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RESEARCH ARTICLE

Long-term dynamics of informal employment and its relationship with the poverty of the Russian population against the backdrop of the COVID-19 pandemic

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Abstract

The study aims at assessing the prevalence of informal employment in the Russian labour market and evaluating its relationship with the risks of monetary poverty. Empirically, the study bases on the data of the Russian Longitudinal Monitoring Survey (RLMS HSE) for 2000-2020. Calculations have shown that over the past 20 years, on average, about a quarter of Russian employees were included in the informal labour market for their main or secondary employment. The results of the study provide some evidence on the existence of several zones of informality in the Russian labour market, in which there are different motives for deformalization, in particular: low-skilled employment in the informal sector, employment only in the format of informal part-time / side jobs ("casual employment") and partial departure to the informal sector while maintaining an official employment contract at the main place of work. Employment with part or all of the pay for the main job received informally — that is, without a formal contract or with declared wages below the actual wage received, in violation of current regulations — is more common among men, young people and people of early working age, and as well as citizens with education below vocational secondary. At the same time, women, people aged 30–49, and citizens with vocational secondary education predominate in the structure of informally employed, although with a slight preponderance. Regression analysis shows that there is a statistically significant relationship between involvement in the informal labour market and the risks of monetary poverty: fully informal employment in 2019 is associated with higher chances of the respondent's household falling into poverty, and with lower chances in 2020.

Keywords

informal employment, labour market, poverty, monetary poverty, COVID-19

JEL codes: J31, J46

Introduction

Research on informal employment is in demand for a number of reasons. The ratio of the formal and informal sectors of the economy is a structural indicator that reveals the heterogeneity of economic branches in terms of labour productivity (in the informal sector, labour productivity on average is lower), as well as the quality of the institutional environment (Voskoboynikov and Gimpelson 2015). A significant proportion of jobs in the informal sector are characterized by low and/or unstable wages, and the population employed in such jobs may be exposed to increased risks of unemployment and poverty. The part of the informal sector that is associated with economic activity without legalization does not generate tax revenues and reduces the sustainability of the public insurance system for risks related to health, temporary disability, and old age. Informal workers often receive little or no social protection, which increases their vulnerability during periods of temporary work incapacity, as well as during economic shocks and after retiring from employment.

In the short term, informal employment can play the role of an adaptation mechanism that compensates for income losses, and therefore has countercyclical dynamics, showing growth against the backdrop of an economic downturn (Loayza and Rigolini 2011). This effect is especially pronounced in the poorest population groups, whose representatives may be more willing to enter informal labour relations in the face of unfavourable dynamics in the formal labour market, since for them the marginal effect of income loss is high. In the long term, the dynamics of informal employment depends on the structure and degree of development of the national economy, as well as on the degree of state intervention in its regulation. Existing studies show that economic growth in the early 2000s in Russia contributed to the growth of informal employment: this was due to the ongoing restructuring of the economy and the growth of sectors in which the prevalence of informal employment is high: trade, construction, and domestic services (Gimpelson and Zudina 2011).

Over the past decade, a number of events have taken place in Russia that could have a significant impact on the dynamics of informal employment. Starting from 2014, real incomes of the population have been declining or stagnating under the influence of various external and internal shocks (Ovcharova et al. 2021). Since recently, the country saw a rapid growth of the gig-economy: the creation of digital platforms and the development of new formats for the interaction of workers with consumers of services leads to the convergence of labour supply with demand for it, which, in the absence of clear regulation and institutional conditions for the formation of this (new) segment of the economy, can contribute to the growth of informal employment. Starting on July 1, 2017, the concept of self-employment has been introduced into the Russian regulatory field. A simple registration procedure and a soft tax regime ("professional income tax"), introduced for this category of workers from January 1, 2019, should have facilitated the legalization of part of the informal sector. Finally, the introduction of various restrictions, up to the suspension of enterprises and an almost complete ban on the operation of entire sectors of the economy during the COVID-19 pandemic in 2020-2021, could also have a significant impact on the structure of the Russian economy in terms of the ratio of the formal and informal sectors. On the one hand, the sectors and enterprises affected by the pandemic were characterized by higher levels of informal employment, which could lead to a reduction in the number of informal jobs. On the other hand, the reduction of employees in the face of a decrease in the revenue of enterprises and the liquidation of some of them, and an increase in unemployment in the context of an economic slowdown

could become factors contributing to the deformalization of the economy. These changes could lead to a significant restructuring of the labour market, and the directions of these changes, as can be seen from the above-given description, can be opposite. In this regard, the study of long series of indicators is of particular interest.

The complexity of statistical observation of the informal sector causes a lack of research in this direction. This paper, without claiming to be a comprehensive description of the informal part of the Russian economy, intends to supplement the available information on the main characteristics of informally employed workers, to trace the long-term dynamics in this segment, and to assess the relationship of informal employment with the risks of monetary poverty of the population before the COVID-19 pandemic and in the first year of its development.

The article is structured as follows: in the first section, the authors give definitions of the main concepts and describe the empirical basis of the work; the second section is devoted to a discussion of possible ways of linking informal employment with the risks of monetary poverty and the formulation of research hypotheses; the third section assesses the dynamics of the prevalence of informal employment in Russia and the main changes in the socio-demographic characteristics of informally employed workers. The fourth section of the article presents the results of the regression analysis regarding the relationship between informal employment of the population and the risk of monetary poverty in 2019 and 2020. The final section outlines the main findings and limitations of the present study.

1. Definitions and empirical basis of the work

In Russia, the official statistics defines those employed in the informal sector as "persons who, during the survey period, were employed in at least one of the production units of the informal sector, regardless of the status of their employment and whether this work was their main or secondary job. The criterion for determining units of the informal sector is the absence of state registration as a legal entity" (Rosstat n.d.). However, this is not the only approach to the definition of informal employment that might be found in the literature: the limitations of existing data and the specifics of applied problems that certain authors solve force us to look for other definitions; sometimes they can conflict with each other and produce widely spread estimates (on this, see (Kapelyushnikov 2013; Gimpelson and Zudina 2011), and others).

Most definitions used in the literature can be attributed to one of two approaches: "productive" or "legalistic". According to the "productive" approach, the informal sector of the economy includes jobs in private enterprises owned by individuals or households without a legal entity, and self-employed workers. The "legalistic" approach separates informal employment from formal employment by analyzing the extent to which enterprises or individuals follow the established regulatory rules (Gimpelson and Zudina 2011).

