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NON-STANDARD CONTRACTS, FLEXIBILITY AND EMPLOYMENT ADJUSTMENT: EMPIRICAL EVIDENCE FROM RUSSIAN ESTABLISHMENT DATA

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Abstract/Résumé

Non-standard contracts, flexibility and employment adjustment: Empirical evidence from Russian establishment data

This paper examines the use of two forms of non-standard work contracts in Russia with data from an enterprise survey for the years 2009 to 2011. Non-standard work contracts are less costly and more flexible for employers. Internal adjustment in form of wage cuts or unpaid leave is not covered by the Labour Code and earlier practices to impose such measures are less tolerated. Therefore more firms use non-standard work contracts for external flexibility. Statistical analysis shows that companies using non-standard work contracts have similar unobserved characteristics and consider fixed-term contracts and agency work as complements. The main concern for policy is the growing danger of duality following the asymmetric distribution of adjustment costs for workers.

JEL Classification: J41; J21; J63; J23

Keywords: labour contracts, employment level, labour turnover, Russia

Contrats atypiques, flexibilité et ajustement de l'emploi: enseignements tirés de données sur les établissements en Russie

Cet article examine l'utilisation de deux formes de contrats de travail atypiques en Russie sur la base d'une enquête réalisée auprès des entreprises de 2009 à 2011. Les contrats de travail atypiques sont moins coûteux et plus flexibles pour les employeurs. Les ajustements internes sous la forme de réductions de salaires ou de congés sans solde ne sont pas couverts par le Code du travail et les pratiques antérieures visant à imposer de telles mesures sont moins tolérées. Par conséquent davantage d'entreprises utilisent des contrats de travail atypiques pour accroître leur flexibilité externe. L'analyse statistique montre que les entreprises utilisant des contrats de travail atypiques ont des caractéristiques non observées similaires et considèrent les contrats à durée déterminée et le travail intérimaire comme des compléments. Une préoccupation du point de vue des politiques publiques est le risque croissant de dualisme lié à une distribution asymétrique des coûts d'ajustement pour les travailleurs.

Classification JEL: J41; J21; J63; J23

Mots clés: Contrat de travail, niveau d'emploi, rotation de la main d'œuvre, Russie

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1. Introduction

The application of new forms of labour contracts in Russia increases steadily. It can be already compared with European countries like Germany as well as advanced transition economies like Estonia, Lithuania or Poland (Smirnykh, 2010). In other words, non-standard labour contracts are becoming more important for employees and employers on the Russian labour market, which appears to function relatively well with a low rate of unemployment and a high degree of wage flexibility (OECD, 2011).

However, a related feature of the Russian economy is the comparatively large productivity difference between firms (Brown and Earle, 2013). Underutilisation of labour is not taking the form of open unemployment, but rather persistent productivity differences, accompanied by similar wage differences. Indeed, Russia belongs to a group of countries with very high income inequality (Global Wealth Report, 2013).

Non-standard work contracts play a growing role to adjust to adverse shocks on the labour market. Outright violation of contractual obligations of enterprises by accumulating wage arrears is less tolerated now than during the first decade of transition (OECD, 2009). Therefore other adjustment strategies become more widely used. Non-standard wage contracts have lower termination costs and usually provide less access to social protection. In general, the share of temporary work contracts is higher in countries with stricter employment protection legislation (Annex 1, Figure 1).

Employment contracts and the strictness of employment protection for standard labour contracts shape labour market performance in different ways without a clear pattern. Extreme cases are the United States with its light employment protection and a high degree of external flexibility without the significant use of temporary work contracts and Spain with a high share of temporary workers absorbing all the external flexibility and very strict employment protection without much internal flexibility. An intermediate case is Germany where employment protection legislation is strict, but internal flexibility is high and firm-specific human capital is important. External flexibility is more characteristic for non-standard work contracts (Hüfner et al., 2012). In Turkey on the other hand, with similarly strict employment protection legislation, external flexibility mainly takes place by movement in and out of informality (Gönenc et al., 2012). Non-standard work contracts therefore can contribute to the risk of

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duality on the labour market if there is a difference of social protection and taxation, which provides incentives to substitute standard labour contracts by non-standard labour contracts.

This study identifies factors which increase the probability for a company to use non-standard work contracts and to employ workers on such contracts. Two types of non-standard labour contracts are distinguished - general fixed-term contracts including all types of fixed-term contracts signed by an enterprise with an employee for a specified period of time and agency work contracts, *i.e.* when a labour contract for a specified period of time is signed by an employer and an employment agency (a company supplying manpower to enterprises for a specified period of time). In the latter case there is no contract relation between the employer and the worker.

This paper will focus on three questions:

- What are important factors for the use of non-standard work contracts?
- What is the relation between regular and non-standard work contracts?
- What impact does the increasing use of non-standard work contracts have on worker flows (hiring and firing, labour turnover and labour churning)?

The paper is organised in four substantive sections. The first section describes the regulation of non-standard work contracts in Russia. The second section provides a motivation for looking at non-standard work contracts as a duality threat when standard work contracts do not allow a sufficiently flexible response to adverse shocks on the labour market. The third describes data and methodology. The fourth section presents the results of the empirical analysis. The main findings are summarized in the conclusions.

2. Regulation of non-standard work contracts

According to the Russian Federation Labour Code (RFLC), enterprises have the legal right to conclude fixed-term labour contracts for a period of five years at most, but it does not apply to all workers nor for all categories of jobs (RFLC, 2001).

A fixed-term labour contract is specified for those cases when labour relations cannot be established for an indefinite period of time due to the nature of the job or conditions of its realisation (Article 58 of RFLC). Reasons for a fixed-term labour contract (Article 57 of RFLC) include:

a) the temporary absence of an employee from the workplace for which she has the legal right;
b) a job of temporary nature (up to two months or seasonal work);
c) an urgent labour demand for an activity which is different from a regular job;
d) a labour demand for an additional production activity in case it is known in advance that these jobs have a temporary nature (up to one year);
e) jobs fulfilled in the course of a probation period (to assess the fit with the job requirements at the workplace) and additional professional training;
f) jobs of a preliminary fixed term with an unknown date of its completion;
g) when a hired employee is a full-time student, an old-age pensioner or holds more than one job, if an employee is hired for a top manager or a chief accountant position, appointed in the course of a competition and in any other cases specified by the RFLC or by other federal laws.

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

Fixed-term labour contracts are used by enterprises not only due to reasons specified in the RFLC but also for the adaptation to demand fluctuations and as a longer probation period for selected employees.[3]

The main advantage of fixed term contracts for employers is the lower cost of dismissal. During the duration of the fixed-term contract employees have the same social guarantees as employees working under indefinite (standard) labour contracts. But they are not entitled to a severance payment when their contract expires. Thus the dismissal of employees working under fixed-term labour contracts is less expensive and manpower covered with fixed-term labour contracts is more profitable.

The use and benefits of fixed-term labour contracts are currently restricted by the RFLC:

- Fixed-term labour contracts are not allowed in case it is found that they avoid providing employees with their legitimate rights and insurance arrangements (Article 58 of RFLC).
- Unlike in many European countries, enterprises in Russia do not have any right to conclude several fixed-term labour contracts in succession with one and the same employee involved in one and the same labour operation. If this fact is established the Court has the right to declare a labour contract as indefinite[4] (Resolution of the Plenum of the Supreme Court of RF, March 17, 2004, No. 2).
- Moreover a fixed-term contract can be declared indefinite if the Court establishes that the employee was forced to sign it.
- Upon expiration of a fixed-term contract, if the employee continues to work and the employer does not demand the termination of the contract, it becomes indefinite (Article 58 of RFLC).
- If a fixed-term contract does not specify its validity period it is automatically declared as indefinite (Article 58 of RFLC).

When these institutional limitations apply and a fixed-term contract is not feasible, enterprises may use alternative external forms of labour flexibility, i.e. agency labour for example.

