	0.00570 *** (0.0004)	0.00577 *** (0.0004)	0.00569 *** (0.0004)	0.00576 *** (0.0004)	0.00570 *** (0.0004)	0.00576 *** (0.0004)
Gross margin	0.00280 *** (0.0004)	0.00285 *** (0.0004)	0.00280 *** (0.0004)	0.00285 *** (0.0004)	0.00280 *** (0.0004)	0.00285 *** (0.0004)
Listing on the stock market	-0.14666 (0.1014)	-0.15520 (0.0979)	-0.14426 (0.1024)	-0.15272 (0.0988)	-0.14691 (0.1014)	-0.15539 (0.0979)
Gearing	-0.00037 *** (0.00004)	-0.00036 *** (0.00004)	-0.00037 *** (0.00004)	-0.00036 *** (0.00004)	-0.00037 *** (0.00004)	-0.00036 *** (0.00004)
Firm size	0.09209 *** (0.0050)	0.09071 *** (0.0048)	0.09250 *** (0.0049)	0.09108 *** (0.0048)	0.09236 *** (0.0049)	0.09094 *** (0.0048)
Firm age	0.20309 *** (0.0181)	0.21112 *** (0.0161)	0.20190 *** (0.0184)	0.21015 *** (0.0164)	0.20302 *** (0.0181)	0.21111 *** (0.0161)
Business network	-0.00165 (0.0044)	-0.00005 (0.0041)	-0.00181 (0.0044)	-0.00017 (0.0042)	-0.00168 (0.0044)	-0.00007 (0.0041)
Business diversification	0.00267 (0.0018)	0.00362 ** (0.0017)	0.00272 (0.0018)	0.00367 ** (0.0017)	0.00270 (0.0018)	0.00364 ** (0.0017)
NACE division-level fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	61016	61016	61016	61016	61016	61016
Censored observations	27033	27033	27033	27033	27033	27033
Uncensored observations	33983	33983	33983	33983	33983	33983
Log likelihood	-51590.750	-51619.760	-51589.610	-51618.680	-51590.120	-51619.180
Wald test (χ^2)	3191.770 ***	3243.350 ***	3166.700 ***	3220.530 ***	3190.320 ***	3242.640 ***
ρ	-0.921	-0.936	-0.919	-0.934	-0.921	-0.936
LR test (χ^2)	29.63 ***	37.15 ***	28.59 ***	35.97 ***	29.07 ***	36.57 ***

Notes: This table contains estimation results of a Heckman probit model with a sample selection of the determinants of distressed acquisition. The coefficient of the constant term is omitted from the table. The estimation results of the first stage are reported in Appendix Table A4. Table 3 provides detailed definitions and descriptive statistics of the independent variables used in the estimation. Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all coefficients are zero. The LR test of independence of equations examines the null hypothesis that $\rho = 0$. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix Table A1. Survival status and share of distressed acquisitions in failed firms in Russia, federal districts, and regions, 2007–2019

	Number of firms operating at the end of 2006 (N)	Number of surviving firms (survivors) by the end of 2019 (A)	Number of failed firms by the end of 2019				Failure rate (F/N)	Share of distressed acquisitions in failed firms (D/F)
			Total failed firms (F=B+C+D)	Bankruptcy, liquidation, dissolution (B)	Dormant (C)	Distressed acquisition (D)		
Russian Federation	93,260	42,517	50,743	38,774	1,859	10,110	0.544	0.199
Central Federal District	46,485	20,670	25,815	18,968	1,082	5,765	0.555	0.223
Belgorod Region	796	412	384	297	15	72	0.482	0.188
Bryansk Region	568	292	276	199	10	67	0.486	0.243
Vladimir Region	694	363	331	274	8	49	0.477	0.148
Voronezh Region	1,181	563	618	504	23	91	0.523	0.147
Ivanovo Region	539	224	315	246	10	59	0.584	0.187
