The importance of institutional and organizational characteristics for the use of fixed-term contracts in Russia[1*]

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Abstract

Fixed-term contracts are becoming more used instead of the traditional model of open-ended employment. The authors examine the influence of institutional and organizational factors on the use of fixed-term contracts in Russia, with data from a survey covering 3 313 enterprises[2] for the years 2009 to 2011. Probit and Tobit regressions are used to test several hypotheses derived from the literature. The results indicate that state-owned and unionised enterprises are more likely to use fixed-term contracts, and a high level of perceived dismissal protection for permanent workers is positively associated with the use of fixed-term contracts. Both the incidence and the intensity of fixed-term contracts are lower at enterprises with flexible wages. Among the organizational factors, the presence of workers with a tenure of 5-10 years and high job complexity are negatively related with the use fixed-term contracts.

Keywords: fixed-term contracts; non-standard employment; labour flexibility; Russia
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The most popular form of non-standard labour contracts in Russia is that of fixed-term contracts; the level and scope of their use has become comparable to Western countries. In 2014, the proportion of employees in the European Union (EU) with a contract of limited duration (fixed-term employment) was 14.0% – just in-between the 1.5% in Romania and the 28.3% in Poland (Eurofond 2016). The share of employees working under fixed-term contracts at all the enterprises

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2 Throughout the text, we use the terms enterprise, firm and company synonymously to refer to elements in the Russian Enterprise Survey (RES).

in Russia accounts for an average of 6% of the employed population (Gimpelson/Kapeliushnikov 2006), which is below the corresponding level of 11% in developing countries (Aleksynska/Berg 2016).

Our study explains how fixed-term labour contracts have become so popular and what the reasons are for enterprises' demand for fixed-term contracts in Russia. Other forms of non-standard labour contracts, like agency work, are not included in the empirical analysis of this paper. If the term "non-standard labour contract" is used in the text, then it is merely to differentiate such contracts from the standard (open-ended) labour contracts.

Our research is based on a widely used methodology (Houseman 2001; Hagen 2003; Pfeifer 2005). In this study, like other authors (such as Van Jaarsveld et al. 2009; Liu 2015; Aleksynska/Berg 2016), we consider the institutional and organizational reasons for enterprises using fixed-term contracts. The case of Russia is of interest because it still maintains a strong Soviet-inherited influence of the administrative-command system. Through the example of Russia, we may conclude that an increase in the use of fixed-term contracts can take place not only under the influence of liberal reforms, which have occurred in many European countries since the 1970 s, but that it can also take place while maintaining high employment protection, a considerable share of state property, and with the participation of trade unions. Thus, by studying the case of Russia, we can not only test the significance of the impact of institutional and organizational factors on the use of fixed-term contracts, but also learn more about the Russian model of a market economy with a strong state influence.

We use data for 2009-2011 on 3 313 enterprises, each with more than 50 employees, that are representative of Russia, subject to the size constraint. This survey provides information about the economic situation and adopted management practices. We consider the level of perceived dismissal protection for permanent workers, as well as the share of state ownership, trade union influence and wage flexibility (wage arrears, performance-related pay) as institutional factors. We also consider the organizational factors that characterise labour management and the personnel structure of enterprises, indirectly reflecting their technical and technological level. Among such factors, we consider investment in specific human capital (measured by tenure) and job complexity (measured by the presence of blue-collar workers as an indicator of manual work, whose tasks can be closely supervised) (Goldthorpe 2000). We evaluate the impact of institutional and organizational factors on the likelihood and intensity of the use of fixed-term contracts with the help of Probit and Tobit regressions.

This research provides information that helps to elaborate on the impact of institutions and the costs of fixed-term contracts on how enterprises align their demand for and supply of labour. The case of Russia adds details for studies about

the use of fixed-term contracts during the transition to a market economy, still lacking important market institutions and still under strong state influence.

Institutional background

According to the Russian Federation Labour Code (RFLC), enterprises have the legal right to conclude fixed-term labour contracts for a period of up to five years, provided that certain reasons apply with exceptions for some categories of workers and jobs (RFLC 2001).

A fixed-term labour contract can be concluded for those cases when labour relations cannot be established for an open-ended period of time due to the nature of the job and/or the conditions of its realization (Article 58 of RFLC. The reasons for using a fixed-term labour contract include (Article 57 of RFLC):

1. the temporary absence of employees with a valid contract;
2. a job of a temporary nature (lasting up to two months or seasonal work);
3. an urgent labour demand for an activity which is different from the regular job;
4. a labour demand for additional production activity in case it is known in advance that these jobs have a temporary nature (lasting up to one year);
5. jobs fulfilled during a probation period and additional professional training;
6. jobs of a preliminary fixed term; and
7. cases when a hired employee is a full-time student or an old-age pensioner, or holds more than one job, or when employees are hired for the position of top managers or other positions selected in a competition.

Small businesses, including individual entrepreneurs, can conclude fixed-term labour contracts without restrictions if their total number of employees does not exceed 35 (20 for retail trade and consumer services).

The main advantage of fixed-term contracts for employers is the lower cost of dismissal. Employees with a fixed-term contract have the same social entitlements as employees working under open-ended (standard) labour contracts. But the former are not entitled to severance payment when their contracts expire.

The use of fixed-term labour contracts is currently restricted by the RFLC:

1. Fixed-term labour contracts are not allowed if it is found that they restrict any legitimate right(s) and/or insurance arrangements of employees (Article 58 of RFLC).
2. Unlike in many European countries, enterprises in Russia do not have the right to renew fixed-term labour contracts in succession with the same employee involved in the same operation. If, however, this fact is established, the Supreme Court of the Russian Federation (Court) has the right to declare

a labour contract as open-ended (Resolution of the Plenum of the Supreme Court of the Russian Federation 2004).[3]

3. Moreover, a fixed-term contract can be declared open-ended if the Court establishes that the employee was forced to sign it.
4. Once a fixed-term contract has expired but the employee continues to work and the employer does not demand that the contract be terminated, it becomes open-ended (Article 58 of RFLC).
5. If a fixed-term contract does not specify its duration, it is automatically declared as open-ended (Article 58 of RFLC).

Literature review and hypotheses

Competition and uncertainty generate adjustment needs for enterprises. Successful performance in a market environment requires some form of flexibility, for instance through restructuring and human resource management (Roca-Puig et al. 2008).

At the firm level, there are three principal means of securing flexibility (Atkinson 1987; Beatson 1995). (1) *External or numerical flexibility* is the ability of enterprises to change the number of workers they employ by making use of "non-standard employment" (part-time, temporary and seasonal employees, fixed-term contracts, freelance work, and homework or outsourcing). (2) *Internal or functional flexibility* is the ability of enterprises to vary the amount and content of the regular labour they use. It is accomplished by allocating workers to different tasks. Internal (or functional) flexibility requires employees with a high level of cooperation, time flexibility, education, extensive training and the use of self-managed teams or job rotation. (3) *Wage (reward) or financial flexibility* is the ability of pay and payment systems to respond to labour market conditions. It includes rewards for improved performance (e.g. performance-related pay) but also some degree of loss sharing in the case of negative external shocks.