In both cases, it is difficult to apply the binary principle: the variety of existing jobs can almost never be divided into strictly formal and informal units. Within each of the approaches to the definition of informal employment, as Vladimir Gimpelson and Anna Zudina note in their paper, "one can see a continuum of jobs, within which the ratio of formal and informal can change and include different sets of characteristics" or "a continuum of states limited by complete formality on the one hand and complete informality on the other" (Gimpelson and Zudina 2011: 4). Considering the widespread practice of combining main and secondary

employment in the Russian labour market, main employment, and part-time jobs, etc., this thesis can be expanded, and one can mention a continuum of various combinations, since signs of informal employment can appear in the main job, secondary or part-time / side jobs.

In this paper, formally employed workers include those employed at enterprises and organizations via an employment agreement or contract and receiving official remuneration for their work, without the use of informal, "gray" payments. Workers employed outside this corporate sector, as well as workers who receive part of their wages informally, form a segment of informal employment. Such a definition is based on the "productive" approach to the definition of informal employment (see (In the shadow of regulation... 2014)), expanding it by referring to informal employment "economic activity associated with the production of high-quality (legal) goods or services for sale (for remuneration), but with violation — complete or partial — of the norms of the current [labour or tax] legislation» ((Sinyavskaya 2005); in her work, Oksana Sinyavskaya characterizes this segment as "underground employment"). In other words, we use a broad definition and consider all types of labour relations associated with the receipt of undeclared income (in whole or partially) or with the absence of a formal labour contract as informal employment (for a similar approach, see, for example, (Williams and Windebank 2015)). This largely corresponds to the approach of defining informal employment based on the characteristics of the workplace, proposed by the ILO and reflected in the recommendations of the 17th International Conference of Labour Statisticians (ILO 2002; ILO 2003).

Depending on the subjects that we consider in the course of the analysis, this definition is applied to the main employment or to the entire employment of individuals, i.e., main, secondary, and side jobs. In several cases, we focus exclusively on the mechanisms for obtaining labour income (officially or partially/completely informally), since this approach enables covering the segment of informal employment quite sufficiently due to the fact that receiving informal income implies the absence of a formal contract with the employer or the existence of such a contract and partial payment of wages in violation of applicable laws. In this case, however, self-employed persons fall out of our analysis.

The calculations presented in the paper are based on data from the Russian Longitudinal Monitoring Survey (RLMS HSE). To assess the dynamics of the informal employment prevalence, we consider long series from 2000 to 2020, which were obtained based on processing representative files for respondents aged 15 years and older. When considering the composition of labour income (the presence of unofficial wages), we present the series from 2008, since until that moment the necessary questions were not asked in the RLMS questionnaire.

2. Relationship between informal employment and risks of monetary poverty: literature review

Within the framework of the modernization theory, a broad segment of informal employment is considered to be a sign of developing and lagging (underdeveloped) economies, in connection with which informal employment becomes a sign of insecurity, non-optimality; it is not a voluntary, but rather a forced choice of workers in the absence of a sufficient number of formal jobs and a developed economic infrastructure. Neoliberal theory sees the informal economy as a mechanism for resisting overregulation and high tax burdens, and

informally employed workers as rational economic agents that avoid excessive institutional pressure. In this case, informal employment will become more widespread in economies with higher taxes and levels of government intervention. Finally, the theory of political economy considers informal employment as a consequence of insufficient regulation — that is, weak mechanisms for protecting the rights of workers and supporting the population. Under such conditions, enterprises aimed at maximizing their own profits and reducing costs push workers out of the formal employment (quoted by (Williams and Windebank 2015)). The described theoretical concepts interpret the choice of workers in favour of informal employment in different ways and suggest different directions of influence of the informal status on the agent's economic situation: income level, chances of falling into poverty, protection from the main socio-economic risks.

On the one hand, employment in the informal sector of the economy may be associated with fluctuating income flow, instability, increased risks of unemployment, especially during economic shocks. This may increase the vulnerability of workers and push them into poverty. In addition, informal employment in low-productivity sectors can, in general, be associated with low wages, which can also work to increase the risks of monetary poverty. However, at the same time, informal employment, even in the low-productivity sector, can serve as an adaptation mechanism during periods of economic instability.

On the other hand, if informal employment is a conscious choice of a skilled worker employed in a highly productive segment of the economy, and this choice is associated with the desire to maximize their own income by transferring part of their labour income to the field of informal payments and, accordingly, reducing mandatory tax payments and deductions to state funds, an informal status may be associated with a relatively higher financial position. At the same time, such a strategy of behaviour may be associated with a partial transfer into informality while maintaining a formal labour contract and, accordingly, basic social and labour guarantees. In the changing institutional framework — the revision of the rules for calculating various insurance payments, the restructuring of the pension system — such a choice may look economically rational not only in the short term, but also in the long term.

As noted by Vasily Anikin and Natalia Tikhonova, one of the reasons for the growing prevalence of informal and non-standard employment in Russia is the shortage of jobs for low-skilled workers in the formal sector of the economy (Anikin and Tikhonova 2014). In such a situation, it can be assumed that informal employment, being a forced choice in the context of economic imbalance, will be associated with relatively low incomes and working conditions, and increased vulnerability of workers in terms of poverty. The described situation was observed, for example, in the Polish labour market in the second half of the 2000s (Cichocki and Tyrowicz 2010). In part, this is also evidenced by the results of a recent study by experts from the World Bank, which revealed a statistically significant and gradually increasing gap in earnings between formal and informal workers, as well as the link of informal employment with increased risks of poverty, although less stable and statistically insignificant for hired informal employees (Kim et al. 2019).

At the same time, there are studies showing that the expansion of the informal employment can be a significant factor in reducing poverty in certain (primarily depressed) regions (see, for example, (Magomedova and Magomedova 2012)); informal employment is "better" than unemployment in terms of the financial situation of the population. Indirectly, this is also evidenced by the fact that, according to estimates based on statistics, the size of the informal sector changes counter-cyclically in relation to the dynamics of the unemployment rate (Gimpelson 2002). That means, again, that informal employment may become

a mechanism providing employment for people who are unable to enter the formal labour market. This assumption is supported by the results of foreign studies on developing countries, where informal employment is the main income of the least prosperous segments of the population and is associated with a reduction in the depth of their poverty and its scale (see the meta-review (Sharma and Adhikari 2020)). At the same time, job satisfaction, subjective well-being, and subjective social status of informally employed workers in Russia do not differ from those of the formally employed (Kim et al. 2019), and self-employed workers rate their position even higher than those employed in the formal sector of the economy (Zudina 2013).

