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INFORMAL EMPLOYMENT AND WORKER'S WELL-BEING IN THE RUSSIAN FEDERATION

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ABSTRACT

This paper finds that informal workers are more likely to have inferior work conditions, but do not necessarily report worse subjective well-being. Starting with lower wages, but also with less regularity of hours and paid vacation, informal workers have higher incidence of envelope payments than formal workers but not of hazardous or unstable jobs. After controlling for work conditions, informal workers do not have statistically significantly lower job satisfaction and under no specification are informal workers more likely to self-assess worse health than formal workers. Finally, there is some association between informal employment and household poverty and life satisfaction, but it is not robust to changes in econometric specification or sample composition. The authors conclude that the evidence indicates that informal employment in the Russian Federation is mostly a problem of labor productivity and the design of the social protection system, but worsening wages and some association between informality and household poverty indicate that informality may also be a social equity problem.

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Informal Employment and Worker's Well-Being in the Russian Federation

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I. Introduction

There are three main reasons for informal employment to raise concerns. The first reason is related to the equity aspect, namely that informal workers' well-being could be vulnerable if they are outside the formal social protection system and that poverty and inequality can increase if informal workers are systematically underpaid. Second, the informal sector operates largely outside the state's regulation where tax evasion is the norm, both by firms and workers, which challenges the sustainability of the fiscal system. Third, informal employment could undermine productivity and economic growth if workers or firms choose to adopt small-size/low-productivity organizational and technology settings mostly to avoid tax payments and government regulations, or due to failures in other markets such as access to capital or entrepreneurial skills.

Rigid labor market institutions could lead to higher informality, but previous studies suggest that a combination of weak enforcement and universal access to basic pension and health care are also important drivers of informality in the Russian Federation. A large body of literature has shown that informal and formal labor markets are integrated rather than segmented, implying that workers tend to choose to be informally employed in Russia. In contrast to the large amount of research on the causes and drivers of informality, the welfare consequences of informality are much less researched and understood.

This paper has one main objective: to estimate the impact of informal employment on workers' individual well-being. In order to do so, it also assesses the comparability of available sources of data on informal employment and updates the trends in informal employment through 2016. Several data sources are available for the purpose of studying the impact of informal employment on well-being in Russia. For the estimation of levels and trends of informal employment, we utilize four surveys to see how the trends compare across data sources and definitions. We then focus on one survey, the Russia Longitudinal Monitoring Survey (RLMS), which has rich and detailed information on employment, and complement the analysis with other surveys when appropriate. For all data sources, we maintain a definition of informal employment that is consistent with the legalistic view of informal employment. This definition is in line with the majority of Russian literature and is deemed more appropriate for transition economies.

The top panel of Figure 1 presents informal employment rates across countries from the ILO-WIEGO database for the most recent year for which there exists an estimate for that country. Informal employment rates range between 40-70 percent in Latin American countries but are significantly lower in the Europe and Central Asia region. Russia ranks towards the bottom among all these countries – however it should be noted that this list conspicuously does not include any high-income countries where the share of informally employed is expected to be considerably lower.

Estimates of informal employment for high income economies are less regular but, when compared to this group, Russia does not appear to have systematically higher rates of informal employment. The bottom panel of Figure 1 shows that the proportion of employers, own account and unpaid family workers within total employment (a proxy indicator correlated but not exactly the same as informal employment) in Russia is very low when compared to countries of similar or higher income per capita. An OECD study collects several other proxy indicators of informal employment and does not find Russia as an outlier. For instance, according to this OECD study, 10 percent of Russian workers have no contract, which is well below the 40 percent in Turkey, Greece and Ireland, but is also higher than the 5 percent in Czech Republic, Sweden and Finland. Similarly, 40% firms in Russia do not report all annual sales to tax authorities, less than Turkey, Greece and Czech Republic which misreport more than 50 percent of sales, but more than Spain or the Slovak Republic that misreport around 20 percent of sales.¹ On the other hand, the OECD study finds that most high income countries have less than 10 percent of the labor force being paid “envelop” wages, which is well below the 20 percent that we document for Russia later in this study. Finally, if using contributions to pension schemes as an indicator of formal employment, Russia does not look too different from comparable countries: “...*By the latest available data, in Russia, 65.9 percent of labor force aged 15+ contributed to the pension system, compared to 69.7 percent on average in ECA; additionally, 48.7 percent of the working-age population aged 15-64 contributed, compared to 48.9 percent in ECA on average...*”, but is certainly well below if compared to richer countries because: “...*In developed countries, on average 71.5 percent of individuals aged 15-64 contributed, as well as 92.9 percent of the labor force aged 15+.*”²

However, there is a long-term increase in informality from the early 2000s through 2016. Rosstat estimates that informal employment increased from 12.5 percent in 2001 to 17.6 percent in 2005, then slightly decreased to 16.4 percent in 2010 but increased significantly to 21.2 percent in 2016. Other data sources, used in this study for their rich microdata and for comparison purposes, show similar trends. Moreover, the growth of informality is seen across most economic sectors and, as our findings show, is not due to changes in the structure of the economy or changes in population characteristics.

We find that informal workers are more likely to have inferior work conditions, but do not necessarily report worse subjective well-being. Starting with lower wages, but also with less stability of hours and job benefits, informal workers have higher incidence of envelope payments than formal workers but not of hazardous or unstable jobs. After controlling for work conditions, informal workers do not have statistically significantly lower job satisfaction. Moreover, under no

¹ Numbers taken from (Andrews, Caldera Sanchez, & Johansson, 2011), figure 3 and figure 8, on pages 14 and 18, respectively. This study also reports Russia being the country with the highest share of informal economy (in terms of shadow economy, or percentage of GDP that evades tax payments or regulations, rather than unregulated employment), as per latent variable estimation methods. See Op. Cit., pages 10-12.

² (World Bank, 2018), page 14.

specification are informal workers more likely to self-assess worse health than formal workers. Finally, the association between informal employment and household poverty or life satisfaction is not robust to changes in econometric specification of the sample. It seems the self-employed informals -but not the salaried informals- do find themselves in poorer households and have less life satisfaction, but further research is needed here. This leads the authors to believe that informality in Russia is mostly a problem of fiscal sustainability, labor contract enforcement and labor productivity; but worsening wages and some association to household poverty may turn it also into a social equity problem.

The rest of this paper is organized as follows. Section II provides a review of the international and Russian literature on informal employment, a description of the various data sources used and the levels and trends in informal employment derived from them. Section III describes the methodology used for the regressions that estimate the impact of informal employment on well-being. Section IV presents the main results. Section V summarizes and concludes.

II. Measures of Informal Employment in Russia

This paper focuses on informal employment rather than the informal sector. Informal aspects of the economy are notoriously difficult to measure and there are several definitions of what is meant by “informal”. There is broad agreement that several criteria must be considered, which include registration, legal incorporation, firm size, coverage by statistical surveys, borderline of activity, illegal activity, location and terms of employment. The word “sector” refers to production activities and not a grouping of institutional units (i.e. firms, households, government) in the System of National Accounts (SNA) sense. In addition to the production side and firms’ perspective, employment can also be characterized as formal or informal. It is possible for formal production units to have informal employees, and for informal units to have formal employees. Finally, there is a distinction between a job and an employee as one employee can hold several jobs. Hence informal employment refers to “...the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period...”³

The primary reason for focusing on informal employment in this paper is that the information available from household surveys allows for identification of informal employment from the workers’ side. Importantly, a comprehensive analysis of the informal sector would need to consider firm-level decisions and the use of firm-level data, which we do not use in this paper. Throughout the paper, we rely on variations of legalistic definitions of informal employment, vis-à-vis

³ For a full description on concepts and definitions on informality, see Chapter 25 “Informal aspects of the economy” in *System of National Accounts 2008* (United Nations Department of Economic and Social Affairs, 2010) and see Chapter 8 “Employment in the Informal Economy” in *Key Indicators of the Labour Market 2015* (ILO, Geneva, 2016).

productivity-based ones. The former considers compliance with labor regulation and the right to social protection (e.g., pension, health care). The latter considers the type of job, such as being unskilled self-employed, salaried in a small firm, casual/irregular worker or a zero-income worker. However, this measure has been shown to introduce large measurement errors in transition economies and is deemed less relevant (Lehmann H. , 2014). We draw from multiple sources of data and find a broad congruence across surveys -despite the type of definition used- in the evolution of informal employment in the last decade.

The rest of this section proceeds as follows: we briefly summarize findings from the previous literature on the causes and consequences of informality, both globally and specifically for the case of Russia. Then we describe in more detail the various data sources, the specific definitions of informal employment used, and the evolution of trends that are uncovered from different data sources.

Findings of the previous literature

The literature has approached the causes of informality from two main viewpoints: “exit” and “exclusion”. The exclusion view maintains that workers and firms are excluded from the formal sector, due to cumbersome and expensive regulations, and formal employment is somehow rationed so many workers, despite wanting to have a formal job, are not able to get one. While these factors are important, there is a second perspective, the exit view, which presumes that informality is an outcome preferred by workers and firms as the optimal level of engagement with the state, especially when the perceived costs of formalization outweigh the benefits. In other words, informality is a large-scale opting out of formal institutions by firms and individuals as a result of their valuation of the net benefits from formality and the state’s service provision and enforcement capability. In other places, this labor market divide is explained in terms of segmented (in contrast to integrated) or dual labor markets.⁴ These two viewpoints are generally best understood as complementary, as the context differs across countries and the informal sector itself can be tremendously heterogeneous, with some informal workers choosing to be informal and others being involuntarily excluded (Perry, et al., 2007).

Existing research so far suggests that labor market institutions tend to have a modest impact on the informal sector. Stricter labor market institutions are frequently associated with greater incentives for firms to operate and hire informally. However, a careful review of recent findings in the literature on the impact of labor market institutions concludes that “...their impacts are generally smaller than the heat of debates suggests” (Betcherman G. , 2014). In other words, while it may be expected that minimum wage increases would induce a compositional change in employment from the formal to the informal sector, empirical evidence suggests that these effects are modest.

⁴ Cain G.G. (2018) Segmented Labour Markets. In: Macmillan Publishers Ltd (eds) The New Palgrave Dictionary of Economics. Palgrave Macmillan, London.

In fact, minimum wage increases could as well elevate informal sector wages if they are seen as benchmark wages for unskilled labor, especially in countries with large informal sectors and where enforcement is weak. The relationship between the strength of employment protection legislation (EPL) and the size of informal employment is also less conclusive, given that there could be an interaction effect with other labor market institutions, notably the collective bargaining structure and the strictness of enforcement.

Nevertheless, this does not imply that labor market institutions do not matter: while aggregate employment effects may be modest, distributional impacts are clearer in that youth, women and the less skilled are disproportionately affected. (Packard, 2012) suggests that structural incentives, in particular, taxation, are important determinants of informality in Europe. This is also supported by a literature review in (Pages, 2017) which finds that payroll tax cuts can help lower total labor costs and increase formal employment in economies with high informality and/or unemployment, though this could lead to lower tax collection if the widening of the tax base does not compensate for the revenue loss. In addition, the actual effect of lower taxes on employment could be diluted if the reduced tax is captured by workers through higher wages rather than by employers through lower labor costs (Betcherman & Pages, 2009).

The growing size and persistence of informality in the Russian labor market has spurred a large body of research. The case of Russia presents an interesting case as the economy is mostly non-agricultural, informal employment consists of mainly hired labor rather than self-employed persons, informal workers are relatively highly educated and the rise in informality is largely attributed to a protracted transition process towards a market economy (Gimpelson & Kapeliushnikov, 2014).

There are broadly three perspectives as to why to be concerned about informality. The first relates to equity and the vulnerability of workers. The earnings of informal workers tend to be low and irregular, which has welfare consequences. The growth of the informal sector may have increased access to jobs for many individuals in the lower income deciles, but it has also come with an increased risk to their economic security. Without access to adequate social protection mechanisms, workers are highly vulnerable to economic shocks if informal workers are more likely to be excluded from the formal social safety net (Slonimczyk & Gimpelson, 2013).

Second, the informal sector operates largely outside the state's regulation where tax evasion is the norm. The sustainability of the fiscal system is challenged under growing informality and a shrinking tax base. The state will face increased difficulties to collect taxes and social insurance contributions from workers and firms in the informal sector (Matytsin, Popova, & Sinnott, 2017). This ultimately hinders the provision of social services as they become mostly financed from oil and gas rent revenues and not by tax receipts, and may have particularly adverse effects on the sustainability of the pension and social insurance systems. The implications are that access to basic

public goods is not conditional upon formal employment and individuals are distanced from the state and government bureaucrats are not accountable to taxpayers.

Finally, high informality could undermine productivity and economic growth. There are potential efficiency losses because of suboptimal production decisions related to scale, investment, the use of technology and innovation. A recent analysis showed that the expansion of informality in Russia was found to have partially reduced the positive contribution to productivity growth of labor reallocation during the period 2002-12 (World Bank, 2016). Firm productivity may be hindered both by limited incentives for investing in training informal workers as well as the selective enforcement of formal regulations.

Rigid labor market institutions could lead to higher informality, but previous studies suggest that a combination of weak enforcement and universal access to basic pension and health care are important drivers of informality in Russia. Stringent labor market institutions can incentivize informal employment if they increase the cost of formal job creation. For example, when minimum wages increased in 2007, subsequent increases in informal employment were observed in Russia (Muravyev & Oshchepkov, 2015). More generally however, contrary to the widely held belief that Russia had very rigid employment protection legislation (EPL), internationally comparable estimates showed that Russia's labor law is not particularly restrictive (Lehmann, Muravyev, Razzolini, & Zaiceva, 2013) and (World Bank, 2018). Notably, institutional stringencies appear to have shaped the particular labor market adjustment model observed in Russia. That is, the Russian labor market responds to output falls during economic crises more through lower wages and hours of work, rather than less employment. This is made possible by low minimum wages, low unemployment benefits and weak enforcement of wage and employment regulations, that altogether support flexible wages and flexible working hours (Gimpelson & Kapeliushnikov, 2011). Moreover, there is evidence of limited, or irregular, enforcement of labor law regulations: “...*Workload of the inspectorate is considered high. In 2016 in Federal Labor Inspectorate (FLI), the ratio was one inspector per 34,400 employed, while ILO recommends one inspector per 20,000 workers for transition countries. On average, there were 3,730 enterprises per inspector. Current capacity of FLI allows, on average, one inspection in 28 years while ILO recommends, on average, no less than once in 5 years...*”⁵ The combination of a weak regulatory environment and low unemployment benefits makes informal employment an attractive option, especially in Russia where access to basic pension and health care is weakly dependent upon formal employment. (Gimpelson & Kapeliushnikov, 2014) argue that there is, in addition, a political economy challenge: as informality grows as a consequence of regulatory failure, a vicious circle of more regulatory failure and more informality leads to a weakening of the social contract.

⁵ (World Bank, 2018), page 11.

On welfare consequences, part of the available evidence shows that Russian labor markets are integrated rather than segmented, implying that workers tend to choose to be informally employed. This is mainly shown through analysis of mobility patterns (see (Slonimczyk & Gimpelson, 2013), (Slonimczyk F. , 2013)) and wage gaps between formal and informal workers (Lehmann H. , 2014). However, job loss is associated with higher probability of subsequent informal employment (see (Lehmann, Muravyev, Razzolini, & Zaiceva, 2013); (Lehmann, Razzolini, & Zaiceva, 2009)). This is also compatible with some evidence of involuntary segmentation (i.e., low-paid workers find it difficult to move from informal to formal jobs) at the lower end of the distribution (e.g., (Lukiyanova, 2015) and (Lehmann H. &, 2013)).

Finally, an interesting area of research suggests that fundamentals such as preferences may play a role in the decision to be informally employed, rather than institutions. (Lehmann H. &., 2013) and (Lehmann H. , 2014) find a significant, negative and sizeable relation between risk-aversion and informality. Low-risk individuals may also be attracted to work in the formal sector because there it has less wage dispersion and more employment stability (Lukiyanova 2015). If workers that are more willing to take risks have a higher probability to engage in informal activity, then that may also suggest that the labor market is integrated rather than segmented.

In contrast to the large amount of research on the causes and drivers of informality, the welfare consequences of informality are much less researched and understood. In Russia, (Slonimczyk F. , 2013) uses measures of satisfaction with life and economic conditions to show that formal entrepreneurs are the most satisfied and workers engaging in irregular activities the least satisfied among the employed. A few papers exist outside Russia: for example, informal workers appear to be less happy in Bosnia and Herzegovina (Krstic & Sanfey, 2007) and report poor self-perceived and poor mental health in Central America (Lopez-Ruiz, 2015). In the Dominican Republic, informal salaried workers consider themselves as poor as formal salaried workers, whereas in Argentina, there is no differential impact of being in one group over the other on self-rated poverty (Perry, et al., 2007). (Cassar, 2010) suggests that conditional on income, job protection and workplace conditions, self-employed workers experience higher job satisfaction because they derive procedural utility from independence.