Kaluga Region	544	320	224	179	13	32	0.412	0.143
Kostroma Region	285	120	165	131	11	23	0.579	0.139
Kursk Region	455	230	225	187	9	29	0.495	0.129
Lipetsk Region	349	178	171	139	2	30	0.490	0.175
Moscow Region	4,483	2,342	2,141	1,608	109	424	0.478	0.198
Orel Region	347	188	159	129	10	20	0.458	0.126
Ryazan Region	477	272	205	164	6	35	0.430	0.171
Smolensk Region	529	270	259	207	7	45	0.490	0.174
Tambov Region	238	95	143	126	1	16	0.601	0.112
Tver Region	608	302	306	262	4	40	0.503	0.131
Tula Region	725	380	345	283	21	41	0.476	0.119
Yaroslavl Region	911	411	500	362	31	107	0.549	0.214
Moscow Federal City	32,756	13,708	19,048	13,671	792	4,585	0.582	0.241
Northwestern Federal District	9,493	4,603	4,890	4,048	149	693	0.515	0.142
Republic of Karelia	451	220	231	195	3	33	0.512	0.143
Republic of Komi	407	196	211	177	7	27	0.518	0.128
Arkhangelsk Region	481	259	222	180	5	37	0.462	0.167
Nenets Autonomous Area	27	15	12	8	0	4	0.444	0.333
Vologda Region	703	321	382	293	7	82	0.543	0.215
Kaliningrad Region	463	252	211	164	6	41	0.456	0.194
Leningrad Region	640	356	284	226	10	48	0.444	0.169
Murmansk Region	493	227	266	215	3	48	0.540	0.180
Novgorod Region	323	191	132	102	8	22	0.409	0.167
Pskov Region	311	174	137	112	4	21	0.441	0.153
St. Petersburg Federal City	5,194	2,392	2,802	2,376	96	330	0.539	0.118
Southern Federal District	5,614	2,764	2,850	2,168	114	568	0.508	0.199
Republic of Adygeya	74	42	32	28	1	3	0.432	0.094
Republic of Kalmykia	34	11	23	15	1	7	0.676	0.304
Krasnodar Territory	2,159	1,171	988	765	46	177	0.458	0.179
Astrakhan Region	266	116	150	128	1	21	0.564	0.140
Volgograd Region	922	347	575	429	21	125	0.624	0.217
Rostov Region	2,159	1,077	1,082	803	44	235	0.501	0.217
North Caucasus Federal District	1,303	716	587	486	15	86	0.450	0.147
Republic of Dagestan	135	89	46	37	1	8	0.341	0.174
Republic of Ingushetia	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Kabardino-Balkarian Republic	89	43	46	36	2	8	0.517	0.174
Karachayevsko-Circassian Republic	95	54	41	36	1	4	0.432	0.098
Republic of North Ossetia-Alania	121	63	58	49	2	7	0.479	0.121
Chechen Republic	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stavropol Territory	863	467	396	328	9	59	0.459	0.149
Volga Federal District	12,678	5,892	6,786	5,224	188	1,374	0.535	0.202
Republic of Bashkortostan	1,116	544	572	469	17	86	0.513	0.150
Republic of Mari El	310	155	155	123	7	25	0.500	0.161
Republic of Mordovia	298	142	156	124	10	22	0.523	0.141
Republic of Tatarstan	1,327	628	699	520	8	171	0.527	0.245
Republic of Udmurtia	774	298	476	408	12	56	0.615	0.118
Chuvash Republic	524	314	210	166	10	34	0.401	0.162
Perm Territory	1,249	617	632	500	28	104	0.506	0.165
Kirov Region	703	305	398	282	10	106	0.566	0.266
Nizhny Novgorod Region	1,882	924	958	745	27	186	0.509	0.194
Orenburg Region	341	146	195	160	6	29	0.572	0.149
Penza Region	589	279	310	232	11	67	0.526	0.216
Samara Region	1,991	825	1,166	816	24	326	0.586	0.280
Saratov Region	966	470	496	427	9	60	0.513	0.121
Ulyanovsk Region	608	245	363	252	9	102	0.597	0.281
Ural Federal District	6,394	2,948	3,446	2,768	97	581	0.539	0.169
Kurgan Region	254	121	133	114	4	15	0.524	0.113