Agency labour, similar to fixed-term contracts, is one of the types of temporary employment. Like all other types of non-standard employment it is of temporary nature. Contracts signed with agency employees are fixed-term contracts.

Despite this similarity, agency labour differs significantly from other types of temporary employment. It is based on the cooperation of three members (an agency employee, an enterprise-user and a company-provider) contrary to other types of temporary employment with only two members (an employee and an employer).

The peculiarity of agency labour in Russia lies in the fact that until recently this specific type of temporary employment was not included into the RFLC. Accordingly, all the problems of agency labour application at enterprises were solved by the Civil and Tax Codes of Russian Federation.

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3. According to the Russian Labour Code (RFLC) the probation period cannot exceed three months and six months for top managers and their deputies. The probation cannot be longer than two weeks for fixed-term labour contracts signed for the period from two and up to six months. The probation for temporary work employees with an employment period of up to two month is not established (Article 289 of RFLC) and it should not exceed two weeks for seasonal workers (Article 70 of RFLC). The probation does not include an employee's temporary disability and other legitimate periods when she is not at work.

4. An enterprise will be obliged not only to restore the workplace for an employee, to compensate his loss of earnings, moral damage and to pay fine, but it will also loose the right to continue its activity for the period of up to three months.

However since January 1, 2014 and as per the Federal Law 421-FZ of 28.12.2013 "About the specific assessment of labour conditions", the RFLC has included some supplements which rule out civil law contracts for labour relations between employees and employers (Article 15 of RFLC). The coverage of labour law was extended (Article 19 of RFLC). The term of "actual employee" was established. It specifies the party for whom an agency worker performs a jobs and who should pay for the employees' labour (Article 67 of RFLC). Employers need to have a labour contract with all workers. The employer is held administratively responsible for other contract forms with its workers.

Moreover, according to a more recent Federal Law (116-FL of 5.05.2014), a new concept of "employees' (personnel) labour provision" will be applied in Russia from 2016 on. It will signify that an employer will send his employees by their consent to physical or juridical entities to work for a certain period of time managed and controlled by the receiving party. Thus the Law includes the time limitations for agency labour provision. The legal rights to provide employees will be granted to both accredited private employment agencies with fixed capital of not less than one million rouble, with an agency manager fulfilling certain qualification requirements[5] and to other juridical entities if they are affiliated by the receiving party or possess a corporate agreement, for example, as a shareholder.

Small and medium-sized enterprises enjoying preferential tax treatment and private entrepreneurs cannot perform as a party "providing employees labour", thus cannot act as labour agencies. However the latest changes in legislation do not completely prohibit agency labour. Necessary measures were taken for its regulation based on previous experience with agency labour.

The missing proper legal control of agency labour led to widespread informality. In particular organisations (companies-providers) providing enterprises-users with agency labour workers operated on the basis of a simplified taxation system (STS) and were exempt from value added tax (VAT).[6] It resulted in widespread tax evasion. Moreover Russia was lagging behind other countries in the provision of social security and workplace safety conditions for agency workers. On the one hand the ILO Convention № 181, regulating the utilisation of agency labour was not ratified in Russia.[7] On the other hand RFLC was not covering agency labour. Legal rights and obligations of agency workers were not explicitly specified in Russia up to recently.[8] As a result all aspects of social protection concerning agency workers' rights were placed outside the scope of labour legislation.

Following new rules set by the Agency Labour Law (FL-116 of 5.05.2014), enterprises cannot use agency workers on unhealthy and dangerous jobs, on sea and mixed navigation (river-sea) vessels or in construction.

5. Employment agency manager should have higher education and previous experience in the field of people employment of not less than two years within the period of last three years, unavailability of criminal record for personal crimes or crimes in the field of economics.

6. The STS allowed the rate decrease of insurance fees contributed to off-budget funds (Retirement Fund, Social Security Fund, and Obligatory Medical Insurance Fund) for many organisations comparing them with the usual size of the given rates. Under a certain conditions the rates of insurance fees according to STS are not at all specified (Federal Law 212-FL, 2009) for some types of labour activity and employees categories.

7. Though the given Convention is also not ratified in many other countries (United States, Germany, France, United Kingdom) using agency labour.

8. This includes legislative standards for agency labour which control parties financial responsibility, industrial safety, overtime payment, the duration of labour contract with agency workers, terms of its renewal and its prolongation on a perpetual basis, assessment of labour experience and the establishment of guarantees for medical certificates and vacations payments.

The social insurance rates for agency workers will be calculated not on the basis of the company-provider activity[9] but on the basis of receiving party operations (enterprise-user). The supplied labour value (agency labour) is considered to be an enterprise-user's expense.

Currently, agency workers are not accumulating benefits for the continuous service at an enterprise; they do not have the right to take part in a collective agreement of an enterprise, to receive bonuses for collective labour results and so on. An enterprise trade union cannot protect agency workers interests. These workers are not covered by regional privileges;[10] they are not eligible for benefits when performing unhealthy jobs and jobs with future preferential (early retirement) pension etc. All these drawbacks explain employee's aversion against agency labour.

According to the new law on agency labour, from 2016 the conditions of labour remuneration for employees working under an agency contract should not be worse than those of enterprise-user's employees with the same labour functions and the same qualification.

All these innovations still preserve incentives for employers to use agency labour. They lie in the fact that according to the Russian Tax Code (RFTC, §19, item 1, article 264)[11] enterprise expenses for using agency labour decrease their corporate income tax base.

3. A literature survey

Labour adjustments can occur in different ways. Firms have several options to react to demand-induced output fluctuations (Pfeifer, 2005). They can use internal or (and) external forms of flexibility. Firms will normally make use of more than one instrument of adjustment. Each form can be subdivided into functional and numerical flexibility. Instruments of internal labour supply flexibility comprise working time flexibility (overtime, short-time work, flexible work schedules). Instruments of external labour supply flexibility comprise employment adjustments (layoffs, hiring, fixed-term contracts). Functional instruments of internal flexibility (in-house transfers of employees, training and life-long learning) can help to adjust output to shocks or implement strategic restructuring measures without changing the labour force of a firm.

The need for firms to react flexibly to demand fluctuations has long been discussed (Brodsky, 1994). Companies facing large job-separation and hiring costs and workers with a significant share of company-specific human capital prefer internal flexibility over external flexibility (Bellmann and Alda, 2004). Instruments used in this respect are functional flexibility, hours flexibility and wage flexibility. However, such forms of flexibility are limited. Wages and hours can vary only within the restrictions set by law and collective agreements, as well as technology-specific aspects, which determine the fixed costs of a workplace. Therefore it is not surprising that employers use also external flexibility in the form of fixed-term contracts to adjust to demand shocks (Hagen, 2003).

Once the possibilities of internal and functional flexibility are exhausted, external flexibility measures (layoffs or hiring new employees) must be applied (Capelli and Neumark, 2001). Usually all forms of hours flexibility are exploited before agency work is used (Bellmann, 2012). Laying off workers is

9. These organisations very often operate on the basis of simplified taxation system and the rates of social payments are decreased or unavailable for them.

10. If agency employees perform their labour activity in the region with regional privileges and their real employer is registered in a region without privileges of this kind.

11. It means costs on employees supply services (technical and managerial personnel) provided by outside organisations for participating in the production process, production management or for performing some other functions related to production and (or) to sales of products (services).

associated with potentially hard-to-predict separation costs, especially if the job separation involves court proceedings. Fixed-term contracts and agency work imply smaller adjustment costs than open-ended (standard) work contracts. According to probit estimates demand fluctuations and employment protection legislation for standard work contracts are significant factors influencing the demand for non-standard work contracts (Hagen and Bockmann, 2002).

