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**DISCUSSION PAPER**

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**THE STRUCTURE AND DETERMINANTS  
OF INFORMAL EMPLOYMENT IN RUSSIA:  
EVIDENCE FROM NOBUS DATA**

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This document presents the first stage results of the research of informal employment and its impact on the social security and retirement system in Russia. While according to the previous studies informal employment used to attract in the first place the most prominent groups of the labour force and provided better earning opportunities, in the NOBUS dataset it is associated with lower average wage rates and wealth indicators. At the same time, it is found that employer-specific traits (in particular, industrial classification and ownership type) have much stronger impact on the probability of informal employment than individual or household attributes of the employees involved.

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## 1. INTRODUCTION

The growth of shadow sector of the economy and expansion of informal employment opportunities can be attributed to the important features of the labour markets in the East European countries. This phenomenon reflects both positive and negative aspects of transition. Many individuals sought for informal employment, which provided better opportunities for realization of entrepreneurial initiatives and in many cases gave remarkable economic returns. At the same time, others were forced to join the informal sector as the last refuge from ruined organizations of the formal sector and insolvent systems of social security, accepting jobs they would not select for a lifetime under different circumstances. Various aspects of transitional economy contributing to the growth of informal employment can be identified, including expansion of opportunities for self-employment, family enterprises and small individual business, unregistered part-time employment, non-documented hiring and underestimation of reported wage bills.

According to the official statistics, in 2004 the number of individuals employed by informal sector in Russia exceeded 10 million, which is over 15% of the labour force (Goskomstat, 2004). Although Russia is not in the worst position comparing to other post-soviet countries, where in many cases the majority of population is employed informally (Schneider, 2002), the magnitude of the problem becomes apparent when it is considered along with the issues of social security. The two are closely interrelated. On the one hand, informal employees in most cases are not subject to the labour regulations, and for this reason happen to be among the most vulnerable groups of the work force. On the other hand, prevalent number of individuals in the informal sector undermines the base for taxes and social security contributions, in the short run most visibly when it concerns the benefits financed on redistribution basis.

These problems can not be ignored by policy makers, given the scale of informal sector in the country. Development of sound policy aimed at informally employed individuals becomes therefore a topical issue for the social security system. However, successful design and implementation of any social policy measures requires a thorough understanding of individual motivation

and explanation of participation in different segments of informal labour market. Therefore, the objective of this research is to investigate the occurrence of informal employment in Russia, its determinants, dynamics and trends, and the consequences for ongoing social security reforms based on the data from NOBUS survey.

In general, the results of existing empirical work identify two prevalent views of informal employment. The first view argues that informal sector in transition economies is used as a *survival option* to compensate for the failures of the formal labour market and government guarantees. From this standpoint the need for survival pushes people to the informal market since there are no plausible employment options found in the official economy.

The defenders of this view generally treat informal employment favourably. Positive aspects include additional flexibility of the labour market, restriction of unemployment growth in case of wage arrears, limits to social security claims and provision of individual survival opportunities to cope with economic crisis. From this standpoint informal employment also stimulates competitiveness through supply of cheaper goods. Fighting informal employment in this case means cutting the way to survival for the individuals and reduction of entrepreneurial activities.

On the contrary, the second opinion states that the benefits of informal employment are so high in comparison to the drawbacks of incompliance that it attracts the most prominent individuals. As a confirmation of this theory, Maslova and Baranenkova (2003) find high income differentiation where few excessively rich people can afford to hire informal labour at wages significantly exceeding those in the formal market. They also state that the share of informal income is much higher for the higher income brackets: for example, in 2000 10% of the most rich people received over 50% of their income in informal sector. Numerous negative aspects of informal employment arise in this case. For instant, too big informal sector makes labour market unmanageable, and the data collected unreliable.

The paper starts with discussion of the definitions for informal employment and related concepts. Section 3 provides a brief history of informal employment in Russia, its origins, the current situation, review of the main groups identified in the informal labour market and its dynamics on the national level. Section 4 summarizes the key findings of existing research of Russian informal employment, emphasizing empirical studies of the issue. The main hypotheses are formulated in section 5, followed by NOBUS data description in section 6. The structure of informal employment registered in the NOBUS dataset is analysed in section 7. This descriptive analysis is continued with estimation of parameters of regression modelling the probability of informal sector employment in section 8. Section 9 concludes.

## 2. DEFINITIONS

The definition of informal employment requires at least a short discussion of some related broader concepts. The entire idea of the phenomena, which is known under a variety of names, is based on the dualistic approach that considers the entire national economy to be composed of two coexistent segments. The difference between the two is that while the processes taking place in one are transparent and accountable to the government authorities, the results achieved in the other for some reasons are not directly observed or measured.

Research literature of the last three decades elaborated over a dozen of different names to denote economic activities that fall outside of the formally accounted area<sup>1</sup>. Despite of the difference in the terms used, various approaches generally agree that considered phenomenon can be defined as the economic activity that is not observed by the regulators (see, inter alia, Dalgado, 1990; Schneider and Enste, 2003; Feige, 1983; Gutmann, 1979). Consequently, in the remaining part of this paper it is referred to as non-observed economy (NOE). As it is shown below, this term is also adopted for the statistical purposes by the System of National Accounts (SNA) standards.

There are two different approaches to determine what aspects of the economic activity actually are not observed – fiscal and economic. Fiscal approach defines non-observed sector in terms of the amount of fiscal income unreported to the authorities<sup>2</sup>, while economic approach puts in the first place the volume of economic income not recorded in the national accounts<sup>3</sup>. Feige (1989) and Bernabe (2002) provide an exhaustive discussion of the scope and limits of these approaches, as well as the specifics of definitions applicable under various economic conditions.

Further, various subgroups of non-observed activities can be identified based mainly on the reason why they were omitted from calculations. Non-inclusion can be caused by conventional disregard of certain activities by SNA or tax system, deliberate concealment of economic results by participating agents, insufficient development of statistical tools or excessive practical problems arising in case of proper registration.

Over the last years, serious efforts were undertaken by international statistical community in order to harmonize existing concepts and definitions for the

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<sup>1</sup> The terms used by different authors to denote the entire area or some of its segments include alternative, hidden, grey, informal, irregular sector, parallel, second, shadow, underground, unobserved, etc.

<sup>2</sup> Tax-based definition is given, for instance, by Gutmann (1979): ‘the subterranean economy comprises all transactions that escape from taxation’

<sup>3</sup> See, for example, definition by Pommerehne and Kirchgassner (1994): ‘the term underground economy comprises all goods and services which normally should be added to the calculation of the national product but are not part of the latter for certain reasons’ (p. 851).

purpose of national accounting systems. As a result, the most consistent internationally accepted set of definitions used in economic statistics is offered by 1993 SNA. In accordance with this approach, NOE is composed of five problem areas, which are allowed to overlap, but together provide a comprehensive vision of unaccounted national product (OECD, 2002):

1. *underground production* – legal productive activities, deliberately concealed from public authorities to avoid payment of taxes or complying with regulations;
2. *illegal production* – productive activities, supplying goods or services that are legally forbidden or unlawful when carried out by unauthorised producers;
3. *informal sector production*– productive activities conducted by unincorporated enterprises in the household sector (excepting production for own final use);
4. *production of households for own final use* - productive activities, generating goods or services consumed by the producing households;
5. *statistical discrepancies* - activities unaccounted due to the deficiencies of data collection procedures.

Therefore, *informal sector*, defined by statement 3, is considered as one of subsection of non-observed economy. Activities of informal sector are in most cases legal and even when they violate certain legislative prescriptions, this is not necessarily done intentionally. But, as it is noted above, an overlap between informal and underground or even illegal activities is still possible.

Provided definition implies explicitly that the units composing informal sector are unincorporated household enterprises, which become thus a key notion for understanding. Hussmanns (2002) defines these economic units for the purposes of ILO based on three identification criteria:

1. *ownership*: these enterprises are owned by individuals or households and do not represent separate legal entities independent of their owners;
2. *market transactions*: all or at least some part of the production is intended to be sold or exchanged in the market;
3. *size*: the number of employees should not exceed a threshold defined in accordance with national standards. Enterprises and/or their employees are not registered under established national legislation.

The primary goal of the informal sector enterprises is usually to provide employment and income to the persons involved. They normally resort to the help of family members or use personal connections rather than formally arranged employment relationships. They are often different from formal sector enterprises in terms of legal status and do not allow to distinguish between company assets and activities and those of its owners. The areas of unincorporated enterprises activities are associated with low entry barriers, small scale and low level of formal organization. They are concentrated in labour

rather than capital intensive production and often suffer from limited access to organized markets, including distribution, raw materials, infrastructure, financial services, education and training opportunities.

While informal sector is described in term of production units, *informal employment* is a broader concept, that comprises all individuals employed in informal sector and, in addition, individuals holding informal jobs in the formal sector enterprises. There are few reasons for a job in the formal sector to be classified as informal. First, it can happen because an enterprise is too small or for other reasons not registered by national statistical practices. Second, existing labour legislation might not cover these specific employment relationships - for instance, seasonal, casual or home-based jobs. And, third, employment relationships can intentionally conflict with regulation. Consequently, comparing to the informal sector employment, informal jobs in the formal sector are more frequently associated with illegal activities. In terms of individuals involved, informal employment according to SNA 93 standards consists of *contributing family workers*, *own-account workers* and *employees holding informal jobs* both in formal and informal sector enterprises.

Russian statistical methodology follows closely enough SNA 93 and ILO recommendations. According to Goskomstat definition, shadow economy includes three groups of activities - hidden, informal and illegal – with the concept of informal economy coming most closely to the definitions given above (Masakova, 1999). Therefore, it is reasonable to use SNA/ILO methodology for" the analysis of NOBUS dataset, a survey designed and conducted by Goskomstat in accordance with its standards. Section 6 discusses how above mentioned categories of informal employment can be identified in case of NOBUS dataset.

A few more issues implying certain restrictions for further discussion are worth mentioning in this section. The first concerns distinction between agricultural and non-agricultural sectors in terms of informal employment. A common approach is to separate the two groups for research purposes, often leading to exclusion of agriculture from consideration. The main reason is that employment in agriculture commonly takes more traditional forms, and many countries have weaker regulatory requirements for this part of the economy, resulting in completely different patterns of informal activities (see Charmes, 2000; Canagarajah and Sethuraman, 2001). A typical example of softer regulation in Russia are lower rates for payroll taxes applicable to the agricultural workers. For this reason, this research is limited to the informal employment in non-agricultural areas of activities.

Second, most aspects of informal activity in the formal sector are virtually never captured by established statistical procedures. While the activities of informal sector are legally allowed and therefore their results are more or less readily observed, the top priority of the formal sector participants is to hide in-compliance from any external observer, whether it is a government agency or an



independent researcher. However, the picture would be incomplete if the formal sector part would be simply omitted from consideration. Therefore, analysis of informal relationships in the formal sector is run based on certain assumptions on the common patterns of informal employment that are further discussed in section 3.