Sverdlovsk Region	2,409	1,048	1,361	1,069	25	267	0.565	0.196
Tyumen Region	832	359	473	375	25	73	0.569	0.154
Khanty-Mansi Autonomous Area-Yugra	926	507	419	328	11	80	0.452	0.191
Yamal-Nenets Autonomous Area	242	112	130	109	0	21	0.537	0.162
Chelyabinsk Region	1,731	801	930	773	32	125	0.537	0.134
Siberian Federal District	8,035	3,272	4,763	3,832	145	786	0.593	0.165
Republic of Altai	147	29	118	82	6	30	0.803	0.254
Republic of Tuva	23	12	11	11	0	0	0.478	0.000
Republic of Khakasia	155	74	81	70	2	9	0.523	0.111
Altai Territory	949	392	557	465	25	67	0.587	0.120
Krasnoyarsk Territory	1,152	546	606	474	21	111	0.526	0.183
Irkutsk Region	1,102	473	629	494	12	123	0.571	0.196
Kemerovo Region	1,220	437	783	593	16	174	0.642	0.222
Novosibirsk Region	1,843	693	1,150	943	33	174	0.624	0.151
Omsk Region	762	289	473	409	14	50	0.621	0.106
Tomsk Region	682	327	355	291	16	48	0.521	0.135
Far East Federal District	3,258	1,652	1,606	1,280	69	257	0.493	0.160
Republic of Buryatia	175	89	86	75	4	7	0.491	0.081
Republic of Sakha (Yakutia)	322	177	145	129	6	10	0.450	0.069
Zabaikalsk Territory	143	71	72	64	1	7	0.503	0.097
Kamchatka Territory	210	91	119	99	2	18	0.567	0.151
Primorsky Territory	980	496	484	382	25	77	0.494	0.159
Khabarovsk Territory	765	373	392	283	21	88	0.512	0.224
Amur Region	202	100	102	91	4	7	0.505	0.069
Magadan Region	137	66	71	57	2	12	0.518	0.169
Sakhalin Region	288	166	122	87	4	31	0.424	0.254
Jewish Autonomous Region	26	17	9	9	0	0	0.346	0.000
Chukotka Autonomous Area	10	6	4	4	0	0	0.400	0.000

Appendix Table A2. Estimation results of the principal component analysis of region-level risk variables

Eigenvalue of the correlation matrix				Eigenvectors of the first component	
Component no.	Eigenvalue	Difference	Cumulative percentage of total variance	Variables	Eigenvector
1	2.4125	1.204	0.483	Economic risk	0.5214
2	1.2081	0.607	0.242	Financial risk	0.5426
3	0.6009	0.149	0.120	Criminal risk	0.4476
4	0.4521	0.126	0.090	Political risk	0.0063
5	0.3264	-	0.065	Administrative risk	0.4830

Note : For sources, definitions, and descriptive statistics of the variables, see Table 3.

Appendix Table A3. Correlation matrix of variables used in empirical analysis

Variable No.	Variable name	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
[1]	Legal weakness	1.000													
[2]	Economic risk	-0.483	1.000												
[3]	Financial risk	-0.380	0.593	1.000											
[4]	Criminal risk	-0.450	0.491	0.389	1.000										
[5]	Political risk	0.236	-0.127	0.019	-0.139	1.000									
[6]	Administrative risk	-0.232	0.404	0.585	0.341	0.267	1.000								
[7]	Comprehensive socioeconomic risk	-0.496	0.810	0.843	0.695	0.011	0.750	1.000							
[8]	Location in a monotown	-0.035	0.123	0.172	0.116	-0.068	0.039	0.146	1.000						
[9]	Open joint-stock company	-0.028	0.042	0.055	0.009	-0.017	0.035	0.047	0.027	1.000					
[10]	Closed joint-stock company	0.017	-0.046	-0.052	-0.020	0.015	-0.038	-0.051	-0.012	-0.139	1.000				
[11]	Limited liability company	-0.035	0.021	0.021	0.049	-0.020	0.011	0.032	-0.019	-0.495	-0.592	1.000			
[12]	Large shareholding	0.013	-0.039	-0.053	-0.036	0.015	-0.039	-0.054	-0.038	-0.032	0.015	0.034	1.000		