In this article, we consider only fixed-term employment contracts, as one of the types of external labour flexibility. The two basic reasons for the use of fixed-term contracts are to shield regular employees from being laid off when the employer's demand is temporarily reduced and to have the ability to deal with greater variability in production volume without the need to increase the size of the regular workforce (Valverde et al. 2000; Gramm/Schnell 2001).

The benefits associated with this policy are a greater capacity to adapt and lower fixed labour costs incurred (Matusik/Hill 1998). At the same time, this policy

3 An enterprise will be obliged not only to restore the workplace for an employee, to compensate earning losses and moral damage, and to pay a fine, but it will also lose the right to continue its activity for a period of up to three months.

can be counterproductive if its use works against the enterprises' commitment to hiring, developing and retaining skilled workers (Appelbaum et al. 2000). Goudswaard/de Nanteuil (2000) provide a classification of various forms of internal and external flexibility, and demonstrate with case studies on various sectors that there is large variety in how enterprises use flexibility and what consequences this has for working conditions. An excellent overview of the determinants of fixed-term contracts is provided by Aleksynska and Berg (2016). The following hypotheses build on this and other work, with the focus on Russia.

Employment protection and cost advantages

In theory, high levels of dismissal protection for permanent workers and low entry barriers for temporary workers should be associated with a large proportion of the workforce being hired on fixed-term contracts (Kahn 2007; Baranowska/Gebel 2010; Boeri 2011).

One implication of the Mortensen-Pissarides model (Mortensen/Pissarides 1999) is that the share of fixed-term contract workers increases with the strictness of employment (dismissal) protection for open-ended contracts (Boeri 2011). Terminating an employment relationship with permanent workers, at the initiative of the employer, usually entails certain costs, including severance payments, costs associated with notification procedures and other compensatory payments if the terminations are unfair (Lazear 1990; Lindbeck/Snower 2001; OECD 2011). The use of fixed-term contracts has often been explained by the significantly lower dismissal costs, as compared to open-ended work contracts. At the end of a fixed-term contract, the employer generally does not need to provide any reasons to justify the end of the employment relationship.

The RFLC differentiates strongly between open-ended and fixed-term work contracts (OECD 2011). While regular contracts are more protected than in any Organization for Economic Cooperation and Development (OECD) member country except Portugal, fixed-term contracts are much less protected than on average in OECD countries. What makes employment protection strict is mainly a notice period and a severance pay obligation of two months wages, independent of the tenure of the contract in the case of job separation of a regular contract. Both regulations are absent from temporary work contracts. This makes an open-ended contract more expensive than a fixed-term work contract in the case of filling a temporary vacancy. Fixed-term contracts provide a cost-saving possibility to achieve numerical flexibility.

However, the results of some studies show that an increase in external flexibility can have a positive or a negative effect on enterprises' performance, depending on the level of internal flexibility (Roca-Puig et al. 2008). Thus, for example, in enterprises with low internal labour flexibility – i.e. in those with little investment in training and employees with a low level of education – it could be bene-

ficial to increase the number of employees with temporary contracts. On the contrary, for enterprises with high internal flexibility, an increase in external flexibility could be damaging, with a significant fall of economic performance, if it reduced the degree of cooperation from the regular workers, especially in the case of innovation activities (Michie/Sheehan-Quinn 2001).

Hypothesis 1: A high level of perceived dismissal protection for permanent workers is positively associated with the use of fixed-term contracts.

Enterprises can use several modes of labour flexibility as they react to demand fluctuations (Pfeifer 2005). They will choose between the different modes of flexibility by comparing their costs. Some researchers (such as Kalleberg 2001; Lepak/Snell 2002; Lepak et al. 2003; Cappelli/Neumark 2004) argue that external and internal labour flexibility are interdependent approaches. While for authors such as Tüselmann (1996) and Appelbaum et al. (2000) the two labour flexibility approaches are substitutes, Kalleberg (2001) and Lepak et al. (2003) consider them as complements. This is a very complex issue which goes beyond the scope of a single paper, and some authors are even proposing the establishment of a new discipline dealing exclusively with the management of flexibility (Goudswaard/De Nanteuil 2000).

Wage flexibility

Wage flexibility is an alternative to numerical flexibility (Clarke/Borisov 1999). Wage flexibility allows real wages to respond to changing macroeconomic conditions such as adverse shocks.

The different modes of labour flexibility can support or substitute each other so that all labour markets develop some form of adaptability. Alternative combinations of numerical and wage flexibility can achieve a similar level of overall adaptability.

The Russian model of decentralised wage determination responds to the economic situation at individual enterprise level. Survey information about wage flexibility includes arrears of wages and performance-based pay. Performance-based pay dominates since 1992 (Kapeliushnikov 2007). The start of market reforms in Russia meant the abolition of most of the administrative constraints that had operated under the previous economic regime. Enterprises were granted the right to make decisions on most issues relating to the setting and changing of wages. A strong positive connection between performance indicators and the level of wages is not just valid "in fact", but is formalised and enshrined in the existing staff remuneration systems. According to some estimates, the payroll fund is formed in direct proportion to revenues in 60% of enterprises (Kapeliushnikov 2007). Performance-related pay in such an institutional environment

means that enterprises are willing to "share" with their workers part of the gains while workers are willing to carry part of the losses.

From 1992 to 2008, direct government regulation remained only in the public sector where the single tariff scale was introduced. In the centrally planned system, the enterprise autonomy index in wage policy was equal to slightly over 30 points, but since the beginning of reforms, it has fluctuated in the range of 70-80 points (Kapeliushnikov 2007). When setting wages, heads of enterprises have more freedom than in setting prices for manufactured products (Kapeliushnikov 2007).

Wage arrears are a Russian phenomenon, which practically does not exist anywhere else (Earle/Sabirianova Peter 2004). In 2006, the RFLC was amended with an article on the liability of the employer for the violation of the terms of payment of wages (Article 142 of RFLC). This increased the cost for enterprises to use wage flexibility in the form of wage arrears. Due to possible fines, this simultaneously made fixed-term contracts more attractive for enterprises.

Wage flexibility and numerical flexibility (fixed-term contracts) are therefore more likely to be substitutes of each other than complementary of each other. In this case, if the costs of labour adjustment by wage flexibility are higher than the adjustment costs of fixed-term contracts, enterprises are more likely to use fixed-term contracts (and vice versa).

Hypothesis 2: Wage flexibility is negatively associated with the use of fixed-term contracts.

State ownership

State-owned enterprises (SOEs) have softer budget constraints than private enterprises (Kornai 1979; Earle/Estrin 2003). Therefore, SOEs will not necessarily use fixed-term work contracts for saving costs.

SOEs in Russia usually serve a stable market, dominated by public procurement (Augustynowicz 2014). For this reason, they have fewer incentives than private enterprises to use fixed-term contracts to adapt to fluctuations in demand.

Nevertheless, SOEs may use fixed-term work contracts to reduce the cost of implementing projects with funding from the state. If savings can be kept, these funds can be directed to the promotion of regular employees.