Based on the relationships described above, the authors of this paper formulate the following hypotheses:

- informal employment in the Russian labour market will become more widespread during periods of economic downturns;
- In Russia, informal employment will be associated with lower incomes compared to the formal segment of the economy and, consequently, with higher risks of monetary poverty.

3. Prevalence of informal employment in Russia

The results of calculations based on RLMS data indicate that, over the past 20 years, on average, about a quarter of those employed in Russia were included in the informal labour market for their main or secondary job (Fig. 1)[1]. The maximum prevalence of informal relations over the entire observation period was recorded in 2017 (28% of employed respondents were fully or partially employed informally), and the minimum — in 2001 (19.7% of employed respondents). Our estimates show soft undulate dynamics of indicators: a rather noticeable labour market deformalization during the period of economic growth in the early 2000s (2001–2004), then a gradual decrease in the share of respondents included in informal labour relations in 2004–2008, a comparable increase in informal employment in 2009–2017, and another reduction in 2018–2020. In the last year of observations, 2020, the share of those employed informally at the main or secondary job amounted to 24.2%, having decreased by 1.4 percentage points compared to the previous period. Thus, in the year of the pandemic, the trends outlined earlier were not interrupted, and the negative consequences of the restrictions imposed on the labour market did not lead to the deformalization of employment. This may be due both to the fact that the greatest losses from temporary lockdowns and remote employment affected, first of all, service and trade enterprises, which are characterized by a relatively high prevalence of informal labour relations, and led to a reduction in labour supply due to the closure of borders and the departure of a significant part of labour migrants.

A more detailed examination of the composition of the informally employed respondents shows that the practice of formal employment at the main job and informal employment in secondary or side jobs is gradually becoming less widespread in the Russian labour market (Fig. 2). If in the early 2000s the share of such respondents accounted for over 5% in the total structure of the employed, by 2020 this share went down to 2.3%. Almost throughout

1 To estimate the prevalence of informal employment, we use a subsample of respondents who indicated that they work or are on any paid or unpaid leave when answering the question about the main job / occupation. The sample size for each of the considered years is given in Appendix 1.

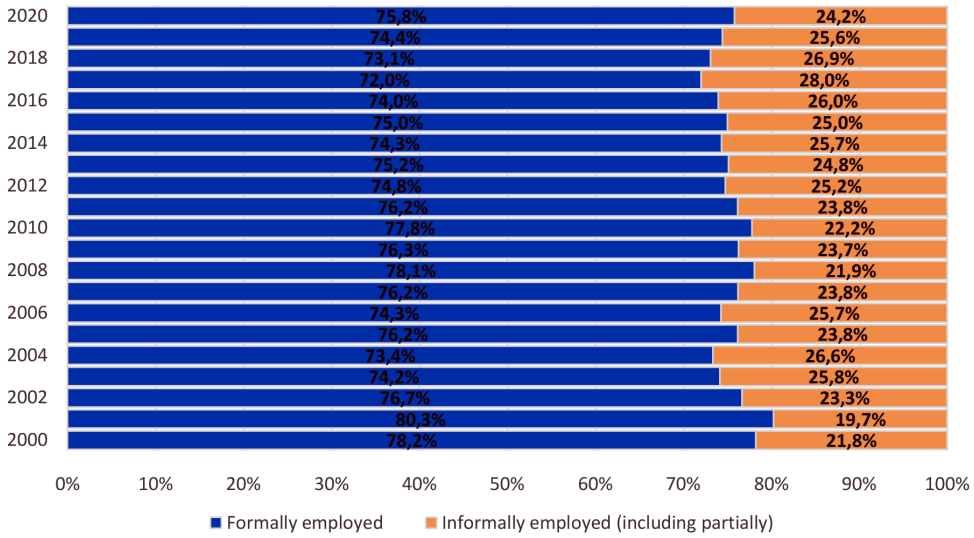

Figure 1. Informal employment prevalence: informality in main or secondary job (including side jobs), 2000–2020. *Note*: In 2000-2001, informal/formal employment is determined without taking into account questions about the job contract due to their absence in the questionnaire. The question about the salary paid at the main job has been asked since 2008. *Source*: author's calculations based on RLMS HSE data.

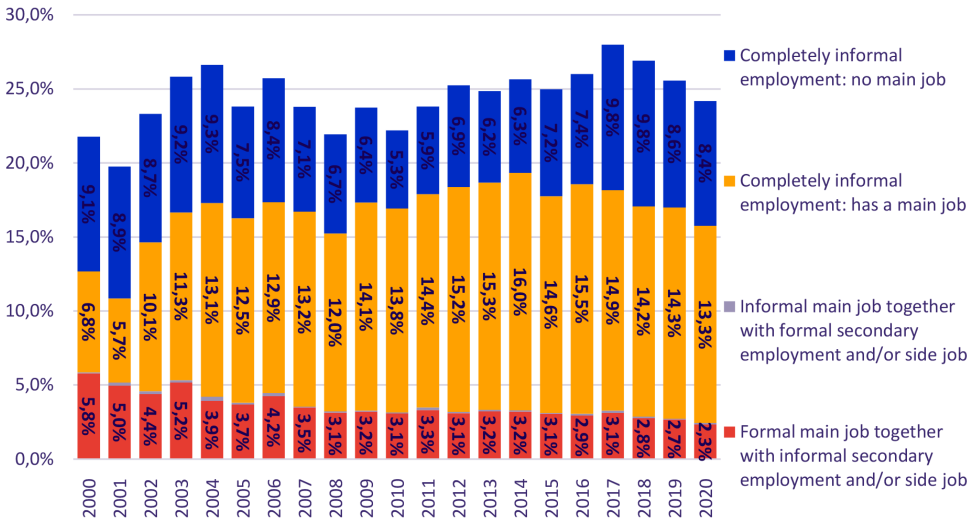

Figure 2. Structure of informal employment: informality in the main or secondary job (including side jobs), 2000–2020, % of the total number of respondents included in informal labour relations. *Note:* In 2000-2001, informal/formal employment is determined without taking into account questions about the job contract due to their absence in the questionnaire. The question about the salary paid at the main job has been asked since 2008. *Source:* author's calculations based on HSE RLMS data.

the entire period under review, the bulk of the informally employed respondents were the people who work solely in the informal sector. The next largest group is those included in the informal sector of employment through secondary or side jobs; this group also includes young people, temporarily disabled respondents, and pensioners who are engaged in regular or incidental part-time jobs to increase their own income; the latter may choose to work in the informal sector in order to maintain their basic pension rights in full.