The third issue is the original assumption of dichotomy between formal and informal sector. In most cases this relationship as a matter of fact is not dichotomous, with individuals and firms being simultaneously involved in both sectors, having different proportions of informal participation, which leads to some classification problems. In case of this paper any person holding at least one informal job is viewed as employed informally.

### **3. HISTORY, CURRENT DEVELOPMENTS AND ESTIMATES OF INFORMAL EMPLOYMENT**

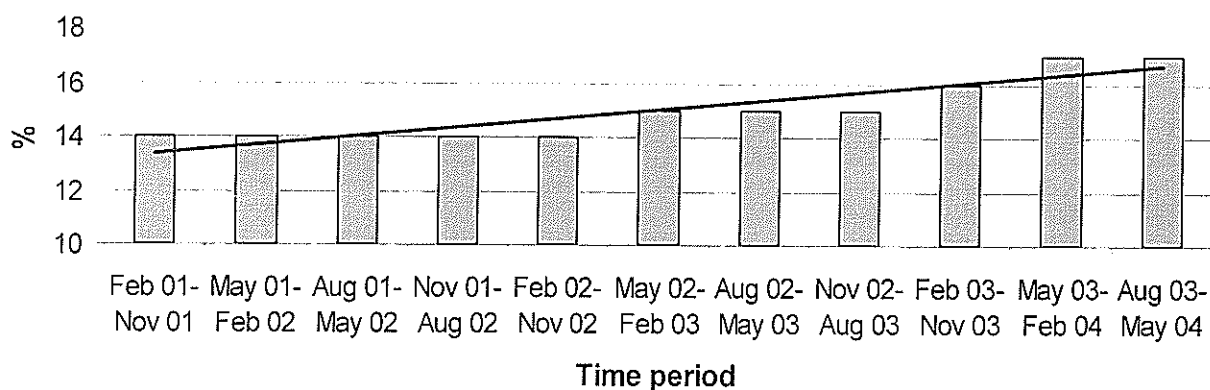
Non-observed sector and informal employment are probably unavoidable phenomena for any economy. However, the scale and structure of informal activities vary significantly across the world. Schneider and Enste (2003) show the results of estimation of shadow economies for 76 countries varying from an average 12% of GNP for OECD states to 44% for African region.

Russia could not stay aside from this pattern even in the Soviet times. Informal activities of the Soviet households, usually aimed at provision of goods and services unavailable or scarce in the planned economy, were studied before as well as after the Soviet Union collapse. Earlier empirical studies of this problem are mostly based on the emigrants' surveys (for example, Grossman, 1982), while more recent ones attempt to use the historic data collected by Soviet authorities (Kim, 2003) and retrospective interviews (Ledeneva, 1998).

As a result, it would not be appropriate to state that informal activities emerged in course of transition process. Yet, Russian informal economy differs dramatically from its predecessor, shadow economy of the USSR. A number of studies describe the peculiarities of transition process from one to another (Braithwaite, 1995; Sik, 1992). Some activities that used to be informal were legalized in course of the last years, while new developments replaced them in the informal sector. This implies that even if the number of people employed informally did not change, the shifts in the structure of informal economic activities made it almost unrecognizable comparing to the Soviet second economy. Although it is difficult to give a viable estimate of the size of the Soviet shadow economy, many authors agree that the scope of informal employment in Russia grew tremendously within the last decade (Namazie, 2003; Maslova and Baranenkova, 2003).

Estimates of the size of non-observed economy and informal sector in Russia vary seriously, to some extent even between the government sources of

information. Official information of Goskomstat RF provides a stable share of the shadow economy as 20-25% of the GDP depending on the region. At the same time, the Ministry of Internal Affairs, which is responsible for the procedures of tax enforcement, states that shadow economy, including criminal sector, can constitute as much as 40% of the GDP. According to the results of Population Employment Survey, in spring 2004 informal sector employed 11.5 million people and accounted for about 17% of the labour force. Analyzed over a longer time period and adjusted for seasonal variation, these values show a gradual increase in the number of informal sector employees over the last three years (figure 1).



Source: Goskomstat RF, 2004

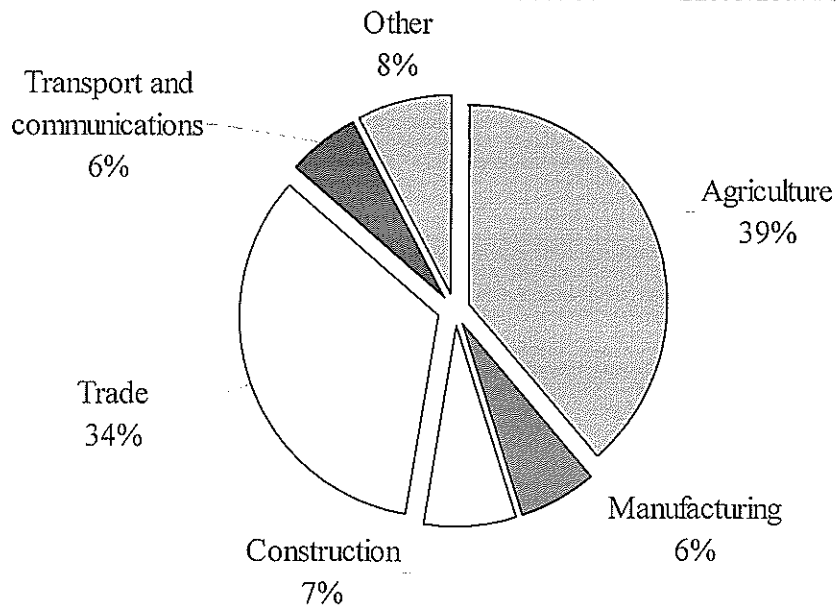
**Figure 1. Informal sector employment, % to the labour force, 2001-2004**

While some of the researchers prefer to rely on official estimates (see, for example, Gorbacheva and Ryjikova, 2002), other state that the figures provided by Goskomstat are significantly biased down. Their results depend seriously on the estimation technique employed. Maslova and Baranenkova (2003) analyze the figures provided by different sources and come up with a conclusion that informal employment amounts to 25 million people, or 30% of the labour force. Schneider and Enste (2003) state even higher values of 35 million people (42% of labour force) in shadow employment obtained based on the World Bank data, with shadow economy constituting 41% of GDP according to electricity consumption method. The highest values however are obtained when expert evaluation techniques are applied. According to Ryvkina (2001), at least half of Russian population is employed in the informal sector. Eliseeva and Schirina (2003) state that in case of St.-Petersburg region, which officially comes very closely to the national average, shadow economy amounts to 113% of the GRP.

In addition to the differences in scale, every country enjoys certain individual structural features of informal sector caused by the differences in regulatory environment, economic systems, and country-specific lifestyle and be-

haviour patterns. As it is defined in section 2, informal employment consists of two groups of individuals: working in informal sector and informally employed by formally established organizations.

The groups of informal sector employment come directly from the definitions given in section 2 – they include informal sector employees, contributing family and own-account workers. According to the data of Population Employment Survey, in May 2004 the first group accounted for 43% of informal sector employment in Russia. Over 70% of informal sector labour force was occupied in agriculture and trade, other important areas being construction, transport and manufacturing (figure 2). In accordance with the specifics of informal fields of activity, informal sector involvement is almost three times higher in rural areas. The highest share of informal sector employment to the labour force (24%) is observed in the Southern Federal area; Privoljsky and Siberian areas also have ratios exceeding the national average.



Source: Goskomstat (2004)

**Figure 2. Distribution of informal sector employees by field of activity**

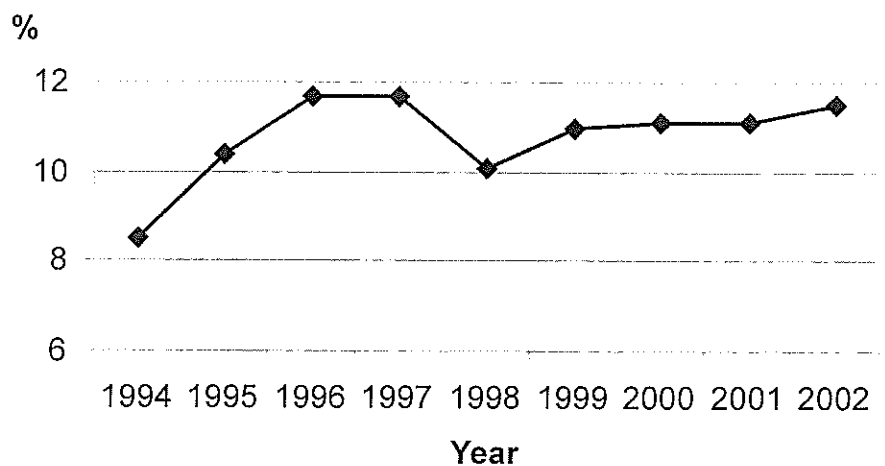
Apart from employment in the informal sector, two groups of interests can be identified in the Russian labour market to contribute to the informal labour relationships in the formal sector – multiple job holders and illicit workers.

The term *multiple job holders*, or moonlighters, refers to the individuals working on a part-time basis in addition to the main occupation, either in formal or informal sector. This category, although overlapping to a certain extent with informal sector employment (Goskomstat data show that almost 20% of informal sector participants have a formal primary job), can still include significant number of formal sector employees, whose labour relationships are not properly registered due to the fragmentary nature of work rather than characteristics of employing enterprise.

The second group comprises *illicit workers* – employees with a primary job in the formal sector partially or completely failing to comply with labour, tax or other types of regulation. Few common patterns of illicit employment different in terms of reason for being noncompliant are widely spread in the Russian labour market.

Probably an overwhelming group are *tax evaders*, working illicitly in registered organizations in correspondence with the general company strategy. The primary reason for a deviant behaviour in this case is attempt to evade payroll taxes. Possible options may include not documented employees who work without labour contract (an option illegal in Russia) and usage of casual or temporary employment agreements for permanent staff. Fully documented employees can also evade taxes receiving regular not registered compensation in addition to declared salary, while understated wage bills are submitted to tax authorities. Another visible group comprises *unauthorized employment* of individuals who are not allowed to work in official economy – for example, immigrants who have no registration in the city of employment.

These groups, although being of primary importance for research of informal employment, are the most complicated to discover and analyze, since the parties involved put all possible efforts hiding their activities. These areas of employment are not captured by official statistics: although Goskomstat provides an adjustment for hidden wage payments in the SNA, obtained figures at about 12% of GDP and their dynamic hardly capture the entire problem (figure 2). For instant, on the contrary to a stable trend demonstrated on figure 2, Maslova and Baranenkova (2003) claim that alternative Goskomstat procedures based on indirect and expert methods allow to conclude that the volume of hidden wages increased almost two times within the period between 1993 and 2001. However, additional indirect measures can be used at least to illustrate the scale and importance of considered issue.



Source: Goskomstat (2002, 2003).