In addition, SOEs in Russia often downsize an inherited, oversized labour force from Soviet times (Kapeliushnikov 1998). To achieve a gradual release of employees, they can replace permanent jobs with temporary jobs. They transfer a portion of the permanent workers to fixed-term employment contracts.

Hypothesis 3: State ownership is positively associated with the use of fixed-term contracts.

Trade unions

According to dual labour market theory and the core-periphery hypothesis, non-standard employment can be interpreted as a firm's peripheral workforce while regular employment is the core workforce (Kalleberg 2001; Cappelli/Neumark 2004). The core-periphery hypothesis implies that the regular employees gain more job security due to the use of a flexible workforce since non-standard employment is used as a "buffer" which is adjusted to demand fluctuations (Booth et al. 2002). Moreover, the core workforce has better working conditions, including a higher income. This should lead to lower layoffs and quits among the regular employees, which results in higher job stability.

Trade unions mainly have members belonging to the core workforce and tolerate an internal dual labour market if this does not lead to the substitution of the core through the marginal workforce. This also explains why the local trade union in a company usually accepts such initiatives from management although the central trade union opposes them in principle (Atkinson 1987). In Germany, the probability of non-standard contracts increases with the existence of a collective agreement (Kaiser/Pfeiffer 2000), and the ambivalent influence of labour councils is confirmed empirically (Boockmann/Hagen 2003).

In Russia, about 45% of the total number of workers employed at enterprises of all forms of ownership is organised in a trade union (Kozina 2007). Like in other countries, a decrease in the share of industrial production personnel due to technological development and innovation has been leading to a weakening of trade unions' positions (Vermuyten 2004).

In addition, there are uniquely Russian features characterising the position of trade unions. Firstly, the Soviet past has left its mark on Russian trade unions. In Russia, trade unions did not become independent organisations able to negotiate better working conditions for employees. Also, Russian trade unions have been extremely slow in gaining awareness of their independent role as a representative of workers' interests.

Secondly, trade unions in Russia are somewhat heterogeneous. At present, there are two types of trade unions at Russian enterprises: the so-called "old" ones, which constitute the majority and act on the principles of the past Soviet life, in fact performing the function of social patronage over workers (Sobolev 2007), and the "new" trade unions, which are relatively small organisations that have appeared in response to the intensification of contradictions in the labour sphere and which try to act within the framework of classical trade unionism (Kozina 2007).

Thirdly, the growing importance of multinational corporations, followed by the introduction of new management practices, has resulted in a reduction of trade union members at the expense of highly skilled groups of workers and managers. At the same time, it has revealed the need to strengthen the protection of workers' rights. The traditional activity of Russian trade unions in the distribution of social services and the exchange of information with employees, inherited from the Soviet past, has proven inadequate in the new economic situation.

Fourthly, legislation directs unions to interact with employers at the enterprise level. However, in practice such cooperation appears to be difficult, since the real owner to negotiate with can only be introduced at company management level. This requires the establishment of horizontal and vertical links between the professional organisations of different companies that are part of a corporation (holding), which are hampered by regional and sectoral differences in the interest of primary trade unions, and which often face resistance from management.

Nevertheless, after the exodus of union members in the years of economic reforms, there has been a revival of trade union membership in recent years. Still, trade unions in Russia have not yet become a fully-fledged party, equal in strength in the negotiation process. In this regard, they are still too weak and fragmented to confront the expansion of non-standard employment contracts offered by management.

Hypothesis 4: The presence of trade union on enterprises is positively associated with fixed-term contracts.

Enterprise-specific human capital

Enterprise-specific human capital is a long-run investment. Hence, if the contract of the employees ends after a relatively short period of time, there is little incentive for enterprises to invest in the specific human capital of these employees. Therefore, an increasing share of fixed-term contracts should go in line with decreasing investments in enterprise-specific human capital (Booth et al. 2002; Arulampalam et al. 2004). Moreover, enterprises offering further training tend to make use of regular contracts rather than temporary employment (Albert et al. 2005; Shire et al. 2009). Enterprises that do not provide vocational training have higher shares of temporary workers. Consequently, the ever-increasing share of employees with temporary contracts reduces labour productivity due to lower investments in firm-specific human capital.

Enterprises need to ensure that they have sufficient and knowledgeable staff to carry out the core operations of the enterprise and ensure its survival. Thus, enterprises seek the right balance between stability and flexibility in their workforce. Economists have long recognised that enterprises operate with this consideration in mind. Within an enterprise, there are essentially two labour mar-

kets: a primary (or internal) market consisting of jobs that are well-paid, stable and with career opportunities, and a secondary (or external) market, which is lower-paid, lower-skilled and with fewer career opportunities (Doeringer/ Piore 1971).

This dualism can arise along the permanent-vs-temporary workers divide endogenously as a response to demand fluctuations (Saint-Paul 1996). As adjusting labour to demand fluctuations is costly, enterprises have an incentive to differentiate contract forms between scarce qualified workers and unqualified workers, the latter of which are easy to replace.

As fixed-term workers are found in the secondary segment, they become trapped in a cycle of fixed-term jobs and unemployment, and experience low wages and low wage growth.

In general, researchers have found fixed-term workers to earn less than comparable permanent employees, although this wage differential falls away when unobserved heterogeneity is accounted for (Booth et al. 2002; Mertens/McGinnity 2004; Gash 2008). Workers on fixed-term contracts in Spain earn nearly 50% less than permanent workers, compared with 32% less in Germany. When accounting for the differences between jobs and individuals, the mean penalty falls to 18% in both countries.

A partial labour market reform can provide incentives for employers to use fixed-term contracts for low-educated workers (Esping-Andersen/Regini 2000; Blanchard/Landier 2002). However, empirical evidence suggests that, in Germany, for example, fixed-term contracts are not confined to the low-skilled sector (Giesecke/Groß 2003; Buchholz/Kurz 2005). In Spain, Polavieja (2006) has found that the segmenting consequences of fixed-term contracts occurred in both high-skilled and low-skilled occupations. And although, in Spain, fixed-term contracts are predominantly used for low-skilled jobs performed by individuals with low qualifications, in Germany fixed-term contract workers have a more heterogeneous skills profile (Mertens et al. 2007). In France, employers increased the concentration of low-educated workers in temporary jobs with low adjustment costs (DiPrete et al. 2006).

Moreover, the fixed-term contract may have different implications for professionals and for unskilled manual workers. In Germany, there is a non-linear (U-form) relationship between a worker's educational level and the risk of holding a temporary employment contract. High shares of temporary contracts are observed for low-educated persons without vocational training but also for holders of university degrees (Giesecke/Groß 2003; Hagen 2004; Mertens/McGinnity 2004; Mertens 2007). Furthermore, there are differences in the wage penalty between high-skilled and low-skilled fixed-term workers (Mertens/McGinnity 2004).

In Russia, the stability of employment and the accumulation of enterprise-specific human capital have substantially declined since 1994, and specific human capital has not been valued (Malzeva 2009). Employees have not received any positive return on specific human capital, and they have also faced a penalty for their specificity. Between 2000 and 2006, a one-year increase in the duration of the relationship with the same employer led to a decrease in wages of 0.8% (on average).