The Russian Labour Code differentiates between regular and temporary work contracts (OECD, 2011). While the regular contract is more protected than in any OECD country except Portugal temporary contracts are much less protected than on average in OECD countries. This is mainly because of a notice period and severance pay obligation of two months, independent of the tenure of the contract in case of job separation of a regular contract. Both regulations are absent for temporary work contracts. This makes a regular contract more expensive than a temporary work contract in the case of filling a temporary vacancy. The following hypotheses (motivated by the theoretical literature) are the basis for the specification of the empirical estimates in the subsequent section.

a) Firms use non-standard work contracts for external flexibility in case of demand shocks. They prefer fixed-term contracts and agency work contracts to avoid the relatively high job-separation costs, which are coming together with hiring workers on open-ended contracts for temporary labour demand needs.

   Relative cost advantages play a role for determining the structure of the employed labour force. However, the relative wage costs of labour hired with standard or non-standard contracts is not clear. On one side, the theory of compensating wage differentials (Rosen, 1986; Wang and Weiss, 1998; Boockmann and Hagen, 2001) predicts that non-standard contracts are more expensive, because they have to compensate the lower security and job-protection on such jobs. On the other side, workers employed with non-standard contracts are usually less well organised and have less bargaining power, resulting in lower wages and fewer fringe benefits. Empirical studies find more evidence for a negative wage differential for workers employed with a non-standard contract (Booth et al., 2002; Houseman, 2001; Hagen, 2002; Kwasnicka and Werwatz, 2002, 2003). A wage cost advantage of non-standard work contracts has however to be balanced against the advantages of higher efficiency wages paid for standard wage contracts, which reduce control costs and increase compliance and efforts of the worker. Wage differentials could also be overcompensated by productivity differentials due to missing firm-specific human capital or the lack of commitment. Substitution of standard work contracts through non-standard work contracts is more likely for low productivity workplaces, for which effort and human capital play a less important role and control costs are usually low.

   Technological change and accompanying innovations have an influence on the structure of the workforce. On one side such innovations can simplify work and downgrade skill requirements (cashiers at the supermarket do not need to be able to count if supported by the bar-code technology). On the other side innovations can also require higher qualifications (skill-biased technological change), for instance computer and internet literacy. If technical progress is weakening the position of unskilled workers in the firm then there might be pressure to accept switching to non-standard contracts. Skill-biased innovations make monitoring more difficult and thereby favour the core work force and increase the scope for employing a marginal workforce on non-standard contracts.

b) The demand for non-standard work contracts falls with rising firm-specific human capital requirements.
c) The lower is the human capital of workers on open-ended (regular, standard) contracts, the higher is the probability that they are replaced by workers with (cheaper) non-standard contracts.

Another explanation for the demand for non-standard work contracts is provided by the existence of an internal, dual labour market in the company (Atkinson, 1987; Kalleberg, 2001; Cappelli and Neumark, 2004). A dual labour market develops because of uncertainty about the demand for the output of the firm. For a profit-maximizing company it is preferable to shelter its core workforce with standard contracts from hiring and firing fluctuations and absorb the fluctuations of its labour demand due to fluctuating demand for its output with a marginal labour force employed on non-standard work contracts. Non-standard labour contracts then act as a buffer (Booth et al., 2002).

The efficiency wage hypothesis has a different explanation for non-standard contracts: For workplaces and functions with difficult and costly monitoring a core work force with high wages and stable employment relationships develops, while for activities which can be easily monitored workers are employed with (cheaper) non-standard work contracts (Saint-Paul, 1991, 1996).

Trade unions mainly have members belonging to the core workforce, which further supports the existence of an internal dual labour market as long as this does not erode the sustainability of the core work force because of substitution through the marginal work force working on non-standard contracts. This also explains why the local trade union in the company usually accepts such initiatives from the 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 (Keiser and Pfeiffer, 2000). The ambivalent influence of labour councils is also confirmed in empirical studies for Germany (Boockmann and Hagen, 2003; Dull and Ellguth, 1999).

d) Trade unions support the emergence of a stable core work force and are therefore not against an internal dual labour market with a marginal labour force employed on non-standard contracts as long as this does not threaten the existence of the core workforce.

Also the geographical location of a company plays a role (Abraham and Taylor, 1996). Companies in urban areas are more likely to use non-standard labour contracts mainly because the supply of such workers is higher and costs are lower.

e) Firms in urban areas are more likely to employ workers on non-standard labour contracts.

Another reason for demanding non-standard work contracts is the need to replace unforeseen absence of members of the core workforce due to for example sickness or maternity leave (Abraham, 1988). In such cases it does not seem to be reasonable to hire a worker on a standard, open-ended contract, because the return of the absent worker would make a costly job termination process for one or the other necessary. Boockmann und Hagen (2002) find that temporary work is used to replace absence because of (longer and predictable) maternity leave, while agency work is usually replacing absence due to sick leave, which is less long but also less predictable.

Several studies (Stephan, 1991; Schnabel and Stephan, 1993; Stephan, 1994; Barmby and Stephan, 2000) confirm that besides the size of the labour force also the share of women contributes to an increase of absence. On the contrary, absence rates decline with the share of white collar workers and the level of education.

f) The higher is the share of women in a company, the higher is the likelihood of absence from work because of maternity leave. Consequently, firms are more likely to use temporary work to deal with such issues.

According to dual labour market theory and core-periphery hypothesis, non-standard employment can be interpreted as a firm's peripheral workforce, while regular employment is the core workforce (Atkinson, 1987; Kalleberg, 2001; Cappelli and Neumark, 2004). The core-periphery hypothesis implies that the regular employees gain a higher degree of job security (probability of keeping the job) 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., 2002a). Moreover, the core

workforce has better working conditions including a higher income. This should lead to lower involuntary turnover (layoffs) and lower voluntary turnover (quits) among the regular employees, which results in a higher job stability (time spent on the job).

g) Firms that use non-standard employment contracts have higher labour turnover.

At the same time a number of investigation results demonstrate that "…contingent work and involuntary turnover of the permanent workforce are positively and significantly related, contradicting the core-periphery hypothesis" (Cappelli and Neumark, 2004). And Pfeifer (2005) in German Establishments Data also finds no evidence that the use of temporary employment lowers turnover among the core workforce.

It is quite possible that nonstandard labour contracts are regarded by enterprises as channels for "entrance" and "exit' obtaining permanent workplaces and firing them in case of a demand decrease. In the first case enterprises not only more often employ but also more often dismiss employees to achieve better job matching (Jovanovic, 1979). In the second case enterprises transfer permanent employees to perform jobs on a temporary employment basis. In both cases enterprises using nonstandard labour contracts exercise more intensive manpower turnover for both permanent and temporary workplaces then those which do not use such contracts.

High turnover on temporary positions can be part of the firm's personnel policies. To put it differently, non-standard contracts are mainly used as instruments of churning policies, implying that workers may go through different spells of jobs or of unemployment before finding a permanent job. As a result, transition rates into permanent employment are low. In this case labour churning is most likely increasing with an increasing use of non-standard labour contracts. (Cahuc and Postel-Vinay, 2002).

With the growth of labour turnover and with a decrease of job turnover labour churning will increase. This is possible if non-standard contracts have a different impact on the labour turnover and on the job turnover.

h) Non-standard contracts will increase the rate of labour churning if with the growth of labour turnover will be decrease of job turnover.

4. Data and methodology

Data used for the present study were obtained from a Survey of Enterprises in Russia (RES) in 2009-11. The sample included 3618 enterprises[12] with more than 50 employees operating in six branches of the economy, including mining, manufacturing, construction, transport and communication, trade and finances. The data base obtained includes both the current and retrospective information covering enterprises' main characteristics, which are subdivided into four groups. The first group includes factors characterizing the employment structure, and its demographic composition. The second includes factors showing enterprises' strategic behaviour (innovations and investments, organisational characteristics), their personnel policy (recruiting and dismissal share, vacancies, employees training, and employees leave without payment, part time employment, and reduction of wages). The third group includes factors of enterprise characteristics (enterprise age, ownership status, its size, industrial sector and the region of its location). And finally, the fourth group includes factors of enterprise's external appraisal of the present economic and institutional situation (changes in the course of time, labour legislation appraisal, assessments of factors creating obstacles and threats for enterprise activity).