**Figure 3. Hidden wages, % to GDP (1994–2002)**

First, illicit employment is virtually related to the phenomena of 'black' money, or unrecorded cash turnover, suggesting that the two can be analysed jointly. Iakovlev (2002) presents the results of 'black' money economy investigation based on the interviews with representatives of business community conducted in 1997-1998. According to his estimates, hidden payments add from 50 to 95% to the submitted wage bills. The resulting difference between undeclared informal wages and alternative earning opportunities in the formal sector is estimated as at least 20-25%. The schemes of tax evasion identified in course of these interviews are still operating today, being a rational strategy for many employers even after implementation of reforms aimed at reduction of the tax burden.

Second, the ratio and dynamics of individuals and employers registered and reporting to social security and tax authorities can be used as another indicator of illicit labour market size. Additional indirect measurement of informal employment became available in course of implementation of pension reform, when the first information on the funded pension component and individual savings became available. An audit conducted by Schetnaia Palata among randomly selected taxpayers in Russian regions uncovered that the amount of contributions paid to the pension fund remained below 30% of the estimated requirements (Schetnaia Palata, 2003). The result of the first year of reform implementation showed that employers did not pay in contributions for up to 12% of the labour force, resulting in 8 million blank statements (Samina, 2003). These estimates, however tentative and emphasizing direct incompliance rather than partial hidden wage payments, still can be used as indicators of the trends in the development of informal labour market.

#### **4. THE STUDIES OF INFORMAL EMPLOYMENT**

There are at least three noticeable research directions on different aspects of informal employment in Russia. The first is mainly concerned with estimation of the scales of NOE and informal employment based on regional accounts system and elaboration of statistical methodology to obtain reliable data for estimation of informal activities. Among these studies is a project on the definitions of the parameters of shadow economy run jointly by Goskomstat and Italian Statistical Institute (Masakova, 2000) and estimation procedures elaborated by a group of St.Petersburg statisticians (Eliseeva and Schirina, 2003). However, as it was shown in the discussion of the size on informal labour market, there are visible problems associated with a measurement-based focus of research, originating in the diverse definitions of the research object and application of different measurement techniques capturing different informal sector aspects.

The second direction develops theoretical models of informal sector and non-observed economy aimed at the explanation of the impact of selected economic indicators, such as tax and enforcement policy, labour regulations, composition of social security benefits or hidden wage payments. Among these studies are Bouev (2002), Commander and Tolstopiatenko (1997), Namazie (2003).

Finally, the third direction comprises empirical estimation of econometric models of informal employment. The noticeable works in this area are Kim (2002) and Kolev (1998). Kolev uses RLMS round VI data (1995) and argues that informal sector in Russia defined in terms of multiple job holding is a way to earn higher wages rather than to cope with economic difficulties. He finds that informal sector provides the wage rates that are over 3 times higher than those in the formal sector. Informally employed individuals seem to be younger and more educated, and they more often reside in urban areas. There is no visible association between informal employment and wage arrears. Similar conclusions about higher wage rates in informal sector based on RLMS data are obtained by Braithwaite (1995) and Foley (1997), showing consistent results for all earlier rounds of RLMS.

Kim uses VTsIOM data (1997-1999) for a study of secondary employment, making an explicit difference between formal and informal secondary employment based on oral agreement and unregistered entrepreneurship criteria. He finds that although informal employment is associated with higher wage rates, it tends to employ younger individuals with lower education level, more often women. Although these groups can be viewed as somewhat disadvantaged, there is no more direct evidence of using informal employment as a survival strategy based on selected criteria, such as income from primary employment, needed income and wage arrears. Meanwhile, an evidence of privileged position of informal sector is similar or higher qualification requirements. Hence, the conclusion is that the main motivation for informal activities are broader opportunities offered by informal sector in form of higher untaxed wages.

A problem with both studies conducted by Kim and Kolev is that authors identify informal sector with the moonlighting or multiple job holding, including into informal employment individuals reporting additional working activity except for their primary job. Although based on the common sense and anecdotal evidence, second job holders are most likely to fail to register their additional income source with any legal authorities, this assumption entails some estimation problems. Such approach, common enough for studies of informal employment in developed economies, is more ambiguous in case of Russia, where a great degree of informal activities take place at primary place of employment. This paper adopts a broader view of informal employment summing up explicitly information on diverse groups that compose informally employed population.

## 5. HYPOTHESES

Based on the provided summary of research results and informal employment structure, this paper assumes that both groups of informal workers outlined in the introductory section – disadvantaged and opportunistic high-earning individuals – can be present at the different segments of informal labour market. However, they are driven with different motivation. The following features of involvement into informal sector and possible determinants of individual decisions on participation in the shadow labour force can be expected for the two types of participating groups.

First, in case if informal employment is viewed as providing advantageous opportunities, it would employ individuals with higher income potential and having better opportunities in the labour market. Thus, informal employment should return higher wage rates and be associated with higher wealth and income indicators. Informal sector would attract workers with higher qualification and education level and prior professional status.

Second, when informal employment is considered as a survival strategy, it would attract individuals with lower bargaining skills. In particular, informally employed would more likely to be found among women, less educated people, inexperienced workers, people with lower qualifications and modest household income. Insecure social groups, such as pensioners and people of pre-retirement age, youth, and households with higher level of debts would be more likely to be involved into informal activities under this assumption. Informal employment will be more likely in case of lasting wage arrears or compulsory leaves.

Third, in addition, it can be expected that there are certain features of informal employment that do not arise due to the specifics of individual decision-making. More likely, they can be attributed to the external environment factors – such as specifics of employer, industry or region. It means that differences in the levels of informal employment can be explained by the factors other than individual features, preference or life circumstances of the individual employed. These factors would include employer-specific differences, such as industrial belonging. At the same time, informal labour would be more popular in the large cities that provide more job opportunities and lower chances of being detected, and regions with higher migration flows and labour turnover. Areas with highly positive migration balance, including Southern and Western parts of the European Russia, capital area, Southern Siberia and Far East, where there are more people who have no opportunity and/or legal rights to work would have higher informal employment rates.

A special explanation of the third hypothesis is the balance of employers' and employees' interests in the process of determination of the degree of labour relationships formalization. In the first development stage of employment relationships within the period of the reforms, the need for survival pushed indi-

viduals to the non-observed sector since there were no plausible employment options that they could find in the official economy. This process resulted in the mutual benefits in terms of tax evasion to the employers as well as to the employees: while the most apparent benefit gained by employees was avoidance of income tax, the employers enjoyed much more in terms of payroll tax payments, and therefore did not want to pay white wages. However, in more recent periods there emerge strong incentives for individuals to be employed in the official sector, including access to the consumer credits and other financial services, international mobility and social security. Assuming that originally individuals in general tend to be loyal to the system, this final hypothesis states that individuals are pushed to the shadow due to the employers' preferences who have stronger bargaining power in the marketplace.

## 6. DATA

The paper uses data from NOBUS – a national survey of households welfare and social programs participation conducted by Goskomstat in April-May 2003. The survey collected data on a random sample of 44,529 households located in 79 regions of Russian Federation, including 2438 settlements. In total it contains data on 97,813 adult individuals (aged over 16), among them 55,829 residing in urban and 41,984 in rural areas. This dataset has not been previously used for the studies of informal labour market and has larger sample size than other data previously used for the studies of informal employment – such as RLMS or VTsIOM. Comparing to the previously used datasets, NOBUS survey design allows to distinguish between broader groups of informal employment rather than merely moonlighting, thus better reflecting the specifics of Russian labour market.

Following the definitions of informal employment provided in section 2, the following categories of informally employed individuals can be defined in NOBUS dataset.

- ◆ Informal sector employment:
  - *contributing family workers* include individuals who performed unpaid job at family enterprises at the period surveyed;
  - *own-account workers* consist of individual unregistered entrepreneurs and individually employed respondents;
  - *members of producers' cooperatives* are registered directly as one of employment relationships types;
  - *informal sector employees* are the respondents employed by individuals, i.e. those who gave this answer to the questions on the status of current activity.
- Formal sector employment:



- *illicit job holders* include respondents who reported working by oral employment agreement answering the survey question on the type of employment relationships and individuals with temporary agreement having service records with current employers over 3 years.
- *multiple job holders* are the respondents who reported holding an additional job or performing additional income generating activity.

Individual is considered as informally employed if at least one of his jobs can be classified as informal. At the same time, some of the respondents can hold more than one informal job – for this reason the total number of individuals in all groups of informal employment is higher than the overall number of informally employed.

For the reasons discussed in section 2, all further considerations are limited to a subsample of non-agricultural workers. This results in a sample size of 92,975 individuals, including 53,705 women and 39,270 men. All calculations are weighted to make a sample nationally representative. Definition of the variables used is provided in Table 1.

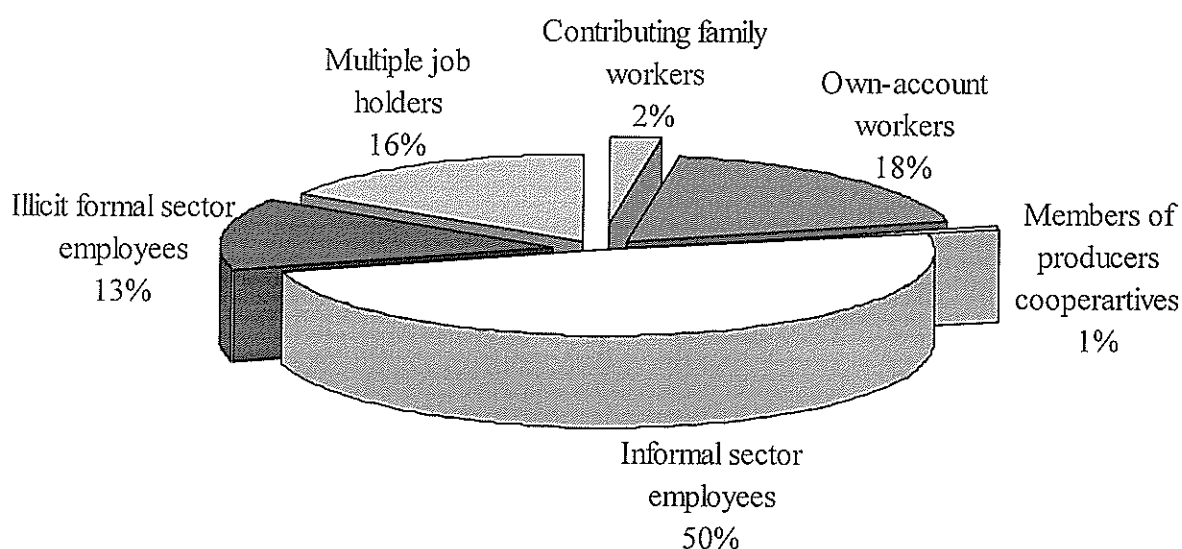
**Table 1. Definition of variables and mean values**