This happened for two reasons. Firstly, mobility proved more favourable to employees in the context of economic reforms. All else being equal, individuals who changed jobs between 2000 and 2006 gained 14.22% in wages compared to those who continued to work in the same place (Malzeva 2009).

Secondly, due to economic globalisation and the development of the services sector, many business processes have become standardised. They require common competencies, not specific ones. In addition, management practices like outsourcing reduce the scope for internal labour markets, and labour productivity in several occupations does not change when people change companies. When the accumulation of specific human capital is reduced, we can expect an increase in the level of demand for fixed-term contracts. This could also be the case for highly skilled specialists. Their employment in enterprises can fill gaps but is not likely to initiate productivity-increasing interactions, which need time to materialise. However, given the information in our sample, this hypothesis can only be tested on a very general level. Future research could shed more light on the extent to which technologies in enterprises with a higher share of highly qualified temporary workers becomes more standardised with limited possibilities for enterprise-specific innovations.

Hypothesis 5: The demand for fixed-term contracts increases with falling enterprise-specific human capital requirements.

Job complexity

Technological change and the accompanying innovations have an influence on the structure of the workforce. On one side, such innovations can simplify work and downgrade skills requirements. On the other side, innovations can also require higher qualifications (skills-biased technological change), for instance computer and Internet literacy.

Computerization (digitalization) changes the distribution of job tasks. According to OECD estimates, on average less than 10% of workers in the OECD area are in jobs that are at risk of being replaced by machines, but 25% are in jobs where a high percentage of tasks (50-70%) could be automated (Arntz et al. 2016). This underlines the need for flexible skills which would allow workers to shift to new tasks that are difficult to automate. As a result, workers today, for example

in Germany, compared to those in the 1970 s must have a more varied skills set enabling them to perform multiple tasks rather than one specific task (Becker/ Muendler 2015).

Global employment trends indicate that physical, routine and machine-using tasks are in decline, while intellectual tasks, social tasks and the use of information and communication technology are experiencing steady growth.

Technological progress leads to job polarization (Autor et al. 2003; Autor et al. 2006, 2008; Goos/Manning 2007 for Great Britain; Goos et al. 2009 for 16 European countries; Autor/Dorn 2013 for the United States (US)). Job polarization decreases the demand for medium-skilled labour relative to both skilled and unskilled labour. In recent years, routine task methods have shrunk in structural terms (because the most routine occupations are in decline) while traditionally non-routine occupations have become considerably routinised. At the same time, the growth of regular work contracts (core employment) is increasingly confined to top-quintile, well-paid jobs; in all other quintiles of wage distribution, it is decreasing and being partly replaced by non-standard employment (Eurofond 2016).

At the same time, the heterogeneity of workers and jobs is the main reason for labour market segmentation, generating a core and a periphery at enterprise level.

Computerization (digitalization) is having a profound impact on the design of organisations and human resource practices within firms (Holmstrom/Milgrom 1994; Milgrom/Roberts 1995; Laing 2011). Modern human resource management is diverse and depends on finding the right mix of policies that fit the firm's overall organizational design. Human resource management practices are becoming more important (Bloom et al. 2012). For example, US-owned firms exploit information from people management practices (concerning promotions, rewards, hiring and firing) to increase productivity. An emerging literature has shifted the focus to trade in tasks rather than trade in physical output (Grossman/ Rossi-Hansberg 2008). The authors argue that the traditional view to classify workers as skilled or unskilled fails to capture the complexity of production. Workers, they say, should be classified according to the task they perform rather than their level of education. In routine jobs that require low levels of tasks, the demand for knowledgeable workers is limited. And vice versa: fixed-term employment contracts are less likely concluded for jobs with high complexity levels. The substitution of regular work contracts through fixed-term work contracts is more likely for low-productivity workplaces, where effort and human capital play a less important role and control costs are usually low.

According to studies of stages of economic growth (Acemoglu et al. 2006, 2007), Russia is classified as a catching-up country (Gorban et al. 2010). The

country has an innovative model of the "garage" type (Schumpeter Model 1). It is based on common and available knowledge, and within its framework enterprises prefer to hire workers from outside their business environment rather than "growing" them to accumulate the necessary knowledge and skills.

Due to the import and adaptation of advanced technologies, big enterprises serve as the main drivers of productivity growth. However, using the technology and the experience of foreign enterprises means that the level of innovative activity within local enterprises remains relatively low. In this regard, Russian enterprises still have a high proportion of manual workers (blue-collar employees) performing routine tasks. In Russia, the share of blue-collar workers is almost three times higher (38%) than in the US (13.6%). However, in 2000-2015 this number decreased by about 20% for unskilled and by about 10% for skilled blue-collar workers, while total employment increased by about 11% (Kapeliushnikov 2017). Many of the skills required to perform these tasks can be applied by employees regardless of their occupations. Such skills and knowledge are gained relatively rapidly, thus workers can be easily replaced.

Hypothesis 6: The presence of blue-collar workers increases the demand for workers on fixed-term contracts.

Methods

Sample

The data used for the present study were obtained from a representative Survey of Enterprises in Russia (RES) for 2009-2011. The sample was created on two criteria: firm size and type of sectors. Data were formed based on interviews with managers of enterprises.

The sample consisted of 3 313 enterprises, each with more than 50 employees, operating in mining, manufacturing, construction, transport and communication, trade, finance, and business services. The sample was not a panel, and the enterprises changed in each year surveyed. The questionnaires for a particular year repeated almost 90% of the questions in the preceding years.

The database obtained includes both current and retrospective information covering enterprises' main characteristics, which are subdivided into four groups. The first group includes factors characterising the employment structure and its demographic composition. The second includes factors showing enterprises' strategic behaviour (innovations and investments, organizational characteristics) and their personnel policy (recruitment and dismissal share, vacancies, employee training, employees' leave without payment, part-time employment, and reduction of wages). The third group includes factors of enterprise characteristics (enterprise age, ownership status, size, industrial sector, and region). Finally, the fourth group includes factors of enterprises' external appraisal of the present

economic and institutional situation (changes over time, labour legislation appraisal, assessments of factors creating obstacles, and threats for enterprise activity). RES was specifically designed for research about enterprises' use of fixed-term contracts.

Measures

In this paper, we analyse one type of non-standard labour contracts as a dependent variable: the general fixed-term contract, including all the types of fixed-term contracts signed by an enterprise with an employee for a specified period.

We examined both the incidence and the intensity of the use of fixed-term contracts (Houseman 2001; Olsen/Kalleberg 2004). First, we asked whether the respondents used fixed-term workers. Second, we asked what percentage of the workforce was covered by fixed-term contracts. Based on the responses to these questions, we constructed measures to reflect the incidence of use (i.e. whether these arrangements were in use at all) as well as the intensity of use (i.e. the extent to which they were being used).

Two categories of independent variables are included in our analysis: institutional characteristics and organizational characteristics.