In general, as the analysis of RLMS data shows that the practice of signing a formal labour contract for secondary or side job is rather weakly spread in Russia. If the share of respondents employed under a contract in their main job remains fairly stable throughout the period under review and steadily exceeds 80%, a formal contract for secondary and side job is signed in no more than a quarter of cases (see Table 1). At the same time, over the long term, the prevalence of this practice is declining: from 23% on average in the early 2000s up to 15% on average in the late 2010s.

Table 1. Prevalence of formal employment at the main and secondary job, 2002–2020, %

	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Share of respondents with a formal contract for their main job, % of those having main job	88.6	87.2	85.1	86.2	85.6	85.7	86.9	84.7	85.3	84.4
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	
	83.5	83.4	82.7	84.0	83.0	83.2	84.0	84.1	85.2	
Share of those with a formal contract for secondary and side job, % of those with secondary or side jobs	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
	26.1	20.5	21.6	23.1	20.6	22.0	23.2	23.9	25.2	23.7
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	
	20.2	21.5	16.9	19.5	16.4	14.2	12.0	18.2	15.7	

Note: In 2000-2001, issues of formal employment registration are not included in the questionnaire.
Source: author's calculations based on HSE RLMS data

There is at least one worker employed informally at his/her main job in 13.8% of Russian households, and in 15.2% of households there are workers who receive part or all their income from their main employment informally. The probability of being included in informal employment grows with the size of the household (for example, in 2020, it was estimated at 5.3% in one-person households to 25% in households consisting of 5 or more people). On the one hand, several people of working age more often live in large households, each of whom can be employed informally; on the other hand, with an increase in the size of a household, the average number of dependents in its composition (minor children, pensioners, etc.) increases, and their presence preconditions the need to find secondary and part-time jobs, including in the informal sector of the economy.

The prevalence of informal employment is higher among men; in 2008–2020, no less than 21% of employed men in the sample received at least part of their pay at their main job unofficially (the horizon of the analysis is due to the fact that the question of wages at the main job has been asked in the RLMS survey since 2008, and it is from this moment that it is possible to conduct more accurate comparisons), while among women this figure exceeded 20% only in 2009 and 2011. This result is consistent with estimates from other data — both official statistics and population surveys show a high prevalence of informal employment in Russia among men (Mukhanova 2017; Karimov and Fatkullina 2021). Additionally, it can

be noted that the RLMS data indicate an increase in the prevalence of informal payments among employed men during the economic recession and stagnation of 2014–2017 and stabilization of this indicator among women.

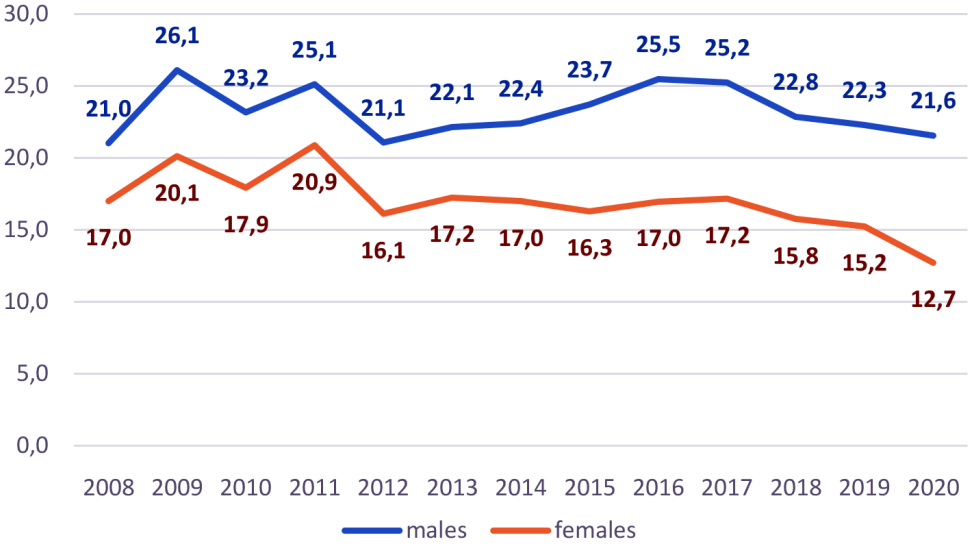

Figure 3. Share of men and women who receive part or all of their wages at their main job unofficially, 2008–2020, %. *Note:* in 2008–2014 the question of wages at the main job is asked as follows: "What percentage of this money do you think was transferred officially, that is, taxes were paid from them?". Since 2015, the question takes a more general form: "Do you think all this money was transferred officially?" Fluctuations in the distribution of answers may be associated with this change (before 2015, the question could cause more difficulty for respondents). In this regard, strictly speaking, the comparison of dynamics is correct for two intervals: 2008–2014 and 2015–2020; this applies to the results shown in Fig. 3 and 4 in tables 2 and 3. *Source:* author's calculations based on HSE RLMS data.

Women slightly predominate in the structure of employees who receive part or all of their wages at their main job unofficially, but over time these differences level out: if in 2008 among the respondents who indicated that they received part or all of their income unofficially, women accounted for 57,9%, and men for 42.1%, in 2020 these proportions amounted to 55.3% and 44.7%, respectively.

An analysis of the RLMS data by age shows a consistently high proportion of those who receive informal labour income in the youngest groups of the population (see Table 2). The minimum indicators throughout the entire observed period show groups of pre-retirement and retirement ages. At the same time, participation in employment with informal payments at the main job in all groups of the population shows similar dynamics: an increase during the economic crisis of 2009 (in all groups, except for the youngest), then a slight decrease in the period up to 2013, and growth against the background of the deteriorating economic situation that began in 2014.