Variable	Description and underlying survey questions	Encoding	Weighted mean
1	2	3	4
<i>informal</i>	Informally employed: satisfies at least one of defined informal employment criteria	Dummy: 1 – informally employed, 0 – no	0.14
<i>contrib</i>	Contributing family worker (A2V02, A2V42)	Dummy: 1 – employed as contributing family worker, 0 – no	0.003
<i>ownacc</i>	Own-account worker (A2V05, A2V42, A2V43)	Dummy: 1 – own-account worker, 0 – no	0.03
<i>coop</i>	Members of producers cooperatives (A2V05, A2V42)	Dummy: 1 – member of producers cooperative, 0 – no	0.001
<i>indemp</i>	Employee in the informal sector (A2V05, A2V42)	Dummy : 1 – employees in the informal sector, 0 – no	0.07
<i>illicit</i>	Employed illicitly in formal sector (A2V08, A2V07)	Dummy: 1 – employed illicitly in formal sector, 0 – no	0.02
<i>mult</i>	Multiple job holder (A2V19, A2V21)	Dummy: 1 – multiple job holder, 0 – no	0.02
<i>age</i>	Age (R1A01M2Y-R1A10M2Y)	Continuous (years)	41.53
<i>married</i>	Marital status (A1B04)	Dummy: 1 – married (registered or unregistered marriage), 0 – no	0.59
<i>male</i>	Gender (R1A01M2G-R1A10M2G)	Dummy: 1 – male, 0 – female	0.44
<i>highed</i>	Higher educational degree	Dummy: 1 – higher educa-	0.23

1	2	3	4
	(A1B07)	tion, 0 – no	
<i>sec</i>	Secondary education (A1B07)	Dummy: 1 – secondary education, 0 – no	0.41
<i>secprof</i>	Secondary professional education (A1B07)	Dummy: 1 – secondary professional education, 0 – no	0.27
<i>record</i>	Total employment record (A2V14)	Dummy: 1 – under 3 years, 0 – over 3 years	0.06
<i>curemp</i>	Length of employment with current employer (A2V07)	Dummy: 1 – under 3 years, 0 – over 3 years	0.17
<i>curact</i>	Length of employment at current sphere (A2V06)	Dummy: 1 – under 3 years, 0 – over 3 years	0.01
<i>arrears</i>	Existence of wage arrears (A2V11)	Dummy: 1 – exist wage arrears, 0 – no	0.11
<i>num</i>	Number of household members	Continuous (people)	3.15
<i>single</i>	Households consisting of 1 member	Dummy: 1 – single member household, 0 – no	0.07
<i>child</i>	Number of children in the household	Continuous (people)	0.33
<i>wage</i>	Total wage income	Continuous (rubles)	3887.78
<i>hrlwage</i>	Hourly wage rate	Continuous (rubles)	22.73
<i>retired</i>	Respondent retired (A2V43)	Dummy: 1 – retired, 0 – no	0.25
<i>student</i>	Respondent studies (A1B08)	Dummy: 1 – student, 0 – no	0.14
<i>indinc</i>	Amount of monthly individual income	Continuous (rubles)	3094.89
<i>income</i>	Amount of monthly household income	Continuous (rubles)	6403.18
<i>incpc</i>	Per capita monthly household income	Continuous (rubles)	2230.71
<i>borrowed</i>	Amount borrowed within the last month (R416)	Continuous (rubles)	4805.68
<i>privliv</i>	Dwelling ownership (R202)	Dummy: 1 – privatized dwelling, 0 – no	0.59
<i>earner</i>	Respondent is the main contributor to the household budget (R504)	Dummy: 1 – main contributor, 0 – no	0.43
<i>addprop</i>	Additional property ownership (R215MX1)	Dummy: 1 – owns additional property, 0 – no	0.52
<i>urban</i>	Household location (A003PT)	Dummy: 1 – urban, 0 – rural	0.67
<i>industry1-industry17</i>	Employer's industrial classification (A2V17)	Dummies	
<i>position1-position10</i>	Position in organization (A2V18)	Dummies	
<i>ownership1-ownership7</i>	Company ownership (A2V09)	Dummies	
<i>city1-city8</i>	City size (A003PT)	Dummies	

## 7. THE STRUCTURE OF INFORMAL EMPLOYMENT

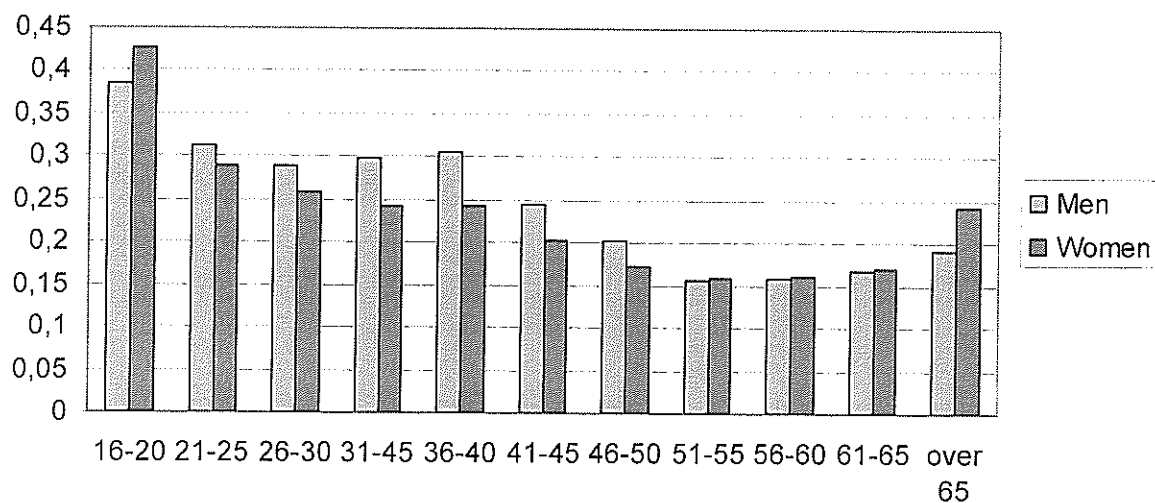
The overall rates of informal employment for adult population in non-agricultural sector calculated according to the specified approach are about 14%. In terms of the relationship to the labour force this ratio is almost 24% of working individuals. However, these figures should be much higher to give a complete account of informal labour market, as the current definition of informal employment groups evidently omits some of them from consideration. In particular, the group of illicit formal sector employees is definitely underestimated both because of the data collection procedures and misleading answers. The structure of informal employment in non-agricultural sector is shown on figure 4. Among all types of informal employment the major input – 50% – comes from the employees of informal sector. Own-account workers, multiple job holders and incompliant formal sector employees account respectively for 18, 16 and 13%. The share of contributing family workers and members of producers cooperatives is almost negligible, together they amount to 3% of informally employed.



**Figure 4. Structure of informal employment**

In most age groups the share of individuals employed informally to the total amount of those working is higher for men than for women, with an overall difference of about 4%. The two genders are equalised starting at the age 50, and the youngest and the oldest groups of women are the two to outnumber male informal employment. Age structure of informal employment by gender shown on Figure 5 demonstrates that the highest informal employment rates are observed among younger age groups. A return to the informal employment is also observed among the oldest group, in particular women. This pattern suggests that opportunities of informal employment can be used by older people and youth as an important source of financial support.

In contradiction to the common results from the studies of informal employment based on RLMS data, showing that informal employment in Russia provides higher returns in terms of both wage rates and total wage amounts, it is found that informal sector remains considerably behind in terms of selected income indicators. Informal employment on average provides lower wage rates as well as lower monthly wage amounts: while wage rates in the formal sector are 23 rubles and average monthly wages are almost 4000, informal employees remain at the levels of 20 and 3500 roubles for the two indicators. This gap is not compensated by non-wage income, which is almost 30% lower for informal workers. However, the contribution of other family members almost equalizes the financial situation between the representatives of the two labour market segments, resulting in total household income which is almost equal for the two groups. The households of formally and informally employed individuals also do not differ much in terms of their assets in real estate ownership (Table 2).



**Figure 5. Age structure of informal employment, ratio to the number of employed respondents**

Taking into consideration higher relevancy of the data used in this research, this finding suggests a structural change of the pattern of informal employment observed in the 90<sup>th</sup> with a general switch from extraction of excessive incomes to the survival strategy, at least in the observed segments of informal labour market. At the same time, detailed analysis of the wage levels among different groups of informal employment shows that the most remunerative option providing a wage rate above 35 rubles per hour is employment under oral agreement, which is significantly more than an average employee of the formal sector would expect. This fact indicates once again, that the group that can not be duly accounted under adopted approach seems to be the most advantageous for the informally employed individuals. Unfortunately, this analysis is incomplete, as NOBUS does not ask questions on the amount of income from additional jobs and individual economic activity, thus restricting the possibilities for comparison between primary and secondary informal jobs.

**Table 2. Average values for income and wealth indicators**

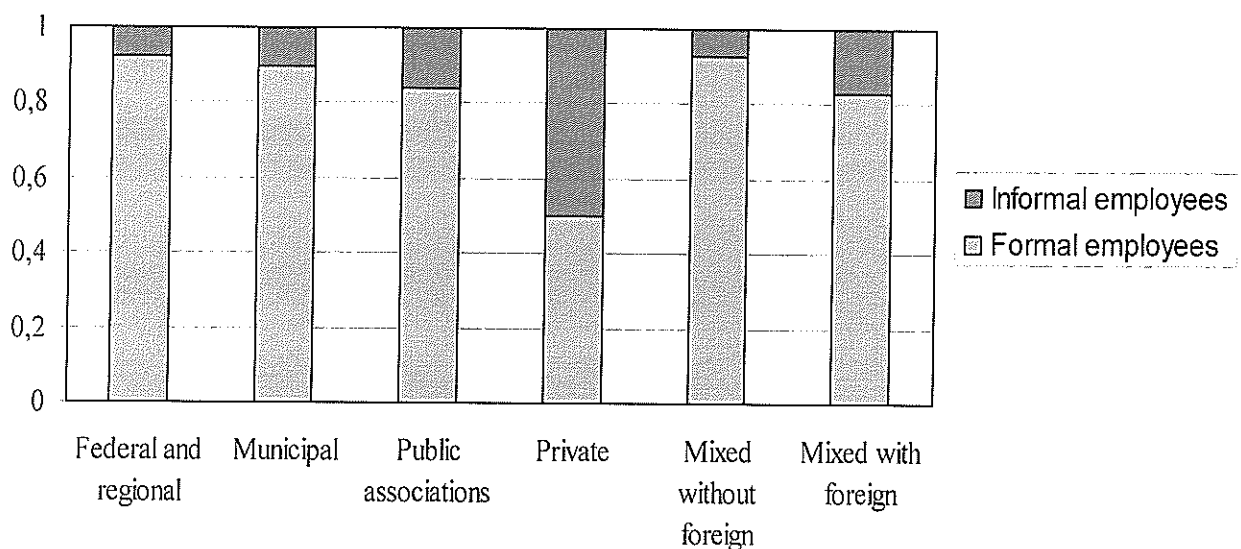
<b>Income and wealth indicators</b>	<b>Formal employment</b>	<b>Informal employment</b>
Hourly wage rate, rubles	23.3	20.4
Monthly wages, rubles	3986.4	3486.0
Individual monthly income (including pensions, benefits etc.), rubles	4146.3	3209.3
Household monthly income, rubles	7622.0	7455.6
Share of individuals with private dwelling	0.55	0.54
Share of individuals possessing additional real estate	0.52	0.49
Share of individuals with wage arrears	0.12	0.06

Despite of the mentioned financial advantages of formal employment, other negative aspects, such as wage arrears, are still more common in this area. In addition, lower payments are compensated with greater flexibility of the working hours: only 52% of individuals employed informally at the primary workplace have a standard workload of 160-180 hours per month, while for the formal sector this value exceeds 70% (assuming of course that the choice of lower working hours is voluntary). Informal employment seems to be more flexible in the treatment of overtime, although conflicting with the labour regulations – 30% of informally employed work more than 45 hours per week, while only about 13% do so in the formal sector. These difference between the two sectors does not change significantly even when multiple job holders are omitted from consideration.

