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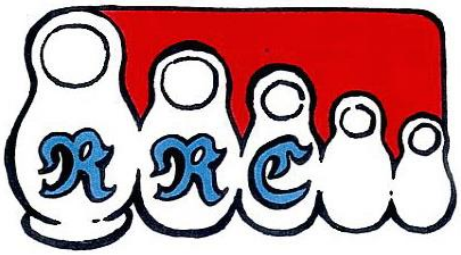

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Firm Entry and Exit during a Crisis Period Evidence from Russian Regions*

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Abstract: In this paper, we aim to empirically analyze the determinants of firm entry and exit in Russia using a regional-level panel data for the years of 2008-2014, with special emphasis on institutional failures and the politico-economic impact of external crises. We found that these two elements exhibit statistically significant and economically meaningful effects both on the creation and destruction of Russian firms, controlling for potentially explanatory factors. Our empirical results also suggest that the process of firm entry and exit is manifold across Russian regions due to their heterogeneity. Nevertheless, a surprisingly robust estimate of the world oil price (irrespective of the difference in target regions) suggests a possible high exposure of each Russian region to a global crisis. This comes from the importance of oil trade with the world and, accordingly, the ongoing crisis may bring a harmful influence to regeneration of Russian businesses.

Keywords: firm entry, firm exit, institutions, economic integration, crisis, Russia
JEL classifications: D22, F15, G01, P31, P33

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1. INTRODUCTION

One generation after the launch of the perestroika, two features characterize Russian business relative to many other transition countries: first, barriers to entry are considerably more pronounced and second, as a result, the extremely low level of firm entry in Russia by international standards. The Amadeus dataset, which is restricted to firms with more than 50 employees, provides a record of formal entry and shows gross entry rates from 1999 at below one percent. Entry rates are significantly lower in Russia than in other former socialist economies, and even these are (negative) outliers by developed economy standards (Aidis and Estrin, 2006; Aidis and Adachi, 2007; Aidis et al., 2008). For comparison, in Brazil the gross entry rates are up to 14% and net entry rates in China and India of over 6% pa and 3–4% pa, respectively. The picture that emerges is a blessing curse, as growth is fueled by oil exports, while other economically important areas, such as small and medium enterprises (SMEs), are not considered in the analysis.

The development of SMEs is key for the emergence of values and norms attached to the market economy. In terms of purely formal constraints, Russia performs relatively well; but enforcement is poor. The rule of law is also weak, creating uncertainty and non-consistency, which is damaging to the firms' prosperity. The absence of confidence in investing at home is reflected by the net private capital outflows, which stood in 2014 at 150 billion US dollars, equivalent to 8 percent of GDP. One of the main problems faced by Russian business owners is illegal practices such as bribing and corruption, as repetitively reflected in the Russian firms' survey by the World Bank. The fatality of being involved in corruption activities constitutes the main pervasive and self-reinforcing entry barrier.

The World Bank doing business indicators provide useful information for assessing the quality of the business environment across a large set of countries: ease of doing business, starting a business (licenses), getting electricity, registering property, getting credit, protecting minority investors, enforcing contracts, resolving insolvency. As reported by Doing Business, Russia ranks 13th out of 25, its worst position being registered under the *protection of minority investors*, *trading across borders*, and *dealing with construction permits* items. Two out of those three indicators correspond to our research questions: *Trading across borders* records the time and cost associated with the logistical process of exporting and importing goods. More precisely, it measures the time and cost (excluding tariffs) associated with three sets of procedures—documentary compliance, border compliance and domestic transport—within the overall process of exporting or importing a shipment of goods. This indicator is about the logistical obstacles towards a deeper integration of Russian enterprises

into the world economy. *Protection of minority rights* measures the strength of minority shareholder's protection against misuse of corporate assets by directors for their personal gain, as well as shareholder rights, governance safeguards and corporate transparency requirements that reduce the risk of abuse. One interesting component in the building of the protection of minority rights is the ease of shareholder suit index, which is one of our variables of interest.

Another pernicious feature of the Russian economic performance over the recent decades is the continuous fall of non-energy goods and services in total exports, echoing the weaknesses of SMEs in the manufacturing and service sectors, while oil represents the lion's share of total trade. In fact, in recent years, the concentration of Russia's economy in the oil and gas sector has steadily increased over time. In addition, Russia's non-energy sector has become less competitive in world markets. While the volume of the nation's non-energy merchandise exports grew at an annual rate of 11 percent in 2010, they grew by only 7.6 percent in 2014.[4] According to the UNCTAD, cumulative foreign direct investment (FDI) per capita over the period 1989-2014 were low up to 2008 as compared with similar countries (CEECs EU and non EU) and from 2008 onwards displayed a relatively higher trend. In the first period they stand at 3558 dollars, respectively 6562 for CEECs EU countries and 3658 dollars for CEECs non EU countries. Same data over the second more recent period (2008-2014) delivers a different picture, Russia having attracted 2443 dollars of FDI per capita while CEECs EU countries and CEECs non EU countries received respectively 2534 and 2174 dollars of FDI per capita, respectively. Needless to say, the top donor of inward FDI is the fuel and energy sector.[5] Overall, Russia's comparative advantage in the oil sector is reinforcing in the last decade. It corresponds to a double hypothesis, which our empirical analysis is focusing on: first the country's sensitivity to the crisis passes essentially to the evolution of the world market for oil. This has obvious repercussions for Russian SMEs because the shocks in the oil market are spreading to the rest of the economy. In addition, Russian firms face the curse of the oil rent, which is amplified by the institutional weaknesses such as low enforcement of property rights and corruption mentioned above.

In this paper, we aim to analyze the determinants of firm entry and exit in Russia using a hand-crafted regional-level panel data for the years of 2008-2014, with a special emphasis on the institutional failures and the politico-economic impact of external crises. We found that these two elements exhibit statistically significant and economically meaningful effects both

[4]Authors' calculation based on the official statistics of the Federal State Statistical Service of Russia (http://www.gks.ru/).

[5] Referred to the UNCTAD database (http://unctadstat.unctad.org). See Iwasaki and Suganuma (2015a, 2015b) for details of the recent trend of international trade and FDI inflow in Russia.

on the creation and destruction of Russian firms, while controlling for potentially explanatory factors. The robust estimate of the world oil price, irrespective of the difference in target regions, indicates that Russian regions are possibly sensitive to a global crisis whatever the circumstances. Accordingly, the ongoing crisis may bring a harmful influence to a regeneration of the Russian business. The study of firm's birth and death in Russia is relatively scarce. Noticeable exceptions are Rinaldi (2008), Iwasaki (2014), and Sprenger (2014), who investigated the firm-level determinants of survival. This paper complements their findings by identifying the national and regional-level factors that significantly affect both the market entry and exit of Russian firms.

The remainder of the paper is structured as follows: The next section reviews the literature about firms' net entry and creative destruction, by focusing on transition countries. Section 3 presents statistical evidence on the entry and exit of Russian firms over the period 2008-2014. Section 4 conducts the empirical analysis while Section 5 interprets the empirical results and concludes the paper.

2. LITERATURE REVIEW

The process of entry of new firms is an important element in the dynamics of market economies, as underlined by Caves (1998) and Bertelsman et al. (2004). New firm entry helps to transfer resources from low to high productivity activities and underlies competitive pressures dissipating monopoly rents. When analyzing ways in which institutional change affects the performance of developing economies, North (1991) emphasized the role that the institutional environment plays in promoting entrepreneurial development and the impact of informal as well as formal institutions, suggesting that entry barriers may be higher in developing countries where the general business environment is weaker. As a developing economy, Russia is characterized indeed by a complex system of entry barriers or entry fostering mechanisms. The weakness of institutions enhances the market power of incumbents (Djankov et al., 2002), with harmful implications for welfare (Banerjee and Ghatak, 2005). Following these ideas, the work of De Soto (1990) has suggested that regulation of entry represents an important entry barrier in emerging markets. The literature has argued that regulation is introduced by policy makers in their own interests, namely the pursuit of their own remuneration (Shleifer and Vishny, 1993). When analyzing how legal and institutional environments raise the cost of doing business, Friedman et al. (2000) found that the costs of enforcing contracts are associated with higher level of corruption. These additional costs bear more heavily on entrants than incumbents and poor institutional environments enhance the

advantages to incumbents yielded by higher levels of regulation.

The empirical evidence on emerging markets strongly supports the predictions with respect to regulations, but the argument with regard to institutions has rarely been tested. Using data on regulations of entry in 85 countries, Djankov et al. (2002) find a positive relationship between the size of informal economy (in turn highly correlated with corruption), and the burden of the entry regulation measured by the number of procedures, time and cost of starting a firm. Similarly, Klapper et al. (2006) find that regulations hinder entry, notably those which are in naturally "high entry" industries. However, regulations are not always always welfare reducing; labor regulations reduce entry into labor intensive sectors but property rights protection increases entry in R&D intensive sectors (Bertrand and Kramarz, 2002). Ciccone and Papaionnaou (2007) show that entry rates are higher when the time for registering new businesses is lower, although this is also influenced by demand and technology factors.

In the specific case of Russia, Aidis and Adachi (2007) attempt to find out the reason for a relatively low number of new firms. Since the internationally comparative data do not provide an explanation for this situation, the authors conclude that the low degree of firm creation and the low survival rate of newly created businesses are due to informal impediments associated with the lack of rule of law, inconsistent enforcement of regulations, regional autonomy and pervasive corruption. These findings are consistent with the conclusions of the survey carried out by Estrin and Prevezer (2010) in a selected group of emerging economies. The survey displays widely varying entry and exit rates among the countries, which is due to different institutional settings. In the case of Russia, relatively good formal rules and structures are undermined by informal mechanisms deterring or blocking business entry.