Informality is a complex phenomenon and different studies have used somewhat different definitions of informality. On the one hand, the “legalistic” perspective is concerned with the compliance of the labor relationship with labor protection rules, i.e., it considers employment relationships informal if the employer does not officially register the job to avoid the payment of taxes and social insurance contribution. The Russian labor code stipulates that a written contract be signed by all employees. The receipt of “envelope payments” where workers receive part of their income as undeclared wages is also a particular aspect of informality in Russia (Lehmann, Razzolini, & Zaiceva, 2009). The “productive” definition, on the other hand, is concerned with the type of job, i.e., workers are considered informal when they are salaried workers in a small firm,

unskilled self-employed, or zero-income family workers (Perry, et al., 2007). The specific definitions used in this paper and corresponding data sources are detailed next.

Sources of data for measuring informal employment in Russia

Several different data sources are available for the purpose of studying the impact of informal employment on well-being in Russia. There are four sources of microdata that include information on informal employment: the Russia Longitudinal Monitoring Survey (RLMS), the Russian Labor Force Survey (LFS), the Life in Transition Survey (LiTS) and the European Social Survey (ESS). For the estimation of levels and trends of informal employment, we utilize all four surveys to see how the trends compare across data sources and by definition. We then focus on the RLMS which has rich and detailed information on employment, and complement the analysis with other surveys when appropriate. For all data sources, we maintain a definition of informal employment that is consistent with the legalistic view described above (mainly whether the worker has a contract). This definition is in line with the majority of Russian literature and, as mentioned before, deemed more appropriate for transition economies.⁶ Below follows a description of each data source used and details on how informal employment is derived from each survey. In all surveys, we focus on the main job only, excluding secondary jobs and other irregular activities.

The Russia Longitudinal Monitoring Survey (RLMS) is a series of nationally representative surveys designed to monitor the effects of Russian reforms on the health and economic welfare of Russians. The project is run jointly by the National Research University Higher School of Economics and ZAO Demoscope, together with the Carolina Population Center at the University of North Carolina, Chapel Hill. The RLMS is a panel survey with annual data available starting in 1994 and is representative at the national level. Data are available through 2016 which maintained a sample size of 7,000 households. The survey includes very detailed information on health status, household expenditure and service utilization, as well as community-level data.⁷

The Russian Labor Force Survey (LFS) is a sample survey of the population on the labor market. The survey is conducted by Rosstat on a quarterly frequency and is representative at the regional level. A sample of approximately 65,000 people between the ages of 15 and 72 years is surveyed. Microdata are publicly available for the period covering 2010-2015.

The Life in Transition Survey (LiTS) was originally developed to capture how transition affected the lives of people and how it shapes their views on democracy and the role of the state. It was conducted jointly by the EBRD and the World Bank in 2006, 2010 and 2016. The surveys are

⁶ (Lehmann H. &, 2007) shows for the case of Ukraine that using a productivity-based definition can introduce large measurement errors in transition economies.

⁷ The RLMS survey data and documentation are publicly available at: <https://www.hse.ru/en/rlms/downloads>

designed to be nationally representative, and in the latest round covered 34 countries, with a target number of interviews of 1,500 per country.⁸

The European Social Survey (ESS) collects information on social conditions, attitudes, and values and behavior. It is a cross-national survey of 36 European countries and is conducted by the European Research Infrastructure Consortium (ERIC) which is an independent legal entity that represents national governments. The survey is regularly undertaken every two years and Russia participated in survey rounds 2006, 2008, 2010, 2012 and 2016. The sample is designed to be nationally representative of all people aged 15 and over, and uses random probability sampling and a minimum target sample size of 1,500. This data were previously used to study informality in the EU in (Packard, 2012).⁹

Next, we identify the questions and the various definitions of informal employment that can be derived from each survey. The main questionnaire of the RLMS allows for the identification of two groups as informally employed: i) workers who are employed at an enterprise without a contract; and ii) workers employed at an entity with no more than one employee. For reasons that will become clearer later, we call these two groups type-1 and type-2 informals (or more colloquially salaried and self-employed, respectively). Workers with a secondary job and individuals that engage in irregular economic activities are not included in this study.¹⁰ Similar measures have been used by Russian and international researchers such as (Lukiyanova, 2015); (Slonimczyk & Gimpelson, 2013); (Lehmann, Razzolini, & Zaiceva, 2009). In 2009, a special supplemental module was conducted within RLMS which asked additional questions on oral contractual agreements, employer's social security contribution, whether business is registered, and whether labor laws and work agreements are respected. While very useful, the supplementary data are outdated at this point and unfortunately, no follow-up has been conducted since.

Using the LFS, informal workers can be identified as follows: i) workers working but not at an enterprise; ii) workers without a written contract; and iii) self-employed without registration. The official Rosstat definition of informally employed uses the first criterion, with the difference being that it includes workers' primary as well as secondary jobs. We define a broader measure that applies all three criteria but only to the primary job (henceforth referred to as "LFS (broad)"). While these differences yield slightly different estimates in levels of informal employment (in fact,

⁸ The Life in Transition Survey data and documentation are publicly available on line at: <https://www.ebrd.com/what-we-do/economic-research-and-data/data/lits.html>

⁹ The European Social Survey data and documentation are publicly available at:
<https://www.europeansocialsurvey.org/data/round-index.html>

¹⁰ Those with a secondary job, by definition have a primary job, so we assume that the main characteristics of their employment are defined by the primary job. There is an important share of workers who have no primary job but do have an irregular job (around 9 percent for the period 2010-2016), but we decided not to include these because of two reasons: first, irregular workers' attachment to the labor market is not very clear and, second, several questions about welfare and other job characteristics - necessary for the analyses done in the rest of the paper- are not included for this group in the RLMS.

the Rosstat's official estimates are slightly higher), the trends are quite similar as shown in the next section.

Using the LiTS, informal workers are identified as those without a written contract in their main job. The 2016 survey contains a question that asks whether the individual had a written contract for the primary job, with possible responses including permanent with/without contract, temporary with/without contract, seasonal with/without contract, daily laborer and other. In previous survey rounds, the relevant question asked only whether an individual had a written contract in her main job or not. We define a worker as formal if she has a contract in her primary job, whether permanent, temporary or seasonal, and informal otherwise.

Using the ESS, informal workers are identified as those without a contract in their main job. Among employment-related questions, the survey asks whether the individual held a contract in the main job, and whether it was of unlimited or limited duration. We define a worker as formal if she held a contract in her main job, regardless of duration of contract, and informal otherwise.

Recent evolution of informal employment in Russia

In this section, we proceed to estimate levels of informal employment and examine trends across surveys. We are able to extend the trend using recent estimates of informal employment as fortunately all data sources are updated through 2016. This allows a close comparison of trends over time across different surveys. For each survey, we focus on informal employment in the main job as described in the previous section. We observe a long-term increase in informality from the early 2000s (and even before that based on RLMS data, though not shown here) through 2016, with a short period of stagnation or even decrease in the second half of the 2000s. Encouragingly, this trend appears to be consistent across different data sources, including the official measure of informal employment monitored by Rosstat, which is presented alongside our estimates for comparison purposes. This result serves as a robust starting point for the rest of the analysis.

A longer-term trend from Rosstat's official measure confirms a rapid increase in informality in the first decade since 2000, with a notable but temporary dip observed in 2010. The reasons behind this seemingly temporary decline are not immediately clear and appears to be an outlier against the long-term trend. In any case, there was a brief stagnation or decrease in informal employment in the years around the financial crisis, which was followed by another period of increase. The official Rosstat definition of informal employment is based on the LFS, and defines as informal those workers who do not work for an enterprise in their primary or secondary job. Notably, it does not capture informal workers in the corporate sector, i.e., those "working at an enterprise" but without a contract. It may also exclude some workers employed by unregistered small businesses, if respondents answer that they are working for "a firm".

Estimates from the RLMS show that informal employment broadly increased through the first half of the 2000s (2001-2004), levelled off in the period 2005-2010, and had a subsequent upward trend since 2010. Estimates show that the second half of the 2000s was marked by a temporary stagnation of informal employment, possibly as a consequence of the financial crisis. Informality started to increase again after 2010. The latest estimate for 2016 puts informal employment at 16.9 percent, up from 14.5 percent in 2010, and from 10.7 percent in 2000 (Figure 2).¹¹

The RLMS trend is broadly consistent with the official trend published by Rosstat in that informal employment increased substantially in the early 2000s, came slightly down around the financial crisis period, and then continued to increase again. Rosstat estimates show that informal employment increased from 12.5 percent in 2001 to 17.6 percent in 2005, then slightly decreased to 16.4 percent in 2010 but increased significantly to 21.2 percent in 2016.

LFS microdata are only available for a shorter period of 2010-2015, but the share of informally employed is invariably increasing, which is consistent with the trend from RLMS as well as Rosstat. Our estimates show that informal employment was at 15.1 percent in 2010 and 19.3 percent in 2015 (Figure 3), which again, is a significant increase over a relatively short period of time. Our definition is focused on measuring informality in workers' primary jobs which yields a slightly lower estimate compared to the official Rosstat measure which is also based on LFS.

Additional estimates of informal employment from the LiTS and ESS show a slight decrease between 2006 and 2010, followed by a marked increase through 2016 (Figure 4 and Figure 5). Using the LiTS, the share of informal workers decreased from 16.1 percent in 2006 to 11.7 percent in 2010, then rose to 15.1 percent in 2016. Using the ESS, that same share started out at 12.8 percent in 2006, stood at 11.2 percent in 2010, but then recorded a large increase to 19.2 percent in 2016. In fact, the increase estimated from the ESS between 2010 and 2016 is the largest among all surveys.

To summarize, estimates of long-term trends suggest that informal employment in Russia has continued to grow in recent years. A comparison of trends from different surveys reveals that regardless of the data source used, informal employment appears to have increased in the first half of the 2000s, then briefly leveled-off or even fell, but then continued to increase. The deceleration in the relative size of informal employment in second half of the 2000s coincides with the global financial crisis.

¹¹ This 6.2 percentage point increase in the rate of informal employment between 2000 and 2016 is due to an increase of 3.6 percentage points in salaried informals (who grew from 3.1 to 6.7 percent of employment) and a 2.6 percentage points increase of self-employed informals (who grew from 7.6 to 10.2 percent of employment).

As of 2016, informal employment is estimated to be between 15.1 and 21.2 percent. The variation in estimates is largely determined by the different definitions used¹² (Figure 6). While these rates are not particularly high levels by international comparison, the continued increase over the past two decades warrants further attention.

For the rest of the paper, we maintain the definitions of informal employment described in this section. For the analysis on well-being, we rely on three surveys (RLMS, LiTS and ESS) as the LFS has very limited information on welfare outcomes. We focus on the latest year for which data are available, which for all surveys is 2016.

Does de-industrialization explain the trends in informal employment?

Some have hypothesized that rising informal employment could be related to de-industrialization. As the sectoral structure of the economy shifts from manufacturing to services, and because the latter has been observed to have higher informality rates than the former in some countries (see, for instance (Vanek, Chen, Carré, Heintz, & Hausmanns, 2014)), deindustrialization could bring higher incidence of informal employment. While a deeper analysis into the drivers of the increase in informal employment is beyond the scope of this paper, we first test whether changes in the shares of employment across different sectors is a plausible explanation of the increase in informality in Russia.

To investigate this, we modify the original Huppi-Ravallion decomposition to examine whether changes in the rate of informal employment are due to increases in the average informality in specific sectors (“intra-sectoral shift effect”) or whether employment in high-incidence sectors is increasing (“population shift effect”).¹³ We would expect the latter effect to dominate if the increase in informal employment was associated with de-industrialization trends and the relative share of employment shifting away from manufacturing and towards services sectors that have a higher incidence of informality.

Specifically, this decomposition is an accounting exercise that breaks down sources of observed changes in informal employment rate into the intra-sectoral effect and population shift effect as follows: the population shift effect shows how much of the change in the outcome was induced by changes in employment shares of sectors between two years. The intra-sectoral effect shows the contribution that is due to changes in the incidence of informality rate within sectors. There is also

12 In order make comparisons across surveys, our analysis concentrates on main job only. The richness of the RLMS also allows for analysis of informal employment in workers' second job, which some researchers have taken advantage of. See for example (Lehmann H. &, 2013).

13 The original Huppi-Ravallion decomposition was applied to changes in poverty rates (Huppi & Ravallion, 1991). This is an application of the shift-share approach which started in regional science around the 1940s (some report the following as a first example of that analysis: Creamer, D.: “Shifts of Manufacturing Industries, in Industrial Location and National Resources,” Government Printing Office, Washington, D.C. 1943). We thank Maurizio Bussolo for this reference.

an interaction effect that arises from the possible correlation between sectoral gains and population shifts. The formula can be specified as follows:

$$I_2 - I_1 = \sum_{i=1}^n (I_{i2} - I_{i1}) n_{i1} + \sum_{i=1}^n (n_{i2} - n_{i1}) I_{i1} + \sum_{i=1}^n (I_{i2} - I_{i1})(n_{i2} - n_{i1})$$

The equation is decomposed into three components using curly braces under each term. The first component, $\sum_{i=1}^n (I_{i2} - I_{i1}) n_{i1}$, is labeled 'Intra-sectoral effects'. The second component, $\sum_{i=1}^n (n_{i2} - n_{i1}) I_{i1}$, is labeled 'Population shift effects'. The third component, $\sum_{i=1}^n (I_{i2} - I_{i1})(n_{i2} - n_{i1})$, is labeled 'Interaction effects'.

where I_{it} is the informality rate in sector i with an employment share n_i in year t .

To ensure comparability, we select the years 2006, 2010 and 2016 from all surveys for the decomposition, with the exception of the LFS for which there is only data for 2010-2015. We aggregate sectors into four groups: i) agriculture and mining; ii) manufacturing; iii) non-public services; and iv) public services.¹⁴

The decomposition results suggest that de-industrialization does not explain the evolution of rates informal employment in the past decade. Figure 7 shows that the intra-sectoral effect dominates the change in informal employment for both 2006-2010 and 2010-2016, implying that informality rates have increased in all sectors, whereas the relative employment distribution across sectors has not changed much.¹⁵ In other words, the change in informality is driven by higher incidence of informal employment across all sectors, and not by shifts in employment towards high-incidence sectors.¹⁶

Alternatively, it could be argued that instead of economic activities or sectors, it is changes in demographic characteristics that explain changes in informality. For example, if women are on average more likely to be informal, an increase in informal employment could be driven by a higher share of women among the employed, or by women becoming even more likely to be

¹⁴ In the ESS, LFS and RLMS, public services are defined to include public administration, health and education. In the LiTS, where we are not able to identify these sectors at the disaggregated level needed, we define public services when individuals report working in the services sector and working for a public organization.

¹⁵ For instance, according to LFS, the rate of informal employment rose from 45.8 to 54.0 in agriculture, from 7.8 to 11.3 in industry, from 21.7 to 27.3 in non-public services and from 2.8 to 4.7 in public services, between 2010 and 2015. Qualitatively similar trends are seen in the other three surveys. In all these cases we refer to aggregate sectors where agriculture refers to agriculture and mining (i.e., primary sector), industry refers to manufacturing, utilities and construction (i.e., secondary sector) and services refers to all the other economic activities, separating into publicly and privately provided.

¹⁶ An additional exercise, using 12 economic activities -rather than 4 economic sectors- renders qualitatively similar results. Available from the authors upon request.

informal than before. The distinction between these is important because it would elicit different policy responses.

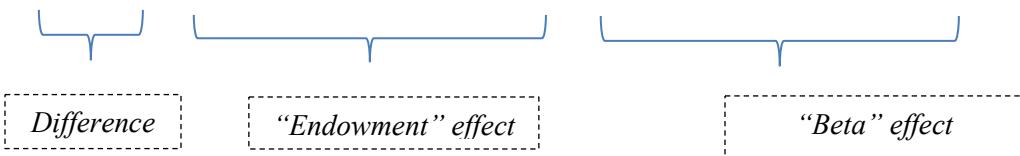
To explore this possibility, we employ a simple Oaxaca-Blinder decomposition which estimates whether certain population groups are becoming more likely to be informal (a change in the “beta” effect) or whether personal characteristics with high informality incidence are becoming more prevalent (a change in the “endowment” effect). The set of personal characteristics is represented by gender, educational attainment and the age group of the individual. Location variables (urban-rural dichotomy and region of residence) are included when available and comparable across years.

The mean difference in informality rates (I_t) between year 1 and year 2 can be expressed as follows:

$$\bar{I}_2 - \bar{I}_1 = \bar{X}_2\beta_2 - \bar{X}_1\beta_1$$

where \bar{X}_t indicates the sample mean of demographic characteristics in year $t = 1, 2$, respectively, i.e., the “endowments”, and β_t is the associated structural parameter that measures the “beta” effects of the characteristics. β_t is estimated separately from the following specification: $I_t = X_t\beta_t + \varepsilon_t$, where ε_t is the usual error term. The above equation can be re-written as:

$$\bar{I}_2 - \bar{I}_1 = (\bar{X}_2 - \bar{X}_1)(D\beta_2 + (1 - D)\beta_1) + (\beta_2 - \beta_1)((1 - D)\bar{X}_2 + D\bar{X}_1)$$



where 1 is an identity matrix and D is a matrix of weights. While the original Oaxaca decomposition uses either D=0 or D=1, we use matrix D with diagonal elements equal to 0.5 so that the average coefficients and average characteristics are used. The first part of the expression on the right-hand-side shows the portion due to changes in endowments and the second part the portion due to changes in returns (“beta”) to endowments.