In terms of location, 75% of non-agricultural informal employment is concentrated in urban areas, mostly in larger cities with the population exceeding 100,000 people. Urban informal employment rates after exclusion of agriculture are approximately 2% higher than rural. Geographically the most ‘informal’ region in terms of the share of residing informally employed is Central followed closely by Privoljskiy Federal Area (23 and 21% of all informally employed), while on the opposite side are Far East and Uralskiy Federal Area with only 9 and 6% respectively. When analyzed across different geographical locations, informal employment rates demonstrate the highest values in the Southern, Siberian and Far Eastern Federal areas. The peak of informal employment – over 30% to the people employed – is reached in the cities with 500,000 to 1,000,000 population. Some regions have exceptionally high informal employment rates – in Magadanskaya oblast and Altay Republic they

exceed 40%, – while the lowest level below 10% of the labour force are observed in Chukotskiy AO and Kurskaya oblast, with the next lowest level (14%) registered in Moscow city.

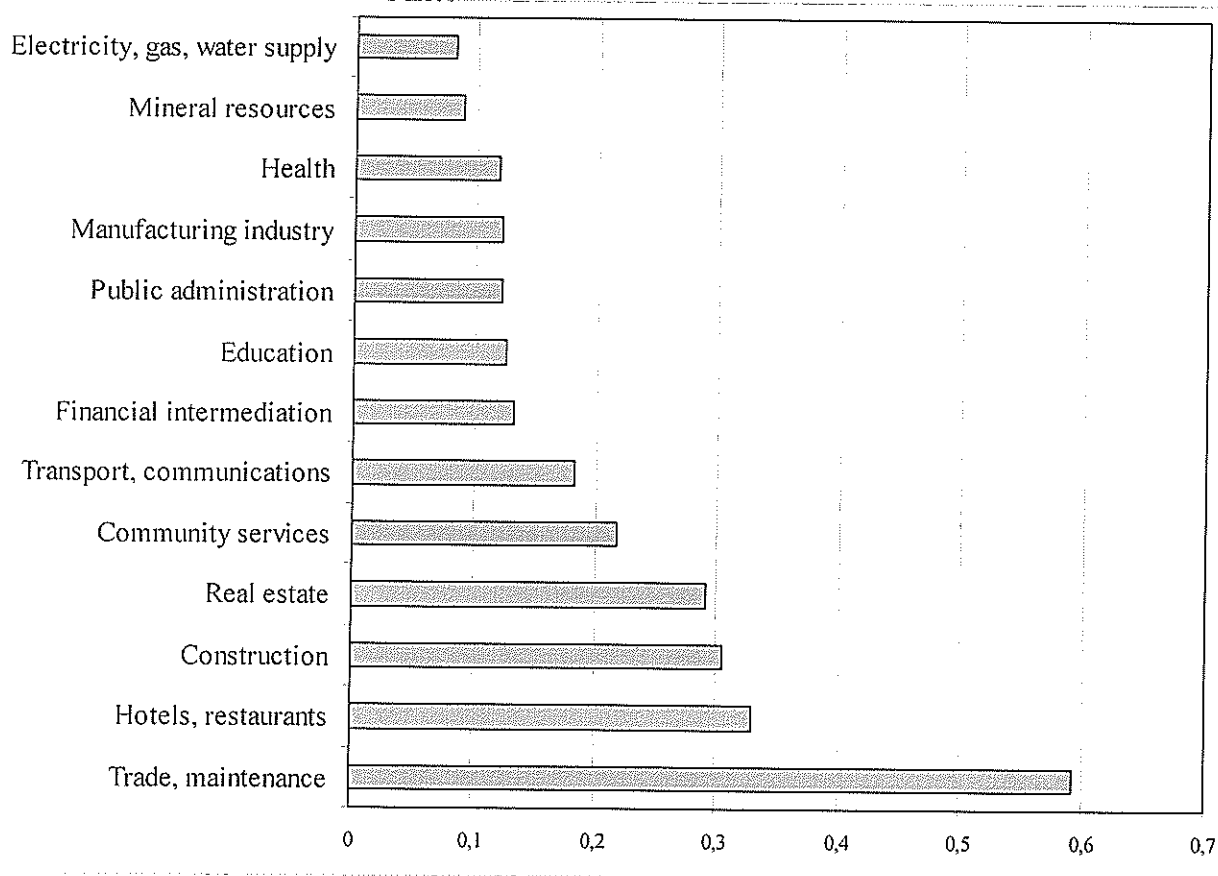
An important aspect of informal employment is the differences observed across industries and types of employers rather than individual characteristics of the employees. Informal employment rates in enterprises with different ownership types are shown on Figure 6. As it could be expected, the prevalence of formal employment – 90% – is observed in the enterprises owned by different levels of government, while 50% of the employees of private sector are employed on informal basis. It is still surprising that some 10% of municipal and 8% of federal and regional employees work informally. More detailed analysis shows however that the majority (over 80%) are multiple job holders and contractual employees either working for the government in addition to the primary activity, or running for additional source of income to complement low budget wages. It is more interesting to mark that the highest share of formal employment – even slightly exceeding the values for public sector – is observed among employees of the companies with mixed property and no foreign capital, probably partly due to the influence of possible public capital share. Still, since the anecdotal evidence suggests that companies with mixed capital are quite likely to practice informal employment strategies, this fact again brings attention to the large companies that might use more sophisticated strategies of informal employment, not captured by labour force surveys.



**Figure 6. Formal and informal employment by ownership type**

Further differences between formal and informal employment arise due to the specifics of industrial and professional division. Certain branches of economic activity are associated with higher rates of informal employment. Summary statistics for informal employment rates across industry branches and oc-

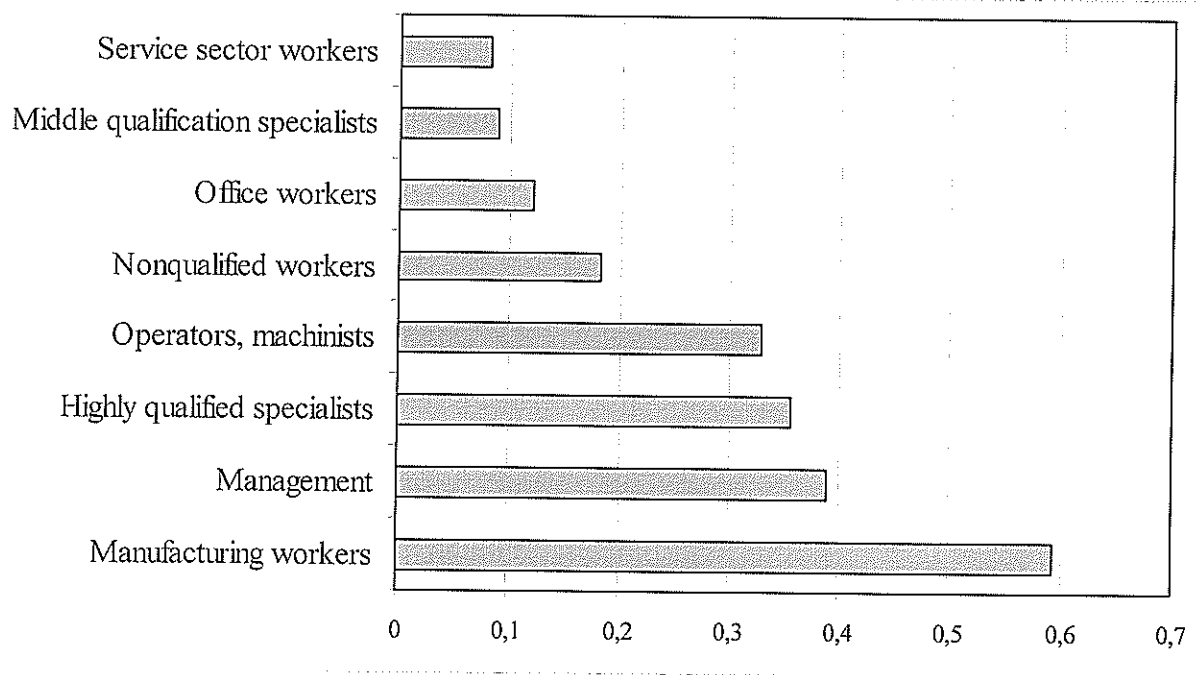
cupation are shown on Figures 7 and 8. Apart from the households with hired labour, which automatically fall within the category of informal employment, the leaders among industrial branches are trade, construction and hotels and restaurants business, all with the share of informal employees exceeding 30%. The three areas are traditionally viewed as informal, being the most prominent participants of the shadow sector even in the Soviet era. On the opposite, industries with traditionally high public sector involvement – education, health, public administration – maintain the level of informal at about 10%, which roughly corresponds to the analyzed above proportion of informally employed in the public sector.



**Figure 7. Informal employment by industry branch (share of employees)**

In terms of occupation groups remarkably low shares of informally employed are observed for the occupations of lower qualification, such as non-qualified workers, office personnel and service sector employees. On the opposite, the specialists of higher qualification and managers are by more than 30% represented informally. This pattern of more frequent informal employment among qualified personnel is also supported by analysis of the educational achievements: the highest shares of informally employed are noticed among the most educated individuals holding doctoral degrees, reflecting the dominating trend to the secondary employment among exclusive specialists in fields of consulting or other qualified services. This outcome does not conflict

with lower wages observed among informally employed, as a large share of the qualified personnel would be employed by public organizations where higher education levels might not be enough to level the market wages. However, the presence of this group might be a result of misclassification, comprising a rare case of secondary job holders who are perfectly accountable to the tax authorities. The second place is shared by different types of professional education, mainly corresponding to the segment of manufacturing workers.



**Figure 8. Informal employment by occupation (share of employees in occupation)**

In terms of social groups that are most frequently viewed as disadvantaged participants of the labour market, it can be stated that although in general informal employment rates are higher among men, the groups commonly considered as economically insecure – students, retirees, single women with children – tend to show higher participation in the informal market comparing to the sample average (table 3). Partly reflecting the fact of higher informal employment rates among younger people, but also contributing to the observations of higher informal employment of insecure groups, information on duration and stability of employment measured by length of service with current employer and total employment record show that there is consistent decline of informal employment rates associated with longer work experience and more lasting employment relationships. Occasional employment with duration under 1 year involves over 40% of informally employed, while employment relationships lasting for decades provide the values about 4 times lower, probably corresponding to the former employment in the state sector (table 4).