This paper analyses two types of non-standard labour contracts: i) general fixed-term contracts including all types of fixed-term contracts signed by an enterprise with an employee for a specified period

12. When referring to "enterprises in Russia" we always mean the enterprises in the RES sample

of time; and ii) agency work contracts, *i.e.* when a labour contract for a specified period of time is signed by an employee and employment agency (a company supplying manpower to enterprises for a specified period of time).

The preference of enterprises for fixed-term or agency work contracts is itself an unobservable value. One can only observe that enterprises actually use either fixed-term or agency contracts. Moreover the use of fixed-term contracts or agency work contracts is not an independent choice of an enterprise; it depends on its external normative and legal environment, the technology used, size and some other factors.

The use of the two types of non-standard labour contracts can be modelled either as a joint process or independently. First we estimate determinants of fixed-term and agency work contracts (probit models of binary choice) and secondly the relationship between them (bivariate probit model).

A probit analysis was performed to determine reasons which characterize differences between enterprises using non-standard labour contracts, respectively,

$$\Pr(Y=1|X)=\Phi(X'\beta),$$

where Pr denotes probability; Φ is the cumulative distribution function of the standard normal distribution; the parameters β are estimated by maximum likelihood. Suppose the response variable Y is binary, that is it can have only two possible outcomes which we will denote as 1 and 0. Suppose there exists a random latent variable that enterprises use one of non-standard contracts (fixed-term/agency work):

$$Y^* = X'\beta + \varepsilon \text{, where } \varepsilon \sim N(0, 1).$$

Then Y can be viewed as an indicator for whether this latent variable is positive:

$$Y = \begin{cases} 1 & if \quad Y^* > 0 \;\; i.e. -\varepsilon < X'\beta \\ 0 & otherwise \end{cases}$$

On the one hand, this analysis should determine what appears to make the use of non-standard contracts more likely. On the other hand, these factors can illustrate requirements and capabilities of enterprises to increase their flexibility on the domestic labour market.

Further, we assume that regressions of fixed-term and agency work contracts are related due to the fact that (simultaneous) errors of dependent variables may be correlated. To verify this hypothesis we analyse the error correlation estimating the system of equations using bivariate probit regression.

$$\begin{aligned} l^* &= \alpha_1 l^* + \beta_{1i} X_{1ij} + \varepsilon_1 \\ t^* &= \alpha_2 t^* + \beta_{2i} X_{2ij} + \varepsilon_2 \end{aligned},$$

where t^* and l^* are endogenous latent variables demonstrating an enterprise's preference for fixed-term and agency work contracts respectively. t^* and l^* are simultaneously determined. X_{1ij} includes the covariates usually capturing preferences for fixed-term labour contracts and X_{2ij} includes the covariates usually linked with the preference for agency work contracts; j - the number of testing units (enterprises); i - the number of covariates; $\varepsilon_1, \varepsilon_2$ - random errors.

We calculate two equations using standard bivariate probit techniques, as shown by the following:

$$y_r = \begin{cases} 1 if\ y^* > 0 \\ 0 if\ y^* < 0 \end{cases},$$

where r =1, 2 (fixed-term work and agency work contracts) and reduced–form disturbance covariance $\mathrm{Cov}(\varepsilon_1, \varepsilon_2) \neq 0$. We test the significance of ρ, which represents the correlation between the errors in the two probit models. The dependent variables are $t = 1$ if firms use fixed-term contracts and $l = 1$ if firms use agency work contracts.

1. Then we supplement the analysis of error correlation with calculations based on the method of seemingly unrelated regressions (SUR) (Cameron and Trivedi, 2010). The regressions are related because the (contemporaneous) errors associated with the dependent variables may be correlated. We estimate the system of econometric equations, each of them performs as an independent equation with its own dependent and explanatory exogenous variables based on the method suggested by Zellner (Zellner 1962, 1963):

$$\begin{aligned} l &= \beta_0 + \beta_i X_{ij} + \varepsilon_1 \\ t &= \gamma_0 + \gamma_i X_{ij} + \varepsilon_2 \end{aligned},$$

l, t - the share of employees covered by fixed-term labour contracts and the share of employees, working under the terms of agency labour contracts over the annual average number of employees on pay-roll at an enterprise j; X_i - explanatory variables $i = 1,\ldots,m$; β_i, γ_i - show the effect of explanatory variables on the dependent variables in two equations; j - the number of the enterprise; i - the number of explanatory variables; $\varepsilon_1, \varepsilon_2$ - random errors in two equations.

As the models have the same set of explanatory variables, we could calculate two equations separately. Yet, we might still choose to estimate them with SUR model as we want to perform the joint test $\beta_i = \gamma_i = 0$. The important characteristic feature of the given equations is that despite their unrelatedness the random errors $\varepsilon_1, \varepsilon_2$ are supposed to be correlated. We estimate the full variance–covariance matrix of the coefficients. With the help of correlation analysis we can investigate whether the fixed term contracts and agency work are substitutes (moving in opposite directions) or complements (moving in the same direction). The impact of non-standard labour contracts on hiring, dismissals and labour turnover was calculated with standard methods (Hamermesh et al., 1996; Abowd et al., 1999; Burgess et al., 1999).

The hiring rate (h_{jt}) and separation rate (s_{jt})[13] of establishment *i* for the period between dates *t*-1 and *t* is given by

$$\begin{aligned} h_{jt} &= \frac{H_{jt}}{0{,}5(L_{jt} + L_{j,t-1})} \\ s_{jt} &= \frac{S_{jt}}{0{,}5(L_{jt} + L_{j,t-1})} \end{aligned} \qquad (1)$$

with H_{jt} denoting the number of hires during this period; S_{jt} is the number of separations; and the average level of employment L_j at dates $(t-1)$ and t.

13. Both forced and voluntary dismissals were taken into account.

The worker turnover rate (WTR) is the sum of the hiring rate (h_{jt}) and the separation rate (s_{jt}) in the respective enterprise, that is,

$$WTR = h_{jt} + s_{jt}$$

Worker turnover can be decomposed into two components. The first component consists of hirings and separations which are associated with job creation or job destruction, that is, net changes in total employment of the enterprise. By using this concept, it is assumed that job creation and destruction is reflected in a net employment change within the establishment.[14] The first component can be expressed in terms of the job creation rate and the job destruction rate. For a given enterprises, the year-to year job creation (JCR) and destruction rates (JDR) are, respectively,[15]

$$JCR_{jt} = \max\left\{0, \frac{\left(L_{jt} - L_{j,t-1}\right)}{0{,}5\left(L_{jt} + L_{j,t-1}\right)}\right\} \quad \text{and} \quad JDR_{jt} = \max\left\{0, \frac{L_{j,t-1} - L_{jt}}{0{,}5\left(L_{jt} + L_{j,t-1}\right)}\right\},$$

where L_{jt} is the number of employees in year t.

The absolute value of the growth rate of the employment stock is given by:

$$GR_{jt} = \left|h_{jt} - s_{jt}\right| = \left|JCR_{jt} - JDR_{jt}\right|$$

The second component of worker turnover consists of hirings and separations which are not related to a net change in employment. This phenomenon is denoted as rotation or churning. The rotation rate (RR_{jt}) is the part of the worker turnover rate that is not associated with a net employment change:

$$RR_{jt} = WTR_{jt} - GR_{jt}$$

Relating the rotation rate to the worker turnover rate leads to the churning rate:

$$CR_{jt} = \frac{RR_{jt}}{WTR_{jt}}$$

The churning rate indicates the proportion of worker turnover that cannot be attributed to net changes in employment. Churning may result either from worker mobility between job positions at different employers (e.g., due to personal factors, low job satisfaction, higher career opportunities at other employers), or from the decision of the employer (workers are exchanged at a given job position because the match turns out to be poor, there is technological or organisational change and churning is a cost-minimizing equilibrium strategy).