We find that changes in the composition of demographic groups in the labor market, as defined by gender, age, education and location, play a very small role in explaining changes of the incidence of informal employment.¹⁷ Figure 8 shows that the “beta” effect predominates in explaining both

¹⁷ The LiTS 2010 sample reportedly suffered from a heavy gender bias in survey respondents. This issue was particularly severe in the Russian sample where the weighted share of men ended up being only 0.27, which is substantially lower than the 0.45 estimated in LiTS. We opt to re-scale the individual weights so that men represent 0.45 of the population and women the remaining 0.55. Demographic characteristics were similar before and after the re-scaling, and the results from the Oaxaca decomposition based on the modified sample are fully consistent with results obtained from other surveys. This issue does not affect the well-being analysis in the latter part of our paper that uses data from 2016 which deliberately chose two respondents per household from the opposite sex and did not suffer from such a bias.

upturns and downturns in the rate of informal employment across all surveys. In other words, it is changes in the probability to be an informal worker, given certain attributes, what explains changes in informality rates. Different surveys give different results about the changes in these “beta” effects, but there is a common trend across all surveys: the probability of being informal has increased among those with only basic education.¹⁸ Interestingly, one of the few demographic characteristics that have changed rapidly over the period is the proportion of workers with tertiary education, this effect has partially compensated the growing probability of informal employment among those without tertiary education. In other words, had the share in tertiary education not increased, the rate of informality would have grown even more.

We conclude that the evolution of informality rates over the past decade cannot be attributed to changes in the sectoral or demographic composition of the labor force. Rather, it appears that incidence of informality has been going up across all economic sectors and particularly among those without at least some tertiary education (the majority of the labor force). This leads us to conclude that informal employment is a quite pervasive phenomenon in Russian labor markets and it cannot be associated to economic sector or population specific influences.

Is migration affecting informal employment in Russia?

There has been recent concern about immigrants in Russia and their labor market impact. The flow of these migrants, mainly stemming from Central Asian countries, increased until the economic crisis hit the region [see (Ryazantsev, 2016)]. Given the attention to the link between rising informality and immigrants, we use the RLMS to investigate their personal and job-related characteristics and whether migrant workers -defined in this survey as non-Russians- are more likely to be informal.¹⁹

¹⁸ For instance, according to RLMS data -on average and after controlling for other personal characteristics- people with higher education are 15.7 percentage points less likely to be informal than those with basic education in 2010. By 2016 those with some tertiary education are 24.2 percentage points less likely to be informal than those with basic education. Other surveys show qualitatively similar results regarding education. These are “conditional” probabilities, in other words, the probability to have an informal job, keeping all the other observable characteristics (e.g., sex, age and location) constant. Given that these personal characteristics are correlated with education, the “unconditional” probabilities can be different. In fact, according to RLMS data, the rate of informal employment has increased for all education levels between 2001 and 2016. However, the rates of growth have differed. For those with less than secondary education, the rates of informality went from 6.9 to 13.6 percent between 2001 and 2016: an 87% increase. Those with secondary went from 12 percent to 21.2 percent: a 77% increase. On the other hand, those with some tertiary went from 10.9 to 15.3 percent, and those with college, from 6.6 to 8.0 percent, that is, 40% and 21.2% growth respectively. Having post-secondary education has prevented workers from becoming informal.

¹⁹ It should be noted that this is the most expansive definition of migrants we can think of using RLMS. It refers to non-Russians in general, independently of birthplace or citizenship. If using a much more fine-tuned definition of migrants (i.e., living in a place that is not where one was born, having been born outside Russia, and having lived there less than 10 years), the proportion of migrants ranges between just 1% and 1.6% of employment in RLMS for the period 2010-2016. This is similar to the data from the LFS which contains a straight question about citizenship. Using LFS, the proportion of migrants within employment ranges between 0.2 and 0.3 percent for the same period. These latter numbers underscore the point often made that these surveys fail to capture illegal migrants either because respondents mislead the surveyors or because the sampling design fails to capture this population group.

Table 2 shows a summary of basic demographic and labor market characteristics of Russians and migrant (defined as non-Russians) workers. On average, migrants are not very different from Russian workers in age and gender composition. However, they are significantly less schooled, less likely to reside in urban areas, more likely to work in market services, and work longer hours. While 15.7 percent of Russians report to be informally employed, for migrant workers that share is significantly higher at 26.2 percent. They also get paid less per hour and have a 29 percent likelihood of receiving part or all of their wages unofficially, compared to 19 percent among Russian workers. These characteristics indicate that migrant workers are most likely clustered at the lower end of the income distribution.

We find that being a migrant (defined as non-Russian) worker is associated with being an informal worker, but not any type of informal worker. The results in Table 3 indicate that migrant workers are more likely to be working informally (column 1), and this association remains significant even after controlling for occupation characteristics (column 2). However, if dropping from the sample self-employed informal workers, being informal loses statistical significance (column 3). In other words, the Russian / non-Russian status does not involve a higher likelihood of being salaried informal (i.e., salaried but without a contract in their primary job).

Again, the important limitation of this analysis is that traditional surveys do not capture either across regions or illegal migrants. Hence, our results do not definitively conclude that migrant workers do not impact informality in Russia. We find evidence with the data at hand that non-Russians are more likely to work as self-employed informals, but not salaried informals. The analysis involving non-Russians, because of not capturing other forms of migration, should be viewed with the caveat that the share of migrants is likely underestimated in the survey and that a more fine-tuned definition of migrants through better surveys may render rather different results.

III. Methodology

The study of well-being using subjective indicators has grown significantly in recent years. Subjective measures of well-being go from life satisfaction (sometimes called happiness) to job satisfaction, self-assessed health and other indicators of access to basic needs. These measures complement, or contrast, the more conventional estimates of well-being that use objective measures such as GDP per capita, labor incomes or consumption-based poverty measures. The quality of these indicators of subjective well-being can help to discern important aspects of economic behavior and policy (Kahneman & Krueger, 2006). Moreover, many of these studies explore the connection between subjective indicators of well-being (i.e., job satisfaction, life satisfaction, self-reported health) and specific labor market status such as unemployment, self-employment, commuting to work, volunteer work or informality.²⁰ Most of these studies test the

20 For a review of the literature on the Economics of Happiness see (MacKerron, 2012).

statistical significance of a given job characteristic, as an explanatory variable, upon a subjective well-being indicator, using either linear (OLS) or non-linear (e.g., probit and ordered probit models) models.

Following this literature, we apply similar specifications to test whether informal employment has an impact upon self-assessed well-being. Given the wealth of subjective well-being variables available across the different data sources, we consider a wide range of outcomes broadly related to job satisfaction, self-assessed health and life satisfaction.

The following model is fitted to identify the impact of informal employment on well-being:

$$y_{it} = f(\beta_0 + \beta_1 I_{it} + \beta_2 X_i + \beta_3 Z_{it} + \beta_4 W_{it} + u_{it})$$

where y_{it} stands for individual i and period t , indicators of welfare (such as wages, self-assessed health status, subjective life and job satisfaction); controlling for informal employment (i.e., I_{it}), personal characteristics such as gender, age and schooling (i.e., X_{it}), labor market characteristics, such as area, economic activity and occupation (i.e., Z_{it}), and job characteristics such as wages and job benefits (i.e., W_{it}). Region, year and personal fixed effects are also included in some specifications. The function $f(\cdot)$ allows for both linear and non-linear specifications of the model.

For each dependent variable, we estimate four specifications, one with a basic set of controls and others with a set of controls of job characteristics. In the set of basic controls, we include individual characteristics such as age, gender, education, region and urban-rural location (when available). In the full set of controls, we additionally include labor market characteristics such as sector of activity, establishment size, and occupation (when available). A third specification includes wages. Finally, indicators on job conditions (i.e., job safety, vacations, job stability and envelope wages) are included as additional controls, although most of these are only available for type-1 informal workers (i.e., salaried without a contract). This helps us understand whether differences in well-being between informal and formal workers are explained by personal, labor market, job-specific characteristics or by formal-informal type of job.

The main hypothesis to be tested is whether there is a statistically significant difference in various dimensions of well-being between informal and formal workers. This would be determined by the statistical significance of the coefficient on informal employment, β_1 . The well-being outcomes of interest, as further detailed in the following section, include elements of subjective well-being such as job satisfaction, self-reported health and life satisfaction. Furthermore, an assessment of the impact of informal employment on monetary measures of well-being such as wages and household poverty status -using a similar specification- complements the analysis on subjective well-being.

IV. Main Results

We find that informal workers do not have lower satisfaction with their jobs, nor lower self-reported health. After controlling for personal characteristics and work conditions, formal and informal workers have no systematic difference in job satisfaction. In terms of self-assessed health, formals and informals never show a systematic difference. On the other hand, we find a significant and growing wage gap between formal and informal workers, and a statistically significant association between informality, life dis-satisfaction, and household poverty among certain types of informal employment.

Informal employment and working conditions

We first explore whether informal workers experience different work conditions. We answer this question making use of detailed information from three surveys. Our analysis includes the number of hours worked (from RLMS), whether the worker has a set or contracted number of hours (from the ESS), and whether the worker would like to work more hours (from the LiTS). Using number of hours worked, we define binary variables that are equal to one if the worker reports to have worked less than 20 hours per week or more than 50 hours per week. Additional measures of work conditions also include binary variables for whether a worker received paid vacations last year, whether the job was considered harmful or dangerous, and whether the worker is concerned about losing their job. The RLMS also provides subjective assessments on the worker's satisfaction with the job's work contract, growth opportunities and pay. Responses to these questions are recorded in a five-point scale, from absolutely dissatisfied to absolutely satisfied, which we use to define a binary outcome variable that equals one if the worker reports being not very satisfied or absolutely unsatisfied with her work contract or the job's growth opportunities. A summary of unconditional means of these work conditions between formal and informal workers is illustrated in Figure 9.

On average, informal workers are more likely to work non-standard hours and have less stability in terms of work hours. Specifically, informal workers are more likely than formal workers to work either few, i.e., less than 20 hours, (4.3 percent and 1.3 percent, respectively) or long hours, i.e., more than 50 hours (28.8 and 10.8 percent, respectively). Informals are also more likely to be willing to work more hours (14 percent of informals, whereas only 8 percent of formals). Informal workers are also less likely to have a basic 'set' or contracted number of hours (64 vis-a-vis 88 percent, respectively). Formal and informals are equally likely to have a second job (about 4 percent).

Moreover, informal workers are much less likely to have paid vacation, but not more likely to have harmful or dangerous jobs or be more concerned about losing their job. Only 14 percent of informal workers have paid vacation whereas 74 percent of formal workers do. On the other hand, 3 percent of informal workers report having a hazardous job, while 13 percent of formal workers do. Concern about job loss is very similar between the two groups (64 and 66 percent, respectively).

Finally, informal workers are also more dissatisfied with their work contract and the growth opportunities that the job offers, but not with pay. Formal and informal workers are almost equally dissatisfied with pay (39 and 37 percent, respectively), but informals see less growth opportunities than formals (32 and 24 percent, respectively) and dislike their work contract more often (17 and 11 percent, respectively).

However, some of these differences in work conditions are not statistically associated to the type of job (formal or informal) but to other variables. After controlling for personal and job market characteristics, informal workers are certainly more likely to work too few or too many hours. On the other hand, after controlling for other characteristics, informal workers are not more likely to be more dissatisfied with their work contract, work opportunities or pay. Informal workers, however, are more likely to receive envelope payments. Statistical significance of differences in conditional means between informal and formal workers is shown in tables 4 to 6.

The coefficients on informal employment are positive and statistically significant in all regressions of hours of work. In most cases at the 1 percent level, even after controlling for personal and job market characteristics (Table 4, columns 1 to 4). They are also more likely to want to work more hours (Table 4, columns 5 and 6). On the other hand, informal workers are less likely to have a set number of hours (Table 4, columns 7 and 8). In summary, informal workers -even after controlling for personal and labor market characteristics- are more likely to work either short or extra hours, to prefer ore hours of work, and less likely to a pre-defined set of hours of work.

Regression results show that informal workers are less likely to have paid vacation but not a hazardous job. Informals are statistically less likely to have paid vacation, even after controlling for industry, occupation and firm size (Table 5, columns 1 and 2). The coefficient for having a harmful job is an outcome associated with job-specific characteristics and not informality per se: the estimated coefficient for being informally employed is negative and statistically significant in Table 5, column (3) when only individual characteristics are included, but once sector, occupation, and firm size are accounted for, the size of the coefficient on informality drops and turns statistically insignificant (Table 5, column 4). Notably, informal workers are less likely to be concerned about losing their job compared to formal workers, even After accounting for job characteristics (Table 5, columns 5 and 6). The first two conditions -paid vacation and hazardous job- refer to salaried informal workers only because we do not have information about these job conditions among self-employed workers in the questionnaires. The results on concern about job loss refer to all informals.

Once these work conditions are taken into account, informal workers are not more likely to be dissatisfied with the contract or growth opportunities in their job. Under simple specifications, the coefficient of informal employment is positive and significant for regressions of dissatisfaction with work contract, with work opportunities and with pay (not included in Table 6, but available

from the authors). But after including job market and work characteristics, the coefficient becomes insignificant (Table 6, columns 1 to 6, except 3) or negative (Table 6, column 3). It is hazardous conditions, concern about job stability and being paid, partly or fully, off the record (i.e., envelop wages) that are associated to dissatisfaction. The inclusion of these variables removes the significance of the informal employment variable. The lack of statistical significance of type of job contract (formal vs informal) is seen both for all informals (columns 1, 3 and 5) and salaried informal workers (columns 2, 4 and 6). The exception, column 3, indicates that informals are less dissatisfied with work pay, which seems to confirm a view of informal workers not being systematically disgruntled with their job (more on this finding later).

Informal workers are also significantly more likely to receive envelope wages. Receiving part of the wages off the record is an employment practice that is commonly associated with informal employment and still prevalent in some CIS and Central and Eastern European countries. The decision to pay or receive payment in envelope wages is often driven by an intent to evade taxes, or to ease tight economic conditions, and is known to often cover remuneration for regular work hours. The RLMS asks whether all, part or none of a worker's wage payment was transferred unofficially. Table 6, shows that informal workers, both using total and salaried-only samples (columns 7 and 8, respectively) are more likely than formal workers to receive envelope wages even after controlling for personal and job market characteristics.

Although more prevalent, envelope payments are not exclusive among informal workers. The incidence of envelop wages varies markedly by type or work. About 10 percent of formal workers are paid part or all their earnings off the record. In contrast, among salaried informal workers (i.e., in a firm but without a contract), 91.5 percent report to have received all or part of their wages unofficially. Self-employed workers have a 66 percent chance of being paid off the record (Table 7).

Finally, we find that a statistically significant wage gap between formal and informal workers exists since the mid 2000s and has widened since. We use information on net wages received and hours worked to back out an hourly wage rate for all workers. Nominal wages are spatially and temporally deflated.²¹ Differences in hourly wages of informal and formal were not statistically significant at the beginning of the past decade, but a clear divergence is observed since 2005 (Figure 10). Moreover, while real wages declined with the onset of the global (2009) and oil-and-sanctions (2015) crises for both groups, it appears that the drop in real wages was larger for informal workers than formal workers. The difference is partly due to the fact that, among informals, the decline is more acute among the self-employed than among salaried without a

²¹ For spatial deflation, we use the cost of a fixed basket of goods in 2014 for all Russian regions. For temporal deflation, we use regional CPI series. All wages are expressed in 2014 Moscow prices.

contract. The former sub-group of informals -characterized by smaller capital endowment per worker- partly explains the lower level and higher variability of wages among informals.

A simple wage gap regression suggests that informal workers receive on average a lower pay per hour, and this difference is statistically significant and robust against the inclusion of job characteristics. We pool data sets from the RLMS that spans 2004-2016 and remove outliers from the wage distribution.²² Based on results from OLS regressions, there appears to be a wage penalty for informal workers, as suggested by the negative and statistically significant coefficient on being an informal worker, controlling for individual and job-related characteristics, both for salaried and self-employed informals (Table 8, columns 1 and 2). We further control for selection and unobservable characteristics at the individual level using a specification that includes individual fixed effects. Now, we find a statistically significant wage gap only for informal salaried workers (Table 8, columns 3 and 4). This means that, despite controlling for region, year and person fixed effects, there remains a systematic difference in pay between formal and informal workers, even after controlling for all observable productive characteristics. This is an important departure from existing literature that has previously suggested that the labor market is largely integrated with possible weak segmentation only at the bottom of the distribution (Lukyanova, 2015).

The wage gap has widened in recent years, and is statistically significant for both types of informal workers. Using data for year 2016 only, the wage regressions show a much larger coefficient and strong statistical significance for both salaried and self-employed informal workers (Table 8, columns 5 and 6). In contrast with the regressions using pooled surveys, which showed a wage gap of ranging between 2 and 8 percent, the most recent data shows a wage gap between 15 and 19 percent. This confirms the widening informal-formal wage gap (described in foregoing paragraphs and shown in Figure 10). This wage gap is significant even after controlling (for a sample of salaried workers only) for job conditions such as vacations and job hazards (column 7).