[13]	Foreign ownership	0.002	-0.007	-0.013	-0.007	0.004	-0.006	-0.011	0.002	0.010	0.015	-0.006	0.031	1.000	
[14]	Federal state ownership	-0.005	0.020	0.017	0.008	-0.007	0.012	0.019	-0.005	0.177	-0.020	-0.147	0.045	-0.013	1.000
[15]	Regional state ownership	-0.032	0.053	0.043	0.024	-0.038	0.017	0.045	0.041	0.131	-0.063	-0.247	0.059	-0.017	-0.025
[16]	Managerial discretion	-0.013	-0.002	0.006	0.014	-0.003	-0.021	-0.001	-0.006	-0.003	0.132	-0.083	-0.007	-0.076	-0.108
[17]	Number of board directors	-0.040	0.044	0.061	0.022	-0.021	0.042	0.055	0.025	0.710	-0.086	-0.363	0.056	0.017	0.157
[18]	International audit firm	0.001	-0.003	0.001	0.003	0.002	0.001	0.000	0.006	0.047	-0.002	-0.037	0.001	0.068	0.027
[19]	Large Russian audit firm	-0.017	0.008	0.016	0.009	-0.004	0.012	0.014	0.001	0.079	-0.009	-0.044	0.010	0.011	0.137
[20]	Local Russian audit firm	-0.021	0.019	0.029	0.014	-0.008	0.015	0.025	0.012	0.196	-0.010	-0.116	0.012	0.026	0.043
[21]	ROA	-0.041	0.021	-0.001	0.023	-0.024	-0.012	0.010	0.008	-0.076	0.003	0.099	0.144	0.005	-0.010
[22]	Gross margin	0.005	-0.007	-0.021	0.006	-0.001	-0.009	-0.011	-0.023	-0.013	0.043	0.012	0.089	0.038	0.006
[23]	Listing on the stock market	-0.018	0.018	0.019	0.010	-0.012	0.007	0.017	0.008	0.216	-0.033	-0.118	0.025	0.028	0.112
[24]	Gearing	-0.024	0.035	0.053	0.029	-0.010	0.040	0.051	0.002	-0.004	0.003	0.047	-0.072	0.011	-0.040
[25]	Firm size	0.033	-0.022	-0.028	-0.012	-0.015	-0.021	-0.027	-0.004	0.249	0.122	-0.296	-0.076	0.089	0.124
[26]	Firm age	-0.044	0.050	0.040	0.015	-0.038	0.008	0.037	0.023	0.310	0.156	-0.433	0.034	0.008	0.098
[27]	Business network	0.003	-0.006	-0.001	-0.003	-0.001	-0.002	-0.004	0.000	0.166	0.046	-0.163	0.050	0.021	0.074
[28]	Business diversification	0.191	-0.134	-0.151	-0.143	0.037	-0.108	-0.172	-0.052	-0.033	0.030	0.024	0.012	-0.010	-0.010

Variable No.	Variable name	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
[15]	Regional state ownership	1.000													
[16]	Managerial discretion	-0.153	1.000												
[17]	Number of board directors	0.086	-0.001	1.000											
[18]	International audit firm	-0.005	-0.014	0.041	1.000										
[19]	Large Russian audit firm	-0.004	-0.014	0.118	-0.001	1.000									
[20]	Local Russian audit firm	-0.007	-0.016	0.237	-0.002	-0.003	1.000								
[21]	ROA	-0.044	0.027	-0.030	0.009	0.000	-0.011	1.000							
[22]	Gross margin	-0.041	0.004	0.012	0.033	0.007	0.015	0.338	1.000						
[23]	Listing on the stock market	-0.003	-0.020	0.295	0.157	0.194	0.288	0.003	0.032	1.000					
[24]	Gearing	-0.056	-0.021	-0.003	-0.004	0.001	0.006	-0.176	-0.032	-0.005	1.000				
[25]	Firm size	0.056	-0.072	0.245	0.096	0.061	0.139	-0.193	0.030	0.177	0.148	1.000			
[26]	Firm age	0.111	0.089	0.268	0.034	0.045	0.132	0.001	0.063	0.121	-0.035	0.232	1.000		
[27]	Business network	0.018	0.022	0.195	0.220	0.052	0.134	-0.008	0.048	0.246	0.012	0.237	0.161	1.000	
[28]	Business diversification	-0.044	-0.013	-0.014	-0.021	-0.009	-0.023	-0.026	-0.001	-0.027	0.004	0.081	-0.084	0.021	1.000

Note : For sources, definitions, and descriptive statistics of the variables, see Table 3.