The influence of non-standard labour contracts on worker churning (worker turnover; hiring; separation) was calculated by the following system of equations:

14. Following the literature, simultaneous creation and destruction of job positions within the establishment has to be neglected (see, e.g., García-Serrano, 1998). Put differently, if one job position (e.g., with low skill requirements) is destroyed, and one job position (e.g., with high skill requirements) is created within the same establishment (as suggested by the literature on technological change), this is not counted as creation or destruction of jobs.

15. The job turnover rate is not depicted in the following analysis. However, it is computed as the sum of the job creation and destruction rates.

$$\begin{cases} CR_j = \beta_0 + \beta_1 tr_j + \beta_i X_{ij} + \upsilon_j \\ tr_j = \alpha_0 + \alpha_1 work + \alpha_2 flw + \tau_j \end{cases}$$

where CR_j - churning rate; tr - the share of fixed-term contracts (share of agency worker); *work*- workers share at an enterprise in the annual average number of pay-roll employees; flw - the use of flexible salary components by an enterprise (employees' salary depends on the results of an enterprise labour activity- variable share is high in a salary structure); X_i - controlling variables, characterizing an enterprise (period of operation, type of ownership, size, region of location, industry classification, trade-unions availability) equal to $i = 1,\ldots,m$; *i*- the number of controlling variables; *j* – the number of the enterprise; τ_j, υ_j - random errors.

Nonstandard labour contracts appear as an endogenous regressor[16] in the first equation of the system and due to this fact its calculation on the basis of the simple linear regression could provide biased and inconsistent results.

Considering this fact the estimation of the system consisting of two equations was performed on the basis of several methods:[17] two-stage least squares (2SLS), generalized method of moments (GMM)[18] and limited-information maximum likelihood (LIML).[19] Testing of instruments[20] (tests of endogeneity; "first-stage" regression statistics; tests of over identifying restrictions) for all models confirmed that their application provides more precise estimations then calculations made on the basis of ordinary least squares (OLS). Moreover the application of several methods provided a possibility to compare the obtained results, thereby allowing for some robustness considerations.

5. Empirical evidence

5.1. Non-standard contract as instruments of flexibility

According to RES more than 30% of enterprises used non-standard labour contracts in 2009-11 (Table 1). The share of enterprises with non-standard labour contracts increased by 13.2 percentage points between 2009 (21.9%) and 2011 (35.1%). Enterprises found fixed-term labour contracts more attractive than agency work (difference of 26.9 percentage points). Thus the share of enterprises with fixed-term labour contracts in the total number of enterprises was much higher (19.6% and 32.0%) than the share of enterprises using agency work contracts (2.2% and 3.1%). In comparison, in Germany about as many (3%) enterprises use agency work, but far fewer enterprises (17%) use temporary work contracts (Hohendanner and Gerner, 2010). The use of non-standard labour contracts increased by 35% at enterprises between 2009 and 2011, while the number of companies with fixed-term labour contracts increased by 63%, although the number of contracts per company increased as well.

16. The endogenous nature of the given regressor is explained by the existence of unobservable variables (e.g. management quality), which simultaneously exert influence on it and on the dependent variable.

17. We cannot estimate a fixed effect model, because the data do not form a panel.

18. We refit our model by using the GMM estimator, allowing for heteroskedasticity in υ_j.

19. Both theoretical and Monte Carlo exercises indicate that the LIML estimator may yield less bias and confidence intervals with better coverage rates than the 2SLS estimator (Poi, 2006; Stock et al., 2002).

20. Indices of workers share at an enterprise and salary flexibility were used as instrumental variables which correlate with the explanatory endogenous variable and do not correlate with a random error.

Table 1. Non-standard labour contracts in 2009-11, %

Types of contracts	Years			
	2009	2010	2011	2009-2011
Firms with fixed-term contracts				
Total	19.6 (39.7)	37,8 (48,5)	32,0 (46,7)	29,8 (45,8)
Share of employees with fixed-term contracts (basis: all firms)	4,8 (15,8)	5,2 (14,2)	6,2 (17,0)	5,5 (15,9)
Share of employees with fixed-term contracts (basis: firms with fixed-term contracts)	24,4 (28,4)	13,8 (20,4)	19,5 (25,5)	18,4 (24,7)
Firms with agency work contracts				
Total	2,3 (14,9)	3,2 (17,5)	3,1 (17,4)	2,9 (16,7)
Share of employees with agency work contracts (basis: all firms)	0,5 (5,05)	0,2 (2,2)	0,4 (4,3)	0,4 (4,1)
Share of employees with agency work contracts (basis: firms with agency work contracts)	20,7 (27,2)	6,2 (11,1)	13,5 (20,7)	13,0 (20,7)
Firms with fixed-term and agency work contracts				
Total	1,2 (10,8)	2,4 (15,2)	1,7 (13,1)	1,7 (13,1)
Share of employees with fixed-term contracts (basis: firms with fixed-term and agency work contracts)	18,5 (17,4)	11,2 (13,7)	12,1 (19,3)	13,1 (16,9)
Share of employees with agency work contracts (basis: firms with fixed-term and agency work contracts)	19,0 (27,1)	6,3 (11,9)	7,3 (7,1)	9,4 (15,5)
N	1 108	1 010	1 500	3 618

Together with the increasing number of enterprises using non-standard labour contracts, the number of employees recruited under the conditions of these contracts was growing as well. In 2009-11, the percentage of employees working on the basis of fixed-term labour contracts in the total number of employees was equal to 5-6% and this value for those working under the terms of agency work contracts was equal to less than 1% (Table 1). In Germany the absolute numbers are similar, but the increase of non-standard work contracts is more evident for fixed term contracts. In 2010, more than 9% of all employees fully covered by social security in Germany are employed under a fixed-term contract (Nielen and Schiersch, 2012). In 2000 this was only about 6% (Gundert and Hohendanner, 2011). About 2 % of all employees in 2008 were agency workers (Spermann, 2011).

The shares of employees with non-standard labour contracts are of course higher if only enterprises which use such contracts are considered. In 2009-11 the average percentage value of employees working under the conditions of fixed terms at enterprises using fixed-term labour contracts, was equal to 18.4% of the total number of employees. Enterprises using agency work contracts had 13.0% of employees of the general staff number working on the basis of these contracts.

The evolution of non-standard work contracts over time could involve both demand and supply considerations for workers, as well as confidence aspects for employers. During the crisis companies had a very low confidence in the future outlook of their markets and therefore wanted to avoid the longer-term commitments of a standard work contract. As a consequence, any recruitment would only take place in form of non-standard work contracts. Workers, on their part, had a very weak negotiation position and accepted employment also on the less attractive non-standard work contracts. More than 1/3rd of the labour force in companies, which use both temporary and agency work contracts was employed on a non-standard

labour contract (Table 1). The crisis was relatively short and confidence of employers as well as the negotiation power of workers increased. In 2010 therefore the willingness of workers to accept non-standard labour contracts declined and employers could therefore hire only fewer workers on these terms. In 2011 it became clear that the growth rates of the years before the crisis would not be reached soon, which again increased the demand of firms to recruit on non-standard work contracts, which were again more acceptable for workers, who faced a deteriorating outlook on the labour market.

5.2. Determinants of non-standard labour contracts

The probit analysis results demonstrate that the utilization of fixed-term labour contracts and agency work contracts have both similarities and differences (Tables 2 and 3). A list of variables with basic descriptions is provided in the Annex Table.