To summarize, we find that informal workers have systematic differences when compared to formal workers in some working conditions. Informal workers have less stability of work hours and incidence of vacations, are more likely to receive envelope wages and to have lower wages. On the other hand, informal workers are not more dissatisfied with the contract, the pay or the opportunities that their job provides. Neither are they more likely to have a hazardous job or be more concerned about job loss than formal workers. These differences lead to the question on whether informal workers have more or less job satisfaction than formal workers.

Informal employment and job satisfaction

We first examine whether informal workers are more or less likely to be satisfied with their job. The original question in the RLMS asks “How satisfied are you with your job in general?” and

²² To remove the influence from outliers in the wage regression, we drop 1 percent of the sample from both tails of the distribution.

responses are recorded in a five-point scale, i.e., absolutely satisfied, mostly satisfied, neutral, not very satisfied, and absolutely unsatisfied. These were in turn used to construct a binary dependent variable equal to one if the response fell in the bottom two out of five categories, i.e., if the person was either dissatisfied or strongly dissatisfied.

Descriptive statistics show that a higher share of informal workers is dissatisfied with their jobs and the difference with formal workers is statistically significant. 14.9 percent of informal workers report to be either dissatisfied or strongly dissatisfied with their job, compared to just 9.2 percent of formal workers (Figure 11).

However, informal workers are not more likely to be dissatisfied with their jobs than formal workers, after controlling for work conditions. Table 9 presents estimated coefficients from logit regressions of job dissatisfaction and satisfaction. The coefficient on informal employment is positive -negative in the case of satisfaction- and statistically significant at the 1 percent level in specifications only controlling for personal and job market characteristics (columns 1 and 4). However, once work conditions such as wages, concern about job loss and envelop wages (as well as paid vacation and hazardous job in the case of a sample salaried workers only) are included, the coefficients lose significance (columns 2, 3). In particular, hourly wages are highly significant in explaining job dissatisfaction. Hazardous job conditions also explain job dissatisfaction among salaried informals. In the case of job satisfaction, the coefficient of informal employment is unstable: it changes sign and significance to changes in sample and specification. This evidence seems to confirm that it is work conditions, rather than type of job contract (formal vs informal), that explains job dissatisfaction. No conclusive evidence is derived regarding job satisfaction.

Informal employment and health

Next, we explore the relationship between informal employment health outcomes. We are able to define a measure of a worker's health status based on information on self-assessed overall health which is captured through a question that asks how the respondent would rate her general health on a five-point scale. Population health is by definition complex and difficult to measure, and the reliability of one's self-assessment could vary by population subgroup -see (Lundberg, 1996); (Zajacova, 2011). Nevertheless, self-assessed health status is widely used to study empirical trends in population health. In the RLMS, respondents are asked how they would evaluate their health. Possible responses include very good, good, average, bad and very bad. We define a binary measure of "poor health" that includes workers that rate their health as bad or very bad. We also consider another binary variable that defines "good health" which includes the top two responses, i.e., good or very good health. With this, we attempt to capture whether there are health inequities arising from differences in one's informality status.

The distribution of original responses shows that formal and informal workers are in fact not very different in their self-assessed health measure. The distribution is fairly similar between formal

and informal workers: 5.3 percent of informal and 3.8 percent of formal workers report to be in poor health (bottom two out of five categories), and 50.5 percent of informal and 45.8 percent of formal workers report to be in good health (top two out of five categories). The distribution of responses is shown in Figure 12. In neither case the difference between informal and formal workers to report good (or bad) health is statistically significant.

Logit regressions confirm that informal workers are not more or less likely to be in either poor or good health, under all specifications. The result is robust against the inclusion of individual, household and job characteristics. Being informally employed is not associated with better or worse self-reported health under all specifications (Table 10, columns 1 to 6). There are a few reasons that may explain this: first, our measure of health is self-reported and if individuals systematically use different benchmarks to rate their health, there could be a bias in the measurement of the outcome variable. A more objective measure of health may be more useful in this regard, but given the complexity of health itself, there is no single perfect measure. Second, results from the previous sub-section showed that informal workers were not more likely to be engaged in activities that were more harmful or dangerous. If that had been the case, we may have seen differences in health outcomes between formal and informal workers. Interestingly, being involved in a hazardous job is not associated to self-reported health either (see columns 3 and 6). Third, while there are typically disparities in health outcomes by socioeconomic characteristics, it is plausible that after controlling for them (e.g., education, income) there are no further systematic disparities between formal and informal workers. Finally, equal access to public medical services may also lead to both formal and informal workers having the same basic health coverage and little systematic differences in self-assessed health across these employment types.

In sum, being employed informally is not associated with a difference in self-assessed health. Controlling for characteristics, we do not find a statistically significant difference in self-reported health outcomes. In addition, our results are not sensitive to how the binary health outcome is defined, i.e., whether we consider good or bad health.

Informal employment and happiness

Lastly, we examine whether informal employment affects the likelihood of being satisfied with one's life. The specific question in the RLMS that attempts to measure this is formulated as "To what extent are you satisfied with your life in general at the present time?" with possible responses ranging from fully satisfied to not at all satisfied, on a five-point scale. Descriptive summary statistics indicate that informal workers are more likely to report to be less satisfied with life. The distribution of responses on life satisfaction in Figure 13 shows that informal workers are less likely to report to be satisfied and more likely to report to be dissatisfied. We derive two binary variables that are each equal to one and capture the bottom two and top two responses. The difference in the unconditional means of life satisfaction (or dissatisfaction) between formals and

informals is statistically significant. Informal workers are more likely than formal workers to be dissatisfied with life (28 and 19 percent, respectively) and less likely to be satisfied (43 and 56 percent, respectively).

These differences in life dissatisfaction are only partly robust to the inclusion of controls and to type of informal employment. The results are dependent on how the outcome is defined: Columns (1) to (3) of Table 11 show the results from logit regressions when the outcome is defined as life dissatisfaction, and columns (4) to (6) show the results when the outcome is defined as life satisfaction. The coefficient for informal employment is positive (that is being informal increases the likelihood of being dissatisfied with life) and statistically significant even after controlling for job characteristics such as wages, job loss and envelope wages (columns 1, 2, 3). Interestingly, when controlling for more job conditions (i.e., paid vacation, hazardous jobs) -and restricting the sample to salaried workers only- the coefficient for informality on life dissatisfaction loses level of significance (columns 3). In the case of life satisfaction, informal workers are systematically less likely to be satisfied (columns 4 and 5), but the coefficient becomes non-significant when controlling for more job conditions and restricting the sample to salaried workers only (column 6).

There is a line of literature that suggests that job satisfaction and life satisfaction are closely linked -see (Rice, 1980) and (Blanchflower, 2004). But this should not be the case here because, as explained before, informal workers are not more or less dissatisfied than formal workers with their job. It is job conditions what explains job dissatisfaction. The evidence described above indicates that type of job (formal vs informal) does affect life satisfaction but the effect is not fully robust to changes in sample and specification.

To summarize, our findings suggest informal workers are more likely to be dissatisfied with life, although the evidence is less robust regarding life satisfaction. Given previous results about job characteristics, self-reported health status and job satisfaction, where the formal-informal employment divide seems to have no significance, we interpret the association between life satisfaction and informal employment as indicative of non-observable personal characteristics rather than a causal effect of type of employment.

Informal employment and family living standards

Finally, we attempt to better understand the link between informal employment and poverty. The question is whether informal employment is associated to lower household incomes. In particular, whether informal workers are more likely to be in the bottom 20 percent of the income distribution. If the per capita household income of informal workers is not any more likely than that of formal workers to be in the bottom of the distribution, then it is possible informal employment does not drive households into poverty and is, perhaps, a diversification strategy of labor resources within the household.

An analysis using similar specifications as before suggests that the association of informality and poverty depends on the type of informal job. Columns 1 and 2 in Table 12 show that informal workers are more likely to be in the bottom quintile of the per capita household income distribution, even after controlling labor market characteristics. However, the statistically significant coefficient becomes insignificant and substantially smaller once we restrict the sample to salaried workers and control for other job characteristics such as firm-size (column 3).

These results show, again, a fundamental difference between salaried and self-employed informal workers. Like in the case life satisfaction (see Table 11), when excluding self-employed workers from the sample, informal employment is not statistically associated to lower household income. Our results suggest that all informal workers have lower wages than formal workers (see Table 8), all else equal, but salaried informal workers are not necessarily poorer at the household level. On the other hand, self-employed informal workers are associated with certain negative consequences such as lower subjective well-being, and dissatisfaction with pay, all of which together with lower wages, may lead to a situation that leads (or stems) from household poverty.

V. Conclusions

In this paper, we utilize multiple data sources on informal employment in Russia and observe a long-term increase in informality from the early 2000s through 2016, with a short period of stability or even decline in the second half of the 2000s. Encouragingly, this trend appears to be consistent across different data sources and definitions of informal employment, including the official measure of informal employment monitored by Rosstat, which is presented alongside our estimates for comparison purposes.

We assess the comparability of sources in terms of the measurement of informal employment, and maintain a legalistic definition of informal employment throughout all data sources, which is in line with the majority of Russian literature and deemed more appropriate for transition economies. Throughout the analysis for this paper, in most cases the results are qualitatively consistent across the three surveys under study.²³

Importantly, we find that a statistically significant wage gap between formal and informal workers starts to be statistically significant around mid 2000s and has widened since. Hourly wages of informal and formal workers started out at around parity and maintained similar growth rates through the mid 2000s, but a clear divergence is observed after that. Moreover, while real wages

²³ The main exception to this is that we find inconsistent results using the LiTS when measuring the impact of job and life satisfaction. Specifically, we find empirical results that are opposite from those obtained using the RLMS. For example, results from the LiTS suggest that informal workers are more satisfied with their jobs and their lives. Given that the RLMS includes more information to explore other aspects of informality, some of which are used to explain the differences in satisfaction levels, these are the results we report here. We note however that the discrepancy with the LiTS remains an unresolved puzzle.

declined with the onset of the twin oil and sanctions crises amid high inflation, it appears that the drop in real wages was even larger for informal workers, especially in the crises years, and particularly among self-employed informal workers. This wage gap remains statistically significant even after controlling for personal, labor market and job characteristics, and has widened in recent years.

In terms of job conditions, we do find that informal workers have different work conditions such as being more likely to work non-standard work hours, less stability of hours, receive envelop-payments and less likely to have a paid vacation. On the other hand, informal workers are not more likely to have harmful jobs, to be concerned with job loss or be dissatisfied with pay, contract and job opportunities. Once some of these job conditions are taken into consideration, the type of job contract (formal vs informal) loses statistical significance.

Subsequently, we estimate the impact of informal employment on several measures of subjective well-being. We find that informal workers are not less satisfied with their job than formal workers. Moreover, there is no difference between formal and informal workers in terms of self-assessed health. Informal workers are found to express lower life satisfaction, but salaried informal workers are not less likely to be satisfied with life.

Finally, we also find that informal workers are more likely to live in household poverty, although the evidence is not significant in the case of salaried informal workers. The evidence regarding the association between informal employment and life satisfaction or household poverty is not robust to changes in sample and specification and further research is needed to clarify the relationship between these variables.

We believe the evidence above indicates that, in general terms, the informal workers are not much concerned with the type of job contract they have but with work conditions. As long as they have access to some coverage of social protection, and after taking into consideration whether the job has benefits, is hazardous or includes envelop payments, formal and informal workers (as defined in this study) do not differ in job satisfaction or self-assessed health.

This may in part be due to disconnect between job characteristics and access to basic health services. Access to health is not strongly dependent on employment and moreover, pensions are partly subsidized by the state so incentives to contribute to social security are partial. If this is the case, then formalization may not occur simply by changes in labor taxes and transfers but more complex reforms involving reconfiguration of social protection and its financing. Taken together, the evidence may point towards individuals failing to gauge the long-term impact of not having contributed to a social security (myopic behavior) or relying on other people's contributions to finance the public provision of basic health and pensions (moral hazard).

On the other hand, informal workers do earn less on average, particularly in more recent years. This indicates a growing problem of labor productivity among informal workers. Rather than type of regulation, it seems that type of labor law enforcement (i.e., lack of contracts and envelope wages) or productivity by type of firm (i.e., small firms and self-employment vs corporate firms) are behind the formal-informal employment and wage-gap divides.

These findings point to a set of policy implications to induce a reduction in informal employment in Russia. First, the myopic or moral hazard behavior on the part of workers (or their employers) who benefit from social protection without needing to fully pay for it calls for a re-thinking of the design and enforcement of tax and social security contributions/transfers. Second, the evidence regarding informality rates growing faster among less schooled people coincides with the evidence on lower wages in type-2 informal workers (self-employed) or even in type-1 informal workers (salaried without a contract) after controlling for their unobservable characteristics. This suggests the need to address a labor productivity problem by promoting training and education for the demands of the modern economy.

Most informal workers in Russia do not appear to be systematically worse off in terms of subjective well-being (measured by job, life and health satisfaction), but are less productive -earn lower average wages- than formal workers and -due to envelope payments and lack of contracts- do contribute less to fiscal sustainability of the social security system. It seems then that of the three concerns in the literature about informal employment, productivity growth and tax-transfer system design are more important than systematic losses in wellbeing. However, lower wages among informals seem to make them more likely to be part of poor families, a trend which -if not reversed- will also make informal employment a social inequality problem.

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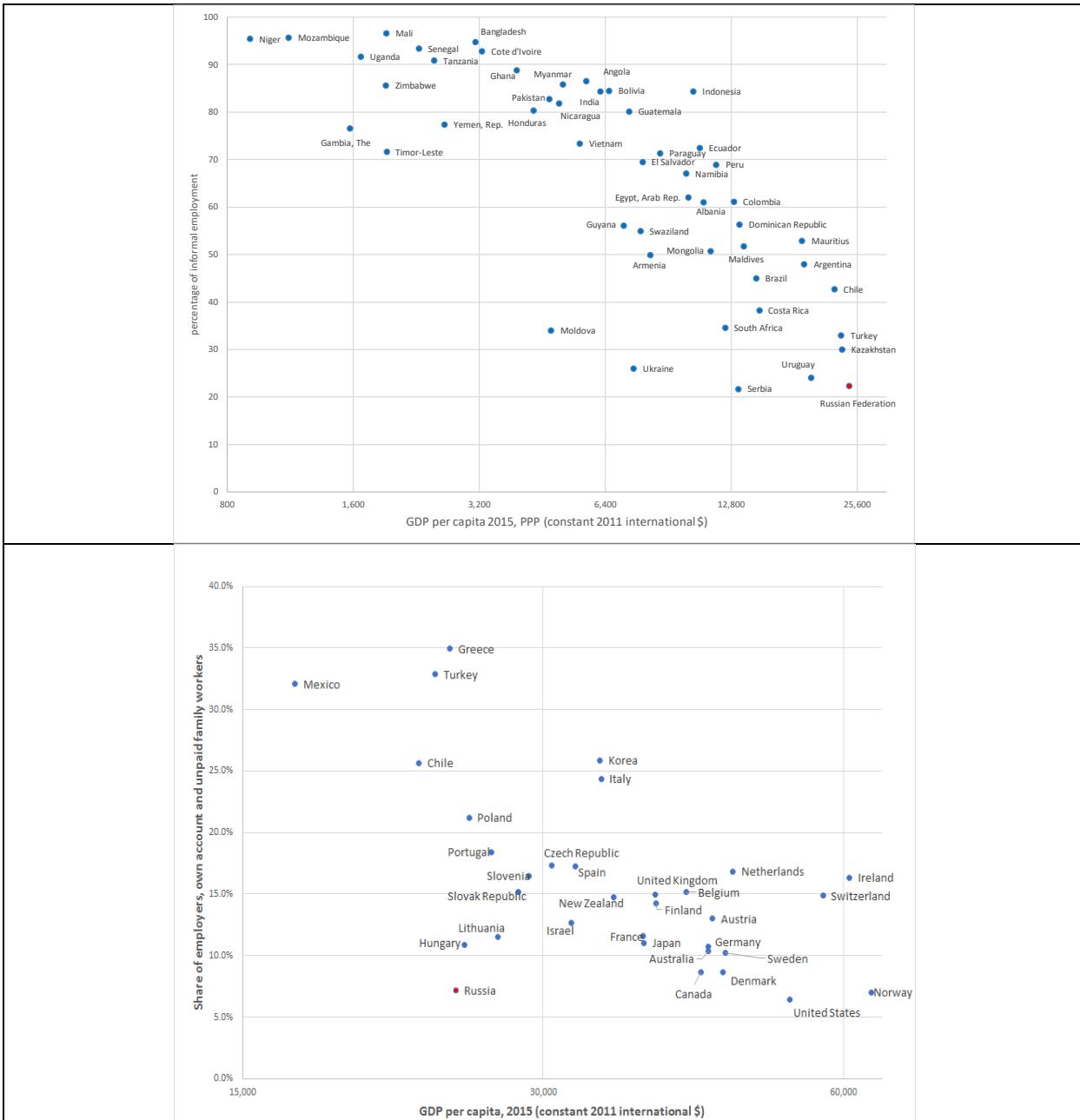
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Figures