The exiting literature has also highlighted the weak institutional environment in Russia with respect to entrepreneurship (Aidis et al., 2008) with negative informal values towards private business and lack of property rights enforcement (Puffer and McCarthy, 2001; Aidis and Adachi, 2007). Berkowitz and DeJong (2005) show that Russian regional entrepreneurial activity exhibits a statistically and quantitatively significant relationship with subsequent growth. However, the regulatory stance that the Russian national and local governments take toward business and the levels of corruption work to the detriment of private sector development (Frye and Shleifer, 1997). Given these specific institutional weaknesses, recent studies have highlighted different aspects concerning the diffusion of new entrepreneurs in connection with institutions. For instance, Aidis et al. (2008) explore the impact of the entrepreneurial environment by comparing Russia with other economies. Their results suggest

that the negative environment for business in Russia has led to low levels of entrepreneurship. The authors conclude that the weakness of Russian institutions is detrimental to entrepreneurial activity and although networks are important, they are not entirely able to offset these deficiencies. In parallel, Bruno et al. (2008), who analyze a three-year panel of Russian firms, conclude that the entry rates in Russia are correlated with natural entry rates, institutions and firm size. A recent paper by Iwasaki (2014) confirms the key importance of institutions, by providing strong evidence that the independence of governance bodies from top management is positively correlated with the survival probability of the firm. This result is in line with one key aspect in corporate governance research: outside shareholders and outsider board members feel freer to criticize the company management than employee shareholders and insider directors, who are more likely to support their company's top executives.

In this paper we also try to quantify the extent to which the 2008 financial shock and subsequent economic crisis affected the firm creation and destruction in Russia. The global turmoil impacted the emerging countries in different ways, depending on their previous growth patterns and forms of international integration (Drahokoupil and Myant, 2012). The initial shock in the United States spread over the rest of the world through a contagion/transmission mechanism which transformed the initial sub-prime crisis into a global economic turmoil. Although being major beneficiaries of the economic boom before 2007, the emerging countries became the first victims of the global crisis after 2008 (Dolphin and Chappell, 2010). This is because the world economy is much more integrated and interdependent today than ten or twenty years ago, which implies a limited national economic sovereignty and consequently higher exposure of all countries to international macroeconomic fluctuations (Dabrowski, 2010). Gurtner (2010) considers that the crisis was transmitted primarily by trade and financial flows and the impact on emerging countries was higher in those that were highly integrated in the world economy.

Although Russia entered the crisis with a strong fiscal position, low public debt and large reserves (Bogetic et al., 2010,) the country experienced one of the sharpest decline of GDP. According to Blanchard et al. (2010), the first shock announcing the crisis was related to the war in Georgia, which practically opened the transmission channel to the economic turbulence. A severe decline in the stock market took place in August 2008, compounded by plummeting oil prices, which initiated a severe economic recession (Barannik, 2010). As a result, numerous weaknesses of its export-dependent economy in the money markets and in the financial sector started to evolve. The high impact of the crisis, in spite of very good fiscal situation, was due to three main factors (Ickes and Gaddy, 2010): high dependence of the

economy on oil and gas; addiction to resources rents, and the specificity of "Protection Racket" system of political economy. These systemic problems have obstructed the complete recovery of the economy after the 2008 crisis.

Further, in December 2014, Russia entered a new financial crisis which has exposed the real scale of the economic problems that have been growing in the country for several years. The main macroeconomic indicators deteriorated considerably, the confidence of its citizens in the state and in institutions in charge of economic stability declined, the government and business elites became increasingly dissatisfied with the policy direction adopted by the Kremlin, and fighting started over the shrinking resources (Łabuszewska, 2015). It should be noted that in addition to the crisis aspect, the Russian economy has been equally affected by the EU-USA sanctions following the annexation of Crimea and further activities in Eastern Ukraine. Oxenstierna and Olsson (2015) conclude that the targeted economic sanctions have contributed to imposing a cost on the Russian economy. In the presence of a politicized economic system, this gave advantage in resource allocation to rent-addicted loss-making producers loyal to the regime over competitive companies, which damages the country's economic performance. On top of those factors, the falling oil price on the world markets, coupled with the depreciation of the ruble, have weakened even more the terms of trade.

Based on the above discussions, we conjecture that the firm entry rate into the market is impacted mainly through the evolution of the oil sector, a fact that is entirely compatible with the low integration of Russian SMEs in the world economy. We also give great attention to the institutional failures that reinforce the curse of the oil sector, namely the poor efficiency of the judiciary system. The latter contributes to bail out inefficient firms and to reinforce barriers to entry and exit.

3. FIRM ENTRY AND EXIT IN RUSSIA: A STATISTICAL OVERVIEW

In this section, we overlook the dynamics and trends of firm entry and exit in Russia overall and its regions during the period 2008-2014. The Federal State Statistics Service (Rosstat) discloses monthly rates of firm entry and exit all over the Russian Federation, respectively yearly rates for federal districts and constituent entities, which are displayed in **Figures 1** and **2,** and in **Table 1**.

As argued in the previous section, Panel (a) of **Figure 1** shows that firm entry rates in Russia are relatively low in comparison with other transition economies and depict a slight decreasing trend (from more than 9 newly established companies per 1,000 existing firms to 8 per 1,000 between 2008 and 2014). On the other hand, as shown in Panel (b) of the same

figure, the number of liquidated companies per 1,000 firms is even lower, but exhibit a much stronger and significant increase (by about two points during the same period). In fact, a simple OLS regression of the firm entry and exit rates on a time trend variable shows that the monthly firm entry rate decreases by 0.0145 and the firm exit rate increases by 0.0673 at 5% and 1% level of statistical significance, respectively.[6]

Regarding the entry of new firms into the market, Panel (a) of **Figure 1** shows that the trend started to revert towards mid-2012 with a slight increasing tendency in the beginning of the second semester of 2014. Over the whole period of observation the evolution of firm entry is rather chaotic, with successive peaks and bottoms; for example, in October 2008 the firm entry rate was 10.1% but in January 2009 it fell to 5.2%, and then again increased to 8.6% by March 2009. This erratic evolution can be observed during the whole time horizon 2008-2014, which shows a significant degree of instability in the economy coupled with high uncertainty related to legislation, political and institutional environment, and discretionary bureaucratic practices in granting new business licenses. On annual basis Panel (a) of **Figure 2** shows that the entry of Russian firms experienced a significant decline from 115.2 per 1,000 firms in 2008 to 88.7 in 2009, remaining afterwards at practically the same level between 2009 and 2014.

With respect to the firm exit, Panel (b) of **Figure 1** shows a relatively constant increase of the indicator until the beginning of 2011, followed by a highly volatile evolution afterwards. This can be attributed to the previous factors – uncertainty and instability – related to informal mechanisms deterring the net expansion of businesses. As a result, towards the end of 2014 the new entries are entirely annulled by the number of firms quitting the market. On annual basis, as Panel (b) of **Figure 2** exhibits, the firm exit rate depicts a modest increase until 2010, then a sudden jump in 2011, followed by a declining trend in the last two years of the period. The high difference in the firm exit rates between 2010 and 2011 can be attributed to the world economic crisis, whose impact arrived with some time-lag as compared to the entry rates, where the effect of the global turmoil took place immediately.

Figures 2 also illustrates time-series changes of firm entry and exit rates at the level of

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[6] The estimation results are the following:

$$\underset{}{\textit{Firm entry}} = \underset{(25.25)}{8.660^{***}} - \underset{(-2.30)}{0.0145^{**}} \times \textit{Trend} \qquad N=84,\ R^2=0.074,\ F=5.28^{**}$$

$$\underset{}{\textit{Firm exit}} = \underset{(12.44)}{2.784^{***}} + \underset{(9.15)}{0.0673^{***}} \times \textit{Trend} \qquad N=84,\ R^2=0.551,\ F=83.76^{***}$$

Figures in parentheses beneath regression coefficients are *t* statistics computed based on robust standard errors. *** and ** denote statistical significance at the 1% and 5% levels, respectively. Null hypothesis of the F test is that all coefficients are zero.

federal districts. From this figure we can observe that there is a weak but negative trend in firm entry, while a notable increasing trend exists in the case of firm exit. In other words, as in the whole federation, Russian districts have experienced an accelerated decrease of turnover (number of firms created plus the number of firms that left the market) since January 2008, with a much more significant contribution of the firm exit. The declining trend of entries, coupled with an increasing tendency of exit rates, suggest an overall low survival rate of Russian companies on the market, as discussed in Aidis and Adachi (2007).

Table 1 reports the rankings of Russian regions in terms of firm entry and exit rates in 2008 and 2014. This table suggests that the situation of each particular region changed substantially during the period. In fact, according to Panel (a) of **Table 1**, out of the first 10 regions ranked with respect to the firm entry rates in 2008, only four are present in the top 10 six years later, in 2014 (Perm Territory, Sverdlovsk, Ivanovo and Nizhny Novgorod). The best performer of 2008 (Chechen Republic) is ranked only 46th in 2014. With few exceptions, we therefore cannot speak about constantly good performers. The business development in a particular region and in a specific period is probably subject to the political orientation of local authorities; when local governments are politically consonant with the central power the region performs well.

Similarly, as indicated in Panel (b) of **Table 1**, out of the top 10 regions recording the lowest firm exit rates in 2008 only three of them (Kaluga, Moscow region and Khanty-Mansi Area) are ranked in 2014 among the first ten best performers; the Moscow capital, for instance, lost 78 positions over the period, passing from an exit rate of 21.7 in 2008 to 120 six years later. At the same time, the Russian Federation contains regions where both firm entry and exit rates are high in 2014 (Saint Petersburg: entry rate 112.7; exit rate 103), as well as regions where both indicators are low (Stavropol: entry rate 53.8; exit rate 35.3). The two categories of regions are relatively balanced and record overall a net rate of business creation. Nevertheless, there are certain regions where the entry rate is low and the exit rate high (Chukotka Area: entry rate 49.8; exit rate 86.5), which implies a net rate of firm destruction and consequently economic depression. There are only very few regions where high firm entry rates coexist with low exit rates, implying a good development potential: only one such region is found within the top 20 with respect to high entry, respectively low exit rates – Republic of Udmurtia: entry rate 103.2; exit rate 51.4.

In sum, the aforementioned findings suggest firstly that the market entry of Russian firms was discouraged by the global financial crisis, which started in September 2008 and lasted at the end of 2014, a period characterized by subsequent economic downturns. Firms' exit exhibited a strong upward trend and it is conceivable that this phenomenon was also triggered

by the 2008 financial shock from the US and amplified by the following crises in Europe and Ukraine. Second, the above tendency was observed in all federal districts, suggesting that the recent crises have negatively influenced Russian firms and entrepreneurs whatever their geographical location and specialization. Third, the level and volatility of firms' entry and exit rates vary greatly across Russian regions and over time. This suggests that the impact of the crisis was different, depending on the vulnerability to the world crisis and the dependence to the oil sector, but in a more discriminative way, on the differences in institutional and business environments.