Appendix Table A4. Determinants of firm distress: Estimation results of the first stage of a Heckman two-stage probit analysis with sample selection

Target industry/region group	All industries	Agriculture, forestry, and fishing (Section A)	Mining, energy, and manufacturing (Sections B-E)	Construction (Section F)	Nonfinancial services (Sections G-J, L-S)	Financial services (Section K)	Central and Northwestern Federal Districts	Southern and North Caucasus Federal Districts	Volga and Ural Federal Districts	Siberian and Far East Federal Districts	All industries	All industries	All industries
Model	Table 5 Model [1]	Table 6 Model [1]	Table 6 Model [3]	Table 6 Model [5]	Table 6 Model [7]	Table 6 Model [9]	Table 7 Model [1]	Table 7 Model [3]	Table 7 Model [5]	Table 7 Model [7]	Table 8 Model [1]	Table 8 Model [3]	Table 8 Model [5]
Location in a monoton	-0.00883 (0.0233)	0.08145 (0.1713)	0.00188 (0.0400)	0.00372 (0.0624)	-0.02205 (0.0330)	0.35112 (0.4974)	-0.09395 * (0.0542)	-0.02108 (0.1385)	-0.03718 (0.0330)	0.20788 *** (0.0511)	-0.03829 (0.1508)		-0.01736 (0.0245)
Location in a monoton × Firm size											0.00293 (0.0149)		
Firms with less than 500 employees in monotowns													-0.00934 (0.0238)
Firms with 500–999 employees in monotowns													-0.08315 (0.1424)
Firms with 1000–4999 employees in monotowns													0.06665 (0.2033)
Firms with 5000–9999 employees in monotowns													0.19079 (0.3795)
Firms with 10000 or more employees in monotowns													0.30327 (0.4306)
Location in a monoton × Federal state ownership													0.14336 (0.1579)
Location in a monoton × Regional state ownership													0.07387 (0.0880)
Open joint-stock company	0.11989 *** (0.0347)	0.27948 *** (0.1050)	-0.04862 (0.0629)	0.01154 (0.1133)	0.05176 (0.0582)	0.25888 (1.8100)	0.13458 *** (0.0419)	0.06757 (0.1509)	0.01414 (0.0842)	-0.02793 (0.1223)	0.12004 *** (0.0347)	0.11981 *** (0.0347)	0.11955 *** (0.0347)
Closed joint-stock company	0.03576 (0.0289)	0.22167 *** (0.0665)	-0.21390 *** (0.0597)	-0.13823 (0.1032)	0.15382 *** (0.0456)	1.10701 (1.7262)	0.06766 ** (0.0345)	-0.16705 (0.1325)	-0.08510 (0.0754)	-0.02345 (0.1052)	0.03576 (0.0289)	0.03589 (0.0289)	0.03572 (0.0289)
Limited liability company	0.07240 *** (0.0272)	0.12837 * (0.0681)	-0.18184 *** (0.0576)	-0.07266 (0.1003)	0.18948 *** (0.0422)	0.80429 (1.7173)	0.13210 *** (0.0326)	-0.16318 (0.1216)	-0.08664 (0.0713)	-0.05720 (0.0982)	0.07239 *** (0.0272)	0.07234 *** (0.0272)	0.07230 *** (0.0272)
Large shareholding	-2.08197 *** (0.0817)	-2.38015 *** (0.2458)	-1.98538 *** (0.1345)	-1.93356 *** (0.2148)	-2.12917 *** (0.1411)	-1.37802 ** (0.6524)	-1.96381 *** (0.1001)	-6.60536 *** (0.2554)	-2.36003 *** (0.2313)	-1.95319 *** (0.2067)	-2.08191 *** (0.0817)	-2.08271 *** (0.0817)	-2.08229 *** (0.0817)