Figure 1: Informal employment rates across the World

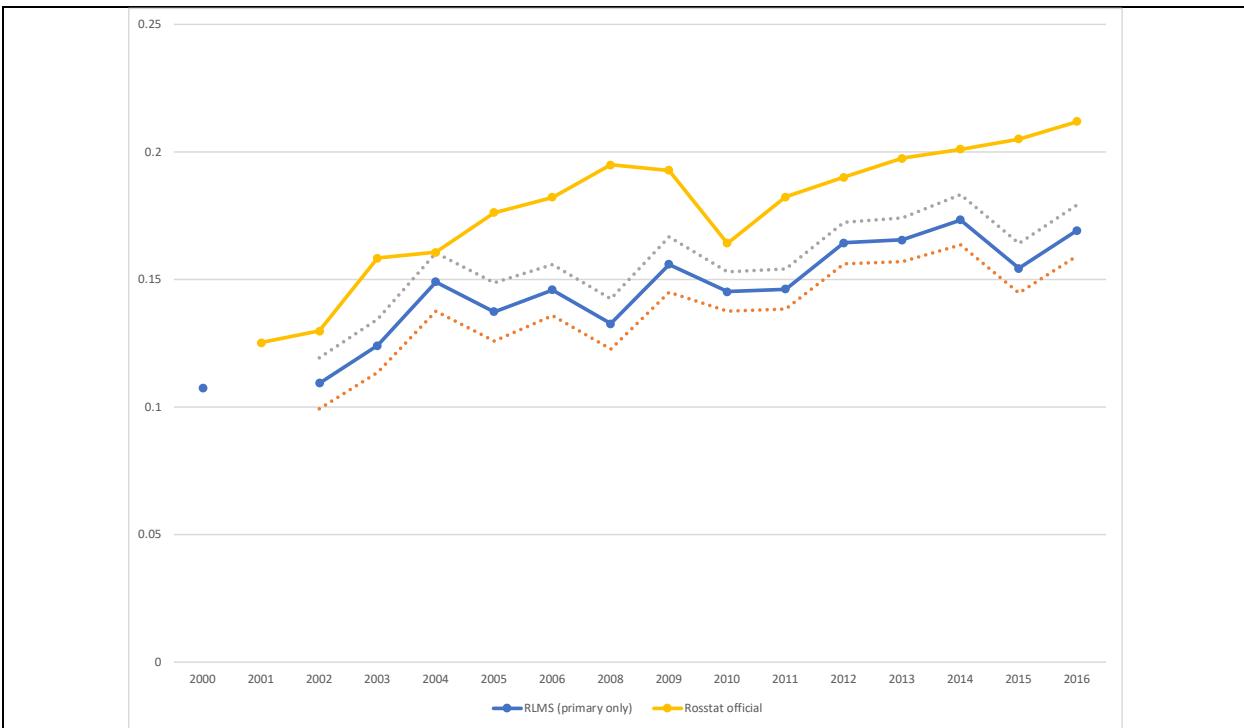


Source: Top figure uses data from ILO-WIEGO informal employment database and ILOSTAT Informal employment, harmonized series, www.ilo.org/ilostat (accessed June 4, 2018), and World development Indicators. Bottom figure uses data from OECD Statistics, <https://stats.oecd.org/> (accessed October 10, 2018) and World development Indicators.

Note: Top panel figure data corresponds to most recent estimate of informal employment rate within the period 2012-2017.

Bottom panel figure corresponds to employers, own account and unpaid family workers as a percentage of total employment and GDP per capita, both for year 2015 (at 2011 PPP)

Figure 2: Informal employment rates estimated using RLMS

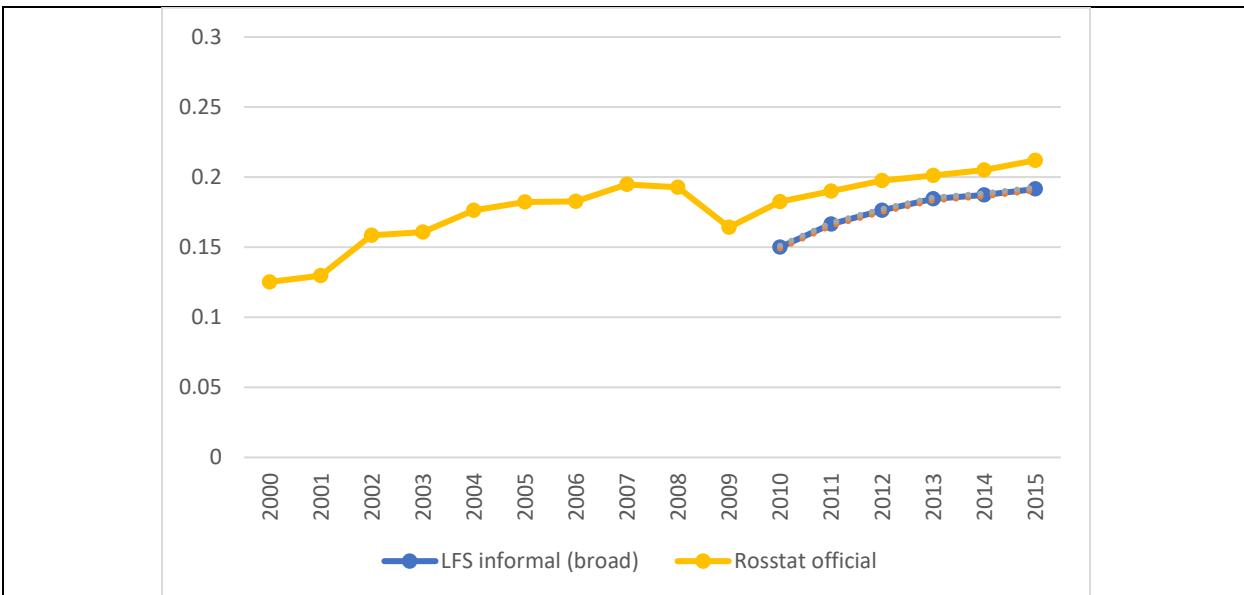


Source: Authors' calculation using RLMS. Official Rosstat from Rosstat, "Labor force, employment and unemployment in Russia", various years. Available at

http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1139918584312 Accessed on March 16, 2018.

Note: Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Workers with a secondary job or in no job but in irregular economic activities are not included. This RLMS-based measure is henceforth referred to as "RLMS (primary only)". Rosstat's official measure of informal employment is estimated using the LFS and includes workers that are employed but not at an enterprise in their primary or secondary job.

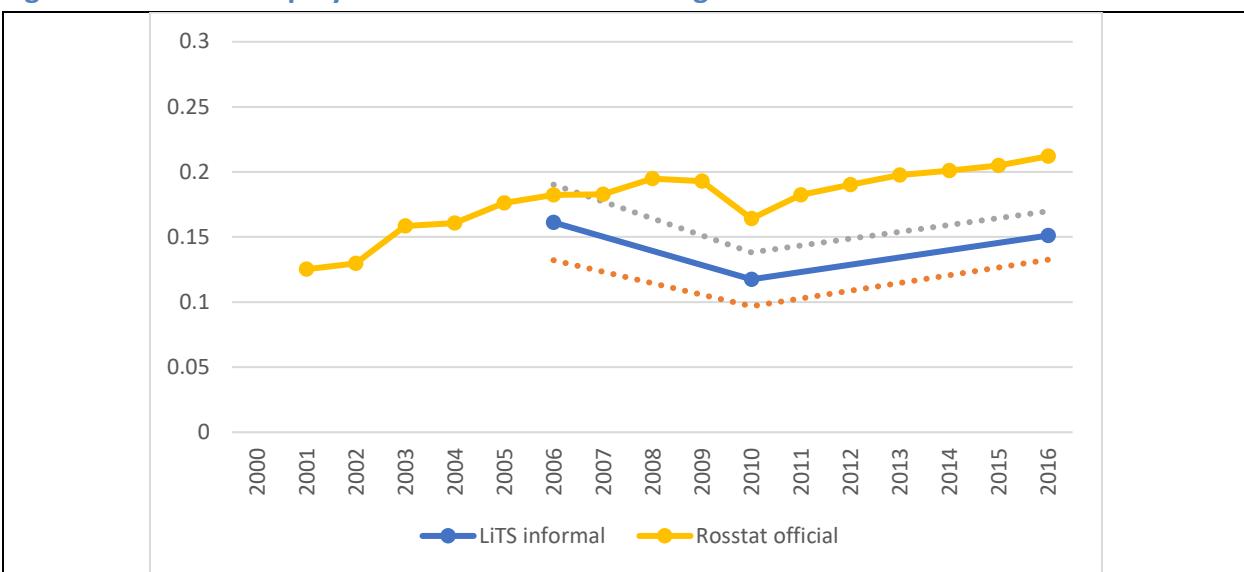
Figure 3: Informal employment rates estimated using LFS



Source: Authors' calculation using LFS.

Note: In the LFS, informal employment includes workers that are employed but not at an enterprise in their primary job, workers employed without a written contract in their primary job, and self-employed workers without registration. This LFS-based measure is henceforth referred to as "LFS (broad)". Rosstat's official measure of informal employment is estimated using the LFS and includes workers that are employed but not at an enterprise in their primary or secondary job. All estimates are weighted. 95% confidence intervals are shown using dotted lines.

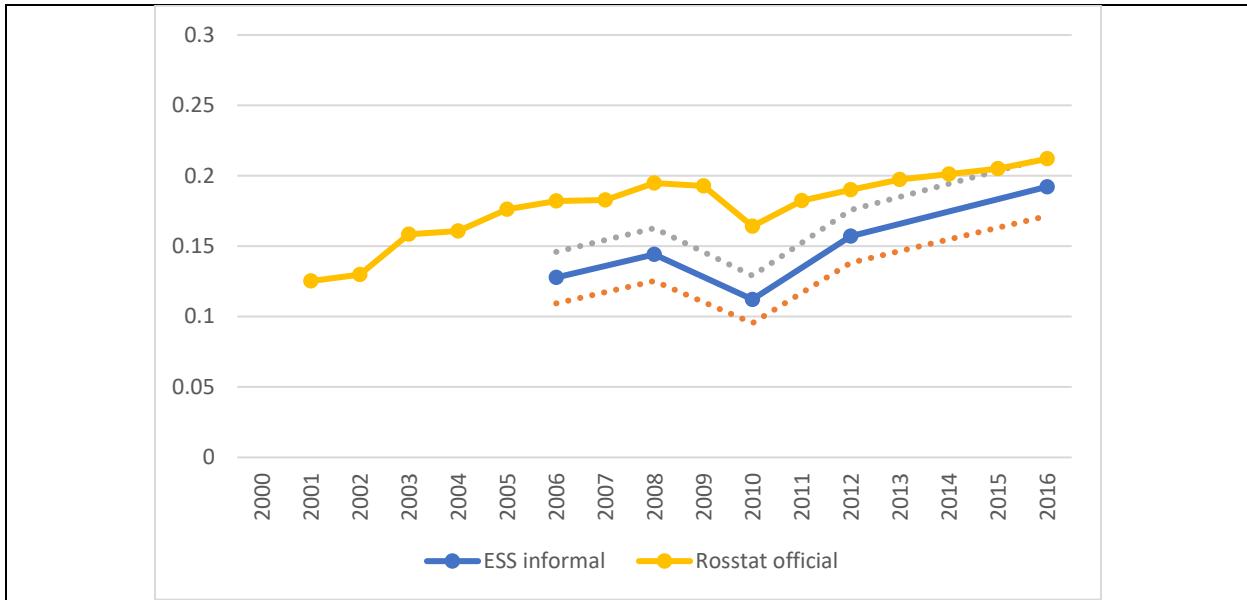
Figure 4: Informal employment rates estimated using LiTS



Source: Authors' calculation using LiTS.

Note: In the LiTS, informal employment is defined as working without a written contract in the main job. Rosstat's official measure of informal employment is estimated using the LFS and includes workers that are employed but not at an enterprise in their primary or secondary job. All estimates are weighted. 95% confidence intervals are shown using dotted lines.

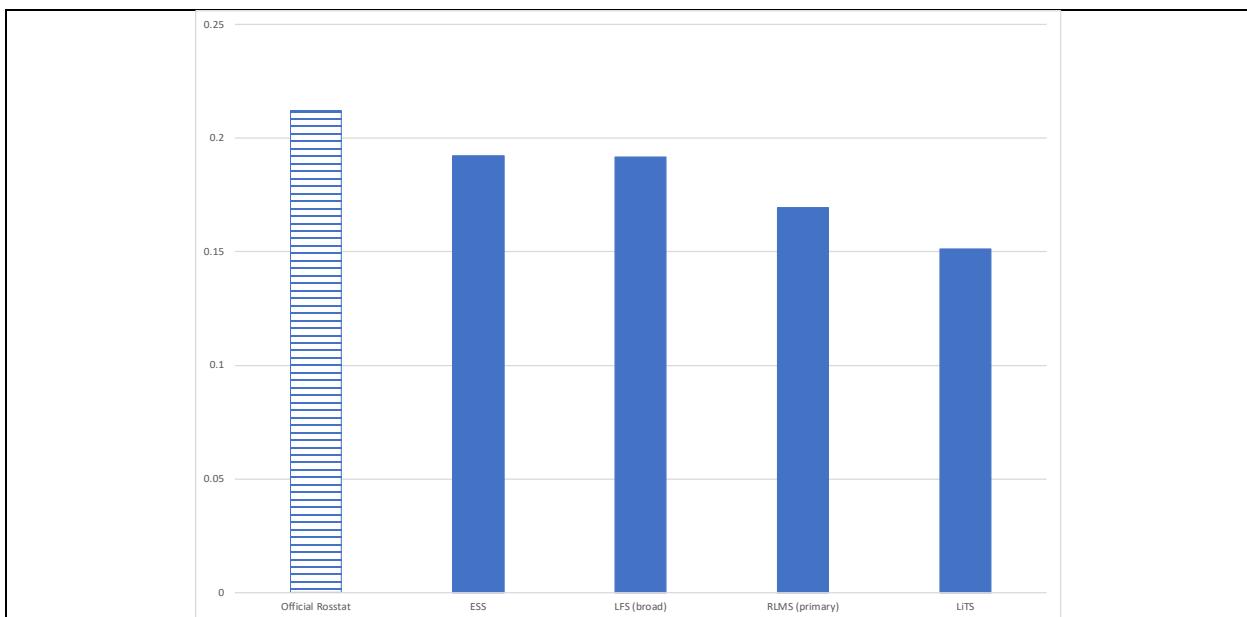
Figure 5: Informal employment rates estimated using ESS



Source: Authors' calculation using ESS.

Note: In the ESS, informal employment is defined as working without a contract in the main job. Rosstat's official measure of informal employment is estimated using the LFS and includes workers that are employed but not at an enterprise in their primary or secondary job. All estimates are weighted. 95% confidence intervals are shown using dotted lines.

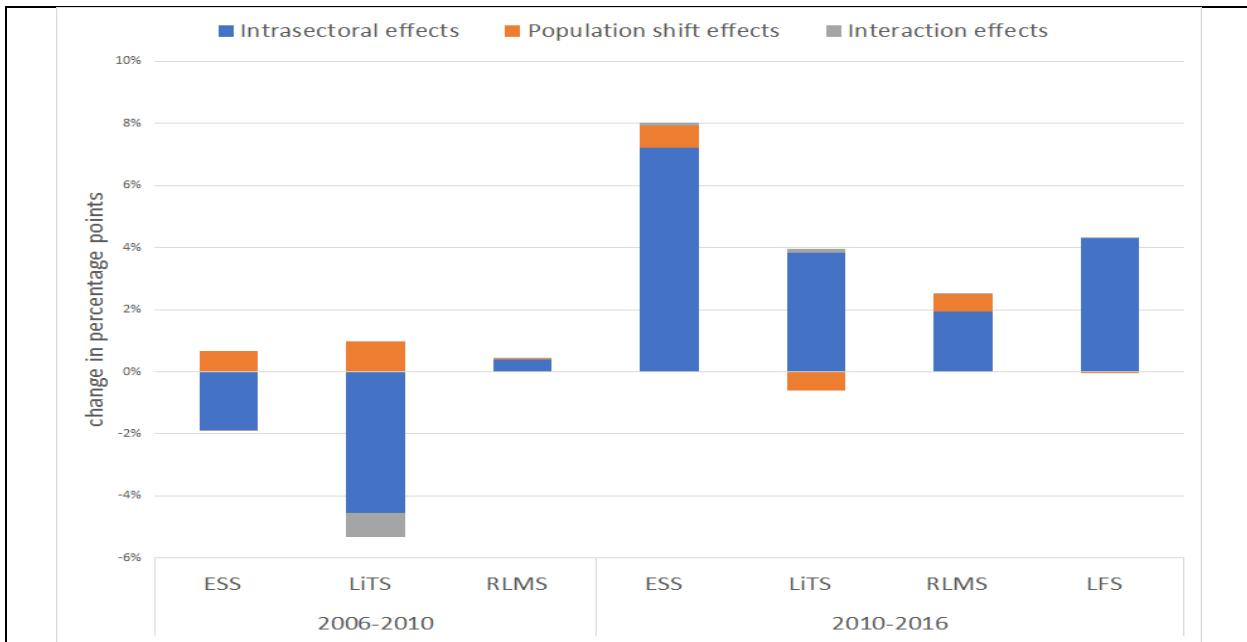
Figure 6: Informal employment rates in 2016 across different surveys



Source: Rosstat and authors' calculation using various surveys.