4. EMPIRICAL ANALYSIS

In this section, we will empirically examine the determinants of firm entry and exit in Russia using a regional-level panel data for the period between 2008 and 2014. Here, inspired by the arguments in the existent literature and the observations reported in the previous section, we intend to perform regression analysis paying a special attention to two aspects: institutional failures and the recent politico-economic crises. More specifically, we will estimate a multivariate regression equation, which takes a natural logarithm of firm entry or exit rate as a dependent variable and proxies for the regional-level institutional quality and the economic integration as independent variables, while controlling for other potentially explanatory factors. The next subsection gives a detailed explanation of independent variables used in our regression analysis. Subsection 4.2 reports estimation results. And Subsection 4.3 checks statistical robustness of the empirical evidence.

4.1 Selection of Independent Variables

To assess the impact of institutional failures on the creation and destruction of Russian firms, we employed four proxies for the efficiency of the judiciary system which are available at the regional level. They include: the mean and median duration of lawsuit at a regional arbitration court, the acceptance rate of petition by regional arbitration courts, and lawsuits application number to regional arbitration courts per 1,000 organizations. As emphasized in Dmitrieva et al. (2012), the duration of a lawsuit at a regional arbitration is a key aspect, as it affects the functioning of a business activity. Slowness and poor performance of the judiciary system to resolve disputes relating to the non-compliance with contracts and the non-payment of arrears can jeopardize the business of SMEs. For the later, delayed payments combined with a limited access to bank credit can result in the inability to continue their business. The Russian Federation is classified as a "high compliance country", which refers to the level of compliance with international standards for corporate governance. The country is considered

therefore as having a sound legal framework at a par with OECD ones (EBRD, 2005). Official data on entry costs (like number of days for starting a business and contract enforcement) puts Russia as the best performer of the BRIC countries. The time needed to resolve overdue payments fell from 7 to 6 weeks between 2002 and 2005. Formal barriers are relatively low. But the *de facto* reality is far from this *de jure* situation. Law enforcement is indeed arbitrary, with over 80% of Russian entrepreneurs suffering from broken contracts (Radaev, 2002). Johnson et al. (1999) indicate that relational contracting plays a significant role in Russia where the court system is inefficient, which is a strong obstacle to the normal development of SMEs. Overall, it seems that the legal and regulatory framework is blurred by numerous inconsistencies, with many Soviet regulations still in force (OECD, 2005); "No one really knows which laws and regulations are implemented and observed, although it is clear that many are not implemented at all, or only partially". These arguments suggest that the above four variables are likely to be negatively related to the net entry rate of Russian firms. We believe that, although these variables are cross-sectional due to information constrains, they well reflect the effectiveness of regional courts; not being derived formally from official definitions, they depict what really happens on the ground.

In addition to the above court-related variables, we will also utilize a criminal risk ranking evaluated by the Expert rating agency – a famous Russian think-tank, which is a regional-level time-variant variable, as an additional proxy for the institutional quality. According to the Transparency International, Russia has much worse levels of corruption than Brazil, China and India for 1998–2004, improving somewhat to converge with Indian levels in 2002. The Business Environment and Enterprise Performance Survey (BEEPS) reports a significant worsening in the perception of corruption between 2002 and 2005 as compared with transition countries, where the situation improved (EBRD, 2005). Corruption refers to the percentage of contract paid to secure a government contract, the percentage of respondents who agreed to pay irregular payments or gifts and losses due to crime as a share of sales, all of which appear to be significant in Russia. This corruption cannot be considered as being wheel-greasing, but it is rather linked to deficiencies in law enforcement, whereby legislation can be interpreted in discretionary ways by the authorities. Radaev (2002) finds that over 80% of Russian entrepreneurs had suffered from broken contracts. Guriev and Radinski (2004) argue that while industrial concentration has increased, the influence of incumbents increased; in certain regions, the governor's influence has protected incumbents who are members of the family: the region of Oryol, for instance (Aidis and Adachi, 2007), Kursk (Kryshtanovskaya and White, 2005). The Expert criminal ranking is regarded as a good proxy for the level of corruption and the institutional failure in general. Accordingly, we will estimate the

coefficient of this variable together with the court-related variables. These five variables are called “institutional variables” hereinafter.

To assess possible impact of the politico-economic crises on firm entry and exit, we adopted four variables according to the discussion in Section 2. They comprise: a natural logarithm of world oil price, total trade volume as percentage of gross regional products (GRP), inflow of FDI in % of GRP, as well as a natural logarithm of direct distance between Brussels and the capital cities of Russian regions. As suggested in Kuboniwa (2014), the world oil price is extremely volatile against a global crisis and greatly influences the economic and business circumstances in Russia. Hence, we expect that the world oil price effectively captures macro-economic shocks of the recent crises on the whole Russian economy. A crisis may affect Russian firms and entrepreneurs through shrinking of international trade and FDI. The total trade and FDI in % of GRP are used to grasp these indirect effects of a crisis. The distance of Brussels and a regional capital is employed as a proxy for the geographical proximity of Russian regions to the EU. We assume that if other conditions are equal, Russian regions located near to the EU market tend to be negatively affected by a crisis much stronger than other regions. We call these four variables as “economic integration variables” hereinafter.

In the regression estimation, we will also control for a series of factors that represent medium-term economic development, financial constraints, quality of social infrastructure, degree of inter-firm competition, market density as well as natural obstacles for business. The medium-term economic development is expressed by the GRP growth rate. The financial constraint is measured by a natural logarithm of number of credit organizations and their branches per 100,000 residents, which is considered as one of major barriers to both starting up and expansion of businesses in Russia (Puffer and McCarthy, 2001; Pissarides et al., 2003). The quality of social infrastructure is proxied by a natural logarithm of number of PCs with internet connection per 100 workers, taking into account the fact that the information technology plays an important role in the contemporary Russian business. A natural logarithm of firms and organizations per 10,000 residents and population density are utilized to capture the effect of interfirm competition and market density, respectively. We expect that the former factor is negatively associated with firm entry and positively related to firm exit. On the other hand, we predict that the latter factor has a promoting effect of firm entry and exit. Average temperature in January serves as a proxy for natural obstacles for business, assuming that more severe climate conditions force Russian firms and entrepreneurs to take higher initial sunk costs that may restrict firm entry and exit (Iwasaki and Suganuma, 2005). In addition to the above six factors, we will also control for the time trend and district-level fixed effects,

which, according to **Figure 1** and **2**, may have a statistically significant impact both on firm entry and exit.

With regard to the time-variant variables, to avoid possible endogeneity with the dependent variables, a lagged three year moving average is utilized except for the world oil price, which is obviously exogenous for the overwhelming majority of Russian firms and entrepreneurs. The definition, descriptive statistics, and source of the aforesaid variables are described in **Table 2**.

4.2 Estimation Results

Tables 3 and **4** show the estimation results of firm entry and exit models, respectively. To obtain coefficients of the time-invariant variables, we carry out a regression analysis by using a pooling OLS and a random-effects estimators and report one of these two estimation results according to the Breusch-Pagan test of the null-hypothesis that the variance of regional individual effects is zero. In both tables, Models [1] to [4] represent this kind of estimation results. In addition, to check statistical robustness of the time-variant variables, we also estimated a fixed-effect model and reported its result as Model [5].

With respect to the institutional variables, **Table 3** shows that the acceptance rate of petition by regional arbitration courts and the lawsuits application number to regional arbitration courts are negatively related to firm entry with a statistical significance at the 10% and 1% level, respectively, in line with our prediction. In the same table, the Expert criminal ranking is insignificant as well as the mean and median duration of a lawsuit at a regional arbitration court in the random-effects models [1] to [4]. But it is given a significant and negative estimate in the fixed-effects model [5]. As shown in **Table 4**, four of the five institutional variables are significantly associated with firm exit and all their coefficients are negative, suggesting that the destruction of Russian firms is closely linked with institutional failure.

In regard to the economic integration variables, the world oil price displays a remarkably robust estimate in the firm entry model. In fact, as reported in **Table 3**, this variable is estimated at 1% significance level with a positive sign in all the five models, irrespective of the difference in model specification and estimator. In contrast, estimates of the other economic integration variables suggest that regional dependence on international trade and direct investment from abroad and geographical proximity to the EU does not significantly affect the decision-making of Russian entrepreneurs who consider new entry to the market. On the other hand, the estimation results in **Table 4** demonstrate that the destiny of Russian firms is nowadays deeply connected with the world economic dynamism. Indeed, not only the

world oil price but also the other four economic integration variables are estimated with a significant coefficient, implying that the 2008 financial shock and subsequent crises greatly damaged Russian businesses as witnessed by Iwasaki (2014) in the case of large and medium-sized industrial companies and by Sprenger (2014) in the case of former socialist enterprises.

Many of the control variables are significantly estimated corresponding with our predictions: medium-term economic growth encourages firm creation and, at the same time, keeps existing organizations alive. Intensive inter-firm competition blocks new comers and evicts poorly performing companies from the market. High market density is a key promoting factor for both firm entry and exit. In regions with hard climate conditions, firms tend to stay in the market easier probably due to high initial sunk costs.

As a next step, we addressed the issue of heterogeneity of Russian regions. It is argued that Russia is a huge country and hence there exists a great variation among regions in terms of the socio-economic systems as well as the market/industrial structure. To examine possible influence of regional heterogeneity, we conducted re-estimation of Model [4] in **Table 3** and Model [2] in **Table 4** by dividing observations into four subsample groups taking historical and geographical similarities of the federal districts into consideration.

The results are reported in **Table 5**. The statistical significance of the key variables is remarkably different between the subsamples, implying that the system of firm creation and destruction is indeed manifold across Russian regions. The world oil price, however, takes a significant and positive coefficient in all the eight models corresponding to the above estimation results. The surprisingly robust estimate of the world oil price suggests the possibility that every Russian region is extremely sensitive to a global crisis and, accordingly, the regeneration of Russian firms was greatly damaged during the recent period.