The observed high involvement of young people in informal employment s consistent with the results of other studies (Karimov and Fatkullina 2021; Gimpelson and Zudina, 2011). At the same time, these studies also indicate a greater prevalence of informal employment among the elderly (in some studies, this pattern is observed in rural areas —

see (Mukhanova 2017)), which does not appear in our data. This is probably due to the fact that other authors operate with the definition of Rosstat and refer those employed in personal subsidiary farms to the informal sector.

Table 2. Share of those who receive part or all of their wages at their main job unofficially, by age, 2008–2020, %

Age	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
15-19	34.0	30.6	30.1	33.3	32.3	21.2	31.4	42.9	48.3	42.9	43.3	42.4	36.0
20-29	16.1	21.4	19.6	19.6	17.9	18.2	19.3	23.3	24.0	23.8	19.5	18.6	16.8
30-39	14.8	19.5	16.0	17.5	15.0	16.4	17.3	19.1	20.5	20.5	18.7	17.5	17.1
40-49	13.1	17.6	14.6	18.7	14.0	14.8	15.4	18.8	20.6	21.3	19.0	17.9	15.9
50-59	10.4	12.1	12.6	13.9	11.1	11.8	12.8	13.0	15.1	14.5	15.1	18.1	14.4
60-72	11.9	14.0	11.5	11.7	10.3	12.2	8.6	13.0	14.2	14.4	14.6	12.3	12.7

Source: author's calculations based on HSE RLMS data.

If we look at the age structure of employees who receive part or all of their wages at their main job unofficially, we can see that this group mostly consists of people of active working age — 30–49 years (Fig. 4). However, over the observation period, the share of workers under the age of 30 has significantly decreased. First of all, this, as well as the gradual increase in the proportion of the population of older working ages, is associated with the changes that have occurred in the structure of the population of Russia: if in 2008, according to official statistics, the share of young people aged 15–29 years in the total population was 24%, then by 2020 it decreased to 16%. The greatest interest in data in Fig. 4 is towards a sharp decrease in people aged 50-59 in the structure of those receiving informal wages in the last year: from 21.3% in 2019 to 16.2% in 2020. It appears that the health risks posed during the COVID-19 pandemic have led people of near-retirement age to temporarily withdraw from informal employment (with informal wages).

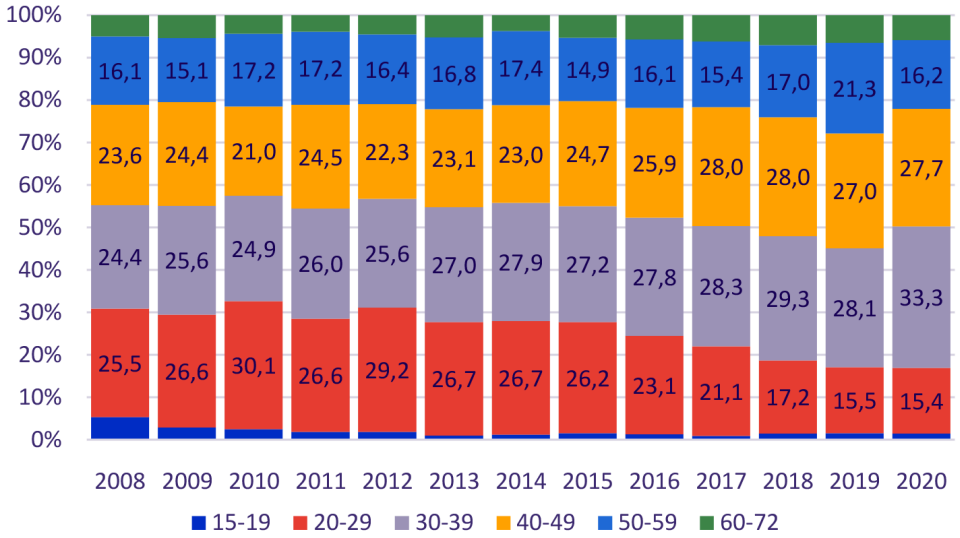

Figure 4. Structure of employed respondents who receive part or all their wages at their main job unofficially, by age (in years), 2008–2020, %. *Source:* author's calculations based on HSE RLMS data.

Table 3 shows information on the prevalence of unofficial wages among respondents with different levels of education. There is a clear gradient over the entire observation period: the maximum involvement in informal payment schemes is recorded among respondents with education lower than vocational secondary (in some years, the prevalence of informal payments in this group approaches 30%), and the minimum is observed among respondents with higher education. At the same time, in the structure of recipients of unofficial payments, the largest share is made up of employees with vocational secondary education: in all years they account for about half of the cases (46.2% in 2008, 48.5% in 2020; minimum — 43.9% in 2021; maximum — 51.7% in 2009). This corresponds well with the conclusion of Vasily Anikin and Natalia Tikhonova about the shortage of jobs for low-skilled workers in the formal segment of the Russian economy (Anikin and Tikhonova 2014).

Table 3. Share of employed people who receive part or all of their wages at their main job unofficially, by education level, 2008–2020, %

Education level	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Below vocational secondary education	16.4	20.0	21.2	20.3	20.3	19.5	20.8	27.8	28.7	26.6	27.1	24.3	23.3
Vocational secondary education	14.2	19.5	16.6	18.4	14.0	16.2	16.9	19.1	21.5	21.3	19.8	19.5	17.8
Higher education and higher	12.2	13.8	11.3	13.7	11.2	11.2	11.5	12.9	13.8	14.6	12.2	12.6	11.6

Source: author's calculations based on HSE RLMS data.

4. Link of informal employment to poverty: 2019 and 2020

To investigate the relationship between informal employment and population poverty, we turn to measuring the total household income and to looking into poverty at the household level, in line with the approach used in official national statistics. In this part of the paper, we focus on two years: 2019, which characterizes the situation on the Russian labour market before the start of the COVID-19 pandemic and related changes in employment, and 2020, the first year of the pandemic's large-scale development. To follow the changes in the relationship between informality and poverty, we perform a regression analysis based on the 28th and 29th waves of the HSE RLMS survey, respectively.

The calculation of household income is based on the questions asked in the RLMS household questionnaire. The amount of income includes labour income of all household members (excluding taxes and other deductions), pensions, student bursaries, all types of benefits, subsidies and allowances (in monetary terms) received by the household, income from the sale or rental of property, cash deposits, shares, bonds, securities and other capital investments, alimony payments, insurance payments and funds from the return of debts, tax deductions (with the conversion of the annual amount into a monthly equivalent), as well as income from the sale of goods produced in the household.