Foreign ownership	-0.02659 (0.0538)	0.11240 (0.2654)	-0.10150 (0.0845)	-0.14970 (0.2835)	0.02505 (0.0768)	-0.00564 (0.6062)	-0.10636 * (0.0635)	-0.11031 (0.2470)	0.22859 * (0.1355)	0.16989 (0.2166)	-0.02657 (0.0538)	-0.02759 (0.0539)	-0.02666 (0.0538)
Federal state ownership	0.23640 *** (0.0374)	0.44386 *** (0.1212)	0.21036 *** (0.0576)	0.02023 (0.1220)	0.19651 *** (0.0618)	0.47758 (0.8075)	0.29945 *** (0.0502)	0.06563 (0.1326)	0.21899 *** (0.0822)	0.07990 (0.1048)	0.23656 *** (0.0374)	0.23576 *** (0.0374)	0.22881 *** (0.0383)
Regional state ownership	0.17948 *** (0.0330)	0.23564 *** (0.1123)	-0.05666 (0.0578)	0.17024 * (0.1022)	0.32323 *** (0.0510)	-0.80315 (1.3700)	0.27301 *** (0.0448)	-0.01739 (0.1243)	0.08089 (0.0694)	-0.09043 (0.1033)	0.17930 *** (0.0330)	0.17930 *** (0.0330)	0.17178 *** (0.0342)
Managerial discretion	0.00450 *** (0.0012)	-0.01515 ** (0.0062)	-0.00872 *** (0.0033)	0.01051 *** (0.0031)	0.01023 *** (0.0015)	-0.00658 (0.0332)	0.00611 *** (0.0016)	-0.00559 (0.0065)	0.00510 ** (0.0024)	-0.00960 ** (0.0047)	0.00450 *** (0.0012)	0.00448 *** (0.0012)	0.00450 *** (0.0012)
Board size	-0.04847 *** (0.0090)	-0.02203 (0.0458)	-0.05871 *** (0.0126)	-0.07122 *** (0.0250)	-0.03859 ** (0.0164)	-0.71201 ** (0.3159)	-0.03141 *** (0.0103)	-0.06674 * (0.0404)	-0.07661 *** (0.0178)	-0.05322 ** (0.0266)	-0.04850 *** (0.0090)	-0.04835 *** (0.0090)	-0.04829 *** (0.0090)
Board size ²	0.00197 *** (0.0006)	-0.00248 (0.0040)	0.00212 *** (0.0008)	0.00441 ** (0.0018)	0.00264 ** (0.0013)	0.05492 ** (0.0252)	0.00107 (0.0007)	0.00181 (0.0029)	0.00396 *** (0.0011)	0.00347 ** (0.0016)	0.00197 *** (0.0006)	0.00195 *** (0.0006)	0.00196 *** (0.0006)
International audit firm	0.16699 (0.2232)		0.15114 (0.2542)		-0.55419 (0.6637)		0.38551 (0.2758)		-0.70038 (0.4562)	-0.47358 (0.3227)	0.16681 (0.2232)	0.15818 (0.2239)	0.16718 (0.2234)
Large Russian audit firm	0.01620 (0.1507)	-0.51997 (0.7199)	-0.00908 (0.2066)	-0.05306 (0.5920)	0.25134 (0.2843)	0.99899 (0.7900)	-0.40024 (0.2573)	0.34730 (0.5294)	0.36394 (0.2410)	-0.29750 (0.4975)	0.01033 (0.1515)	-0.00438 (0.1554)	0.01654 (0.1510)
Local Russian audit firm	0.18651 *** (0.0592)	-0.22143 (0.3528)	0.17872 ** (0.0740)	0.02442 (0.2770)	0.08098 (0.1371)	-0.00307 (0.0077)	0.24577 *** (0.0826)	-0.59112 (0.5026)	0.01752 (0.0971)	0.03091 (0.1924)	0.18613 *** (0.0593)	0.18537 *** (0.0595)	0.18676 *** (0.0593)
ROA	-0.00709 *** (0.0003)	-0.00663 *** (0.0023)	-0.00627 *** (0.0007)	-0.00539 *** (0.0008)	-0.00774 *** (0.0004)	-0.01268 *** (0.0048)	-0.00717 *** (0.0011)	-0.00463 *** (0.0011)	-0.00706 *** (0.0007)	-0.00793 *** (0.0009)	-0.00709 *** (0.0003)	-0.00709 *** (0.0003)	-0.00708 *** (0.0003)