4.3 Robustness Check

In the previous subsection we mainly utilized a random-effects model to obtain estimates of the time-invariant variables and checked the statistical robustness of the time-variant variables by estimating a fixed-effects model. As additional robustness check, we also conducted estimation using a population-average estimator, a between-effects estimator, a Hausman-Tylor estimator and a system GMM estimator, and found no remarkable differences from the estimation results reported in **Tables 3**, **4**, and **5**.[7]

Furthermore, we also carried out a supplementary estimation, in which various sample restrictions were placed on the regression models and confirmed that these sample restrictions

[7] The Hausman-Tylor and system GMM estimations were attempted to estimate and endogenize non-lagged time-variant independent variables.

do not substantially change our major empirical findings. More specifically, supplementary regressions were conducted with the following five settings: (a) excluding Moscow and St. Petersburg, which are under direct control of the Federal government (i.e., federal cities), from observations; (b) excluding so-called "resource-rich" regions from observations; (c) dividing observations into those for the years of 2008-2011 and those for the years of 2012-2014; (d) limiting regions to those with FDI in % of GRP within the mean ±1 standard deviation; (e) limiting regions to those with total trade in % of GRP within the mean ±1 standard deviation.

The above findings led us to the judgment that the estimation results reported in this paper are robust across the various specifications, apart from the regional heterogeneity discussed in the previous subsection.

5. CONCLUSIONS

This paper is based upon a rich and unpublished panel dataset of regional-level data for the period 2008-2014. Our regression analysis gives a special attention to two aspects: institutional failures and the recent economic crises and downturns that characterize the period of investigation. More specifically, we take the natural logarithm of firm entry or exit rate as the dependent variable and focus on two explanatory sets of variables: four proxies for the efficiency of the judiciary system which are provided by Dmitrieva et al. (2012) and the federal arbitration court, and variables that measure the extent of Russians' firms integration in the world economy: the natural logarithm of world oil price, total trade volume in percent of gross regional products (GRP), inflow of FDI in % of GRP and finally the natural logarithm of the distance between Brussels and the capital cities of Russian regions.

The results lead us to the overall conclusion that Russian economy functions within a legal, institutional and political environment that hinders the competition among firms, which is detrimental for economic development. On top of that, corruption and vested interests complicate furthermore the overall framework where private companies are forced to operate. As a result, entry rates of new businesses are declining over the period of the analysis, while the number of firms leaving the market is increasing. This is factual, in spite of already low entry rates as compared to other transitional economies.

More specifically, the entry and exit rates of businesses depend upon the efficiency of the judiciary system to resolve disputes relating to the non-compliance with contracts and the non-payment of arrears. The resulting uncertainty and instability amplified by discretionary bureaucratic practices of public administrations distort dramatically the economic governance

principles at all levels. In terms of entry/exit of businesses, this translates into a chaotic evolution of the two rates, with successive peaks and bottoms over the period.

Two major external factors bring additional menaces to the already fragile economic conditions. Firstly, Russian firms, mainly SMEs, are highly sensitive to the variation of the world oil price, regardless of their geographical location and specialization. The oil price is the only variable pertaining to the integration of Russia in the world economy which is robustly related to firms' entry and exit. Our findings have two policy implications, namely that the oil curse can be a blessing if the rent is not a source of widespread corruption and does not impede the development of other sectors employing entrepreneurs and workers; and a rule of the law favorable to the emergence of a sound business environment is key to allow SMEs to enter/exit the market in a creative way. Russian economy, based essentially on oil and gas related activities, is therefore insufficiently diversified to cope with the negative impact of falling prices of these natural resources. No after-oil strategic perspectives of development exist, which will definitely have serious implications in the future. The second important external factor is related to the vulnerability of the economy to the world crises. Although the degree of integration of Russian economy into the global economy is relatively low, the 2008 crisis impacted the entry and exit of Russian businesses.

The internal and external factors damaging the economic performance influence the firm creation and destruction at national, regional and district levels. Specifically, the entries are declining as a consequence of those factors while exits are increasing, which leads to a low survival rate of enterprises. This tendency is somehow attenuated is certain regions where the local governments are in political harmony with the central power, which grants them some privileges to cope with the adverse effects of exogenous influences. Overall, the impact of external threats on various regions vary according to the degree of vulnerability to outside crises, which in turn depends on the extent to which a particular region is more or less isolated from the source of the crisis.

Concluding, the firm creation and firm destruction in Russia is a multifarious process, in particular at regional level. As a general rule, the medium-term perspectives of economic growth encourages the entries of new businesses, as it is common to all countries. At the same time, those perspectives keep alive the majority of exiting organizations. Strong inter-enterprise competition limits the entry of new comers and evicts poorly performing companies from the market. High market density represents a major promoting factor both for entries and exits.

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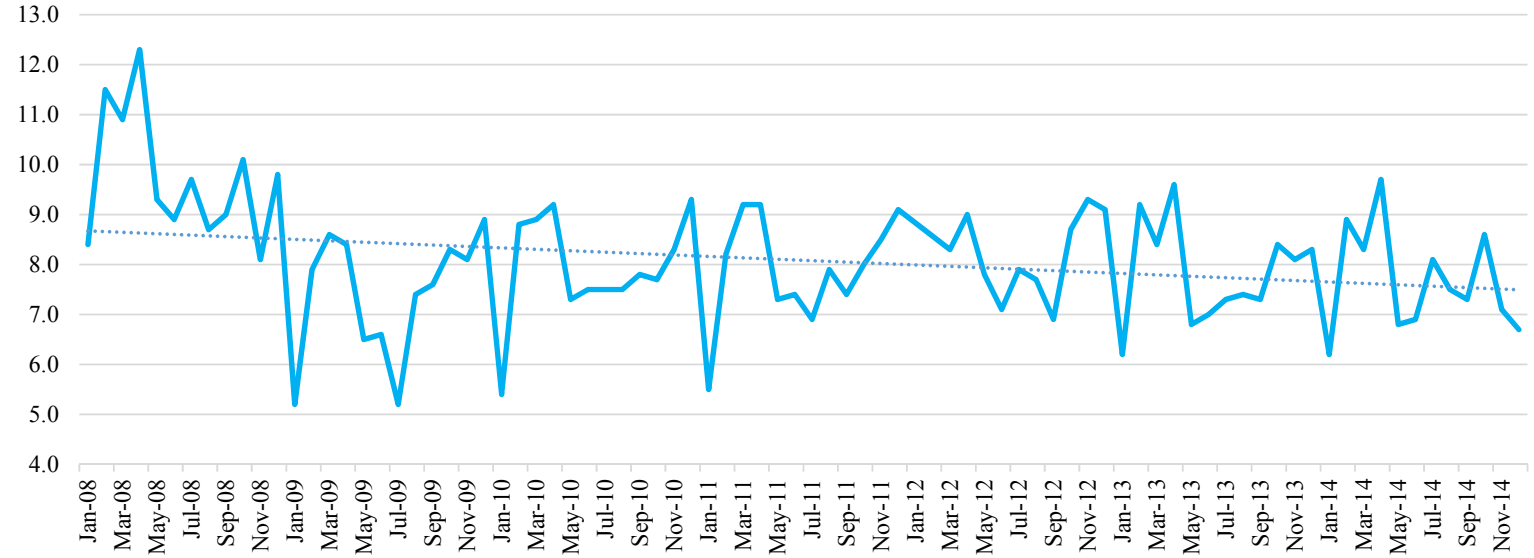
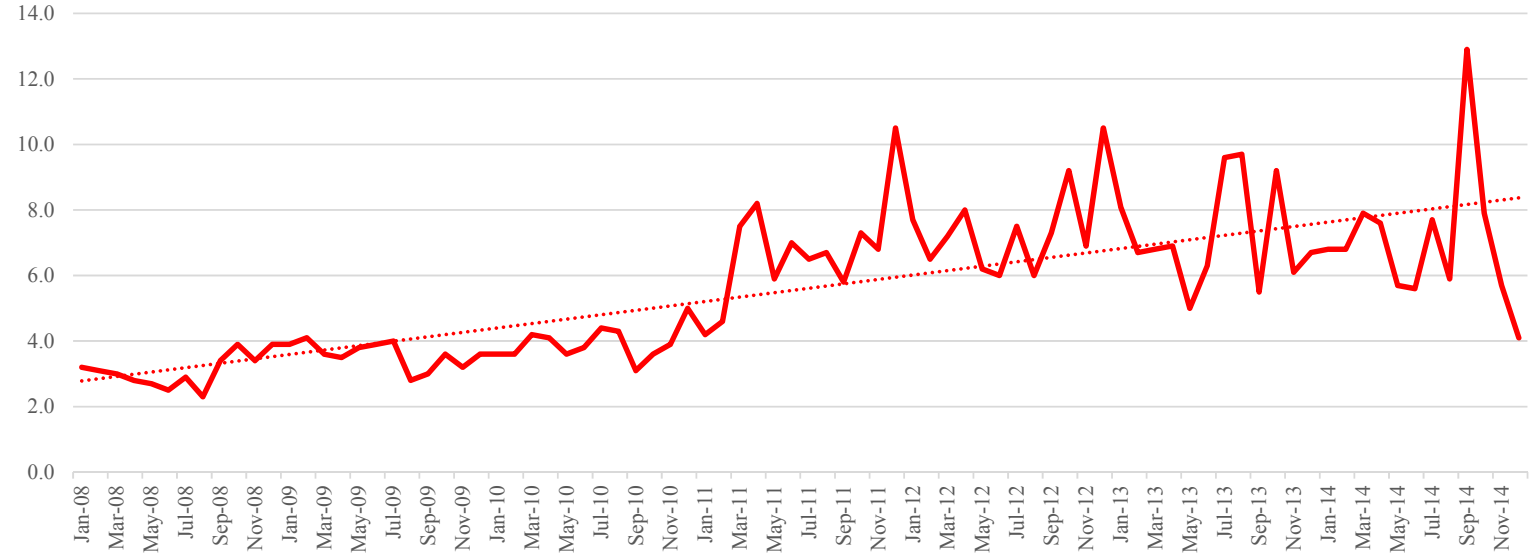
Figure 1. Dynamics of firm entry and exit in Russia, 2008-2014