The general property of these two types of non-standard labour contracts is their frequent simultaneous utilization at the same enterprises and in the same sectors of economy. In particular, both types of non-standard labour contracts are more often used at middle and large-scale industrial enterprises which as a rule are relatively old. These enterprises are very often characterized by staff redundancy and usually need restructuring and modernization.

Enterprises with a large share of female workers tend to use more temporary work contracts, as female workers have a higher rate of temporary absence, which usually is filled with non-standard work contracts. It was also found that if enterprises already use fixed-term labour contracts there is a significant probability that they will use agency work contracts as well. Thus, the relationship between these two types of non-standard labour contracts appears to be complementary.

It may be explained by the difference of benefits obtained by enterprises from each type of non-standard labour contracts. Moreover, to be more precise we may speak about costs savings which will be different when using two types of these contracts. If fixed-term labour contracts allow an enterprise to realize “point” saving by transferring some employees’ jobs under the conditions of fixed-term labour contracts, agency work contracts provide a possibility for an enterprise to obtain “mass” saving, i.e. to decrease costs owing to the larger quantity of employees, transferring some departments and business units under the conditions of agency work contracts.

Fixed-term labour contracts are more often used by medium and large-scale enterprises (more than 500 people). The relation between the utilization of fixed-term labour contracts and enterprise size is also linked with trade unions presence. Large-scale enterprises have more often and powerful trade unions. Since fixed-term labour contracts were more often used at large-scale enterprises so they were mostly enterprises with active trade unions.

At the same time, it can also be explained in a different way. On the one hand, trade unions always opposed the utilization of agency work labour contracts and were less hostile to fixed-term labour contracts as the latter did not “destroy” the traditional employment relationship between employers and employees. On the other hand, fixed-term labour contracts provided a possibility for trade unions to protect incumbent employees (and trade union members) from dismissal. Thus the subdivision of employees into insiders (with standard labour contracts) and outsiders (with fixed-term labour contracts) was in complete correspondence with trade unions policy to protect their members. In line with all these observations the share of fixed –a term labour contract at enterprises with trade unions was found to be rather high.

The utilization of non-standard labour contracts differs also by ownership. Fixed-term labour contracts were mostly used by state owned enterprises and agency work contracts by private enterprises.

Table 2. Fixed-term labour contracts determinants (Probit and Tobit regressions)

Independent variables	Probit Fixed-term contract (1=yes)		Tobit Share of fixed-term contract	
	Delta-method		Delta-method	
	dy/dx	Std. Err.	dy/dx	Std. Err.
Agency contract (1=yes)	0,27***	0,05		
Share of agency contract			0,04	0,04
Share of worker with tenure				
2-5	0,03	0,03	0,89	0,89
5-10	-0,05	0,03	-1,79**	0,92
10-15	0,02	0,05	-0,82	1,39
>15	0,09*	0,05	1,49	1,38
The proportion of women	0,07**	0,03	0,84	0,74
The proportion of worker	0,10***	0,02	2,98***	0,68
On the job training (1=yes)	0,10***	0,01	2,22***	0,42
Presence of trade unions (1=yes)	0,09***	0,02	1,47**	0,54
Age of firm	0,02	0,03	-0,31	0,89
Ownership (state >=50% =1)	0,05*	0,02	1,12*	0,67
The size of the firm (<=100 =1)	-0,08***	0,02	-0,74*	0,45
The size of the town (relative >=1 million = 1)				
The size of the town (500 000-1 million residents)	0,06***	0,02	0,78*	0,53
The size of the town (100 000-500 000)	0,05*	0,03	1,25*	0,73
The size of the town (<100 000)	0,10***	0,02	1,98***	0,67
Sectors	yes		yes	
Years (2009=1)				
2010	0,09***	0,02	1,87***	0,57
2011	0,03*	0,02	1,37**	0,53
Correctly classified	72,57%			
Wald chi2(18)	355,28***			
LR chi2(18)			168,96****	
Log pseudolikelihood	-1997,61			
Log likelihood			-6346,6	
Pseudo R2	0,0902		0,0131	
N	3618			

Note: Levels of significance: * - 10%; ** - 5%; *** - 1%.

One more difference of these two types of non-standard labour contracts was influenced by the development of market infrastructure and in particular by the development of employment service suppliers at the labour market (search of employees, their selection, training, and manpower records management, etc.). An insufficient development of such market services, including labour market service, observed in remote regions far from the centre and in small cities (with the population of less than

1 million people) positively affected the utilization of fixed-term contracts by enterprises. Fixed-term labour contracts are more typical for enterprises located in cities with the population of less than 1 million.

Table 3. Determinants of agency work contracts (Probit and Tobit regressions)

Independent variables	Probit		Tobit	
	Agency contract (1=yes)		Share of agency contract	
	Delta-method		Delta-method	
	dy/dx	Std. Err.	dy/dx	Std. Err.
Fixed-term contract (1=yes)	0,03***	0,01		
Share of fixed-term contract			0,01	0,01
Share of worker with tenure				
2-5	0,00	0,01	0,10	0,89
5-10	-0,01	0,01	-0,56	0,93
10-15	-0,01	0,02	-1,21	1,57
>15	-0,02	0,02	-1,39	1,57
The proportion of women	0,00	0,01	0,31	0,76
The proportion of worker	0,00	0,01	-0,06	0,71
On the job training (1=yes)	0,02**	0,01	1,20**	0,46
Presence of trade unions (1=yes)	0,01	0,01	0,74	0,55
Age of firm	0,01	0,01	1,16	0,85
Ownership (state >=50% =1)	-0,02*	0,01	-1,05	0,77
The size of the firm (<=100 =1)	-0,01	0,01	-0,42	0,48
The size of the town (relative >=1 million = 1)				
The size of the town (500 000-1 million residents)	0,01	0,01	0,25	0,55
The size of the town (100 000-500 000)	0,01	0,01	0,22	0,75
The size of the town (<100 000)	0,01	0,01	0,10	0,67
Sectors	yes		yes	
Years (2009=1)				
2010	0,01	0,01	-0,20	0,61
2011	0,01	0,01	0,04	0,56
Correctly classified	97,12%			
Wald chi2(18)	59***			
LR chi2(18)			832,20	
Log pseudolikelihood	-446,97			
Log likelihood			-832,198	
Pseudo R2	0,05		0,01	
N	3618			

Note: Levels of significance: * - 10%; ** - 5%; *** - 1%.

5.3. Relationships between fixed-term and agency work contracts

The results of bivariate probit models demonstrate that the choice of two types of non-standard labour contracts by enterprises appears as a joint process (Table 4).[21] Enterprises which use fixed-term labour contracts most probably use agency labour as well. Basing on the results of bivariate probit models (Table 4) and appraisals of an average marginal effect (Table 5), these two types of non-standard labour contracts are on the average used by large-scale and average scale enterprises with a big share of the state ownership (more than 50%). Such kinds of enterprises are usually located in small settlements (less than 100 thousand people). The share of women and workers in these enterprises is high. They perform their employees' training at workplaces more often and they have trade unions.

Table 4. Biprobit model

Independent variables	Agency work contract (1=yes)		Fixed-term contract (1=yes)	
	Robust Coef.	Std. Err.	Robust Coef.	Std. Err.
Share of worker with tenure				
2-5	0,08	0,18	0,31***	0,10
5-10	-0,08	0,19	0,03	0,10
10-15	-0,16	0,26	0,19	0,16
>15	-0,26	0,31	0,39**	0,16
The proportion of women	0,06	0,15	0,18**	0,08
The proportion of worker	-0,04	0,15	0,24***	0,08
On the job training (1=yes)	0,32***	0,09	0,29***	0,05
Presence of trade unions (1=yes)	0,15	0,12	0,30***	0,06
Age of firm	0,24	0,18	0,06	0,10
Ownership (state >=50% =1)	-0,24	0,16	0,11	0,08
The size of the firm (<=100 =1)	-0,17*	0,09	-0,27***	0,05
The size of the town (relative >=1 million = 1)				
The size of the town (500 000-1 million residents)	0,08	0,11	0,12**	0,06
The size of the town (100 000-500 000)	-0,04	0,16	0,07	0,08
The size of the town (<100 000)	0,07	0,13	0,22***	0,07
Sectors	yes		yes	
Years (2009=1)				
2010	-0,02	0,12	0,23***	0,07
2011	-0,01	0,12	0,14**	0,06
_cons	-2,09***	0,18	-1,13***	0,10
/athrho	0,25***	0,06		
rho	0,25	0,05		
Wald test of rho=0: chi2[22]	19,96***			
N	3605			

Significance level: * – p<10%; ** – p<5%; *** – p<1%.