To determine the status of a household, the estimated total income is compared with the subsistence level of the household, calculated on the basis of data on the values of regional subsistence levels for the working-age population, pensioners, and children for the fourth quarter of the corresponding year. In the event that the total income of a household is less than its total subsistence level, it is classified as poor. The share of poor households in the 2019 RLMS sample was 12.8%, in the 2020 sample it was 14.5%.

Due to the fact that the level of material well-being and poverty is traditionally assessed at the household level using indicators of average per capita income and largely depends on the size and structure of the household, while employment characteristics are individual, regression analysis is carried out at the individual level, but with including a number of household characteristics as regressors. Due to the fact that persons included in the individual RLMS database can live in the same households and, accordingly, have equal levels of per capita income and other observable and unobservable characteristics, when evaluating the regression models, the observations were clustered at the household level (by household ID).

Regression analysis was carried out in the SPSS statistical package using its functionality for complex samples. At the stage of preparing the data for analysis, we created a file in which the data are clustered by the household identification variable, sampling was made with replacement. On its basis, we estimated a series of logistic regressions, in which the dependent variable is poverty status (assessment at the household level in relation to the individual; the variable is calculated according to the method described above, based on the estimated indicator of the total income of the household and the estimate of its regional subsistence level).

Regressions are estimated for employed respondents selected from the RLMS representative file; at the household level the sample includes, respectively, all households that include at least one employed individual. The total number of observations in each of the models depends on the specification and the number of missing values for the included variables; they are indicated in the last lines of the regression tables given in the text.

The basic set of control variables in the models includes:

- gender and age of the respondent;
- the level of his/her education (3 categories: incomplete higher and higher, vocational secondary, and lower than vocational secondary education);
- health status of the respondent (self-assessment);
- type of settlement in the place of residence of the respondent (4 categories: (1) village / urban-type settlement, (2) city that is not a regional center, (3) regional center, (4) Moscow and St. Petersburg);
- the presence of pensioners in the household;
- the number of minor children in the household (a categorical variable that takes three values: 0, 1, 2 or more children under the age of 18 in the household).

The main independent variable, the relationship of which with poverty is the focus of our interest, is the employment status of the respondent in terms of involvement in the informal labour market. This variable takes three values: (1) the absence of informal employment, that is, fully formal employment (at the main job and — in case of their presence — at secondary and side jobs), (2) the presence of partial informal employment and (3) complete departure to the informal sector for the main and, if present, secondary and side jobs. Informality in this case is defined as the lack of an official contract for work or at least partial payment of wages informally.

While testing the models, we additionally included variables that characterize the employment of the respondent:

- the presence of subordinates at work (a characteristic of the job position);
- duration of the working week: 40 or more hours per week (full-time) and less than 40 hours per week (part-time);
- whether the respondent has secondary job or additional earnings (side jobs);
- the ownership status of the organization/enterprise where the respondent is employed (public/private; inclusion of this variable narrows the regression sample, since it excludes respondents who are not employed by legal entities and, accordingly, find it difficult to answer this question).

Evaluation of models of various configurations showed stable results in terms of the direction of influence of the control and independent variables. The maximum values of the pseudo R-square coefficients are shown by models with a wide range of regressors; the results of the assessment of two models, including the full list of the variables described above, with the exception of the form of ownership of the organization/enterprise, as well as with the inclusion of this variable, are given in tables 4 and 5 below.

Testing models of various configurations did not show a statistically significant relationship between partially informal employment and the chances of the respondent and the household in which he/she lives falling into poverty either in the pre-pandemic or pandemic years.

Fully informal employment in 2019 turns out to be not statistically significant in the absence of control over the organization's ownership status (Table 4), but is associated with higher chances of falling into poverty when such a variable is included in the model (1.6 times higher chances of falling into poverty, the estimate is significant at a 5% level; see Table 5). Thus, in the pre-pandemic period, the deformalization of labour relations in enterprises was associated with lower income levels and increased risks of poverty.

At the same time, in 2020, fully informal employment is associated with almost two times lower chances of falling into poverty compared to formal employment, the coefficient for this variable turns out to be significant at at least a 10% level in all models, while the confidence the interval for exp(B) does not include 1. The observed change in the transition from 2019 to 2020 may be related to a number of developments that occurred in 2020, in particular, restrictions on work during lockdown periods and after the introduction of mandatory vaccination of workers in the formal sector and, accordingly, a deterioration in the relative position of the formally employed simultaneously with the emergence of practices of informal withdrawal of some employees to work under the influence of the indicated circumstances. The dynamics of macroeconomic indicators (see Fig. 1) does not show an expansion of the informal employment segment in 2020, however, the observed dynamics of relative indicators may, apparently, also hide an uneven increase in unemployment or a decrease in actual labour incomes in these two segments of the labour market. Thus, during the unfolding of the COVID-19 pandemic, the transition to informal employment could fulfill an adaptation mechanism that ensures not only the preservation of income through avoiding tax payments, but also the preservation of employment in general. In addition, inclusion in the unemployment benefits programme during the pandemic could have been a significant factor in reducing the risks of monetary poverty among those employed in the informal sector — such workers could have access to state support measures in addition to income from employment, and not instead of them. These assumptions require more in-depth and substantive research.