(a) Firm entry



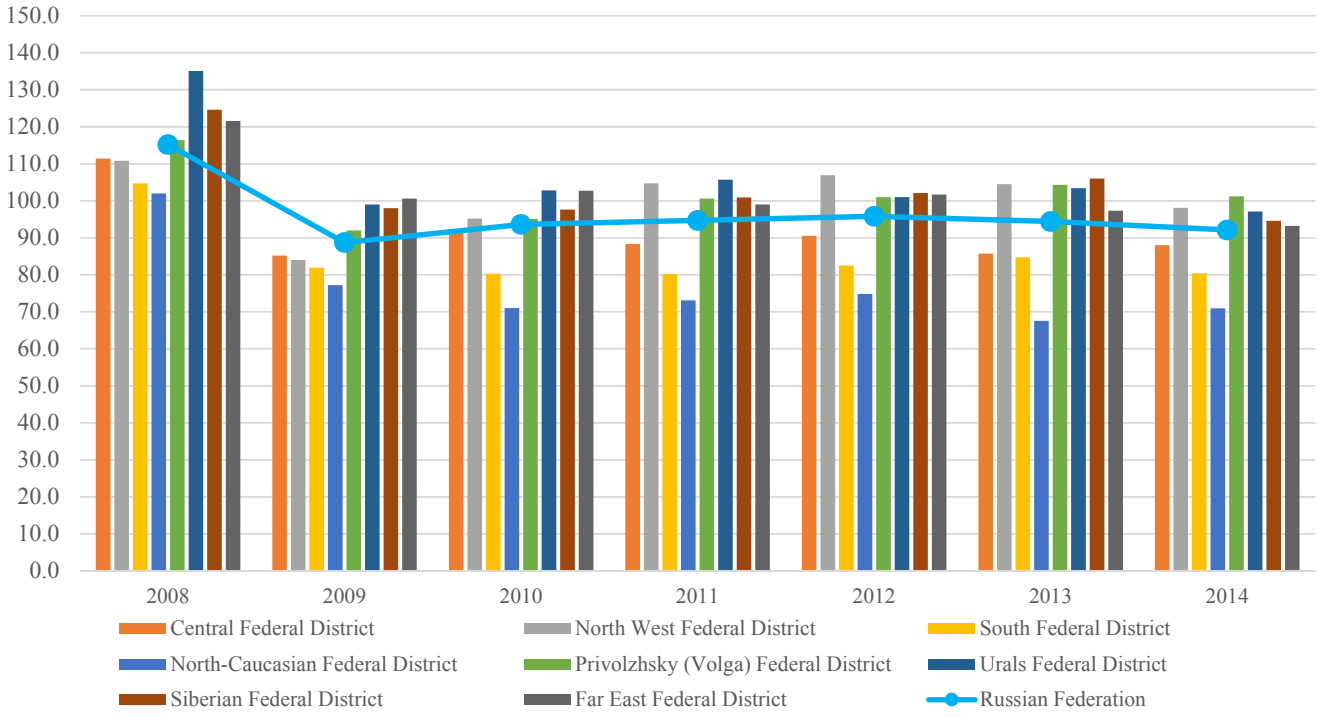
(b) Firm exit



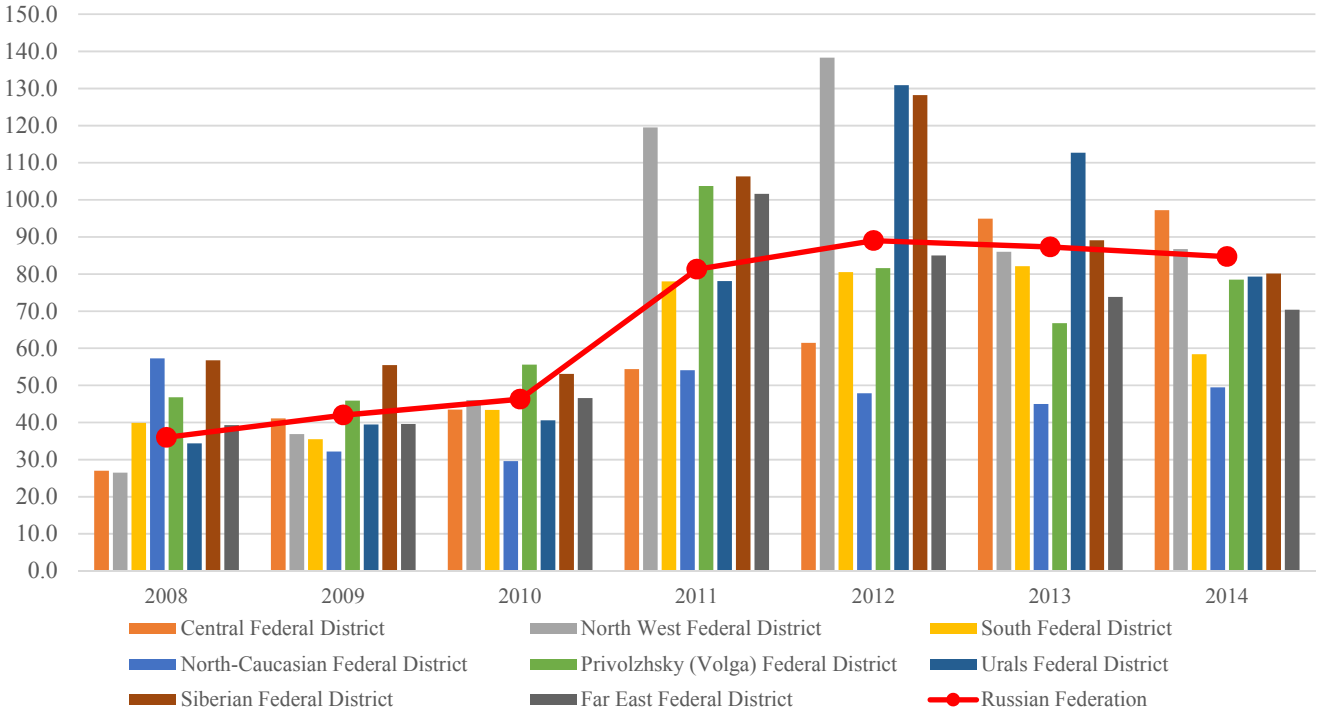
Note: Firm entry and exit rate denote number of newly established and liqudated firms per 1,000 organizations, respectively.
Source: Russian Federal State Statistics Service (http://www.gks.ru/).

Figure 2. Dynamics of firm entry and exit in Russian federal districts, 2008-2014

(a) Firm entry



(b) Firm exit



Note: Firm entry and exit rate denote number of newly established and liqudated firms per 1,000 organizations, respectively.
Source: Russian Federal State Statistics Service (http://www.gks.ru/).

Table 1. Ranking of Russian regions in terms of firm entry and exit in 2008 and 2014