21. A hypothesis of ρ equal to zero is rejected: ρ is a positive value (+0, 25) and basing on the Wald test is significantly different from zero and the log-likelihood of the bivariate estimate is significantly less than the joint binomial probit log-likelihoods.

22. If we had specified the vce (robust) option, this test would be presented as a Wald test instead of as a likelihood-ratio test.

Table 5. Average marginal effects, robust. Pr(l2=1, t1=1)

	dy/dx (*1000)	Std. Err.
On the job training (1=yes)	13,36***	0,003
The size of the firm (<=100 =1)	-8,98***	0,003
Sectors	0,10	0,001
Years (2009=1)		
2010	3,90	0,004
2011	2,46	0,003
The proportion of women	2,28**	0,001
The proportion of worker	2,94***	0,001
Presence of trade unions (1=yes)	3,40***	0,001
Ownership (state >=50% =1)	1,79**	0,001
The size of the town (1:>=1 million; 4: <100 000)	0,71***	0,001
N	3605	

Significance level: * – p<10%; ** – p<5%; *** – p<1%.

The number of enterprises which simultaneously use two types of non-standard labour contracts is on the whole rather small in the Russian market (2%). At the same time there is an overwhelming majority of them (2/3) among agency labour enterprises (Table 6). Thus the majority of enterprises use only one type of non-standard labour contracts – they are fixed-term labour contracts (28%) or do not use them at all (70%) (Table 6).

Table 6. Predicted probability and marginal success probability (postestimation biprobit)

Predicted variables	Mean	Std. Dev.
Pr(y1j = 1; y2j = 1)	2%	1%
Pr(y1j = 1; y2j = 0)	1%	1%
Pr(y1j = 0; y2j = 1)	28%	12%
Pr(y1j = 0; y2j = 0)	70%	13%
Pr(y1j = 1)	3%	2%
Pr(y2j = 1)	29%	13%
N	3605	

2. Test results demonstrated, that the correlations of the residuals in the fixed-term and agency work contracts equations were equal to 0.12 for the same enterprises (Breusch-Pagan test; Breusch and Pagan, 1980), and that we could reject the hypothesis that this correlation was equal to zero (Table 7).

Table 7. Correlation matrix of residuals

	Share of agency contract	Share of fixed-term contract
Share of agency contract	1,00	
Share of fixed-term contract	-0,12	1,00
Breusch-Pagan test of independence: χ^2	15,288***	

Source: Significance level: * – p<10%; ** – p<5%; *** – p<1%.

According to obtained results the largest number of workers operating under the terms of fixed-term labour contracts and agency workers are employed by small-scale enterprises (Table 8). During the economic crisis of 2009 the total number of employees with non-standard labour contracts at enterprises in Russia significantly decreased.

Table 8. Seemingly unrelated regression (SUR model)

	Share of agency work contract		Share of fixed-term contract	
	Coef.	Std. Err.	Coef.	Std. Err.
Share of worker with tenure				
2-5	-1,73*	1,11	-1,29*	3,54
5-10	-1,66	1,14	-4,24	3,63
10-15	-2,67*	1,55	-10,48**	4,94
>15	-2,25*	1,45	-5,66	4,63
The proportion of women	-0,30	0,88	-5,02*	2,81
The proportion of worker	-0,01	0,78	3,64*	2,48
On the job training (1=yes)	-0,48	0,48	-2,99**	1,54
Presence of trade unions (1=yes)	0,14	0,54	-3,71**	1,73
Age of firm	0,26	0,85	-4,43*	2,71
Ownership (state >=50% =1)	-0,28	0,67	0,76	2,12
The size of the firm (<=100 =1)	1,28**	0,50	8,67***	1,58
The size of the town (relative >=1 million = 1)				
The size of the town (500 000-1 million residents)	-0,27	0,56	-4,35**	1,78
The size of the town (100 000-500 000)	1,49**	0,77	0,22	2,44
The size of the town (<100 000)	-0,67	0,67	-1,57	2,13
Sectors	0,01	0,12	0,14	0,40
Years (2009=1)				
2010	-1,44**	0,66	-4,51**	2,09
2011	-0,54	0,64	1,50	2,04
_cons	3,29***	1,15	23,30***	3,68
RMSE	7,30		23,26	
R-sq	0,03		0,11	
F-Stat	2**		8,09***	
N	1115			

Significance level: * – p<10%; ** – p<5%; *** – p<1%.

Similar to a single-equation OLS regression, in a SUR model the sample mean of the fitted values for an equation equals the sample mean of the dependent variable ("share of agency contract" and "share of fixed-term contract"). We are interested in the difference between the predicted values of "agency contract share" and "fixed-term contract share" by sectors, enterprise size and ownership (Table 9). The results obtained demonstrated that small-scale enterprises possessed not only the larger share of two types of non-

standard labour contracts (i.e. a fixed-term work 25.64%, an agency work – 2.32%) but also the higher differentiation level of their predicted values (23.31%). The expected numbers of fixed-term labour and agency contracts in the fields of services and construction are maximum high and they are also higher at private enterprises as compared with state enterprises (Table 9).

Table 9. Predicted values (post-estimation SUR model)

	Predict		
	Fixed-term_hat	Agency work_hat	diff
Total	20,63	1,63	19,00
Sectors:			
mining	18,31	1,24	17,07
industry	18,46	1,32	17,14
construction	22,76	1,86	20,90
trade	21,88	1,86	20,02
transport and communications	22,12	1,77	20,35
finance	20,95	1,72	19,23
services	24,82	2,64	22,18
education	19,00	1,31	17,69
health	15,48	0,73	14,75
The size of the firm:			
>100	14,14	0,74	13,40
<=100	25,64	2,32	23,31
Ownership:			
private	21,28	1,74	19,54
state	15,17	0,72	14,44

In sum, enterprises with non-standard labour contracts form a relatively small segment of flexible employment. Enterprises in this segment which use fixed-term work, most probably use agency work as well. An increase of the number of employees working under fixed-term labour contracts leads to the increase of agency work employees. Enterprises using both fixed-term labour contracts and agency labour are more often average and large-scale state enterprises but the largest number of employees with non-standard labour contracts is concentrated at small-scale private enterprises.

5.4. Non-standard contracts, labour turnover (hiring, separation) and labour churning

The analysis also demonstrated that enterprises which use non-standard labour contracts recruit more workers and more often than those which do not use them (Table 10). At the same time, employees' dismissals more often take place at enterprises with non-standard labour contracts than at enterprises not using them (Table 10). Non-standard labour contracts therefore contribute to the high turnover on the Russian labour market.

Insignificant differences from the general tendency are observed at enterprises with non-standard labour contracts. As a rule the number of recruited workers at these enterprises is larger than the number of dismissed ones. The only exception took place in the crisis year of 2009 when enterprises' adaptation to the demand decrease was primarily performed by "dumping" manpower with nonstandard labour contracts. These labour contracts were not prolonged or renewed on their expiry dates – a cheap way for firms to adjust as it did not require severance pay.