Table 4. Logistic regression results: relationship between poverty and employment status, basic socio-demographic characteristics of the respondent and his/her household. Model 1: narrow set of variables, 2019 and 2020

		2019		2020	
		Exp(B)	stat. significance	Exp(B)	stat. significance
Gender	Male	0.770	0.002	0.789	0.006
	Female (ref.)	1		1	
Age	60 years and older	0.174	0.010	0.223	0.003
	50-59 years old	0.516	0.237	0.270	0.003
	40-49 years old	0.860	0.777	0.508	0.119
	30-39 years old	0.727	0.551	0.442	0.064
	20-29 years old	0.918	0.876	0.457	0.076
	15-19 years old (ref.)	1		1	
Education	Below vocational secondary	2.611	0.000	2.202	0.000
	Vocational secondary	1.906	0.000	1.451	0.004
	Incomplete higher and higher (ref.)	1		1	
Health status (self-assessment)	Bad	1.370	0.340	1.074	0.820
	Medium	1.170	0.212	1.163	0.192
	Good (ref.)	1		1	
Settlement type	Village/ urban-type settlement	1.698	0.020	1.707	0.019
	City	0.950	0.827	1.093	0.696
	Regional center	0.577	0.027	0.788	0.310
	Moscow / St. Petersburg (ref.)	1		1	
Presence of pensioners in the household	Yes	0.522	0.000	0.537	0.000
	No (ref.)	1		1	
Presence of children under 18 in the household	2 or more children	6.997	0.000	6.028	0.000
	1 child	2.392	0.000	1.915	0.000
	No (ref.)	1		1	
Employment status	Completely informal	1.176	0.249	**0.774**	**0.074**
	Partially informal	1.059	0.907	1.903	0.197
	Formal (ref.)	1		1	
Presence of subordinates	No	1.681	0.002	1.668	0.001
	Yes (ref.)	1		1	

		2019		2020	
		Exp(B)	**stat. significance**	**Exp(B)**	**stat. significance**
Working hours per week	39 hours or less	1.124	0.382	1.265	0.071
	40 hours or more (ref.)	1		1	
Secondary or side job	Yes	0.911	0.814	0.531	0.135
	No (ref.)	1.000		1.000	
Sample size		*4716 observations 2913 clusters*		*4912 observations 2827 clusters*	
Pseudo-R ^{2} (Nagelkerke's)		*0.233*		*0.206*	

Note: Models are significant at 0.01 level.
Source: author's calculations based on RLMS HSE data for 2019 and 2020.

The ratios of the chances of falling into poverty among the categories of respondents identified in other variables, when moving from 2019 to 2020, turn out to be stable.

As can be seen from tables 4 and 5, lower chances of falling into poverty in both periods are observed among men (they are about 0.8 of the risk of falling into poverty for women) and people of retirement age (the ratio of the chances of falling into poverty in groups of respondents aged 50-59 years and 60 years and older with a reference group of 15–19-year-olds is about 0.25 and 0.2, respectively). Compared to respondents living in the largest cities (Moscow, St. Petersburg), higher chances of falling into poverty were found among residents of rural areas (the odds ratio reaches 1.7 times), and lower ones — among residents of regional centers. However, this last difference is significant only in 2019 models. Respondents with vocational secondary education are 1.5–1.9 times more likely to fall into poverty than respondents with higher education (including incomplete higher education). The same ratio for respondents with education lower than vocational secondary reaches 2.2–2.8 times in different models. A relatively high official status characterized by the presence of subordinates at work is associated with statistically significantly lower risks of poverty.

The presence of minor children in the household is associated with an increased risk of poverty. Compared to households without children, households with one child are about twice as likely to fall into poverty, and those with two or more children are six to seven times more likely to fall into poverty. At the same time, when moving from 2019 to 2020, the described differences are slightly smoothing out (see tables 4 and 5), which may be due to the introduction of additional cash payments to certain categories of families with children during the pandemic in Russia.

The presence of pensioners in the household is associated with a lower chance of the respondent falling into the category of poor. Apparently, this result can be explained, among other things, by the fact that the sample includes households of working (or informally engaged in part-time work) pensioners whose income level turns out to be above the subsistence level due to the current programme of additional payments to pensions; this partly explains the coefficient we got for this age group in the age variable; for a more correct interpretation of these results, it may be necessary to build separate regressions for households of different types, taking into account their structure.

Table 5. Logistic regression results: relationship between poverty and employment status, basic socio-demographic characteristics of the respondent and his/her household. Model 2: a wide range of variables, taking into account the form of ownership of the organization/enterprise in which the respondent is employed, 2019 and 2020

		2019		2020	
		Exp(B)	stat. significance	Exp(B)	stat. significance
Gender	Male	0.761	0.003	0.842	0.062
	Female (ref.)	1		1.000	
Age	60 years and older	0.111	0.003	0.176	0.003
	50-59 years old	0.444	0.156	0.256	0.011
	40-49 years old	0.800	0.680	0.462	0.144
	30-39 years old	0.641	0.415	0.373	0.065
	20-29 years old	0.925	0.888	0.431	0.114
	15-19 years old (ref.)	1		1	
Education	Below vocational secondary	2.865	0.000	2.161	0.000
	Vocational secondary	2.046	0.000	1.405	0.011
	Incomplete higher and higher (ref.)	1		1.000	
Health status (self-assessment)	Bad	1.184	0.656	1.008	0.982
	Medium	1.259	0.077	1.216	0.105
	Good (ref.)	1		1.000	
Settlement type	Village/ urban-type settlement	1.642	0.037	1.730	0.019
	City	0.949	0.830	1.166	0.509
	Regional center	0.581	0.037	0.798	0.350
	Moscow / St. Petersburg (ref.)	1		1	
Presence of pensioners in the household	Yes	0.516	0.000	0.545	0.000
	No (ref.)	1		1	
Presence of children under 18 in the household	2 or more children	7.428	0.000	6.573	0.000
	1 child	2.349	0.000	2.124	0.000
	No (ref.)	1		1	
Employment status	Completely informal	**1.589**	**0.017**	**0.504**	**0.002**
	Partially informal	1.144	0.789	1.010	0.984
	Formal (ref.)	1		1	
Presence of subordinates	No	1.690	0.003	1.689	0.001
	Yes (ref.)	1		1	

		2019		2020	
		Exp(B)	**stat. significance**	**Exp(B)**	**stat. significance**
Working hours per week	39 hours or less	1.132	0.388	1.238	0.124
	40 hours or more (ref.)	1		1	
Secondary or side job	Yes	0.789	0.554	0.639	0.291
	No (ref.)	1		1.000	
Ownership status of the enterprise / organization	Private property	0.812	0.078	0.760	0.017
	State property (ref.)	1		1	
Sample size		*4334 observations 2756 clusters*		*4497 observations 2827 clusters*	
Pseudo-R ^{2} (Nagelkerke's)		*0.246*		*0.210*	

Note: Models are significant at the 0.01 level.
Source: author's calculations based on RLMS HSE data for 2019 and 2020.