Note: Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Workers with a secondary job or in no job but in irregular economic activities are not included. In the LFS, informal employment includes workers that are employed but not at an enterprise in their primary job, workers employed without a written contract in their primary job, and self-employed workers without registration. In the LiTS, informal employment is defined as working without a written contract in the main job. In the ESS, informal employment is defined as working without a contract in the main job. Rosstat's official measure of informal employment is estimated using the LFS and includes workers that are employed but not at an enterprise in their primary or secondary job. All estimates are from 2016 surveys and weighted.

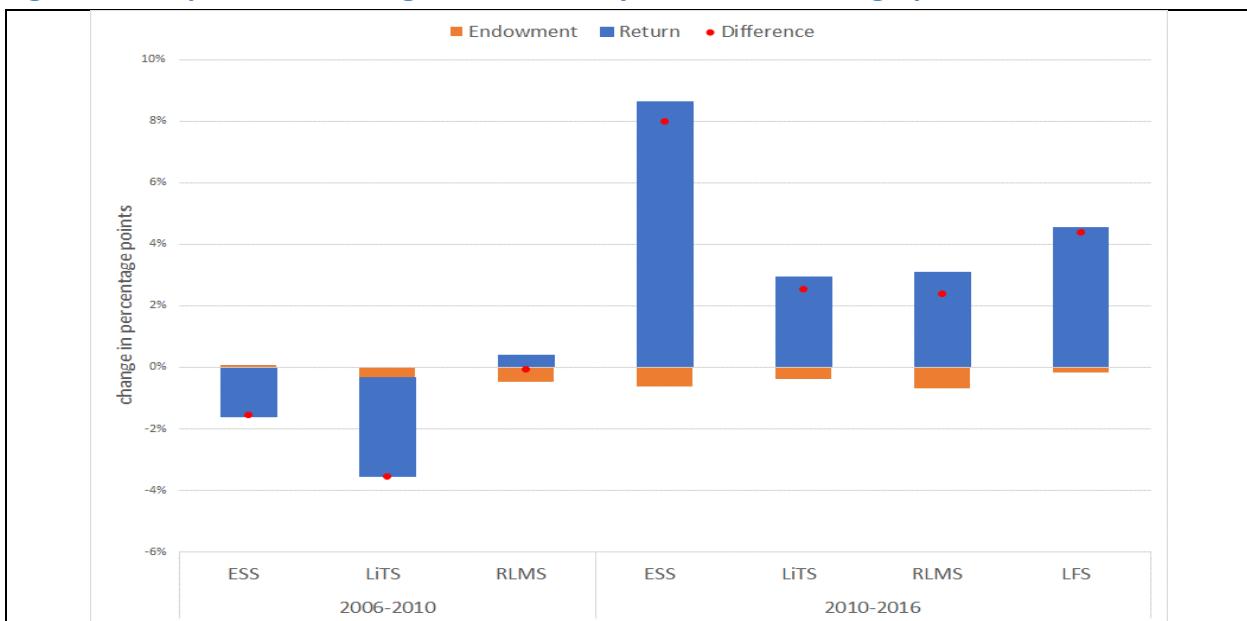
Figure 7: Changes in informality rate due to sectoral changes



Source: Authors' estimation

Note: Results show Huppi-Ravallion decompositions ((Huppi & Ravallion, 1991)) using four sectors: agriculture, manufacturing, public services and non-public services. The population shift effect shows how much of the change in the outcome was induced by changes in employment shares of sectors between two years. The intra-sectoral effect shows the contribution that is due to changes in the incidence of informality rate within sectors. The interaction effect arises from the possible correlation between sectoral gains and population shifts

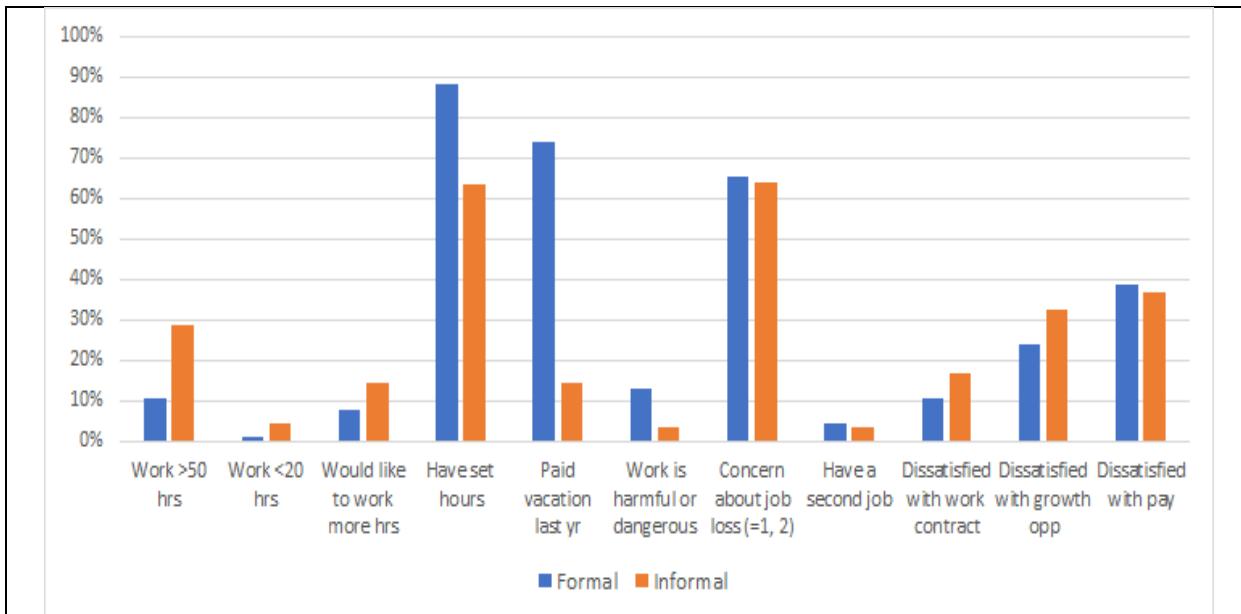
Figure 8: Components of changes in informality rate due to demographic characteristics



Source: Authors' calculation using ESS, LiTS, RLMS and LFS.

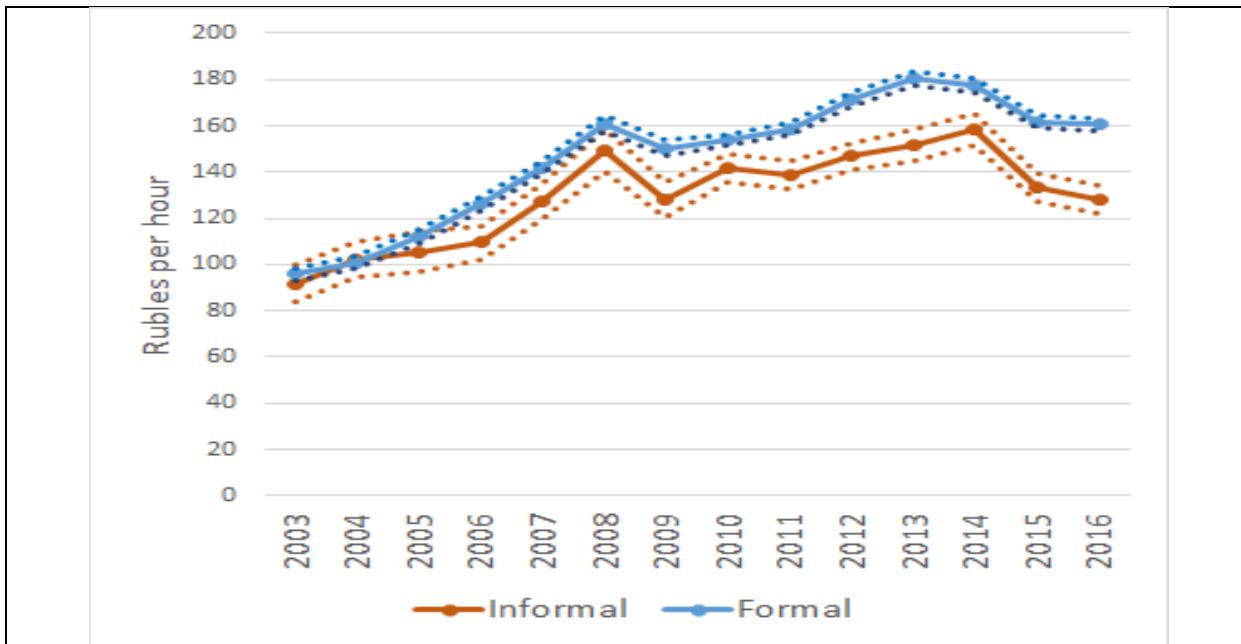
Note: Results show Oaxaca decompositions of the relative contribution of changes in informality rates that can be attributed to changes in endowment and changes in returns to endowments.

Figure 9: Summary statistics of work conditions by formal and informal workers



Source: Source: Authors' estimation using RLMS, ESS, LiTS.

Figure 10: Hourly wages of informal and formal wages, 2003-2016



Source: Authors' estimates using RLMS, 2003-2016.

Note: This figure shows the evolution of mean wages of formal and informal workers over time. In the RLMS, informal employment includes workers that are employed at an enterprise without a contract in their primary job and workers employed but not at an enterprise in their primary job. Workers with a secondary job or in no job but in irregular economic activities are not included.

Figure 11: Distribution of survey responses on job satisfaction

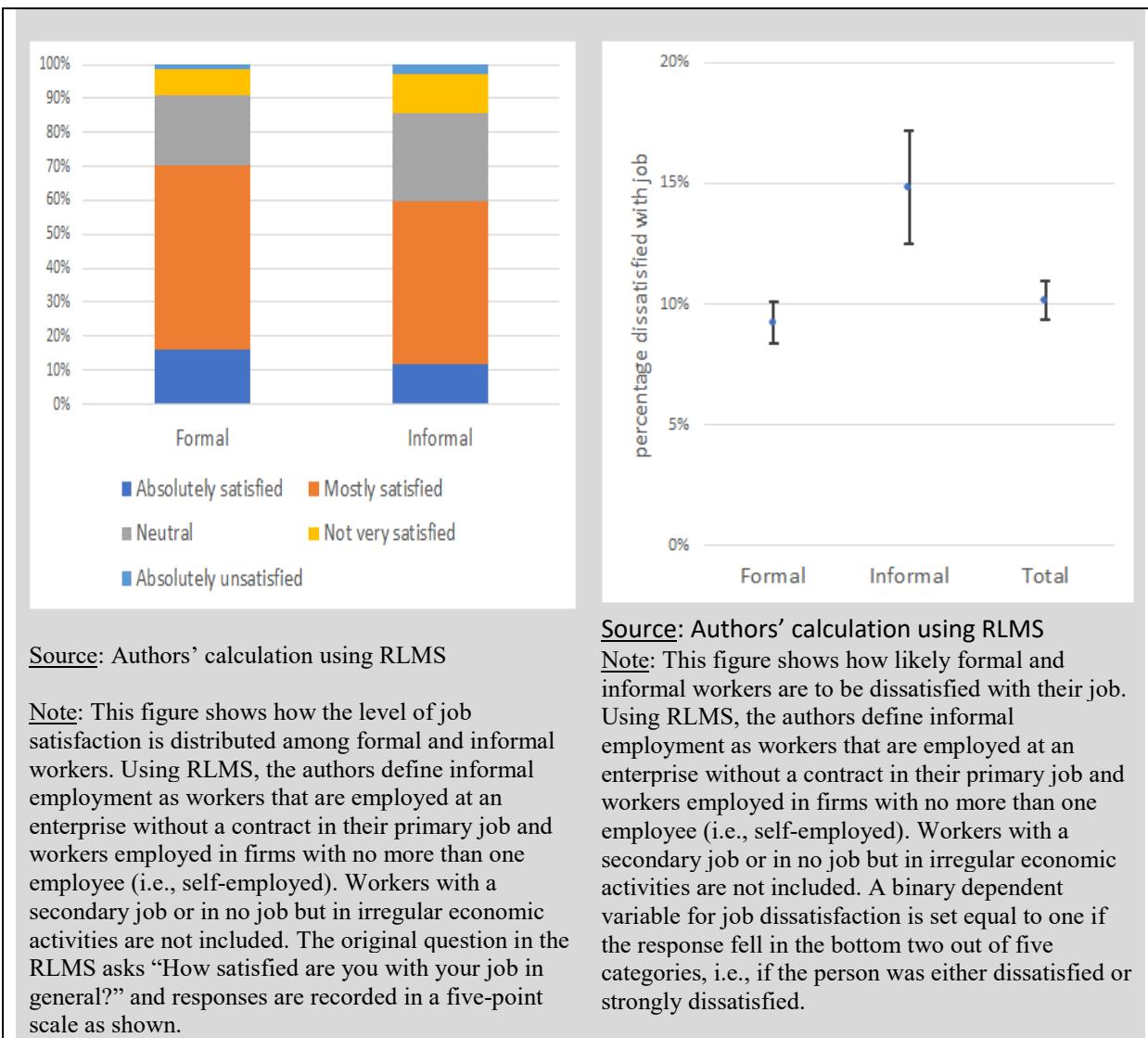


Figure 12: Distribution of health self-assessment among formal and informal workers

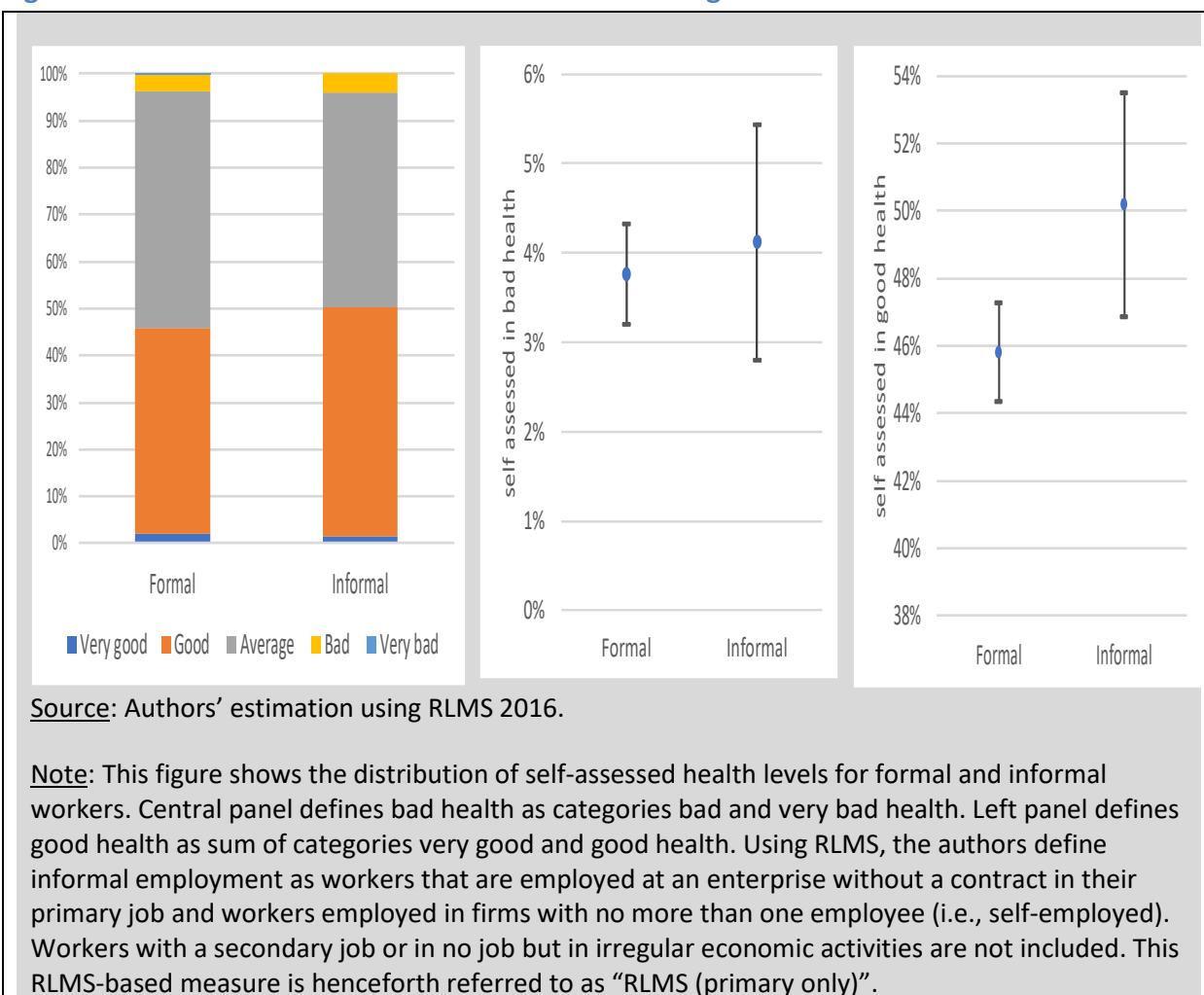
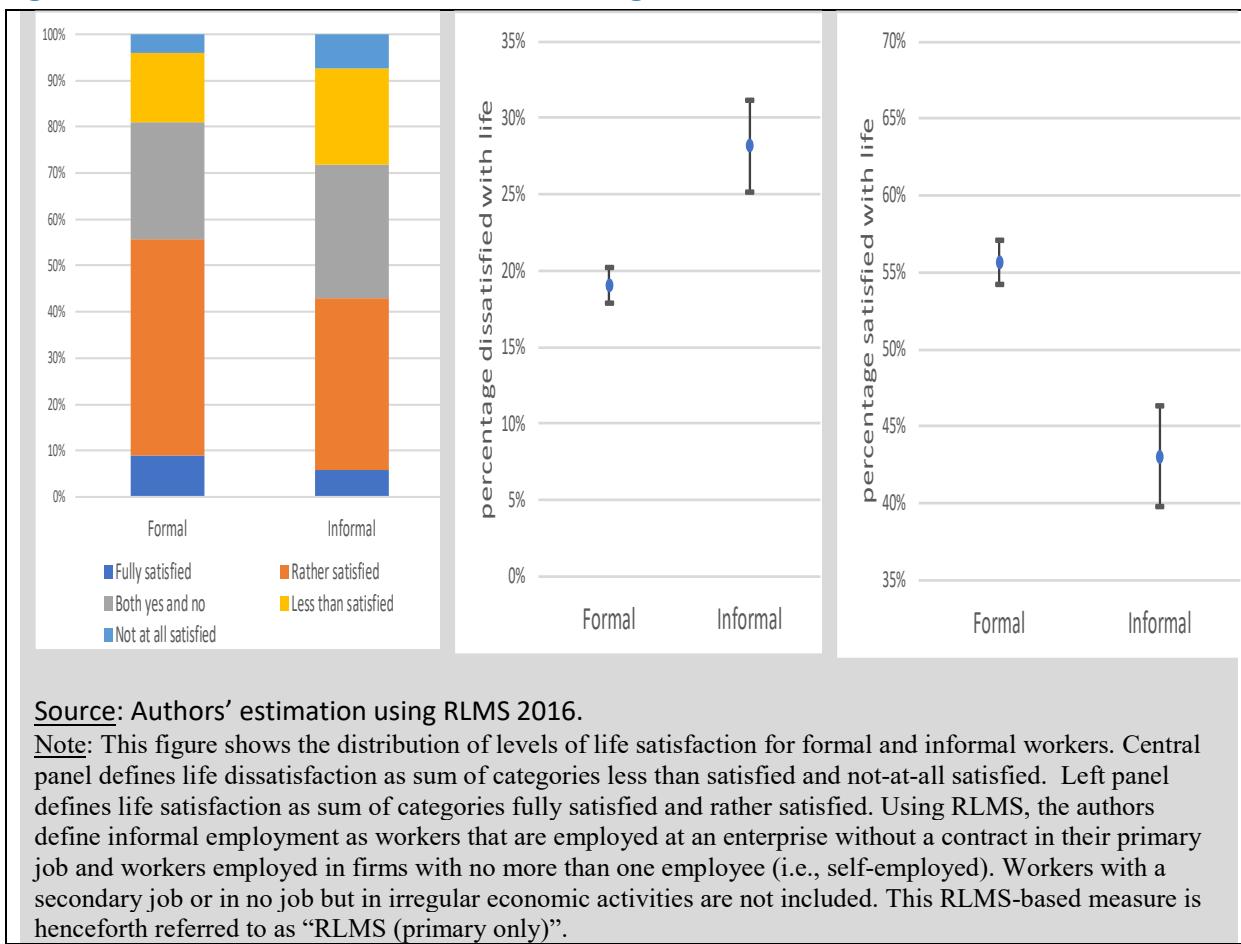