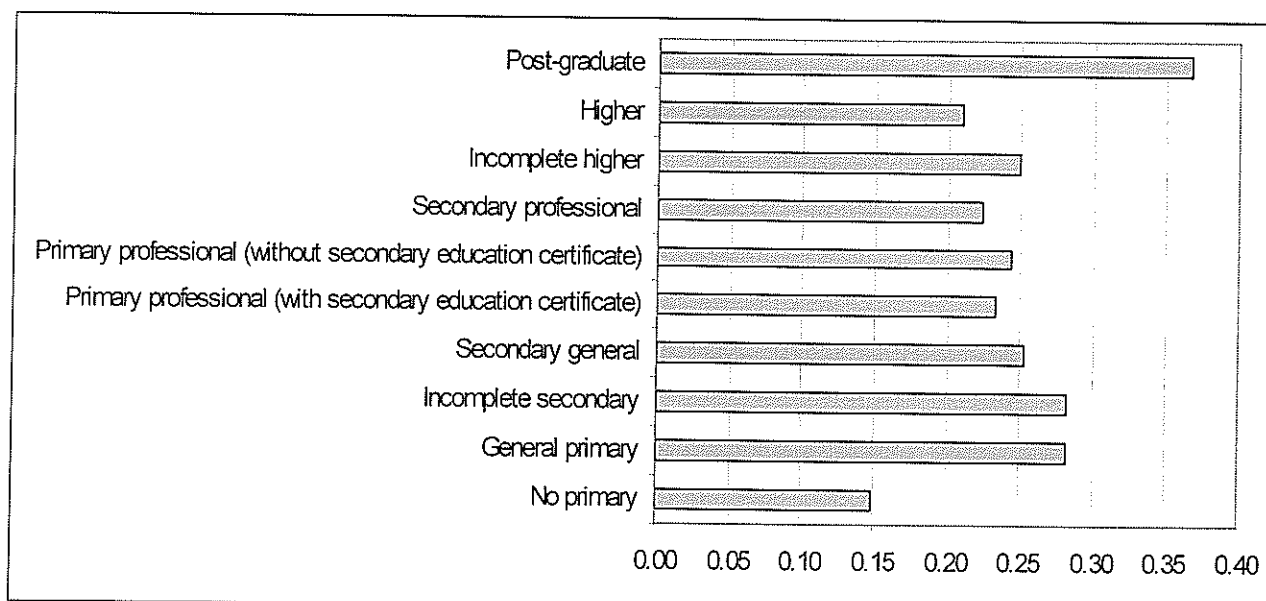
Table 3. Informal employment among insecure groups of population

Group	Share of individuals employed informally
Women	0.22
Women with children	0.23
Single women	0.26
Single women with children	0.28
Students	0.29
Retirees	0.30
<i>Men</i>	<i>0.25</i>
<i>Sample average</i>	<i>0.23</i>

Altogether, means of selected variables for the formally and informally employed individuals are provided in appendix 1. Analysis of profile of an average informal job holder shows that comparing to a typical formally employed individual this person might be on average about years 3.5 younger, more likely to be man and less likely to be married. Partly due to younger age, they tend to demonstrate unstable career patterns, not lasting relationships with current employers and much shorter work experience. In terms of industrial structure, the most popular areas of informal activities are trade, construction, hotels and restaurants and households services supply. There are visible gender specific differences in terms of industrial belonging, with women mostly occupied in trade and men in construction. In terms of occupied position informal workers are more often represented by managers, service sector employees and nonqualified workers, and they are mostly employed by private sector companies. In general it seems that the structural differences are more visible between different types of employers rather than between individual-specific features. This observation suggests that in the current situation belonging to formal or informal sector is mostly defined at the stage of employer selection. Further, as employees have lower bargaining skills, there is little if any chance to negotiate the terms of employment or to push for the formalization of individual employment agreement.

Table 4. Informal employment by period of service

Period length	Less than 1 year	1-3 years	3-5 years	5-10 years	Over 10 years
Length of service with current employer	0.41	0.30	0.21	0.14	0.08
Total employment record	0.42	0.31	0.28	0.27	0.20



**Figure 9. Informal employment by education level, share of employees in the group**

The general conclusion is that analysis of descriptive statistics alone does not provide consistent support to any of the hypothesis formulated in section 5. On the one hand, informal employment gives lower economic returns and therefore seems to serve as a source of support to disadvantaged individuals. On the other hand, however, informal employment is an excessively widespread phenomenon among individuals with the highest educational attainment and beneficial professional position in organizations. The following section continues analysis addressing these issues with the regression modelling.

## 8. DETERMINANTS OF INFORMAL EMPLOYMENT

The approach used to model individual decision-making and determinants of belonging to informal rather than formal employment group is based on probit maximum likelihood estimation with sample selection. Selection equation models the process of taking an individual decision on labor force participation.

The dependent variable in the probit equation is a dummy that denotes whether individual belongs to the informal sector or not, as defined in the previous section. The factors were selected based on the preliminary theoretical considerations and descriptive data analysis. The main groups of explanatory variables allow to capture the impact of individual, household, employer specific and location characteristics on the probability of informal employment. The results of estimation are provided in appendix 2.

Individual-specific determinants control for three education levels (higher, secondary and secondary professional) relatively to omitted lower education groups, age and age squared, and duration of employment record.

Individual financial situation in the organization is reflected by position type and wage arrears dummy. Family status is captured by dummy showing whether respondent's income is the main source of household budget. Potential disadvantaged groups are described by two dummies for student and retiree status.

Household variables relating to the family structure are the number of household members and number of respondent's children. Household income and wealth level is captured by total amount of other household members' income, household debt represented by the amount borrowed within the last month, primary dwelling and additional property ownership. Household location is portrayed by urban versus omitted rural settlement type and geographical region (with Central Federal Area being an omitted category). Employer characteristics include ownership type and industry branch.

Selection equation models the probability of employment, controlling for age, marital status, education level, level of individual non labour and household income, number of household members and number of children, being a student or a retiree and household regional and urban location.

The most visible impact on the probability of informal employment is coming from employing organization ownership type. Since omitted category are organizations belonging to the federal government, all coefficients are positive and in many cases statistically significant – except for insignificant negative coefficient for mixed companies with participation of foreign capital, which is probably due to a very small sample size. The weight of this category is almost negligible, below 1% of the sample. The highest absolute values are recorded for private companies. Informal employment for municipal enterprises is almost indistinguishable from federal: the coefficients are less than for all other groups and have the lowest significance levels. These results are generally consistent with descriptive data analysis conducted in the previous section, and comply with the hypothesis on the employer-determined informal employment status.

Industrial belonging also shows some consistent patterns. The lowest probability of working informally is associated with employment in the area of natural resources exploitation, and observed negative impacts are significant for both genders. In addition, women are less likely to be employed informally in fields of financial intermediation and manufacturing industry. While for men these effects are similar in terms of relative values, they do not allow to make any definite inferences based on significance levels. The differences between genders are especially visible for transport and communications branch: while for women it is not very certain but apparently closer to the top formal activities, the impact on informal employment among men is highly positive and significant.

Surprisingly, construction, which was among the most popular informal activities for men in descriptive analysis, does not show any significant effect in regression analysis, the same situation takes place in case of hotels and restaurants business. On the contrary, trade remains highly informal sphere for both genders, and, contrasting to the preliminary considerations, its impact on the probability of informal employment is even slightly higher for men.

A new outcome concerns education, which was previously attributed to the spheres of high public sector involvement and, respectively, lower informal employment rates. However, in case of regression modelling education returns a high positive influence on the probability of informal employment. In particular, for men education is the first branch to stimulate informal employment in terms of magnitude, and its impact is highly significant. This result most likely reflects the control for public ownership included into the model and allows to separate private education services, which historically are among the most wide spread informal activities. Unexpectedly though, the impact of being employed in education, although highly positive, is not significant for women, who represent the vast majority of secondary education employees. Therefore, the few men who happen to work in the education are extremely active in the aspiration to supplement low official wages with additional activities.

Although employers' characteristics show a systematic impact on the probability of informal employment, once industrial belonging and ownership type are fixed, individual position and functions performed within organization according to the level of qualification do not show any significant impact on the probability of informal employment. The only exception is belonging to the armed forces, that shows strikingly high values and significance of the coefficients. The two possible explanations are inclusion and predominance of private security agents into a small sample of military employees or disastrous income situation combined with good opportunities for informal income extraction among military. Again, this result favors the hypothesis of employer's dominance and partly initiative in the process of choice between formal and informal work conditions.

The impact of individual characteristics is not so pronounced. Age effects show concave pattern with a maximum reached in early thirties, slightly later for women. Therefore, people of the middle age groups are more active informal employees comparing to youth and elderly. Higher education achievements generally tend to have a positive impact on the probability of informal employment, and the values increase with acquirement of additional skills from professional and higher education. However, the only significant result is observed for women with higher education. These outcomes agree to a certain extent with the hypothesis on the advantageous opportunities of informal employment and higher involvement of more active and competitive labor groups.

Yet, on the opposite, informal employment is more likely for individuals with short employment record. In case of women with lower work experience this effect is significant, appealing to the alternative hypothesis of the prevalence of disadvantaged groups in informal employment. However, certain problems can be associated with this variable, including correlation with age and endogeneity due to the accepted definition of dependent variable. Working women whose wages are the main source of the household budget are more likely to resort to informal employment, also an example of being pushed from the formal jobs by harder circumstances, but at the same time reflecting an opportunity of better earnings in the informal labor market. Other groups identified as potentially disadvantaged, students and retirees, show the pattern opposing hypothesis on the disadvantages of informal sector: both groups demonstrate a negative relationship to the probability of informal employment, significant in most cases. This implies that informal sector is not as ready to give jobs to the groups pushed from the formal market, but prefers to retain the best, most qualified, reliable and stable in their life planning candidates.

The presence of wage arrears is negatively related to the probability of informal employment. This can happen due to reverse causality, since wage arrears are in many cases associated with formal public sector employment. At the same time, accumulation wage arrears can be viewed as a tie to the existing place of employment preventing switching to the opportunities provided by informal sector.

The variables included to reflect family situation, including the size of household, debt level, social network, living situation in terms of real estate ownership do not show any significant influence on the probability of informal employment.

In terms of location, degree of urbanization is positively related to the probability of informal employment – an effect significant for men, reflecting broader opportunities of the cities and better chances for getting lost in case of moderate noncompliance with legislation. No clear conclusions can be made for the specifics of informal employment in different federal areas. The only sensible result is higher rates of informal employment in the Far East, in line with hypothesis of higher informal employment in case of worse economic conditions.