The respondent's health status turns out to be statistically insignificant in almost all models when controlling for other socio-demographic parameters and employment characteristics. This may be due to the fact that, firstly, the regression sample is limited to employed respondents (those respondents who, for health reasons, remain economically inactive and for whom this parameter is the most significant both in terms of employment and in terms of material security, fall out of our models), and secondly, with the fact that the state of health of the respondent determines the mode of his employment, official status and its other parameters, i.e., the influence of this variable can manifest itself through other regressors.

5. Limitations and prospects of the study

The results obtained in this paper should be interpreted with caution for several reasons. First of all, the limitations of the analysis are related to the peculiarities of the empirical base of the study. For example, the evolution of HSE RLMS data survey tools over the selected long horizon may violate the comparability of individual indicators; this is stated in the notes to the figures and tables in the text. In addition, the structure of the questionnaires does not enable explicitly singling out self-employed respondents, while dynamics of their number, behaviour, and position are of independent interest. Nevertheless, in our opinion, the estimates given in the paper reflect the scale of the phenomena and the main directions of the ongoing changes.

The results obtained in the regression analysis for two years — pare-pandemic and pandemic — are of interest in terms of changing the relationship of informal employment with the risks of monetary poverty against the background of the shock and the introduction of

emergency regulatory measures. However, in future, in order to test the stability of these regularities, it seems necessary to evaluate models for other periods, both previous and subsequent ones. We assume that the effect of the COVID-19 pandemic is unique due to the exclusivity of the measures introduced at the time when it unfolded, and a positive relationship between informal employment and the risks of household poverty should be observed in some earlier periods, possibly weakening, but not changing direction; for example, it could be the case during periods of economic shocks — the financial and economic crisis of 2008–2009 and recession of the Russian economy in 2014–2016. The analysis of the dynamics of unemployment rates also remained outside the scope of this paper, which can complement the described picture and partially explain the changes in the relative position of formally and informally employed respondents in 2019–2020. These assumptions need to be tested.

Finally, it should be noted that the authors of the presented study work with representative RLMS datasets and focus on cross-sectional analysis, which enables identifying key changes, but makes it difficult to interpret the relationship between the indicators included in the review. When interpreting the regression results, we can only talk about the presence of a statistical relationship, but not about the direction of influence: for example, employment in the informal sector of the economy can determine the financial situation of respondents, however, a low financial position can force respondents to look for any opportunities for paid employment, and thus force them into the informal labour market. In this regard, the development of panel data and the study of the transitions of respondents from formal to informal employment (and vice versa) against the background of various economic shocks and related effects on the risks of monetary poverty at the individual and household levels may become a promising direction for future studies.

6. Discussion and conclusions

Our estimates have shown that over the past 20 years, on average, about a quarter of Russian employees were included in the informal labour market for their main or secondary job. At the same time, involvement in informal employment at the main place of work in all groups of the population, except for the youngest, grows during the economic crisis of 2009, slightly decreases in 2010–2013 and then increases against the background of the worsening economic situation that began in 2014, which confirms the first hypothesis of our study.

Employment with part or all of the pay for the main job received informally — that is, without a formal contract or with declared wages below the actually paid wage, in violation of current regulations — is more common among men, young people and people of early working age, and as well as citizens with education below vocational secondary. At the same time, women, people aged 30–49, and citizens with vocational secondary education predominate in the structure of informally employed, although with a slight preponderance.

Estimates based on the HSE RLMS data confirm that in the Russian labour market during 2000–2020 there are several zones of informality in which different motives for the deformalization of employment may operate (these conclusions are also confirmed by other works — see (Gimpelson and Zudina 2011; Veredyuk 2016) and others; a similar situation is observed in other countries (Williams et al. 2011)).

First, the results obtained in the analysis of the composition of the informally employed by level of education received confirm the conclusions of previous studies about the existence of low-skilled employment in the informal sector. This segment persists due to the lack

of formal jobs for low- and medium-skilled workers. Such employment is associated with the insecurity of workers and the lack of basic labor and social guarantees, increased risks of poverty in general and especially during economic shocks.

The second zone is employment only in the format of informal part-time jobs ("casual employment"). Existing studies show that it is a factor of poverty and inequality, even though it simultaneously acts as a mechanism for smoothing income differentiation and a tool for improving the well-being of certain groups of the population that are unable to find permanent employment (Karabchuk 2005). Estimates obtained within this study indicate that the practice of signing a formal labour contract at secondary job or occasional side jobs in Russia is rather weak, in happens in less than ¼ of all cases. At the same time, informal part-time or side jobs can be a conscious choice of employees despite the high risks of instability in this employment zone (for example, this is relevant for pensioners to maintain their rights to receive pension payments in full).

Finally, the third zone is partial withdrawal to the informal sector while maintaining an official labour contract at the main job, that is, receiving a part of labour income informally in the presence of a formal status of an employed person and basic social and labour guarantees. This strategy of behavior can be both forced and conscious. In the highly skilled labour sector, partial withdrawal to the informal sector may be associated with higher income levels and lower risks of monetary poverty compared to the formal employment sector, but more research is needed to assess the prevalence of such behaviour and identify the indicated association.

Regression analysis shows that there is a statistically significant relationship between involvement in the informal labour market and the risks of monetary poverty: fully informal employment in 2019 is associated with higher chances of the respondent's household falling into poverty, and with lower chances in 2020. Thus, the second hypothesis of the work — about the relationship of informal employment with increased risks of poverty of the population — is confirmed for 2019, but rejected for 2020, against the backdrop of pandemic-related changes in the labour market. In the literature published to date, one can find evidence that in some countries informal employment has indeed contributed to the restoration of incomes of the population and acted as a compensatory mechanism against the background of the pandemic (Alvarez and Pizzinelli 2021). However, this result deserves special attention and more detailed studies, since the observed change in the Russian context may be associated with both the transition of some workers to the informal sector and the deterioration in the relative position of those formally employed due to restrictions imposed on the national labour market during the pandemic (temporary suspension of enterprises in 2020, the introduction of mandatory vaccination in certain areas of employment), and with the effect of state support measures taken against the backdrop of the COVID-19 pandemic, including an increase in unemployment benefits, the programme of which could include informally employed citizens.

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Annex 1

Table P1. Size of the subsample of respondents included in the analysis to estimate the prevalence of informal employment, 2000–2020, persons

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
N	3584	3757	3768	3773	3740	3534	4765	4705	4563	4388	7886
Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	
N	7795	7731	7294	5752	5453	5351	5261	5068	5107	7526	

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