(a) Firm entry

2008			2014			Change from 2008	
Ranking	Region name	Entry rate	Ranking	Region name	Entry rate	Ranking	Entry rate
1	Chechen Republic	155.9	1	Republic of Ingushetia	249.5	79	174.2
2	Perm Territory	148.3	2	Republic of Tatarstan	120.9	14	-8.1
3	Sverdlovsk Region	147.7	3	Lipetsk Region	115.4	8	-18.1
4	Kemerovo Region	142.1	4	St. Petersburg	112.7	33	-0.4
5	Ivanovo Region	142.0	5	Voronezh Region	111.3	66	17.4
6	Chelyabinsk Region	137.4	6	Nizhny Novgorod Region	110.4	2	-24.9
7	Amur Region	136.5	7	Ivanovo Region	108.8	▲ 2	-33.2
8	Nizhny Novgorod Region	135.3	8	Samara Region	106.2	39	-3.0
9	Novosibirsk Region	134.7	9	Perm Territory	105.9	▲ 7	-42.4
10	Khabarovsk Territory	134.6	10	Sverdlovsk Region	105.0	▲ 7	-42.7
11	Lipetsk Region	133.5	11	Vologda Region	103.9	1	-28.5
12	Vologda Region	132.4	12	Republic of Udmurtia	103.2	52	-0.3
13	Belgorod Region	131.0	13	Belgorod Region	102.4	0	-28.6
14	Republic of Buryatia	130.2	14	Novosibirsk Region	102.0	▲ 5	-32.7
15	Volgograd Region	129.1	15	Krasnoyarsk Territory	101.6	4	-25.1
16	Republic of Tatarstan	129.0	16	Primorsky Territory	101.4	9	-19.9
17	Republic of Sakha (Yakutia)	128.0	17	Altai Territory	101.2	11	-18.6
18	Smolensk Region	126.8	18	Khabarovsk Territory	100.7	▲ 8	-33.9
19	Krasnoyarsk Territory	126.7	19	Kirov Region	99.3	30	-8.8
20	Kostroma Region	124.8	20	Yaroslavl Region	99.1	9	-20.4
21	Sakhalin Region	123.6	21	Republic of Buryatia	98.3	▲ 7	-31.9
22	Murmansk Region	123.0	22	Ulyanovsk Region	97.7	28	-10.4
23	Bryansk Region	122.3	23	Amur Region	97.2	▲ 16	-39.3
24	Vladimir Region	121.7	24	Kemerovo Region	94.6	▲ 20	-47.5
25	Primorsky Territory	121.3	25	Chelyabinsk Region	94.6	▲ 19	-42.8
26	Republic of Karelia	120.9	26	Omsk Region	93.1	5	-24.5
27	Tula Region	120.4	27	Penza Region	93.1	7	-22.6
28	Altai Territory	119.8	28	Tyumen Region	91.6	8	-22.2
29	Yaroslavl Region	119.5	29	Chuvash Republic	90.5	6	-24.2
30	Tambov Region	117.9	30	Moscow	90.4	12	-21.3
31	Omsk Region	117.6	31	Tambov Region	89.7	▲ 1	-28.2
32	Tomsk Region	117.5	32	Republic of Bashkortostan	88.4	11	-23.3
33	Republic of Tuva	117.0	33	Murmansk Region	87.9	▲ 11	-35.1
34	Penza Region	115.7	34	Republic of Mari El	87.9	7	-24.1
35	Chuvash Republic	114.7	35	Volgograd Region	87.4	▲ 20	-41.7
36	Tyumen Region	113.8	36	Irkutsk Region	87.3	8	-22.6
37	St. Petersburg	113.1	37	Smolensk Region	86.8	▲ 19	-40.0
38	Novgorod Region	113.0	38	Orenburg Region	86.2	7	-23.3
39	Orel Region	112.7	39	Bryansk Region	85.9	▲ 16	-36.4
40	Republic of Daghestan	112.3	40	Vladimir Region	85.9	▲ 16	-35.8
41	Republic of Mari El	112.0	41	Tula Region	85.7	▲ 14	-34.7
42	Moscow	111.7	42	Jewish Autonomous Region	85.1	12	-22.5
43	Republic of Bashkortostan	111.7	43	Republic of Sakha (Yakutia)	84.9	▲ 26	-43.1
44	Irkutsk Region	109.9	44	Ryazan Region	84.0	13	-22.6
45	Orenburg Region	109.5	45	Tver Region	83.9	30	-0.6
46	Kaliningrad Region	109.4	46	Chechen Republic	82.4	▲ 45	-73.5
47	Samara Region	109.2	47	Republic of North Ossetia - Alania	82.3	18	-20.8
48	Kurgan Region	109.1	48	Yamal-Nenets Autonomous Area	80.1	4	-27.7
49	Kirov Region	108.1	49	Saratov Region	80.0	29	1.1
50	Ulyanovsk Region	108.1	50	Krasnodar Territory	79.7	8	-26.9
51	Kaluga Region	108.0	51	Republic of Karelia	79.5	▲ 25	-41.4
52	Yamal-Nenets Autonomous Area	107.8	52	Rostov Region	78.9	17	-18.0
53	Arkhangelsk Region	107.6	53	Kostroma Region	77.9	▲ 33	-46.9
54	Jewish Autonomous Region	107.6	54	Sakhalin Region	77.7	▲ 33	-45.9
55	Astrakhan Region	107.2	55	Kaliningrad Region	77.3	▲ 9	-32.1
56	Republic of Khakasia	107.0	56	Astrakhan Region	77.1	▲ 1	-30.1
57	Ryazan Region	106.6	57	Kursk Region	77.1	2	-28.8
58	Krasnodar Territory	106.6	58	Tomsk Region	76.7	▲ 26	-40.8
59	Kursk Region	105.9	59	Arkhangelsk Region	76.4	▲ 6	-31.2
60	Republic of Mordovia	105.4	60	Republic of Adygeya	76.3	7	-24.4
61	Moscow Region	104.2	61	Khanty-Mansi Autonomous Area - Yugra	76.1	11	-16.3
62	Republic of Komi	104.2	62	Zabaikalsk Territory	75.6	1	-28.2
63	Zabaikalsk Territory	103.8	63	Republic of Khakasia	74.5	▲ 7	-32.5
64	Republic of Udmurtia	103.5	64	Kamchatka Territory	73.7	9	-17.6
65	Republic of North Ossetia - Alania	103.1	65	Nenets Autonomous Area	73.3	11	-11.1
66	Karachayevo-Circassian Republic	102.5	66	Republic of Daghestan	72.4	▲ 26	-39.9
67	Republic of Adygeya	100.7	67	Republic of Komi	72.0	▲ 5	-32.2
68	Kabardino-Balkarian Republic	98.9	68	Novgorod Region	71.3	▲ 30	-41.7
69	Rostov Region	96.9	69	Republic of Altai	70.3	1	-24.9
70	Republic of Altai	95.2	70	Moscow Region	69.7	▲ 9	-34.5
71	Voronezh Region	93.9	71	Orel Region	68.8	▲ 32	-43.9
72	Khanty-Mansi Autonomous Area - Yugra	92.4	72	Kaluga Region	68.8	▲ 21	-39.2
73	Kamchatka Territory	91.3	73	Pskov Region	67.7	1	-20.4
74	Pskov Region	88.1	74	Republic of Mordovia	66.6	▲ 14	-38.8
75	Tver Region	84.5	75	Republic of Kalmykia	66.6	8	15.9
76	Nenets Autonomous Area	84.4	76	Kurgan Region	66.3	▲ 28	-42.8
77	Stavropol Territory	83.9	77	Kabardino-Balkarian Republic	59.0	▲ 9	-39.9
78	Saratov Region	78.9	78	Karachayevo-Circassian Republic	58.6	▲ 12	-43.9
79	Leningrad Region	77.4	79	Republic of Tuva	58.3	▲ 46	-58.7
80	Republic of Ingushetia	75.3	80	Magadan Region	57.9	1	-13.8
81	Magadan Region	71.7	81	Stavropol Territory	53.8	▲ 4	-30.1
82	Chukotka Autonomous Area	71.2	82	Leningrad Region	51.6	▲ 3	-25.8
83	Republic of Kalmykia	50.7	83	Chukotka Autonomous Area	49.8	▲ 1	-21.4

(b) Firm exit

2008			2014			Change from 2008	
Ranking	Region name	Exit rate	Ranking	Region name	Exit rate	Ranking	Exit rate
1	Republic of North Ossetia - Alania	123.3	1	Tula Region	130.3	72	101.5
2	Republic of Altai	101.8	2	Moscow	120.0	78	98.3
3	Altai Territory	77.3	3	Jewish Autonomous Region	117.5	19	61.3
4	Chuvash Republic	75.4	4	Republic of Kalmykia	113.1	46	74.4
5	Omsk Region	72.7	5	Arkhangelsk Region	111.3	67	82.1
6	Sakhalin Region	70.5	6	Perm Territory	109.4	59	77.2
7	Kabardino-Balkarian Republic	69.4	7	Novosibirsk Region	109.0	5	43.7
8	Tver Region	68.7	8	Republic of Bashkortostan	103.9	16	48.6
9	Chechen Republic	67.0	9	St. Petersburg	103.0	73	83.9
10	Republic of Udmurtia	66.7	10	Yaroslavl Region	101.5	52	67.9
11	Tambov Region	65.8	11	Republic of Mari El	101.4	4	38.6
12	Novosibirsk Region	65.3	12	Penza Region	100.1	15	47.5
13	Zabaikalsk Territory	63.8	13	Kostroma Region	93.4	41	55.9
14	Kemerovo Region	63.3	14	Republic of Altai	93.0	▲ 12	-8.8
15	Republic of Mari El	62.8	15	Chechen Republic	90.9	▲ 6	23.9
16	Orenburg Region	62.3	16	Tambov Region	90.3	▲ 5	24.5
17	Republic of Ingushetia	61.3	17	Yamal-Nenets Autonomous Area	90.1	60	64.3
18	Lipetsk Region	59.1	18	Sverdlovsk Region	89.6	49	57.8
19	Republic of Tuva	58.3	19	Omsk Region	86.8	▲ 14	14.1
20	Bryansk Region	57.5	20	Chukotka Autonomous Area	86.5	21	43.5
21	Ulyanovsk Region	57.5	21	Kamchatka Territory	86.5	55	59.5
22	Jewish Autonomous Region	56.2	22	Ulyanovsk Region	85.5	▲ 1	28.0
23	Kurgan Region	55.7	23	Altai Territory	83.4	▲ 20	6.1
24	Republic of Bashkortostan	55.3	24	Zabaikalsk Territory	81.3	▲ 11	17.5
25	Pskov Region	55.1	25	Nenets Autonomous Area	80.9	31	45.4
26	Smolensk Region	54.0	26	Lipetsk Region	80.1	▲ 8	21.0
27	Penza Region	52.6	27	Kabardino-Balkarian Republic	78.9	▲ 20	9.5
28	Kursk Region	51.9	28	Murmansk Region	75.0	7	29.1
29	Volgograd Region	51.6	29	Vladimir Region	74.9	39	43.3
30	Novgorod Region	51.4	30	Samara Region	74.8	10	30.8
31	Stavropol Territory	48.9	31	Republic of Ingushetia	74.7	▲ 14	13.4
32	Voronezh Region	47.3	32	Chelyabinsk Region	74.2	19	35.7
33	Republic of Karelia	47.2	33	Kemerovo Region	73.7	▲ 19	10.4
34	Amur Region	46.7	34	Tver Region	73.5	▲ 26	4.8
35	Murmansk Region	45.9	35	Primorsky Territory	73.3	39	45.3
36	Kaliningrad Region	45.4	36	Republic of Sakha (Yakutia)	72.7	8	31.4
37	Khabarovsk Territory	45.3	37	Vologda Region	71.9	12	32.1
38	Republic of Mordovia	45.0	38	Kirov Region	71.7	8	31.0
39	Tomsk Region	44.6	39	Republic of North Ossetia - Alania	71.0	▲ 38	-52.3
40	Samara Region	44.0	40	Orenburg Region	70.7	▲ 24	8.4
41	Chukotka Autonomous Area	43.0	41	Tyumen Region	70.5	29	38.9
42	Saratov Region	42.8	42	Voronezh Region	70.3	▲ 10	23.0
43	Rostov Region	41.6	43	Amur Region	69.7	▲ 9	23.0
44	Republic of Sakha (Yakutia)	41.3	44	Republic of Tatarstan	69.4	15	34.6
45	Republic of Buryatia	41.0	45	Nizhny Novgorod Region	66.2	2	25.5
46	Kirov Region	40.7	46	Republic of Tuva	65.9	▲ 27	7.6
47	Nizhny Novgorod Region	40.7	47	Saratov Region	65.6	▲ 5	22.8
48	Orel Region	40.0	48	Krasnoyarsk Territory	64.2	16	31.7
49	Vologda Region	39.8	49	Republic of Karelia	63.2	▲ 16	16.0
50	Republic of Kalmykia	38.7	50	Khabarovsk Territory	62.3	▲ 13	17.0
51	Chelyabinsk Region	38.5	51	Astrakhan Region	59.9	4	23.8
52	Ivanovo Region	38.2	52	Smolensk Region	59.7	▲ 26	5.7
53	Karachayevo-Circassian Republic	37.6	53	Kurgan Region	59.6	▲ 30	3.9
54	Kostroma Region	37.5	54	Volgograd Region	59.6	▲ 25	8.0
55	Astrakhan Region	36.1	55	Sakhalin Region	59.3	▲ 49	-11.2
56	Nenets Autonomous Area	35.5	56	Tomsk Region	59.2	▲ 17	14.6
57	Krasnodar Territory	35.5	57	Ivanovo Region	59.0	▲ 5	20.8
58	Ryazan Region	35.4	58	Rostov Region	57.7	▲ 15	16.1
59	Republic of Tatarstan	34.8	59	Orel Region	57.5	▲ 11	17.5
60	Irkutsk Region	34.4	60	Irkutsk Region	57.5	0	23.1
61	Magadan Region	34.2	61	Magadan Region	57.5	0	23.3
62	Yaroslavl Region	33.6	62	Belgorod Region	57.5	4	25.7
63	Republic of Daghestan	32.7	63	Leningrad Region	57.4	16	32.6
64	Krasnoyarsk Territory	32.5	64	Krasnodar Territory	56.3	▲ 7	20.8
65	Perm Territory	32.2	65	Ryazan Region	56.0	▲ 7	20.6
66	Belgorod Region	31.8	66	Republic of Mordovia	55.8	▲ 28	10.8
67	Sverdlovsk Region	31.8	67	Pskov Region	55.7	▲ 42	0.6
68	Vladimir Region	31.6	68	Chuvash Republic	55.5	▲ 64	-19.9
69	Republic of Komi	31.6	69	Republic of Khakasia	53.1	2	22.4
70	Tyumen Region	31.6	70	Bryansk Region	52.7	▲ 50	-4.8
71	Republic of Khakasia	30.7	71	Republic of Adygeya	52.5	7	27.5
72	Arkhangelsk Region	29.2	72	Kaliningrad Region	51.8	▲ 36	6.4
73	Tula Region	28.8	73	Republic of Udmurtia	51.4	▲ 63	-15.3
74	Primorsky Territory	28.0	74	Karachayevo-Circassian Republic	51.1	▲ 21	13.5
75	Kaluga Region	27.5	75	Republic of Komi	46.8	▲ 6	15.2
76	Kamchatka Territory	27.0	76	Republic of Buryatia	45.1	▲ 31	4.1
77	Yamal-Nenets Autonomous Area	25.8	77	Kaluga Region	42.4	▲ 2	14.9
78	Republic of Adygeya	25.0	78	Khanty-Mansi Autonomous Area - Yugra	42.2	3	22.6
79	Leningrad Region	24.8	79	Republic of Daghestan	39.3	▲ 16	6.6
80	Moscow	21.7	80	Moscow Region	36.8	3	19.2
81	Khanty-Mansi Autonomous Area - Yugra	19.6	81	Kursk Region	36.7	▲ 53	-15.2
82	St. Petersburg	19.1	82	Novgorod Region	35.6	▲ 52	-15.8
83	Moscow Region	17.6	83	Stavropol Territory	35.3	▲ 52	-13.6