To evaluate the institutional characteristics, we included the *perceived dismissal protection level* (stringency of law enforcement), with the value of 10 assigned to the maximum level of perceived dismissal protection for permanent workers and 1 as the minimum level. Theoretically, this variable could be subject to endogeneity. However, fixed-term contracts are not subject to dismissal protection. It is therefore unlikely that a higher share of fixed-term contracts leads to a response from management of higher perceived dismissal protection. We also estimated the extent of *wage flexibility* as an institutional characteristic. Wage flexibility was defined as a combination of wage arrears and performance-based pay. Enterprises use flexible wages (wage flexibility = 1) if they have wage arrears or if they use performance-based pay. In this case, endogeneity should not pose a problem because fixed-term contractors are usually only paid the base wage and do not receive bonuses, which depend on a minimum tenure. Even in the case of wage arrears, it is likely that the holders of temporary work contracts behave differently from those with standard work contracts. A temporary worker has nothing to gain from tolerating wage arrears because he/she cannot be rehired for legal reasons. A formal treatment of the endogeneity problem turned out not to be feasible. The data do not form a panel, and no appropriate instrumental variable could be found. The pressure on enterprises from institutional constituents to use fixed-term contracts was also measured by *state ownership* and *trade union presence*. We operationalised *state ownership* using a dummy variable indicating whether the enterprise was predominantly (>50%) owned by a state institution

(coded as 1). *Trade union presence* measured whether a union was present in the enterprise (also coded as 1).

We created two sets of indicator variables to measure organizational characteristics: (1) whether *the average tenure of workers was 5-10 years* (coded as 1) or whether it was *more than 15 years* (also coded as 1); and (2) whether *job complexity* in the enterprise characterised the execution of tasks using blue-collar workers (coded as 1 if the enterprise had blue-collar workers and 0 if it had only other workers)[4].

These are very crude measures of organizational characteristics. Future research could acquire more information about the qualification of employees as well as the different management practices.

We included an array of control variables in the analysis, based on previous research (Shire et al. 2009). Because larger organisations have more resources than smaller ones to create internal labour markets (Davis-Blake/Uzzi 1993), we measured size as a log transformation of the number of workers at an enterprise. A larger size allows firms to adjust to varying demand by internal reorganisation, including the training of new employees, over a larger base (Knoke/Kalleberg 1994).

We also controlled for other enterprise characteristics that previous research had investigated, including the enterprise age (age groups), sectors and years (Uzzi/Barsness 1998; Kalleberg/Reynolds 2000; Houseman 2001). The vector of control variables included nine age groups of enterprises (1: <= 1 year; 9: > 40 years) and seven industry dummies (mining, manufacturing, construction, transport and communication, trade, finance, and business services).

Enterprises in sectors with highly volatile demand are more likely to recur to fixed-term work (Cappelli/Keller 2013). Aggregate influences (e.g. macroeconomic conditions) are taken into consideration with dummy variables for the years 2009-2011.

We controlled for agglomeration effects (1 = city with a population of over 1 million; 4 = city with a population of less than 100 000). Enterprises in urban areas are more likely to use non-standard labour contracts, mainly because the supply of such workers is higher and the costs are lower (Abraham/Taylor 1996).

The differences in enterprises' employment structure are considered by the following variable: the share of female workers in total employment.

4 Our survey data of enterprises allow selecting only three groups of employees: blue-collar workers, managers, and engineering staff. According to the definition of international statistics, blue-collar workers perform manual work, but they can be either low skilled or highly qualified.

Of the surveyed enterprises, 8% were owned by the state, and unions were present in 18% of the sample. On average, 23% of the enterprises used wage flexibility, and they evaluated perceived dismissal protection at an average of 3.5 (maximum = 10) (Table A.1). The mean number of workers with a tenure of 5-10 years was 27% and the mean number of workers with a tenure of more than 15 years was only 7%, reflecting the high turnover in the Russian labour market (Demmou/Wörgötter 2015). The share of blue-collar workers in the sample was reported to be 42% and the share of female workers – 34% (Table A.1).

Half of the enterprises in the sample (50%) were up to 10 years old, and 15% were over the age of 40 years. More than half of the enterprises (58%) were in cities with a population of over 1 million. A total of 20% of the enterprises was in cities with a population of between 500 000 and 1 million people (Table A.1).

Most of the enterprises in the sample belonged to the industry sector (26%). In second and third place were enterprises of trade (16%) and construction (15%). The fourth and fifth places were occupied by enterprises of transport and communication (13%) and finance (13%) (Table A.1).

Assessing the *incidence* of the use of fixed-term contracts, we analysed the data using Probit regressions, which is the recommended analytical approach for estimating models with dichotomous dependent variables. In evaluating the *intensity* of the use of fixed-term contracts, we employed the left-censored Tobit analysis (Maddala 1992).

The results of the pooled sample Probit and Tobit models, together with their marginal effects, are presented in Table 1. Tables A.3 and A.4 in the Appendix contain detailed estimation results, where the institutional and organizational factors are included separately as well as together. While models 1-5 in Tables A.3-A.4 present the partial effects, model 6 shows the results of the full model.

Results

Descriptive findings

On average, 30% of enterprises in Russia used fixed-term contracts in 2009-2011 (Table A.1). The share of enterprises with fixed-term contracts increased between 2009 (20%) and 2010 (38%), and fell again in 2011 (31%) (Table A.2). In comparison, about 40% of enterprises in the developing countries employ temporary workers (Aleksynska/Berg 2016).

Together with the increasing number of enterprises using fixed-term labour contracts, the number of employees recruited under the conditions of these contracts was growing as well. In 2009-2011, the percentage of employees working on fixed-term contracts of the total number of employees increased from 5% to

about 6% (Table A.2). In comparison, the average share of temporary workers in the developing countries is 11% (Aleksynska/Berg 2016).

The intensity of using fixed-term labour contracts is characterised by the proportion of employees in enterprises, which use such contracts. In 2009-2011, on average, 19% of employees in enterprises using fixed-term contracts worked on such contracts. In comparison, among those enterprises that employ temporary workers in the developing countries, the average share is 27.5% (Aleksynska/Berg 2016).

The intensity of the use of fixed-term contracts was highest in 2009 (24.6%). Then, in 2010, the share of employees on such contracts in enterprises using fixed-term contracts was much lower (14%). However, with the economic recovery in 2011, the share of employees on fixed-term contracts in enterprises using fixed-term contracts increased again (20.3%) (Table A.2).

Empirical results of hypotheses testing

The estimation results provide strong support for the first four hypotheses. Specifically, unionised and state-owned enterprises are associated with 10% and 6% more fixed-term contracts respectively than non-state-owned and non-unionised enterprises (models 2 and 3 in Table A.3). But these effects remain significant and positive only for the unionised enterprises in the full model (model 6 in Table A.3 and Table 1).

The impact of the various institutional and organizational factors on the shares of fixed-term contracts in total employment is estimated with a pooled sample Tobit model (Table A.4 and Table 1). The results show that, in state-owned and unionised enterprises, not only the probability of using fixed-term contracts is higher but also the intensity of their use. Both effects are significant in the full model (Table 1).