Figure 13: Distribution of life satisfaction among formal and informal workers



Tables

Table 1. Identification of informal employment in selected surveys

Survey	Definition of informal employment
RLMS	i) workers that are employed at an enterprise without a contract in their primary job; and ii) workers employed in a firm with no more than one employee (i.e., self-employment). Workers with a secondary job or in no job but in irregular economic activities are not included. This RLMS-based measure is henceforth referred to as “RLMS (primary only)”
LFS	i) workers that are employed but not at an enterprise in their primary job; ii) workers employed without a written contract in their primary job; iii) self-employed workers without registration
LiTS	Work without a written contract in main job
ESS	Work without a contract in main job

Table 2. Summary statistics for Russian workers vs Migrant workers

	Demographics			Schooling			Economic activity			
	Age	Male	Urban	Less than general secondary	Above general secondary	Higher	Agriculture	Industry	Market services	Public services
Not Russian	44.51	48.4%	59.0%	50.1%	31.5%	18.4%	3.1%	15.2%	54.5%	27.3%
Russian	44.04	44.7%	76.7%	32.5%	41.0%	26.5%	3.7%	19.9%	49.3%	27.1%
Total	44.11	45.2%	74.1%	35.1%	39.6%	25.3%	3.7%	19.3%	49.9%	27.1%

	hours of work			Informality			Wages	
	<40 hrs	40-49 hrs	>50 hrs	Corporate employment, no contract	Non-corporate employment	All informal	Hourly wage (Rubles)	Incidence of envelope wages
Not Russian	9.8%	23.1%	67.2%	6.4%	19.8%	26.2%	146.4	28.9%
Russian	8.8%	33.8%	57.4%	6.7%	9.0%	15.7%	161.8	19.0%
Total	8.9%	32.2%	58.8%	6.7%	10.3%	16.9%	160.0	20.2%

Source: Authors' estimation using RLMS 2016.

Table 3. Logit regression of informal employment and migrant workers

Dependent variable: informal employment	(1)	(2)	(3)
migrant	0.540*** (0.105)	0.444*** (0.114)	0.213 (0.207)
Male	0.427*** (0.0799)	0.205* (0.106)	0.421** (0.165)
Age 35-54	-0.0242 (0.0878)	0.0401 (0.0972)	-0.278* (0.145)
Age 55+	-0.422*** (0.122)	-0.211 (0.133)	-0.263 (0.196)
Above general secondary but less than higher	-0.426*** (0.0880)	-0.134 (0.0977)	-0.263* (0.144)
Higher	-1.378*** (0.115)	-0.642*** (0.142)	0.805*** (0.220)
married	-0.361*** (0.0861)	-0.382*** (0.0961)	0.498*** (0.140)
Urban	0.247*** (0.0951)	0.0571 (0.107)	0.257 (0.173)
Industry		-1.162*** (0.240)	0.140 (0.384)
Market services		0.549*** (0.207)	0.912** (0.359)
Public services & NGO		-1.421*** (0.244)	-0.674 (0.412)
professionals		-0.328 (0.278)	0.254 (0.541)
technicians and associate professionals		-0.138 (0.251)	0.960** (0.476)
clerical support workers		-0.475 (0.310)	1.006* (0.523)
service and sales workers		0.847*** (0.239)	1.442*** (0.464)
skilled agricultural forestry and fishery workers		2.071** (1.018)	0 (.)
craft and related trades workers		0.847*** (0.241)	1.786*** (0.448)

plant and machine operators and assemblers	0.479** (0.242)	1.601*** (0.454)
elementary occupations	0.771*** (0.261)	2.391*** (0.467)
11-100	- 1.299*** (0.163)	-
100+	- 1.978*** (0.185)	-
40-49 hrs	-1.086*** (0.127)	0.911*** (0.201)
50+ hrs	-0.135 (0.135)	0.0651 (0.209)
Constant	-0.908*** (0.164)	-0.968*** (0.345)
Observations	5299	5258
		4675

Source: Authors' estimation using RLMS 2016.

Note: Columns (1) and (2) include all observations; column (3) excludes self-employed informals.

This table shows the estimated coefficients from regressions of informal employment on nationality status (i.e., migrants are all those who self-report as non-Russians, but not necessarily as non-residents, non-citizens of the Russian federation or illegal migrants) and other individual and job-related characteristics. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 4. Logit regressions of work conditions related to work hours on informal employment and other characteristics

	Worked <20 hours		Worked >50 hours		Would like to work more hours		Have a set number of hours	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Informal	1.629*** (0.239)	1.682*** (0.290)	1.034*** (0.101)	0.813*** (0.108)	0.674** (0.284)	0.537* (0.286)	-1.470*** (0.176)	-1.379*** (0.232)
Male	-1.136*** (0.261)	-0.861*** (0.300)	0.926*** (0.0947)	0.939*** (0.107)	0.290 (0.234)	0.248 (0.256)	-0.607*** (0.168)	-0.531** (0.222)
Urban	-0.657** (0.256)	-0.718*** (0.270)	-0.191* (0.105)	-0.146 (0.114)	0.0528 (0.331)	-0.319 (0.316)		
<i>Age group</i>								
Age 35-54	0.159 (0.287)	0.116 (0.298)	-0.0121 (0.0981)	-0.0131 (0.100)	-0.585** (0.244)	-0.466* (0.264)	-0.390** (0.179)	-0.503** (0.208)
Age 55+	1.077*** (0.294)	0.899*** (0.321)	-0.468*** (0.140)	-0.475*** (0.145)	-0.527 (0.386)	-0.286 (0.407)	-0.0898 (0.258)	-0.268 (0.291)
<i>Education</i>								
Above general secondary, below higher	-0.0783 (0.289)	0.0831 (0.315)	-0.250** (0.104)	-0.164 (0.107)	-0.223 (0.279)	0.00755 (0.330)	-0.107 (0.213)	-0.0435 (0.242)
Higher	0.275 (0.311)	0.470 (0.392)	-0.728*** (0.130)	-0.430*** (0.150)	-1.177*** (0.306)	-0.907*** (0.331)	-0.134 (0.214)	0.0470 (0.286)
<i>Sector</i>								
Industry	0.893 (1.148)		-0.739*** (0.235)		-1.030 (0.658)		0.709 (0.510)	
Non-public services	1.500 (1.105)		-0.303 (0.217)		-1.110* (0.613)		-0.215 (0.416)	
Public services	1.873* (1.078)		-0.775*** (0.236)		-1.142* (0.639)		0.164 (0.508)	

<i>Occupation</i>				
Professionals	1.375*	-1.423***		0.311
	(0.759)	(0.261)		(0.451)
Technicians and associate professionals	0.651	-0.622***		0.436
	(0.805)	(0.209)		(0.460)
Clerical support workers	1.627**	-0.820***		0.706
	(0.827)	(0.295)		(0.534)
Service and sales workers	0.728	0.270		0.568
	(0.794)	(0.206)		(0.430)
Skilled agricultural forestry fishery workers	0	0.395		-0.00151
	(.)	(1.136)		(0.887)
Craft and related trades workers	1.231	-0.596***		0.329
	(0.898)	(0.219)		(0.451)
Plant and machine operators and assemblers	0.536	-0.298		-0.00929
	(0.986)	(0.219)		(0.462)
Elementary occupations	2.549***	-0.842***		0.433
	(0.795)	(0.257)		(0.556)
<i>Establishment size</i>				
Category 1		0.115		-0.389
		(0.332)		(0.458)
Category 2		0.724*		0.282
		(0.371)		(0.462)
Category 3				0.148
				(0.449)
Category 4				0.168
				(0.477)

Constant	-4.087*** (0.523)	-6.878*** (1.232)	-1.612*** (0.189)	-0.888*** (0.318)	-1.386*** (0.402)	-0.441 (0.735)	3.019*** (0.430)	2.510*** (0.802)
Observations	4905	4874	4905	4879	1430	1313	1381	1138

Source: Authors' estimation using RLMS, ESS and LiTS for year 2016.

Note: This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their work conditions, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Workers with a secondary job or in no job but in irregular economic activities are not included. Dependent variables in columns (1)-(4) are from the RLMS, (5) and (6) from the LiTS and (7) and (8) from the ESS. All dependent variables are defined as binary. The LiTS does not include information on occupation and the ESS does not include a location variable for urban or rural. All specifications include region dummies. Establishment size of place of work is reported in three categories in the RLMS and the LiTS (under 10, 11-100 and 100+) and in five categories in the ESS (under 10, 10-24, 25-99, 100-499 and 500+). The smallest firm size category is excluded in all specifications. Other omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 5. Logit regressions of work conditions on informal employment and other characteristics

Dependent variable	Work is harmful or dangerous					
	Paid vacation last year	(1)	(2)	(3)	(4)	(5)
Informal	-2.740***	-2.430***	-1.355***	-0.418	-0.196**	-0.270**
	(0.163)	(0.174)	(0.292)	(0.317)	(0.0819)	(0.129)
Male	-0.157**	-0.190**	0.0546	-0.0394	0.0210	-0.117
	(0.0714)	(0.0845)	(0.0911)	(0.113)	(0.0608)	(0.0746)
Urban	0.168*	0.184*	-0.296***	-0.220*	-0.0744	-0.225***
	(0.0861)	(0.0955)	(0.106)	(0.117)	(0.0760)	(0.0853)
<i>Age group</i>						
Age 35-54	0.690***	0.687***	0.240**	0.103	0.309***	0.386***
	(0.0780)	(0.0822)	(0.104)	(0.111)	(0.0670)	(0.0727)
Age 55+	1.071***	1.043***	0.00284	-0.222	0.0540	0.123
	(0.107)	(0.113)	(0.138)	(0.151)	(0.0857)	(0.0919)
<i>Education</i>						
Above general secondary but below higher	0.291***	0.142	0.365***	0.236	0.0287	0.117
	(0.0909)	(0.0953)	(0.131)	(0.144)	(0.0798)	(0.0891)
Higher	0.621***	0.318***	0.376***	0.216	-0.258***	0.00387
	(0.0989)	(0.118)	(0.138)	(0.174)	(0.0852)	(0.105)
<i>Sector</i>						
Industry		0.911***		2.228***		0.0502
		(0.195)		(0.537)		(0.201)
Non-public services		0.341*		0.985*		-0.0120
		(0.185)		(0.547)		(0.195)
Public services		0.852***		2.944***		-0.396**
		(0.191)		(0.539)		(0.197)
<i>Occupation</i>						
Professionals		0.476***		0.344		0.149

	(1)	(2)	(3)	(4)	(5)
Technicians and associate professionals	(0.172) 0.387** (0.167)	(0.221) 0.150 (0.227)	(0.146) 0.240 (0.147)		
Clerical support workers	0.0361 (0.205)	-1.366*** (0.475)	0.423** (0.186)		
Service and sales workers	-0.267 (0.174)	-0.0594 (0.254)	0.148 (0.156)		
Skilled agricultural forestry and fishery workers	-0.388 (0.923)	0 (.)	0.331 (1.240)		
Craft and related trades workers	0.232 (0.186)	0.933*** (0.257)	0.501*** (0.168)		
Plant and machine operators and assemblers	0.271 (0.188)	1.073*** (0.256)	0.354** (0.169)		
Elementary occupations	-0.268 (0.203)	-0.800** (0.375)	0.446** (0.186)		
<i>Establishment size</i>					
11-100	0.446*** (0.113)	0.789*** (0.239)	0.0839 (0.103)		
100+	0.442*** (0.112)	1.178*** (0.239)	0.0825 (0.103)		
Constant	-0.0701 (0.156)	-0.944*** (0.280)	-2.188*** (0.215)	-5.362*** (0.645)	0.927*** (0.139)
Observations	4768	4678	4735	4645	5286
					4671

Source: Authors' estimation using RLMS 2016.