Note: Firm entry and exit rate denote number of newly established and liqudated firms per 1,000 organizations, respectively.
Source: Russian Federal State Statistics Service (http://www.gks.ru/).

Table 2. Definition, descriptive statistics, and source of variables used in the empirical analysis

Variable group and name	Additional definition	Descriptive statistics					Source
		Mean	S.D.	Median	Max.	Min.	
Firm entry and exit variables							
Log of firm entry	Log of number of newly established firms per 1,000 organizations	4.50	0.21	4.50	5.52	3.57	Rosstat (http://www.gks.ru/)
Log of firm exit	Log of number of liqudated firms per 1,000 organizations	4.07	0.50	4.07	5.66	1.36	Rosstat
Institutional variables							
Log of duration of a lawsuit at a regional arbitration court (mean)	Data during 2007-2011	4.26	0.22	4.23	5.53	3.80	Dmitrieva et al. (2012)
Log of duration of a lawsuit at a regional arbitration court (median)	Data during 2007-2011	4.04	0.19	4.07	4.68	3.37	Dmitrieva et al. (2012)
Acceptance rate of petition by regional arbitration courts (%)	Data in 2014	94.75	2.21	95.10	98.54	87.70	Federal Arbitration court (http://www.arbitr.ru/)
Log of lawsuit application number to regional arbitration courts per 1,000 organization	Data in 2014	5.96	0.41	5.92	7.04	5.02	Federal Arbitration court (http://www.arbitr.ru/)
Expert criminal risk ranking	Lagged 3 year moving average	43.19	21.48	43.33	87.00	1.33	Expert rating agency (http://www.raexpert.ru/)
Economic integration variables							
Log of world oil price	Log of simple average of spot prices of Dated Brent, West Texas Intermediate, and the Dubai Fateh computed using monthly data	4.51	0.18	4.58	4.65	4.12	IMF Commodity Price Database (http://www.imf.org/external/np/res/commod/index.aspx/)
Total trade in % of GRP	Lagged 3 year moving average	23.85	21.33	17.27	133.93	0.03	Rosstat
FDI inflow in % of GRP	Lagged 3 year moving average	3.82	5.85	2.02	68.59	0.00	Rosstat
Log of direct distance from Brussels	Distance from region capital in kilo meters	8.11	0.44	7.99	9.04	7.04	Authors' calculation
Control variables							
GRP growth rate (%)	% to previous year; lagged 3 year moving average	3.98	3.49	3.80	16.27	-7.27	Rosstat
Log of number of credit organizations and their branchs per 100,000 residents	Lagged 3 year moving average	0.99	0.49	0.97	2.61	-2.48	Rosstat
Log of number of PCs with internet connection per 100 workers	Lagged 3 year moving average	2.48	0.50	2.54	3.90	0.29	Rosstat
Log of number of firms and organizations per 10,000 residents	Lagged 3 year moving average	5.49	0.40	5.49	6.95	4.20	Rosstat
Log of population density	Per km^2; lagged 3 year moving average	2.71	1.79	3.10	8.43	-2.65	Rosstat
Average temparature in January	In centigrade; lagged 3 year moving average	-12.29	7.67	-10.87	1.40	-34.10	Rosstat
Time trend dummy	2008=0	3.00	2.00	3.00	6.00	0.00	Authors' calculation

Source: Compiled by the authors.

Table 3. Panel data estimation of firm entry model in Russian regions

Dependent variable	Log of firm entry				
Estimation period	2008-2014				
Target regions	All regions				
Estimator	Random-effects	Random-effects	Random-effects	Random-effects	Fixed-effects
Model	[1]	[2]	[3]	[4]	[5]
Institutional variables					
Log of duration of a lawsuit at a regional arbitration court (mean)	-0.1148				
	(-0.960)				
Log of duration of a lawsuit at a regional arbitration court (median)		-0.0227			
		(-0.120)			
Acceptance rate of petition by regional arbitration courts (%)			-0.0184 *		
			(-1.810)		
Log of lawsuit application number to regional arbitration courts per 1,000 organization				-0.1705 ***	
				(-2.820)	
Expert criminal risk ranking	-0.0004	-0.0004	-0.0003	-0.0002	-0.0009 *
	(-0.800)	(-0.800)	(-0.610)	(-0.460)	(-1.790)
Economic integration variables					
Log of world oil price	0.4424 ***	0.4425 ***	0.4161 ***	0.4164 ***	0.4217 ***
	(14.850)	(14.970)	(13.360)	(13.610)	(14.530)
Total trade in % of GRP	-0.0013	-0.0013	-0.0011	-0.0012	-0.0007
	(-1.460)	(-1.520)	(-1.040)	(-1.120)	(-0.550)
FDI inflow in % of GRP	-0.0015	-0.0016	-0.0014	-0.0016	-0.0012
	(-0.740)	(-0.780)	(-0.620)	(-0.680)	(-0.450)
Log of direct distance from Brussels	0.1453	0.1187	0.1285	0.1299	
	(0.870)	(0.690)	(0.760)	(0.840)	
Control variables					
GRP growth rate (%)	0.0137 ***	0.0136 ***	0.0122 ***	0.0118 ***	0.0104 ***
	(6.900)	(6.850)	(4.450)	(4.330)	(4.280)
Log of number of credit organizations and their branchs per 100,000 residents	0.0478	0.0406	-0.1032	-0.0976	-0.1923 *
	(0.750)	(0.620)	(-1.530)	(-1.530)	(-1.690)
Log of number of PCs with internet connection per 100 workers	0.2361 *	0.2307 *	0.1647	0.1492	0.1369
	(1.800)	(1.730)	(1.120)	(1.040)	(1.020)
Log of number of firms and organizations per 10,000 residents	-0.3374 ***	-0.3517 ***	-0.2732 **	-0.3032 **	-0.7550 ***
	(-3.270)	(-3.470)	(-2.230)	(-2.460)	(-5.310)
Log of population density	0.0817 ***	0.0764 ***	0.0738 ***	0.0556 ***	0.1892
	(4.320)	(4.070)	(5.070)	(4.150)	(0.280)
Average temparature in January	0.0024	0.0025	-0.0021	-0.0016	-0.0030
	(0.820)	(0.870)	(-0.620)	(-0.500)	(-0.850)
Time trend dummy	-0.0766 ***	-0.0759 ***	-0.0718 ***	-0.0686 ***	-0.0702 ***
	(-3.280)	(-3.210)	(-2.710)	(-2.640)	(-2.700)
Constant term	3.0643 **	2.9831 **	4.5010 **	4.0051 ***	6.2841 ***
	(2.290)	(2.230)	(2.360)	(2.750)	(3.370)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes	No
Control for individual effects of regions	Yes	Yes	Yes	Yes	Yes
N	563	563	576	576	576
R^2	0.28	0.26	0.29	0.31	0.51
Breusch-Pagan test [a]	481.18 ***	491.66 ***	422.07 ***	407.13 ***	430.93 ***
Hausman-test [b]	-	-	-	-	154.50 ***
Wald test/F test (χ^2) [c]	872.52 ***	881.37 ***	677.00 ***	598.94 ***	57.26 ***

Notes:

[a] Null hypothesis: The variance of regional individual effects are zero.

[b] Null hypothesis: Random-effects assumption is valid.

[c] Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, resp

Source: Authors' estimation. See Table 2 for the definitions and descriptive statistics of the variables used in the estimation.