The relation between the utilization of fixed-term contracts and the presence of trade unions is also linked with enterprise size. Often large enterprises have powerful trade unions. Fixed-term labour contracts provide a possibility for trade unions to protect incumbent employees (who are more likely to be their members) from dismissal. Thus, the subdivision of employees into insiders (those with open-ended contracts) and outsiders (those with fixed-term contracts) is in complete correspondence with trade unions' policy to protect their members. Our estimates find that the incidence and intensity of fixed-term labour contracts at large enterprises (Tables A.3 and A.4) and at enterprises with trade unions is rather high (Table 1).

An increase in the level of perceived dismissal protection for permanent workers leads to a higher probability that an enterprise will use fixed-term contracts: a one-unit increase in the level of perceived dismissal protection for permanent

workers is associated with 6% more fixed-term contracts (Table A.3 and Table 1). Also, an increase in the level of perceived dismissal protection for open-ended contracts leads to an increased intensity in the use of fixed-term contracts (Table A.4 and Table 1).

In addition, the presence of wage flexibility is significantly negatively correlated with the probability and intensity of using fixed-term contracts (Tables A.3, A.4 and Table 1). Enterprises with flexible wage schemes are 17% less likely to use fixed-term contracts. In enterprises with wage flexibility, the share of workers on fixed-term contracts is about 4% lower than in enterprises that do not have a flexible wage. These results support hypotheses 1-4, to the effect that enterprises in Russia use fixed-term contracts under the influence of institutional factors (Table 1).

The estimation results for the organizational factors (i.e. tenure and the share of blue-collar workers) are also presented in Tables A.3-A.4 and Table 1. When testing hypothesis 5, we proceeded from the fact that the average tenure of employees is a proxy for the accumulation of firm-specific human capital. Our results show that the influence of tenure on the use and share of fixed-term contracts is mostly significant only for the share of employees with tenure between 5 and 10 years. For these enterprises, the expected negative sign is confirmed (model 4 in Tables A.3-A.4). These effects also remain significant and negative in the full model (Table 1). This finding might indicate the complexity of internal labour markets in Russia. For example, the hiring and training costs are often larger for skilled workers, so that the use of fixed-term contracts for skilled workers is less attractive. Furthermore, skilled workers cannot be easily replaced by temporary workers with lower levels of human capital. From a labour supply perspective, skilled workers have better overall employment chances (e.g. lower unemployment), which should lead to a lower acceptance of fixed-term contracts among such workers (Pfeifer 2005).

The share of workers with a tenure of more than 15 years is significantly positively correlated with the probability of using fixed-term contracts (model 4 in Tables A.3-A.4), but it is not significant in the full model (Table 1). Our results are consistent with previous results on the impact of investments in specific human capital on the Russian labour market (Malzeva 2009). We also find that enterprises evaluate investments in specific human capital differently. If the tenure of workers exceeds 15 years (tenure > 15 years), the probability and intensity of fixed-term contracts increases. These workers had accumulated specific human capital in Soviet times, and they face little demand from enterprises. However, if the level of investments in specific human capital is less than 10 years (tenure <= 10 years), enterprises often have open-ended contracts with workers and are less likely to have workers with fixed-term employment contracts. Enterprises

evaluate human capital higher if it is accumulated in the post-Soviet era (Malzeva 2009).

Not only the qualification of workers, but also the quality of jobs has an impact on the use of fixed-term contracts. The lower the technology level, the lower the skills requirement. The greater the share of manual work in teams, the higher the proportion of blue-collar workers. Such workers are easier to find on the external labour market. They are also easier to replace. Therefore, blue-collar workers are more likely to be employed on fixed-term contracts than workers who perform more complex work. Our findings show that an enterprise with blue-collar workers is more likely to use fixed-term contracts; this is in line with hypothesis 6 (model 5 in Tables A.3-A.4).

Table 1. Incidence and intensity of fixed-term contracts

Variables	Incidence of fixed-term contracts (Probit model)		Intensity of fixed-term contracts (Tobit model)	
	dy/dx	Std. err.	dy/dx	Std. err.
Institutional characteristics				
Dismissal protection level	0,06**	0,03	1,68**	0,79
Wage flexibility (1 = yes)	-0,17***	0,02	-4,10***	0,58
Union presence (1 = yes)	0,08***	0,02	1,21**	0,58
State ownership (1 = yes)	0,04	0,03	1,45*	0,76
Organizational characteristics				
Workers with tenure of 5-10 years (1 = yes)	-0,07**	0,03	-2,43**	0,91
Workers with tenure of > 15 years (1 = yes)	0,06	0,05	0,77	1,40
Blue-collar workers in teams (1 = yes)	0,11***	0,03	3,15***	0,73
N (After eliminating observations with missing values for state-ownership)	3 296		3 296	

Note: Levels of significance: * = 0.10%; ** = 0.05%; *** = 0.01%

Most of the control variables were significant in the Probit and Tobit models (Tables A.3-A.4). Medium and large enterprises (with more than 500 employees) use fixed-term contracts more often. The availability of labour market infrastructure, such as employment services providers (for the search of employees, selection, training, manpower records management etc.), is correlated with the probability of using fixed-term contracts. An insufficient development of such market services, including labour market services, which was observed in

remote regions and in small and medium-sized cities (with a population of less than 1 million people), positively affected the utilization of fixed-term contracts by enterprises.

Enterprises with a large share of female workers tend to use fixed-term contracts more often, as female workers have a higher rate of temporary absence (Table A. 3). However, the share of female workers has no significant effect on the intensity of fixed-term contracts (Table A.4). The age of enterprises has a positive effect only on the probability of the use of fixed-term contracts. Enterprises aged 25-30 years use fixed-term contracts more often than other enterprises (Table A. 3). But the age of enterprises has no effect on the intensity of the use of fixed-term contracts (Table A.4). Fixed-term contracts are used more often and in greater numbers in construction enterprises than in the mining industry. Less incidence and intensity of fixed-term contracts was observed in trade and finance compared with the mining industry (Tables A.3-A.4).

Conclusions

Non-standard labour contracts started to be widely used in Russia since the reform period of the 1990 s. These include different types of fixed-term contracts. In Soviet times, the RFLC limited the application of fixed-term contracts, and the assignment of employees to their workplaces with minimal use of outside, auxiliary workers was the rule. Under the influence of reforms, the activity of enterprises in Russia became exposed to demand fluctuations and business cycles, increasing the number of temporary workplaces. In 2009-2011, 30% of enterprises used fixed-term contracts (on average); the percentage of employees working on fixed-term contracts in the total number of employees was about 6%. Thus, after 2000, the use of fixed-term labour contracts in Russia became similar to that in other countries.

Using enterprise-level survey data, we find that a high level of perceived dismissal protection for permanent workers, state ownership (of over 50%) and trade union presence are positively associated with an increased use of fixed-term contracts (hypotheses 1, 3, 4). These factors contribute to a dualization of the labour market in Russia and further aggravate the high inequality of incomes and opportunities (OECD 2011).

The probability of fixed-term contracts being used is lower at enterprises with wage flexibility (hypothesis 2). Wage flexibility includes wage arrears and performance-based pay. Our results suggest that wage flexibility is an alternative strategy for coping with external shocks. In this respect, wage flexibility and the use of fixed-term labour contracts are substitutes.