## **9. CONCLUSIONS**

The paper analysed the structure and determinants of informal employment in Russia based on 2003 data from NOBUS survey. Informal employment was defined as comprising individuals employed in informal sector and individuals holding informal jobs in the formal sector enterprises. The main conclusions from empirical part of the research are:

- ◆ Informal employment estimated in accordance with adopted definition amounts at least to 23% of non-agricultural labour force. These estimates however do not include a whole range of illegal informal activities concealed from surveying and therefore can be viewed as biased downwards. The main structural group comprising 50% of informal workers are the employees of informal sector, while incompliant formal sector employees according to the survey data account only for 13% of informal employment. Multiple job holders and own-account workers constitute respectively 16 and 18% of informally employed individuals.
- ◆ The rates of informal employment among men are on average 4% higher than among women. Men are more frequently employed informally than women in most age groups, except for the youngest and the oldest. The highest informal employment rates are observed among people aged 16-20 for both genders.
- ◆ In terms of economic returns, informal employment on average provides lower wage rates. Average non-wage income is also lower for informal workers. This result can be viewed as the main confirmation of the switch of informal employment in Russia from privileged to disadvantaged area of activities. However, the situation is different in case of illicit employment under oral agreement, that provides the highest average wage rates of 35 rubles per hour.
- ◆ Most part (75%) of informally employed non-agricultural workers reside in urban areas. Yet, metropolitan areas of Moscow and St.-Petersburg are found among ten regions with the lowest informal employment rates. The maximum rates of informal employment – over 30% to the people employed – are reached in the cities with 500,000 to 1,000,000 population.
- ◆ The main differences in terms of informal employment patterns are observed between private and public sector companies. This results are found both in descriptive analysis and regression modelling, where ownership type of employing organization provides the most visible impact on the probability of informal employment.
- ◆ In terms of industrial structure the highest rates of informal employment are observed in trade, hotels and restaurants business, and construction. Employment in exploitation of natural resources, financial intermediation and manufacturing industry significantly reduces the chances of informal labour relationships, while trade returns a high positive impact on the probability of informal employment. Men working in the areas of education are the most likely to have informal relationships either at primary or at secondary workplace, although in terms of overall rates education falls into the category of extensive public involvement and, respectively, lower rates of informal employment.

- ◆ The probability of informal employment is concave in age, and increases with higher education levels. Informal employment is more likely for women with short employment record and less likely among students and retirees. Women whose wages contribute the major share to the household budget are also more frequently involved into informal activities.
- ◆ Household characteristics do not have any significant influence on the probability of informal employment.
- ◆ Individuals residing in urban areas are more likely to be employed informally, and the probabilities of informal employment are significantly higher in the Far Eastern Federal Area.

Summing up, in comparison to the previous studies it seems that Russia is starting to approach gradually developed countries, where informal sector is the one employing disadvantaged individuals (such as older people, youth with no experience or low education etc.), rather than a way to earn higher incomes due to tax evasion. In particular, the relationship between wages in formal and informal sector is more in favour of formal.

The balance of interests between employee and employer is might be changing in favour of the latter. For a long time it used to be convenient for both parties to join the informal sector. As a result, informal sector turned to provide superior employment opportunities with higher wage rates and higher qualification requirements, attracting mobile and promising individuals. However, the latest trends suggest that the balance of interests between employers and employees is on its way to being upset. The last years brought a number of problems for informally employed individuals, such as restricted participation in the social security system, limited access to the financial services and international mobility. However, due to unequal bargaining powers employees in certain cases continue to maintain informal relationships despite of their actual interests.

In terms of policy-making, two approaches are usually defined regarding potential policy content: (1) measures aimed at forced or voluntary reduction of informal sector or (2) its legalization and transfer to formal.

The first group of measures that come up to banning informality is a worthwhile solution only in limited number of situations, such as limitation of hidden activities run by the owners and top management of larger enterprises, use of unregistered hired labour or overtime and tax system abuse. In terms of adopted definition of informal employment, the target for these measures is mostly informal relationships in the formal sector. Other than that, reduction of informal labour market by force might not be a feasible and defensible alternative even for a very strong government. The segment of black wages recipients therefore is the most approachable sector of informal employment in terms of

direct influence. It is also the most immediate and accountable target for social security reforms, as the deviant behaviour in other segments can be more frequently explained by reasonable and traditional arguments, providing more moral excuses and being less abusing to the legislation. At the same time, a strategy aimed at gradual voluntary switch towards formalization should be aimed at the individuals, who should get higher motivation to declare incomes. Acquisition of rights for social security benefits can be used as one of possibilities, assuming of course improving system performance and more viable guarantees.

The second group relates mainly to the activities of informal sector employees. The governments in general like an idea of entrepreneurship and are actively running various programs promoting the development of small business, omitting the issue of informal relationships from consideration. Potential recommendation in this case would comprise a possibility to legalize some additional types of activities, thus creating conditions for the growth of micro enterprises, including again development of specific social security measures.

The factors influencing the probability of informal employment identified in this research can be used to justify specific policy measures. In particular, any policy should consider regional and industry-specific aspects of informal employment, resulting in differentiated actions aimed at various demographic, social and economic groups.

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**APPENDIX 1. MEANS TABLE (LIMITED TO WORKING NON-AGRICULTURAL SUB-SAMPLE)**

	Informally employed			Formally employed		
	All sample	Men	Women	All sample	Men	Women
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
<b>Demographic characteristics:</b>						
<i>Age:</i>	38.16	37.70	38.62	41.63	41.53	41.71
age 16–25	0.17	0.18	0.17	0.11	0.12	0.10
age 26–40	0.40	0.42	0.38	0.33	0.33	0.33
age 41–60	0.39	0.37	0.41	0.51	0.49	0.53
age over 60	0.04	0.04	0.04	0.05	0.06	0.04
<i>Marital status (1 – married)</i>	0.61	0.71	0.52	0.69	0.76	0.63
<i>Gender (1 – male)</i>	0.50			0.46		
<b>Education:</b>						
No primary	0.00	0.00	0.00	0.00	0.00	0.00
General primary	0.01	0.01	0.01	0.01	0.01	0.01
Incomplete secondary	0.07	0.08	0.06	0.05	0.06	0.04
Secondary general	0.20	0.21	0.19	0.18	0.21	0.16
Primary professional (with secondary education certificate)	0.08	0.09	0.07	0.08	0.09	0.07
Primary professional (without secondary education certificate)	0.04	0.05	0.04	0.04	0.05	0.04
Secondary professional	0.32	0.29	0.36	0.34	0.31	0.37
Incomplete higher	0.05	0.04	0.05	0.04	0.04	0.04
Higher	0.22	0.22	0.22	0.25	0.22	0.27
Post-graduate	0.01	0.01	0.01	0.00	0.00	0.00
<b>Employment characteristics:</b>						
<b>Employment record</b>						
under 1 year	0.06	0.06	0.06	0.02	0.03	0.02
1–3 years	0.09	0.09	0.10	0.06	0.06	0.06
3–5 years	0.08	0.08	0.07	0.06	0.07	0.05
5–10 years	0.15	0.16	0.13	0.12	0.12	0.11
over 10 years	0.62	0.61	0.64	0.74	0.72	0.75
<b>Employment with current employer</b>						
under 1 year	0.27	0.28	0.25	0.09	0.11	0.08
1–3 years	0.31	0.29	0.32	0.17	0.18	0.17
3–5 years	0.14	0.15	0.13	0.13	0.14	0.12

	1	2	3	4	5	6
5–10 years	0.13	0.13	0.13	0.19	0.18	0.19
over 10 years	0.16	0.14	0.17	0.42	0.39	0.45
<b>Industry:</b>						
Fishing	0.01	0.01	0.00	0.00	0.01	0.00
Mineral resources	0.01	0.01	0.01	0.03	0.05	0.02
Manufacturing industry	0.09	0.11	0.08	0.20	0.24	0.17
Electricity, gas, water supply	0.01	0.02	0.01	0.04	0.06	0.03
Construction	0.11	0.18	0.04	0.07	0.12	0.04
Trade (wholesale and retail), maintenance	0.39	0.29	0.48	0.08	0.06	0.09
Hotels and restaurants	0.02	0.01	0.03	0.01	0.01	0.02
Transport, warehousing, communications	0.08	0.13	0.04	0.11	0.15	0.07
Financial intermediation	0.01	0.01	0.01	0.02	0.01	0.02
Real estate and rent	0.02	0.03	0.02	0.02	0.02	0.02
Public administration, defence, social security	0.05	0.06	0.03	0.10	0.11	0.10
Education	0.06	0.03	0.09	0.12	0.05	0.18
Health and social services	0.04	0.02	0.07	0.10	0.04	0.15
Supply of public utilities, social and personal services	0.08	0.07	0.08	0.08	0.07	0.08
Private households with hired services	0.02	0.01	0.02	0.00	0.00	0.00
Exterritorial organizations	0.00	0.00	0.00	0.00	0.00	0.00
<b>Position:</b>						
Managers of all levels and heads of government agencies	0.06	0.08	0.04	0.03	0.03	0.02
High qualification specialist	0.10	0.10	0.11	0.17	0.14	0.20
Middle qualification specialist	0.12	0.11	0.13	0.23	0.17	0.27
Office worker (preparation of information, documents registration, accounting and service)	0.04	0.02	0.06	0.06	0.02	0.10
Service sector, housing and utilities, trade	0.31	0.19	0.43	0.11	0.08	0.14
Qualified worker in agriculture, forestry, hunting, fishery	0.01	0.01	0.00	0.01	0.01	0.00

	1	2	3	4	5	6
Worker at manufacturing enterprise, art, construction, transport, communications, geology	0.15	0.23	0.07	0.20	0.31	0.10
Operators, machinists, fitters	0.04	0.07	0.01	0.07	0.11	0.04
Nonqualified worker	0.15	0.17	0.13	0.11	0.09	0.12
Military	0.02	0.03	0.00	0.02	0.03	0.01
<b>wage arrears:</b>						
existence of wage arrears	0.06	0.08	0.05	0.12	0.13	0.11
amount of wage arrears	3485.98	4193.83	2817.46	3986.36	4877.71	3241.11
<b>company ownership:</b>						
state (Federal or regional)	0.19	0.19	0.20	0.55	0.55	0.55
municipal	0.09	0.06	0.11	0.18	0.13	0.23
public associations	0.02	0.02	0.02	0.02	0.02	0.02
private	0.67	0.69	0.65	0.16	0.19	0.13
mixed without foreign capital	0.03	0.03	0.02	0.08	0.10	0.06
mixed with foreign capital	0.01	0.01	0.01	0.01	0.01	0.01
foreign	0.00	0.00	0.00	0.00	0.00	0.00
<b>Income characteristics:</b>						
monthly wage with main employer	3485.98	4193.83	2817.46	3986.36	4877.71	3241.11
hourly wage rate	20.43	23.67	17.36	23.31	27.72	19.62
hours worked per month	186.09	193.43	178.72	173.81	179.37	169.15
total personal income	3209.26	3706.14	2711.37	4150.35	4995.35	3439.05
personal wage income	3885.09	4662.44	3145.67	3986.36	4877.71	3241.11
social benefits	524.61	722.18	446.45	334.04	202.37	381.23
pension	1731.16	1866.70	1630.07	1793.14	2018.83	1645.56
<b>Family characteristics:</b>						
number of family members	3.24	3.34	3.14	3.19	3.26	3.13
single member household	0.07	0.06	0.07	0.06	0.05	0.07
<b>number of children</b>	0.57	0.59	0.55	0.50	0.48	0.51
children 0-3	0.09	0.11	0.07	0.08	0.09	0.07
children 4-6	0.09	0.08	0.09	0.08	0.07	0.08
children 7-15	0.40	0.40	0.40	0.34	0.32	0.36
number of own children	0.43	0.46	0.39	0.38	0.37	0.38
monthly family income	7455.57	8114.36	6815.31	7608.88	8159.23	7156.79
debt level	7001.07	6227.91	7720.50	5437.77	5999.55	5002.34