Table 4. Panel data estimation of firm exit model in Russian regions

Dependent variable	Log of firm exit				
Estimation period	2008-2014				
Target regions	All regions				
Estimator	Random-effects	Random-effects	Random-effects	Random-effects	Fixed-effects
Model	[1]	[2]	[3]	[4]	[5]
Institutional variables					
Log of duration of a lawsuit at a regional arbitration court (mean)	-0.4439 **				
	(-2.370)				
Log of duration of a lawsuit at a regional arbitration court (median)		-0.6972 ***			
		(-3.190)			
Acceptance rate of petition by regional arbitration courts (%)			-0.0341 **		
			(-2.180)		
Log of lawsuit application number to regional arbitration courts per 1,000 organization				0.1286	
				(1.250)	
Expert criminal risk ranking	-0.0025 **	-0.0023 **	-0.0023 **	-0.0019 *	-0.0018 *
	(-2.090)	(-1.980)	(-1.990)	(-1.640)	(-1.770)
Economic integration variables					
Log of world oil price	0.6838 ***	0.6796 ***	0.7019 ***	0.7029 ***	0.6603 ***
	(7.760)	(7.790)	(8.090)	(8.190)	(7.560)
Total trade in % of GRP	-0.0037 ***	-0.0028 ***	-0.0035 ***	-0.0035 ***	-0.0035 *
	(-3.370)	(-2.630)	(-3.190)	(-3.060)	(-1.640)
FDI inflow in % of GRP	0.0117 ***	0.0119 ***	0.0082 *	0.0095 *	0.0104 **
	(2.740)	(2.950)	(1.640)	(1.880)	(2.090)
Log of direct distance from Brussels	-0.3021	-0.1465	-0.3574 *	-0.4942 **	
	(-1.490)	(-0.730)	(-1.740)	(-2.280)	
Control variables					
GRP growth rate (%)	-0.0288 ***	-0.0294 ***	-0.0307 ***	-0.0302 ***	-0.0274 ***
	(-5.030)	(-5.040)	(-5.560)	(-5.660)	(-4.390)
Log of number of credit organizations and their branchs per 100,000 residents	0.0719	0.0821	-0.0662	-0.0452	0.1927
	(0.590)	(0.710)	(-0.550)	(-0.360)	(1.270)
Log of number of PCs with internet connection per 100 workers	-0.2784 *	-0.2533	-0.2187	-0.2312	-0.1517
	(-1.770)	(-1.540)	(-1.350)	(-1.450)	(-0.970)
Log of number of firms and organizations per 10,000 residents	0.3455 **	0.3395 **	0.2623 *	0.3067 *	0.3301
	(2.240)	(2.270)	(1.840)	(1.840)	(0.570)
Log of population density	0.0695 ***	0.0675 ***	0.0526 **	0.0499 **	2.0269
	(3.190)	(3.300)	(2.390)	(2.140)	(1.300)
Average temparature in January	-0.0265 ***	-0.0269 ***	-0.0259 ***	-0.0253 ***	-0.0456 ***
	(-4.080)	(-4.340)	(-3.720)	(-3.690)	(-4.840)
Time trend dummy	0.0937 ***	0.0897 ***	0.0771 **	0.0811 **	0.0742 **
	(2.720)	(2.580)	(2.130)	(2.250)	(1.970)
Constant term	3.3873 **	3.0776 *	5.6176 **	2.4230	-6.6001
	(1.990)	(1.790)	(2.410)	(1.370)	(-1.050)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes	No
Control for individual effects of regions	Yes	Yes	Yes	Yes	Yes
N	562	562	575	575	575
R^2	0.43	0.44	0.42	0.41	0.46
Breusch-Pagan test [a]	49.88 ***	39.46 ***	42.14 ***	48.34 ***	53.04 ***
Hausman-test [b]	-	-	-	-	32.37 ***
Wald test/F test (χ^2) [c]	557.34 ***	538.54 ***	531.72 ***	511.81 ***	42.58 ***

Notes:

[a] Null hypothesis: The variance of regional individual effects are zero.

[b] Null hypothesis: Random-effects assumption is valid.

[c] Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table 2 for the definitions and descriptive statistics of the variables used in the estimation.

Table 5. Examination of heterogeneity among Russian regions

(a) Firm entry

Dependent variable	Log of firm entry			
Estimation period	2008-2014			
Target regions	North Caucasus and Southern Districts	Central and Northwest Districts	Volga and Urals Districts	Siberian and Far East Districts
Estimator	Pooling OLS	Random-effects	Random-effects	Random-effects
Model	[1]	[2]	[3]	[4]
Institutional variables				
Log of lawsuit application number to regional arbitration courts per 1,000 organization	0.0360	-0.2088 **	-0.0954	-0.2357 ***
	(0.330)	(-1.990)	(-0.530)	(-3.730)
Expert criminal risk ranking	0.0028	-0.0002	-0.0001	-0.00037
	(1.160)	(-0.250)	(-0.150)	(-0.610)
Economic integration variables				
Log of world oil price	0.5613 ***	0.4811 ***	0.4131 ***	0.3730 ***
	(4.400)	(9.000)	(9.670)	(6.490)
Total trade in % of GRP	-0.0051 **	0.0001	0.0032	0.0000
	(-2.470)	(0.060)	(1.210)	(-0.040)
FDI inflow in % of GRP	-0.0307	-0.0048	-0.0070	0.0001
	(-1.050)	(-0.960)	(-1.280)	(0.070)
Log of direct distance from Brussels	-0.4690	0.6934 ***	-0.1648	0.1763
	(-0.500)	(3.230)	(-0.270)	(1.210)
Control variables				
GRP growth rate (%)	0.0227 *	0.0070 **	0.0146 ***	0.0095 ***
	(1.740)	(2.040)	(3.760)	(3.060)
Log of number of credit organizations and their branchs per 100,000 residents	-0.0409	0.0298	0.1291	-0.1484 ***
	(-0.610)	(0.240)	(0.930)	(-2.820)
Log of number of PCs with internet connection per 100 workers	-0.0054	-0.1838 *	-0.0993	-0.0021
	(-0.040)	(-1.750)	(-0.650)	(-0.040)
Log of number of firms and organizations per 10,000 residents	-0.1159	-0.1930	-0.1216	-0.1013
	(-0.890)	(-1.430)	(-0.730)	(-1.200)
Log of population density	0.2299 ***	0.0703 ***	0.0334	0.0660 **
	(3.730)	(2.670)	(0.720)	(2.540)
Average temparature in January	-0.0408 ***	0.0179 ***	0.0025	-0.0101 ***
	(-2.770)	(3.430)	(0.750)	(-2.820)
Time trend dummy	-0.0233	0.0062	0.0027	-0.0563 ***
	(-0.690)	(0.290)	(0.080)	(-4.990)
Constant term	5.1432	-0.2498	5.2981	3.3762 **
	(0.680)	(-0.120)	(0.880)	(2.130)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes
Control for individual effects of regions	No	Yes	Yes	Yes
N	90	203	140	143
R^2	0.49	0.33	0.22	0.67
Breusch-Pagan test [a]	0.00	206.42 ***	55.14 ***	26.41 ***
Wald test/F test (χ^2) [b]	6.48 ***	377.07 ***	2207.91 ***	1766.72 ***

(b) Firm exit

Dependent variable	Log of firm exit			
Estimation period	2008-2014			
Target regions	North Caucasus and Southern Districts	Central and Northwest Districts	Volga and Urals Districts	Siberian and Far East Districts
Estimator	Pooling OLS	Random-effects	Random-effects	Pooling OLS
Model	[1]	[2]	[3]	[4]
Institutional variables				
Log of duration of a lawsuit at a regional arbitration court (median)	-0.5783 *	-0.7549 **	-1.1080 *	-0.1469
	(-1.670)	(-2.250)	(-1.770)	(-0.470)
Expert criminal risk ranking	-0.0049	-0.0039 *	-0.0059 ***	-0.0005
	(-1.150)	(-1.800)	(-2.750)	(-0.260)
Economic integration variables				
Log of world oil price	0.8414 **	0.4158 ***	0.5878 ***	0.7513 ***
	(2.530)	(3.230)	(3.060)	(4.310)
Total trade in % of GRP	0.0004	0.0008	-0.0097 *	-0.0052 ***
	(0.060)	(0.350)	(-1.830)	(-2.660)
FDI inflow in % of GRP	0.0061	-0.0055	0.0274 *	0.0102 ***
	(0.110)	(-0.470)	(1.660)	(3.010)
Log of direct distance from Brussels	4.4697 **	-0.5696	1.7801 *	0.0310
	(2.160)	(-1.110)	(1.680)	(0.080)
Control variables				
GRP growth rate (%)	-0.0413 **	-0.0397 ***	-0.0209	-0.0090
	(-2.310)	(-3.860)	(-1.590)	(-0.850)
Log of number of credit organizations and their branchs per 100,000 residents	-0.9893 *	0.1923	0.7060 ***	0.1871
	(-1.870)	(1.130)	(2.930)	(1.240)
Log of number of PCs with internet connection per 100 workers	0.8113 **	-0.4048 *	-0.8634 ***	-0.6831 ***
	(2.160)	(-1.850)	(-2.930)	(-5.490)
Log of number of firms and organizations per 10,000 residents	0.9106 **	0.0100	0.7951 ***	0.4955 ***
	(2.190)	(0.050)	(2.910)	(3.770)
Log of population density	0.4113 **	0.1487 ***	0.2502 ***	0.1045 *
	(2.510)	(3.880)	(2.920)	(1.920)
Average temparature in January	-0.0566 **	-0.0796 ***	-0.0276 **	-0.0118
	(-2.010)	(-5.550)	(-2.040)	(-1.140)
Time trend dummy	-0.1791 **	0.1133 **	0.2206 ***	0.1768 ***
	(-2.190)	(2.270)	(3.450)	(6.520)
Constant term	-39.5232 **	9.1650 ***	-13.0383 *	-2.0756
	(-2.240)	(2.620)	(-1.760)	(-0.520)
Control for district-level fixed-effects	Yes	Yes	Yes	Yes
Control for individual effects of regions	No	Yes	Yes	No
N	84	196	140	142
R^2	0.58	0.52	0.50	0.48
Breusch-Pagan test [a]	0.00	3.45 **	1.84 *	0.19
Wald test/F test (χ^2) [b]	4.77 ***	369.94 ***	444.54 ***	10.09 ***

Notes:

[a] Null hypothesis: The variance of regional individual effects are zero.

[b] Null hypothesis: All coefficients are zero.

Figures in parentheses beneath regression coefficients are t statistics computed basing on robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimation. See Table 2 for the definitions and descriptive statistics of the variables used in the estimation.