The impact of organizational factors is confirmed for fixed-term contracts. On the one hand, in the face of market-based competition for a skilled and stable

labour force, employers in Russia use tactics to promote long-term employment. Enterprises use fewer fixed-term contracts if they have workers with a tenure of more than 5 and less than 10 years (hypothesis 5).

On the other hand, enterprises search for ways to reduce costs in order to gain competitive advantages. All the risks of cost reduction are borne by workers who perform standardised functions (entailing fewer complex interactions between the workers and the production processes), who can be easily found in the labour market and replaced without any additional training. Such employees are often blue-collar workers, although they can also have specialized skills. The results we have obtained demonstrate that enterprises with blue-collar workers are more likely to use fixed-term contracts, and at a larger scale (hypothesis 6). This is a further indication that fixed-term contracts can contribute to a dualization in the labour market.

Our results also show that the intensity of employees with fixed-term contracts increases with the number of employees. The highest level of fixed-term contracts' incidence and intensity is observed in construction.

The use of fixed-term contracts makes the Russian labour market more flexible. Fixed-term labour contracts reduce job stability and make employment precarious. Additional risks of labour flexibility are borne by workers with a non-standard contract. As our research has shown, the expansion of state ownership (an increase in the number of state-owned enterprises) and the influence of trade unions in Russia do not limit the use of fixed-term contracts. On the contrary, under market conditions, state-owned firms and firms with a trade union use fixed-term contracts more widely.

The likelihood of using fixed-term contracts falls with investment in firm-specific human capital and higher job complexity. Increasing the level of professional skills and investing in firm-specific human capital can protect employees against fixed-term contracts (Eichhorst/Marx 2015). For example, labour market reforms in Germany and France have generally promoted developments in which the status and privileges of labour market insiders remain relatively well protected. Flexibility, necessary to stabilise the core of the workforce, is being achieved at the expense of a growing number of workers in "atypical" or "non-standard" employment relationships (Palier/Thelen 2010).

In general, employment prospects are favourable where human capacities and skills are complementary to technological possibilities (Eichhorst 2017). Workers able to perform at a high level are not easily found in the external labour market, and these types of tasks cannot be easily outsourced or automated. In

such cases, strict dismissal protection can foster innovation (Acharya et al. 2013).

This study represents only a first step in understanding how some institutional and organizational factors influence the use of fixed-term contracts in Russia. The limitations of the study are suggestive of possible research extensions. Future studies could examine the effect of other organizational factors. For example, what is the impact of training or outsourcing on the use of fixed-term contracts? It is not clear at this stage whether a bigger number of trained workers increases or decreases the number of fixed-term contracts in use. The outsourcing of business processes is accompanied by changes to the organizational structure of enterprises to get rid of non-core functions. Outsourcing increases the flexibility of enterprises and reduces job heterogeneity inside the enterprise. However, it increases the heterogeneity of jobs outside and can lead to labour market segmentation. Further research is needed to investigate whether outsourcing will increase the number of fixed-term contracts being used. Another area for research is the influence of digitalization on the structure of employment as well as the ratio of core and periphery of the workforce in Russia and other emerging economies in comparison with the more advanced economies.

In addition, our study does not cover the considerations of a more long-term nature. Kalleberg (2003), for instance, argues that more numerical flexibility in the form of non-standard labour contracts increases the insider-outsider divide of the labour force of a company. This could have negative consequences for teamwork and informal coordination, which could eventually lead to lower productivity. Indeed, Wang and Heyes (2017) find that, for a large sample of EU firms, a higher share of fixed-term contracts is associated with a lower level of labour productivity and, under certain conditions, also lower growth of labour productivity. On the other hand, Roca-Puig et al. (2008) find that the relations between flexibility and performance are not linear. There is no undisputed way in which flexibility is implemented by employers and experienced by workers. Our investigation offers a small, but a significant, part of an overall mosaic; for its completion more research is needed.

Further research could also shed some light on how greater labour flexibility associated with non-standard labour contracts affects hiring and job creation, as well as innovation and the productivity of enterprises in Russia. Furthermore, it should be investigated whether the employment of highly skilled temporary workers follows a similar pattern as the employment of temporary workers with standard skills.

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Appendix

Table A.1. Descriptive statistics

Variable	Mean	Std. dev.
Incidence of use of fixed-term contracts (1 = yes)	0,30	0,46
Workers with fixed-term contract, %	5,61	16,15
Dismissal protection level (max. = 10)	3,46	2,89
Wage flexibility (1 = yes)	0,23	0,42
Union presence (1 = yes)	0,18	0,38
State ownership (1 = yes)	0,08	0,27
Workers with tenure of 5-10 years (1 = yes)	0,27	0,26
Workers with tenure of > 15 years (1 = yes)	0,07	0,16
Blue-collar worker in teams (1 = yes)	0,42	0,32
Female workers (1 = yes)	0,34	0,29
Age, years	19,89	24,85
Age (ln)	2,43	1,09
Age groups:		
1 – =< 5 years	0,21	0,41
5 – <= 10 years	0,23	0,42
10 – <= 15 years	0,13	0,34
15 – <= 20 years	0,16	0,37
20 – <= 25 years	0,02	0,15
25 – <= 30 years	0,01	0,10
30 – <= 40 years	0,03	0,17
> 40 years	0,15	0,36
Size (ln)	4,56	1,51
Location size:		
500 000 – 1 000 000	0,20	0,40
100 000 – 500 000	0,10	0,30
< 100 000	0,12	0,33
Sectors:		
Industry	0,26	0,44
Construction	0,15	0,35
Trade	0,16	0,36
Transport and communications	0,13	0,34
Finance	0,13	0,33
Business services	0,06	0,25

Table A.2. Fixed-term contracts in 2009-2011, %

Types of contracts	Years			
	2009	2010	2011	2009-2011
Share of enterprises with fixed-term contracts	20,23	38,16	31,12	29,79
	(40,19)	(48,60)	(46,32)	(45,74)
Share of employees with fixed-term contracts (basis: all enterprises)	4,98	5,35	6,31	5,61
	(16,12)	(14,39)	(17,37)	(16,15)
N (all enterprises)	1 038	980	1 295	3 313
Share of employees with fixed-term contracts (basis: enterprises with fixed-term contracts)	24,61	14,01	20,29	18,83
	(28,36)	(20,53)	(26,21)	(25,04)
N (enterprises with fixed-term contracts)	210	374	403	987

Note: The numbers in brackets are standard deviations.