High levels of recruitments and dismissals at enterprises with non-standard labour contracts also made for a higher level of labour turnover. Labour turnover at enterprises using non-standard labour contracts was more intensive comparing it with those which did not use such contracts. Labour turnover at enterprises using standard labour contracts averaged 20%, as against 33% at enterprises using non-standard labour contracts (Table 10).

Table 10. Non-standard contracts and labour turnover

Variable	2009-2011			2009			2010			2011		
	total	t=1*	t=0**	total	t=1	t=0	total	t=1	t=0	total	t=1	t=0
Hires												
Number of firms with hires	69,6	84,2	63,2	42,0	61,2	37,0	81,0	89,9	75,4	81,2	90,0	77,1
Average hires per firm	12,3	17,0	10,2	8,2	12,6	7,1	14,7	18,3	12,4	13,5	18,1	11,3
Separations												
Number of firms with separations	70,5	84,0	64,6	48,1	61,7	44,6	74,6	85,1	68,1	83,5	93,2	78,9
Average separations per firm	12,3	16,1	10,7	11,6	13,9	11,1	12,2	16,0	9,9	12,9	17,2	10,9
Labour turnover	24,4	33,0	20,6	18,5	25,8	16,7	27,1	34,6	22,4	26,7	35,0	22,7

NOTE: *t=1, if an enterprise uses at least one of the types of non-standard labour contracts (either fixed-term labour contracts or agency labour); **t=0, if an enterprise uses only standard labour contracts and do not use none of non-standard contracts.

A one percentage point increase of the fixed-term labour share in the average annual number of employees on the pay-roll raised labour turnover almost by 3% and the increase of agency labour share was associated with labour turnover growth of almost 20% (Table 11).

Table 11. Regression analysis: Impact of non-standard contracts on churning and turnover

	Hiring	Separation	Labour turnover
	Coef. (Robust Std. Err.)	Coef. (Robust Std. Err.)	Coef. (Robust Std. Err.)
Fixed-term contract	1,67*** (0,40)	1,12*** (0,30)	2,80*** (0,66)
Agency work contract	11,96** (4,84)	7,89** (3,46)	19,84** (7,97)
		Labour churning	
	2SLS	GMM	LIML
	Coef. (Robust Std. Err.)	Coef. (Robust Std. Err.)	Coef. (Robust Std. Err.)
Fixed-term contract	3,85*** (0,94)	3,76*** (0,92)	4,10*** (1,05)
Agency work contract	29,81** (11,76)	30,02** (11,83)	45,91* (26,89)

Source: Significance level: * – p<10%; ** – p<5%; *** – p<1%.

A 1% increase in the number of fixed-term contracts led to an increase in labour churning by almost 4%, while a one-percent increase in the number of agency workers caused it to increase by 30% to 45%, depending on the estimation method (Table 11).

Increasing the flexibility with non-standard labour contracts allows enterprises to adjust to demand fluctuations. And the level of their impact on the probability of employees' recruiting is higher than on the employees' dismissals. It can serve as evidence that enterprises use non-standard labour contracts for employee's selection and search for better matching of employees and workplaces, or it can be an evidence of a larger number of employees (workplaces) transfer from standard employment to non-standard. In both cases the recruitment level will grow under the increase of non-standard labour contracts.

To sum up, the increase of flexibility on the Russian labour market due to non-standard contracts comes with the price of the deterioration of employment conditions of individual workplaces and for individual employees' groups. The share of these workplaces and the number of employees with non-standard contracts is relatively small but steadily rising.

Conclusion

Non-standard labour contracts started to be widely used in Russia during the reform period of the 1990s. They include different types of fixed-term contracts and agency labour. In Soviet times the application of fixed-term contracts was limited by the Russian Federation Labour Code and the nature of labour relations was specified by employees' assignment to their workplaces with minimal use of outside auxiliary workers. In the course of reforms the level of outside temporary manpower increased, operating under fixed-term contracts. Under the influence of market reforms the activity of enterprises in Russia began to depend on demand fluctuations and business cycles, increasing the number of temporary workplaces. They were created instead of permanent workplaces and often renewed. The arrival of international corporations boosted the development of agency labour. Agency work was not specified in Russian Labour Legislation, but it was subject to Russian Civil and Tax Codes. Its range was constantly expanding. As a result, after 2000 the magnitude of non-standard labour contracts at enterprises in Russia became similar to other countries. At present more than 30% of all enterprises in Russia use non-standard contracts.

The number of enterprises which use simultaneously two types of non-standard labour contracts is rather small (2%). The majority of enterprises uses only one type of non-standard labour contracts (fixed-term contracts) or does not use them at all (70%). The vast majority of enterprises with two types of non-standard contracts (2/3) are agency work enterprises.

The two types of non-standard labour contracts are more often used by average-scale and large-scale enterprises with a high level of state ownership (over 50%). These enterprises are old and as a rule need restructuring. Also enterprises located in small settlements (less than 100 thousand people) use the two types of non-standard labour contracts more often. These enterprises employ a larger share of women and workers than other enterprises. They more often provide training courses for their employees at workplaces and they tend to have trade unions. The highest level of non-standard labour contracts concentration is observed in services and construction and at private rather than state-owned enterprises. The probability to use the two types of non-standard labour contracts is lower at small-scale and private enterprises which are comparatively young. However they display a higher concentration of employees with non-standard labour contracts than larger enterprises. In other words, average-scale and large-scale enterprises use non-standard labour contracts more often, but in a relatively small number while small-scale enterprises do it more rarely, but if they use them, the number of employees on these contracts is comparatively high.

Enterprises using non-standard labour contracts recruit and dismiss employees more often and in bigger numbers than enterprises which do not use these contracts. Moreover, while the average number of hires and dismissals at all enterprises is almost equal, the number of hires exceeds the number of dismissals at enterprises with non-standard labour contracts. Only in 2009 the number of dismissals at these enterprises exceeded the number of hires as a result of crisis-related mass layoffs.

High rates of hires and dismissals increase labour turnover. Turnover at enterprises with non-standard labour contracts was higher (33%) than at enterprises which did not use such contracts (20%). The increase of fixed-term contracts by 1% increased the turnover almost by 3%, and the increase of agency work share led to an almost 20% increase of turnover. Labour churning is increasing even more. If fixed-term contracts increase by 1%, job creation increases by 4%. An increase of agency workers by 1% increases job creation by 30%.

The use of non-standard labour contracts makes the Russian labour market more flexible. Non-standard labour contracts promote the search for better correspondence between an employee's skills and his job at relatively low cost and exert a positive influence on the employment probability, although possibly on an unstable contract relationship. However high rates of recruitment and layoffs under the impact of non-standard labour contracts decrease specific investment in human capital, and increase labour mobility due to the decrease of employment protection and a lower probability to obtain a permanent workplace.

Further research is necessary to determine how the greater labour flexibility associated with non-standard labour contracts affects job creation, innovation and productivity at enterprises in Russia.

ANNEX

DESCRIPTION OF VARIABLES

Agency work contracts	1/0 dummy: 1 if enterprises have agency work contracts
Fixed-term contracts	1/0 dummy: 1 if enterprises have fixed-term contracts
Share of fixed-term contract	Number of workers witch a fixed-term contract
Share of agency work contract	Number of workers with an agency work contract
The proportion of women	Share of women in total employment
The proportion of worker	Share of blue collar workers in total employment
Ownership	1/0 dummy: 1= if more than 50% owned by the state
On the job training	1/0 dummy: 1= on the job training
The size of the firm	The size of the firm (<100 workers=1)
Share of worker with tenure	(< 2 years = ref.)
Presence of trade unions	1/0 dummy: 1= if there are trade unions
The size of the town	Volume of residents in the town (≥1000000 residents = ref.)
Sectors: Industry, Construction, Trade, Mining, Transport and communications, Finance	Sectors of the economy (Industry = ref.)
Years	(2009=ref.)
Age of firm	Age of firm, years

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