Gross margin	-0.00273 *** (0.0004)	-0.00719 *** (0.0018)	-0.00413 *** (0.0008)	-0.00532 *** (0.0010)	-0.00076 * (0.0005)	0.11473 (0.2940)	-0.00334 *** (0.0004)	-0.00163 (0.0014)	-0.00295 *** (0.0009)	0.00061 (0.0011)	-0.00273 *** (0.0004)	-0.00273 *** (0.0004)	-0.00273 *** (0.0004)
Listing on the stock market	0.15364 ** (0.0736)	0.59362 (0.5158)	0.06012 (0.0903)	0.62087 *** (0.1983)	-0.46856 * (0.2444)	-0.00200 (0.0005)	0.20410 ** (0.1041)	-0.03757 (0.2372)	0.37294 *** (0.1433)	-0.26262 (0.2284)	0.15429 ** (0.0736)	0.15087 ** (0.0739)	0.15356 ** (0.0736)
Gearing	0.00026 (0.0000)	0.00082 (0.0002)	0.00041 (0.0001)	0.00028 (0.0001)	0.00018 (0.0000)	-0.00394 (0.0806)	0.00027 (0.0000)	0.00024 (0.0001)	0.00025 (0.0001)	0.00045 (0.0001)	0.00026 (0.0000)	0.00026 (0.0000)	0.00026 (0.0000)
Firm size	-0.05833 *** (0.0041)	-0.12579 *** (0.0206)	-0.07260 *** (0.0085)	-0.04295 *** (0.0106)	-0.05367 *** (0.0055)	-0.01580 (0.1777)	-0.05760 *** (0.0051)	-0.05102 *** (0.0171)	-0.06726 *** (0.0096)	-0.06753 *** (0.0130)	-0.05850 *** (0.0042)	-0.05839 *** (0.0041)	-0.05830 *** (0.0041)
Firm age	-0.40813 *** (0.0082)	-0.21277 *** (0.0421)	-0.30741 *** (0.0164)	-0.41191 *** (0.0228)	-0.46901 *** (0.0110)	0.01103 (0.0322)	-0.42650 *** (0.0107)	-0.32150 *** (0.0318)	-0.37613 *** (0.0182)	-0.38109 *** (0.0248)	-0.40813 *** (0.0082)	-0.40812 *** (0.0082)	-0.40810 *** (0.0082)
Business network	-0.01647 *** (0.0026)	-0.00460 (0.0094)	-0.00917 ** (0.0046)	-0.03324 *** (0.0077)	-0.01854 *** (0.0039)	0.02272 (0.0312)	-0.01878 *** (0.0032)	-0.02420 ** (0.0128)	-0.00874 (0.0058)	-0.01629 ** (0.0081)	-0.01646 *** (0.0015)	-0.01653 *** (0.0015)	-0.01646 *** (0.0015)
Business diversification	0.00246 * (0.0015)	-0.00337 (0.0051)	0.00797 *** (0.0029)	0.00500 (0.0042)	0.00072 (0.0020)	1.41285 (2.0220)	0.00582 *** (0.0019)	-0.00126 (0.0055)	-0.01199 *** (0.0033)	0.00000 (0.0044)	0.00246 * (0.0015)	0.00246 * (0.0015)	0.00245 * (0.0015)
NACE division-level fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table contains estimation results of the first stage of a Heckman two-stage probit model with a sample selection of the determinants of distressed acquisition. The coefficient of the constant term is omitted from the table. The dependent variable is a dummy variable for failed firms. The estimation results of the second stage are reported in Tables 5 to 8. Table 3 provides detailed definitions and descriptive statistics of the independent variables used in the estimation. Figures in parentheses are robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.