Table A.3. Incidence of fixed-term contracts (Probit model)

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Institutional Characteristics												
Dismissal protection level (max=10)	0,06**	0,03									0,06**	0,03
Wage flexibility (1= yes)	-0,17***	0,02									-0,17***	0,02
Union Presence (1= yes)			0,10***	0,02							0,08***	0,02
State ownership (1= yes)					0,06**	0,03					0,04	0,03
Organizational Characteristics												
Workers with tenure from 5 to 10 years (1=yes)							-0,07**	0,03			-0,07**	0,03
Workers with tenure >15 years (1= yes)							0,11**	0,05			0,06	0,05
Blue color worker Force in Teams (1= yes)									0,10***	0,03	0,11***	0,03
Control Variables												
Female workers (1=yes)	0,06**	0,03	0,07**	0,03	0,07**	0,03	0,07**	0,03	0,08**	0,03	0,06**	0,03
Age Groups:												
1 - =< 5 years	0,07*	0,04	0,08**	0,04	0,08**	0,04	0,09**	0,04	0,08**	0,04	0,08**	0,04
5 - <= 10years	0,05	0,04	0,06	0,04	0,06	0,04	0,08**	0,04	0,06*	0,04	0,07*	0,04
10 - <= 15 years	0,01	0,04	0,02	0,04	0,02	0,04	0,04	0,04	0,02	0,04	0,03	0,04
15 - <= 20 years	0,06	0,04	0,07	0,04	0,07	0,04	0,08**	0,04	0,07*	0,04	0,07*	0,04
20 - <= 25 years	-0,01	0,06	-0,01	0,06	-0,01	0,06	0,01	0,06	0,00	0,06	-0,01	0,06
25 - <= 30 years	0,21**	0,09	0,21**	0,09	0,21**	0,09	0,22**	0,09	0,21**	0,09	0,19**	0,09
30 - <= 40 years	0,09	0,06	0,07	0,06	0,08	0,06	0,10*	0,06	0,10*	0,06	0,07	0,06
>40 years	0,10**	0,04	0,10**	0,04	0,11**	0,04	0,12**	0,04	0,12***	0,04	0,08*	0,04

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Size (ln employment)	0,05***	0,01	0,05***	0,01	0,06***	0,01	0,05***	0,01	0,05***	0,01	0,04***	0,01
Years: (2009=ref.)												
2010	0,09***	0,02	0,07***	0,02	0,08***	0,02	0,07**	0,02	0,08***	0,02	0,09***	0,02
2011	0,03	0,02	0,02	0,02	0,02	0,02	0,01	0,02	0,02	0,02	0,03	0,02
Locality, Cities with population: (>1 million=ref.)												
500 thousand - 1 million	0,06**	0,02	0,07***	0,02	0,07***	0,02	0,06***	0,02	0,07***	0,02	0,05**	0,02
100 thousand - 500 thousand	0,03	0,03	0,05*	0,03	0,06**	0,03	0,06**	0,03	0,06**	0,03	0,03	0,03
< 100 thousand	0,09***	0,03	0,10***	0,03	0,10***	0,03	0,11***	0,03	0,11***	0,03	0,08***	0,03
Sectors: (mining=ref.)												
Industry	0,01	0,03	0,01	0,03	0,00	0,03	0,01	0,03	0,01	0,03	0,00	0,03
Construction	0,08**	0,03	0,07**	0,03	0,07**	0,03	0,07**	0,03	0,06**	0,03	0,08**	0,03
Trade	-0,07**	0,03	-0,06**	0,03	-0,07**	0,03	-0,07**	0,03	-0,06**	0,03	-0,06**	0,03
Transport and Communications	-0,03	0,03	-0,03	0,03	-0,03	0,03	-0,03	0,03	-0,03	0,03	-0,03	0,03
Finance	-0,03	0,03	-0,02	0,03	-0,03	0,03	-0,02	0,03	0,01	0,04	0,00	0,03
Business Services	0,04	0,04	0,04	0,04	0,04	0,04	0,05	0,04	0,08*	0,05	0,06	0,04
Log pseudo likelihood	-1823,39		-1855,01		-1861,78		-1860,5		-1858,1		-1798,75	
Wald chi2	337,85***		296,25***		279,47***		283,18***		290,46***		384,43***	
Pseudo R2	0,09		0,08		0,07		0,08		0,08		0,11	
Correctly classified	71,74%		71,77%		71,42%		71,26%		72,04%		72,42%	
Number of observation	3298		3298		3296		3298		3298		3296	

Note: Levels of significance: * = 0.10%; ** = 0.05%; *** = 0.01%; [a] after elimination of missing values for state ownership.

Table A.4. Intensity of fixed-term contracts (Tobit model)

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Institutional Characteristics												
Dismissal protection level (max=10)	1,63**	0,79									1,68**	0,79
Wage flexibility (1= yes)	-4,02***	0,58									-4,10***	0,58
Union Presence (1= yes)			1,72**	0,57							1,21**	0,58
State ownership (1= yes)					1,67**	0,76					1,45*	0,76
Organizational Characteristics												
Workers with tenure from 5 to 10 years (1=yes)							-2,48**	0,92			-2,43**	0,91
Workers with tenure >15 years (1= yes)							1,69	1,40			0,77	1,40
Blue color worker Force in Teams (1= yes)									2,91***	0,73	3,15***	0,73
Control Variables												
Female workers (1=yes)	0,77	0,84	0,99	0,84	0,99	0,84	1,01	0,84	1,12	0,84	0,71	0,84
Age Groups	yes		yes		yes		yes		yes		yes	
Size(ln)	0,62***	0,18	0,58***	0,18	0,68***	0,18	0,67***	0,18	0,65***	0,18	0,35*	0,18
Years: (2009=ref.)												
2010	2,55***	0,61	2,15***	0,61	2,29***	0,61	1,94***	0,62	2,16***	0,61	2,33***	0,62
2011	1,89***	0,62	1,62***	0,57	1,65***	0,56	1,39**	0,57	1,70***	0,56	1,78***	0,62
Locality, Cities with population: (>1 million=ref.)												
500 thousand - 1 million	0,67	0,56	0,95*	0,56	0,96*	0,56	0,88	0,56	0,92	0,56	0,59	0,56
100 thousand - 500 thousand	0,66	0,73	1,12	0,74	1,31*	0,74	1,26*	0,74	1,24*	0,74	0,66	0,73

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
< 100 thousand	1,63**	0,71	2,03**	0,72	2,06***	0,72	2,12***	0,72	2,07***	0,72	1,56**	0,71
Sectors: (mining=ref.)												
Industry	-0,65	0,76	-0,70	0,77	-0,78	0,77	-0,65	0,77	-0,64	0,76	-0,83	0,76
Construction	2,54**	0,92	2,27**	0,91	2,21**	0,92	2,19**	0,91	2,23***	0,90	2,47**	0,91
Trade	-2,30**	0,87	-2,17**	0,88	-2,26**	0,88	-2,25***	0,87	-2,01**	0,87	-2,13***	0,87
Transport and Communications	-1,17	0,87	-1,21	0,87	-1,39	0,88	-1,25	0,87	-1,13	0,86	-1,39	0,86
Finance	-1,94**	0,94	-1,73*	0,94	-1,83**	0,95	-1,82**	0,94	-0,85	0,99	-1,00	0,98
Business Services	0,94	1,24	1,09	1,26	1,01	1,26	1,16	1,26	2,09	1,31	1,76	1,30
LR chi2(28)	190,9***		140,7***		136,6***		141,8***		147,5***		229,2***	
Log likelihood	-5908,87		-5933,98		-5930,88		-5933,42		-5930,59		-5884,63	
Number of observation	3298		3298		3296		3298		3298		3296	

Note: Levels of significance: * = 0.10%; ** = 0.05%; *** = 0.01%; [a] after elimination of missing values for state ownership.