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
real estate ownership	0.54	0.55	0.54	0.55	0.54	0.55
additional property ownership	0.49	0.51	0.48	0.52	0.54	0.50
respondent – main earner	0.56	0.66	0.46	0.55	0.71	0.42
<b>Location characteristics:</b>						
<i>urban location</i>	0.75	0.74	0.76	0.73	0.74	0.72
<i>city size:</i>						
over 1 million	0.19	0.19	0.19	0.22	0.23	0.22
500-999	0.13	0.12	0.13	0.09	0.09	0.09
250-500	0.14	0.14	0.15	0.12	0.11	0.12
100-250	0.12	0.12	0.12	0.11	0.11	0.11
50-100	0.09	0.08	0.09	0.09	0.09	0.09
20-50	0.08	0.08	0.09	0.10	0.10	0.10
urban type village	0.10	0.11	0.10	0.11	0.11	0.11
village	0.14	0.15	0.14	0.16	0.15	0.17
<b>Region:</b>						
Central	0.23	0.24	0.23	0.29	0.29	0.29
North-West	0.11	0.11	0.11	0.12	0.12	0.12
Southern	0.15	0.16	0.14	0.11	0.11	0.10
Volga	0.21	0.21	0.21	0.21	0.21	0.22
Ural	0.09	0.09	0.09	0.10	0.10	0.10
Siberia	0.15	0.14	0.16	0.13	0.13	0.12
Far East	0.06	0.06	0.06	0.05	0.05	0.05
<b>Labour market status:</b>						
retired (may be working)	0.02	0.02	0.03	0.02	0.01	0.02
student (may be working)	0.06	0.05	0.07	0.04	0.04	0.05
<b>Number of observations</b>	11522	5779	5743	34739	15757	18982

**APPENDIX 2. RESULTS OF PROBIT REGRESSION PREDICTING PROBABILITY OF INFORMAL SECTOR EMPLOYMENT (ESTIMATED COEFFICIENTS)**

Variable	Variable name	Men	Women
Age	age	0.0426*	0.0442*
Age squared	age2	-0.0007**	-0.0006**
<i>Education level (omits below secondary):</i>			
Secondary	sec	0.0137	-0.1747
secondary professional	secprof	0.1715	0.1361
Higher	highed	0.1320	0.3890**
Length of employment record under 3 years	record	0.1883	0.2814*
<i>Industry (omits fishing):</i>			
mineral resources	industry5	-0.6466*	-1.5412***
manufacturing industry	industry6	-0.2604	-0.7035***
electricity, gas, water supply	industry7	0.1583	-0.2692
Construction	industry8	0.1950	0.1293
trade (wholesale and retail), maintenance	industry9	0.5280***	0.5096***
hotels and restaurants	industry10	0.3350	0.3692
transport, warehousing, communications	industry11	0.3079*	-0.2852
financial intermediation	industry12	-0.6125	-1.1414***
real estate and rent	industry13	0.2176	-0.2380
public administration, defense, social security	industry14	0.1745	0.0852
Education	industry15	0.5960***	0.2013
health and social services	industry16	-0.0483	0.0334
supply of public utilities, social and personal services	industry17	0.1651	0.1383
<i>Position (omits management):</i>			
high qualification specialist	position2	-0.3873	-0.1635
middle qualification specialist	position3	0.0374	0.0533
office worker (preparation of information, documents registration, accounting and service)	position4	-0.0974	0.0188
service sector, housing and utilities, trade	position5	0.1558	0.2783
qualified worker in agriculture, forestry, hunting, fishery	position6	-0.2246	-0.0703
worker at manufacturing enterprise, art, construction, transport, communications, geology	position7	-0.0856	0.3164
operators, machinists, fitters	position8	-0.1916	-0.0036
nonqualified worker	position9	0.0966	0.0767
military	position10	0.9305**	1.4889***
<i>Enterprise ownership (omits federal and foreign):</i>			
municipal	ownership2	0.2577*	0.1194
public associations	ownership3	0.4310	0.7479***
private	ownership4	1.5119***	1.4988***

mixed without foreign capital	ownership5	0.4761***	0.3871*
mixed with foreign capital	ownership6	0.5626*	-4.3234
Amount of wage arrears (log)	logarr	-0.0943	-0.2302***
Household income (log)	logincome	-0.0229	-0.0587
Number of household members	num	0.0338	0.0195
Amount borrowed within the last month (rub/1000)	borrowedsc	0.0000	0.0014
Privatized dwelling (1 – yes)	privliv	-0.0453	-0.0641
Additional property ownership (1 – yes)	addprop	-0.0812	0.0565
Respondent is the main household earner (1 – yes)	earner	0.1348	0.1506*
Students (1 – yes)	student	-0.3265*	-0.1983
Retired (1 – yes)	retired	-0.6816*	-1.6063***
Urban location (1 – yes)	urban	0.2825**	0.1332
<i>Federal area (omits Central):</i>			
North-Western	northwest	0.2160	0.1692
Southern	south	0.0920	-0.0450
Volga	volga	0.0201	-0.2288*
Ural	ural	0.0205	0.0760
Siberia	siberia	0.0515	-0.0960
Far East	fareast	0.3134**	0.3811***
<i>Selection equation</i>			
Age	age	0.0796***	0.1913***
Age squared	age2	-0.0007***	-0.0016***
Marital status (1 – married)	married	1.1356***	-0.0007
<i>Education level (omits below secondary):</i>			
secondary	sec	-0.0195	-0.0724
secondary professional	secprof	0.2911**	0.2980**
higher	highed	0.6110***	0.5641***
Number of household members	num	-0.0360	0.0022
Single-member household	single	0.2190	-0.2803
Number of respondent's children	child	-0.1887***	-0.1832***
Student	student	-1.7009***	-0.6775***
Retired	retired	-2.7795***	-2.5935***
Household income (log)	logincome	0.0744	-0.0660***
Personal non-wage income (log)	lognowage	-0.5733***	-0.5771***
Urban location (1 – yes)	urban	0.4261***	0.3381***
<i>Federal area (omits Central):</i>			
North-Western	northwest	0.4802***	0.2949*
Southern	south	0.1648	0.1006
Volga	volga	0.3193**	0.2647*
Ural	ural	0.5988***	0.1591
Siberia	siberia	0.2919**	0.1002
Far East	fareast	0.5605***	0.5403***
<i>Number of observations</i>		10 289	15 078

\*\*\* — coefficient is statistically significant at 1% level

\*\* — coefficient is statistically significant at 5% level

\* — coefficient is statistically significant at 10% level



**APPENDIX 3. RESULTS OF PROBIT REGRESSION PREDICTING PROBABILITY OF INFORMAL SECTOR EMPLOYMENT (MARGINAL PREDICTED PROBABILITIES FROM HECKMAN PROBIT REGRESSION)**

Variable	Variable name	Men	Women
1	2	3	4
Age	age	0.00231 **	0.00064 *
Age squared	age2	-0.00003 **	-0.00001 **
<i>Education level (omits below secondary):</i>			
Secondary	sec	0.00040	-0.00185
secondary professional	secprof	0.01018	0.00188
Higher	highed	0.01023	0.00680
Length of employment record under 3 years	record	0.00867	0.00407
<i>Industry (omits fishing):</i>			
mineral resources	industry5	-0.02600	-0.01633 *
manufacturing industry	industry6	-0.01047	-0.00745 *
electricity, gas, water supply	industry7	0.00636	-0.00285
Construction	industry8	0.00784	0.00137
trade (wholesale and retail), maintenance	industry9	0.02123 **	0.00540 *
hotels and restaurants	industry10	0.01347	0.00391
transport, warehousing, communications	industry11	0.01238	-0.00302
financial intermediation	industry12	-0.02463	-0.01209 *
real estate and rent	industry13	0.00875	-0.00252
public administration, defense, social security	industry14	0.00702	0.00090
Education	industry15	0.02396 **	0.00213
health and social services	industry16	-0.00194	0.00035
supply of public utilities, social and personal services	industry17	0.00664	0.00147
<i>Position (omits management):</i>			
high qualification specialist	position2	-0.01557	-0.00173
middle qualification specialist	position3	0.00151	0.00057
office worker (preparation of information, documents registration, accounting and service)	position4	-0.00392	0.00020
service sector, housing and utilities, trade	position5	0.00627	0.00295
qualified worker in agriculture, forestry, hunting, fishery	position6	-0.00903	-0.00074
worker at manufacturing enterprise, art, construction, transport, communications, geology	position7	-0.00344	0.00335
operators, machinists, fitters	position8	-0.00770	-0.00004
nonqualified worker	position9	0.00388	0.00081
military	position10	0.03741 *	0.01577 *

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Enterprise ownership (omits federal and foreign):</i>			
municipal	ownership2	0.01036 *	0.00126
public associations	ownership3	0.01733	0.00792
private	ownership4	0.06079 ***	0.01588 **
mixed without foreign capital	ownership5	0.01914 **	0.00410
mixed with foreign capital	ownership6	0.02262 *	-0.07116 **
Amount of wage arrears (log)	logarr	-0.00379	-0.00244 *
Household income (log)	logincome	-0.00036	-0.00062
Number of household members	num	0.00109	0.00021
Amount borrowed within the last month (rub/1000)	borrowedsc	0.00000	0.00001
Privatized dwelling (1 – yes)	privliv	-0.00182	-0.00068
Additional property ownership (1 – yes)	addprop	-0.00330	0.00060
Respondent is the main household earner (1 – yes)	earner	0.00538	0.00159 *
Students (1 – yes)	student	-0.02001 **	-0.00227
Retired (1 – yes)	retired	-0.04795 ***	-0.04677 ***
Urban location (1 – yes)	urban	0.01402 **	0.00165
<i>Federal area (omits Central):</i>			
North-Western	northwest	0.01475	0.00249
Southern	south	0.00530	-0.00039
Volga	volga	0.00302	-0.00198
Ural	ural	0.00411	0.00103
Siberia	siberia	0.00426	-0.00088
Far East	fareast	0.02278 *	0.00734
Marital status (1 – married)	married	0.01067	0.00000
Single-member household	single	0.00142	-0.00032
Number of respondent's children	child	-0.00142	-0.00016
Personal non-wage income (log)	lognowage	-0.00430	-0.00051
<i>Number of observations</i>		<i>10 289</i>	<i>19657</i>

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