Note: This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their work conditions, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Data source for dependent variable in columns (1)-(6) is RLMS. All dependent variables are defined as binary. All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 6. Logit regressions of subjective work conditions and envelope wages on informal employment and other characteristics

Dependent variable:	Dissatisfied with work contract		Dissatisfied with pay		Dissatisfied with growth opp		Whether paid envelope wages	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Informal in primary job	0.160 (0.159)	0.322 (0.213)	-0.268** (0.118)	-0.104 (0.176)	0.0457 (0.126)	0.227 (0.180)	3.106*** (0.120)	4.405*** (0.262)
Male	0.256** (0.116)	0.212* (0.128)	0.182** (0.0774)	0.198** (0.0836)	0.238*** (0.0873)	0.266*** (0.0943)	0.0426 (0.114)	0.0628 (0.132)
Age								
Age 35-54	0.345*** (0.112)	0.417*** (0.124)	0.240*** (0.0737)	0.267*** (0.0791)	0.215*** (0.0827)	0.259*** (0.0890)	0.0253 (0.0259)	-0.0873 (0.121)
Age 55+	-0.166 (0.153)	-0.209 (0.170)	-0.0844 (0.0978)	-0.0796 (0.104)	-0.0953 (0.112)	-0.0842 (0.121)	-0.000547* (0.000308)	-0.721*** (0.193)
Schooling:								
Secondary but less than higher	-0.00448 (0.118)	-0.0526 (0.129)	0.00180 (0.0864)	-0.0445 (0.0933)	-0.0770 (0.0953)	-0.153 (0.102)	-0.0607 (0.120)	0.153 (0.150)
Higher	0.0550 (0.166)	0.0336 (0.180)	-0.0609 (0.110)	-0.0956 (0.117)	0.0242 (0.123)	-0.0259 (0.130)	-0.115 (0.155)	0.0431 (0.180)
Urban	-0.121 (0.124)	-0.216 (0.133)	0.0427 (0.0847)	0.0139 (0.0904)	0.265*** (0.0984)	0.253** (0.105)	0.812*** (0.136)	0.960*** (0.187)
Economic Activity								
Industry	0.0621 (0.265)	0.244 (0.311)	-0.0109 (0.191)	0.131 (0.202)	-0.0235 (0.200)	0.0767 (0.217)	0.488* (0.274)	1.268*** (0.437)
Market services	0.170 (0.250)	0.542* (0.294)	-0.110 (0.183)	0.0735 (0.195)	-0.0448 (0.191)	0.0989 (0.209)	1.134*** (0.254)	1.921*** (0.424)
Public services & NGO	-0.0169 (0.262)	0.200 (0.304)	0.0158 (0.187)	0.117 (0.199)	-0.0242 (0.199)	0.103 (0.216)	-0.344 (0.285)	0.0507 (0.457)
Occupation								
professionals	0.112 (0.340)	-0.0263 (0.345)	0.251 (0.170)	0.146 (0.175)	0.117 (0.209)	-0.000798 (0.214)	0.00169 (0.313)	-0.260 (0.294)

technicians and associate professionals	0.493 (0.325)	0.262 (0.333)	0.256 (0.170)	0.109 (0.176)	0.405** (0.205)	0.246 (0.211)	0.305 (0.298)	-0.00616 (0.277)
clerical support workers	0.742** (0.365)	0.675* (0.374)	0.359* (0.202)	0.320 (0.210)	0.932*** (0.235)	0.840*** (0.242)	0.165 (0.357)	-0.00474 (0.348)
service and sales workers	0.814** (0.329)	0.673* (0.344)	0.366** (0.178)	0.202 (0.189)	0.693*** (0.211)	0.592*** (0.221)	0.539* (0.304)	0.400 (0.284)
skilled agricultural forestry and fishery workers	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
craft and related trades workers	1.102*** (0.329)	1.008*** (0.342)	0.425** (0.184)	0.345* (0.196)	0.523** (0.218)	0.444* (0.230)	0.636** (0.314)	0.328 (0.303)
plant and machine operators and assemblers	1.041*** (0.329)	0.904*** (0.342)	0.512*** (0.184)	0.471** (0.195)	0.684*** (0.217)	0.660*** (0.227)	0.279 (0.318)	0.0387 (0.308)
elementary occupations	1.641*** (0.336)	1.538*** (0.352)	0.619*** (0.202)	0.523** (0.216)	1.297*** (0.231)	1.070*** (0.245)	0.609* (0.328)	0.0196 (0.360)
Firm size	11-100		0.538*** (0.185)	0.259** (0.114)		0.210 (0.130)		0.152 (0.173)
	100+		0.423** (0.188)	0.185 (0.116)		0.209 (0.131)		-0.393** (0.177)
Hours of work	40-49 hrs	0.112 (0.144)	0.0913 (0.156)	0.00608 (0.0930)	-0.0611 (0.100)	0.0237 (0.106)	-0.0502 (0.114)	0.0461 (0.147)
	50+ hrs	0.0965 (0.172)	0.115 (0.191)	-0.0830 (0.116)	-0.158 (0.127)	0.0321 (0.128)	-0.0400 (0.141)	0.586*** (0.167)
Net wages	-	0.444*** (0.0741)	-0.434*** (0.0810)	0.812*** (0.0834)	-0.870*** (0.0923)	0.387*** (0.0690)	-0.419*** (0.0787)	
Paid vacation last yr			-0.0329 (0.132)		-0.0871 (0.0892)		-0.103 (0.0979)	

Work is harmful or dangerous		0.490*** (0.156)	0.190* (0.106)	-0.0636 (0.125)				
Concern about job loss	-0.174* (0.103)	-0.232** (0.110)	0.130* (0.0694)	0.160** (0.0734)	0.102 (0.0788)	0.129 (0.0836)		
Any part of wages transferred off the record?	0.162 (0.149)	0.201 (0.168)	0.152 (0.106)	0.231* (0.124)	0.352*** (0.114)	0.371*** (0.132)		
Constant	1.464* (0.813)	0.850 (0.884)	7.529*** (0.848)	7.941*** (0.934)	1.937*** (0.727)	2.202*** (0.820)	-3.893*** (0.672) -4.567*** (0.592)	
Observations	4624	4104	4616	4098	4425	3930	4902	4389

Source: Authors' estimation using RLMS 2016.

Note: Odd number columns include all observations, even number columns exclude type-2 informals (i.e., who workers employed but not at an enterprise in their primary job). This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their subjective work characteristics and the incidence of envelope wages, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). All dependent variables are defined as binary. All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 7. Incidence of envelope wages

Incidence of envelope wages by informal group:	Envelope wages?				Share of employed
	None	Part	All	Part or all	
Informal type-1: salaried at firm, no contract	8.5%	11.4%	80.0%	91.5%	6.7%
Informal type-2: self-employed	34.0%	9.6%	56.4%	66.0%	10.3%
Informal: primary	23.9%	10.3%	65.8%	76.1%	17.0%
Formal workers	90.4%	9.0%	0.6%	9.6%	83.0%
Total	79.8%	9.2%	11.0%	20.2%	100.0%

Source: Authors' estimates using RLMS 2016.

Note: In the RLMS, informal employment includes workers that are employed at an enterprise without a contract in their primary job and workers employed but not at an enterprise in their primary job. Workers with a secondary job or in no job but in irregular economic activities are not included.

Table 8. Results from informal-formal wage gap regressions

	Data: 2004-2016				Data: 2016 only		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Informal in primary job	-0.0483*** (0.00713)		-0.00194 (0.00973)		-0.177*** (0.0279)		
Salaried informals		-0.0747*** (0.00997)		-0.0255** (0.0128)		-0.152*** (0.0356)	-0.183*** (0.0370)
Self-employed informals		-0.0296*** (0.00905)		0.0180 (0.0122)		-0.191*** (0.0342)	
Male	0.269*** (0.00523)	0.270*** (0.00523)	0 (.)	0 (.)	0.219*** (0.0178)	0.219*** (0.0178)	0.248*** (0.0181)
Age 35-54	0.0242*** (0.00498)	0.0236*** (0.00498)	0.0134 (0.0116)	0.0135 (0.0116)	0.0418** (0.0174)	0.0424** (0.0175)	0.0353** (0.0176)
Age 55+	-0.165*** (0.00668)	-0.165*** (0.00668)	-0.0860*** (0.0166)	-0.0852*** (0.0166)	-0.100*** (0.0218)	-0.100*** (0.0218)	-0.102*** (0.0222)
Above general secondary but less than higher	0.0528*** (0.00549)	0.0526*** (0.00549)	0.0339*** (0.0103)	0.0334*** (0.0103)	0.0743*** (0.0196)	0.0749*** (0.0196)	0.0556*** (0.0201)
Higher	0.270*** (0.00717)	0.270*** (0.00717)	0.128*** (0.0185)	0.127*** (0.0185)	0.275*** (0.0246)	0.275*** (0.0246)	0.250*** (0.0249)
married	0.0439*** (0.00482)	0.0437*** (0.00482)	0.0157 (0.0104)	0.0156 (0.0104)	0.0501*** (0.0165)	0.0500*** (0.0165)	0.0222 (0.0167)
Urban	0.201*** (0.00575)	0.202*** (0.00575)	-0.137 (0.0950)	-0.137 (0.0944)	0.210*** (0.0190)	0.210*** (0.0190)	0.219*** (0.0191)
Industry	0.335*** (0.0131)	0.336*** (0.0131)	0.127*** (0.0254)	0.127*** (0.0254)	0.248*** (0.0430)	0.247*** (0.0430)	0.211*** (0.0421)
Market services	0.323*** (0.0126)	0.323*** (0.0126)	0.118*** (0.0249)	0.117*** (0.0248)	0.191*** (0.0415)	0.191*** (0.0416)	0.184*** (0.0408)
Public services & NGO	0.113*** (0.0126)	0.113*** (0.0126)	0.0226	0.0229	0.0109	0.00984	-0.0241

	(0.0129)	(0.0129)	(0.0257)	(0.0257)	(0.0427)	(0.0427)	(0.0421)
professionals	-0.122*** (0.0109)	-0.121*** (0.0109)	-0.0369** (0.0162)	-0.0366** (0.0162)	-0.159*** (0.0366)	-0.159*** (0.0366)	-0.187*** (0.0361)
technicians and associate professionals	-0.214*** (0.0108)	-0.213*** (0.0109)	-0.0863*** (0.0155)	-0.0860*** (0.0155)	-0.235*** (0.0356)	-0.236*** (0.0357)	-0.264*** (0.0353)
clerical support workers	-0.390*** (0.0133)	-0.387*** (0.0133)	-0.145*** (0.0191)	-0.144*** (0.0191)	-0.444*** (0.0439)	-0.445*** (0.0439)	-0.462*** (0.0435)
service and sales workers	-0.497*** (0.0112)	-0.496*** (0.0112)	-0.209*** (0.0172)	-0.210*** (0.0172)	-0.490*** (0.0382)	-0.490*** (0.0382)	-0.521*** (0.0381)
skilled agricultural forestry and fishery workers	-0.357*** (0.0490)	-0.359*** (0.0489)	-0.0341 (0.0633)	-0.0348 (0.0635)	-0.654* (0.380)	-0.651* (0.384)	-1.079*** (0.166)
craft and related trades workers	-0.262*** (0.0116)	-0.260*** (0.0116)	-0.0598*** (0.0192)	-0.0595*** (0.0192)	-0.288*** (0.0387)	-0.289*** (0.0387)	-0.342*** (0.0390)
plant and machine operators and assemblers	-0.288*** (0.0117)	-0.286*** (0.0117)	-0.0785*** (0.0195)	-0.0775*** (0.0195)	-0.267*** (0.0400)	-0.267*** (0.0400)	-0.307*** (0.0398)
elementary occupations	-0.550*** (0.0128)	-0.546*** (0.0128)	-0.168*** (0.0209)	-0.167*** (0.0209)	-0.583*** (0.0415)	-0.586*** (0.0416)	-0.610*** (0.0413)
40-49 hrs	-0.172*** (0.00634)	-0.172*** (0.00635)	-0.228*** (0.00772)	-0.228*** (0.00772)	-0.137*** (0.0222)	-0.138*** (0.0222)	-0.151*** (0.0229)
50+ hrs	-0.339*** (0.00828)	-0.339*** (0.00828)	-0.466*** (0.0100)	-0.466*** (0.0100)	-0.274*** (0.0294)	-0.275*** (0.0294)	-0.286*** (0.0301)
Concern about job loss	-0.00453 (0.00444)	-0.00474 (0.00444)	0.0194*** (0.00478)	0.0194*** (0.00478)	-0.0405*** (0.0155)	-0.0402*** (0.0156)	-0.0198 (0.0155)
Any part of wages transferred off the record?					0.0561** (0.0239)	0.0525** (0.0241)	0.161*** (0.0246)
Paid vacation last year						0.108*** (0.0204)	

Work is harmful or dangerous							0.121*** (0.0233)
Constant	4.219*** (0.0222)	4.217*** (0.0222)	5.173*** (0.0828)	5.172*** (0.0824)	4.840*** (0.0643)	4.840*** (0.0644)	4.769*** (0.0649)
Observations	60318	60318	60318	60318	4318	4318	3881
Year FE	Y	Y	Y	Y	-	-	-
Region FE	Y	Y	Y	Y	Y	Y	Y
Individual FE	N	N	Y	Y	N	N	N

Source: Authors' estimation using RLMS 2004-2016.

Note: Columns (1) to (6) include all observations, column (7) exclude self-employed informals.

This table shows the estimated coefficients from OLS regressions of hourly wages on informal employment and other individual and job-related characteristics. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Sample used in these wage regressions exclude outliers (1% from both tails). All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 9. Logit regression of job satisfaction on informal employment and other characteristics

Dependent variable:	Dissatisfied with job			Satisfied with job		
	(1)	(2)	(3)	(4)	(5)	(6)
Informal in primary job	0.285** (0.127)	0.0928 (0.167)	0.151 (0.219)	-0.226** (0.0883)	0.00456 (0.116)	-0.302* (0.170)
Male	0.165 (0.114)	0.385*** (0.122)	0.349*** (0.135)	0.0295 (0.0740)	-0.156* (0.0810)	-0.138 (0.0877)
Age 35-54	0.403*** (0.111)	0.485*** (0.122)	0.568*** (0.132)	-0.144** (0.0710)	-0.207*** (0.0768)	-0.236*** (0.0830)
Age 55+	0.0904 (0.148)	0.0735 (0.161)	0.00579 (0.179)	0.236** (0.0965)	0.282*** (0.105)	0.292** (0.113)
Secondary but less than higher	0.0568 (0.119)	0.102 (0.128)	0.0891 (0.141)	0.0485 (0.0815)	-0.0128 (0.0878)	0.0383 (0.0949)
Higher	0.0177 (0.161)	0.190 (0.176)	0.192 (0.192)	0.0389 (0.105)	-0.116 (0.115)	-0.0845 (0.123)
Urban	-0.0187 (0.123)	0.0584 (0.135)	-0.0544 (0.147)	0.135* (0.0815)	0.106 (0.0882)	0.168* (0.0944)
Industry	-0.358 (0.258)	-0.222 (0.282)	0.105 (0.338)	0.276 (0.177)	0.194 (0.192)	0.162 (0.209)
Market services	-0.215 (0.242)	-0.100 (0.266)	0.330 (0.319)	0.212 (0.169)	0.131 (0.182)	0.00189 (0.200)
Public services & NGO	-0.331 (0.255)	-0.308 (0.276)	-0.0292 (0.329)	0.216 (0.175)	0.213 (0.188)	0.176 (0.205)
professionals	0.0103 (0.305)	-0.0875 (0.336)	-0.223 (0.344)	-0.402** (0.189)	-0.237 (0.205)	-0.0996 (0.210)
technicians and associate professionals	0.402 (0.290)	0.246 (0.319)	0.0821 (0.326)	-0.711*** (0.186)	-0.509** (0.202)	-0.322 (0.209)
clerical support workers	0.794**	0.470	0.426	-1.008***	-0.731***	-0.617**

	(0.331)	(0.365)	(0.371)	(0.217)	(0.237)	(0.245)
servece and sales workers	0.846*** (0.294)	0.649** (0.325)	0.527 (0.340)	-1.304*** (0.190)	-1.027*** (0.208)	-0.911*** (0.219)
skilled agricultural forestry and fishery workers	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
craft and related trades workers	0.953*** (0.295)	0.726** (0.322)	0.594* (0.334)	-1.354*** (0.197)	-1.130*** (0.212)	-0.954*** (0.224)
plant and machine operators and assemblers	0.646** (0.304)	0.527 (0.327)	0.375 (0.340)	-1.118*** (0.198)	-0.918*** (0.212)	-0.810*** (0.222)
elementary occupations	1.721*** (0.301)	1.441*** (0.328)	1.404*** (0.341)	-1.960*** (0.209)	-1.583*** (0.228)	-1.333*** (0.241)
11-100			0.483*** (0.187)			-0.364*** (0.122)
100+			0.285 (0.191)			-0.424*** (0.122)
40-49 hrs	-0.242* (0.135)	-0.0716 (0.148)	-0.0348 (0.163)	0.00351 (0.0924)	-0.102 (0.100)	-0.0395 (0.108)
50+ hrs	-0.261 (0.161)	-0.143 (0.183)	-0.0873 (0.204)	-0.0310 (0.107)	-0.170 (0.120)	-0.0504 (0.132)
Net wages		-0.524*** (0.0810)	-0.518*** (0.0895)		0.470*** (0.0701)	0.505*** (0.0799)
Paid vacation last yr			-0.197 (0.139)			-0.0131 (0.0915)
Work is harmful or dangerous			0.465*** (0.170)			-0.175 (0.112)
Concern about job loss		-0.0657 (0.111)	-0.119 (0.119)		0.0387 (0.0733)	0.0115 (0.0782)
Any part of wages transferred off the record?	0.241	0.276		-0.300***	-0.337***	

	(0.158)	(0.176)		(0.107)	(0.125)
Constant	-2.741*** (0.410)	2.141** (0.862)	1.631* (0.949)	1.525*** (0.279)	-2.986*** (0.735)
Observations	5207	4632	4111	5207	4632
Work conditions	N	Y	Y	N	Y
Wages	N	Y	Y	N	Y
Region FE	Y	Y	Y	Y	Y

Source: Authors' estimation using RLMS 2016

Note: Columns (3) and (6) exclude self-employed informals.

This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their level of job dissatisfaction, controlling for other factors. The dependent variable is measured as a binary variable equal to one if the worker is either dissatisfied or strongly dissatisfied with her job ("Dissatisfied with job"), or either satisfied or strongly satisfied with her job ("Satisfied with job"). Omitted categories are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10), hours worked (<40 hours). Armed forces are dropped from the sample. Region dummies are included in all specifications. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed).

Table 10. Logit results of self-assessed health on informal employment and other characteristics

Dependent variable:	Poor health			Good health		
	(1)	(2)	(3)	(4)	(5)	(6)
Informal in primary job	0.106 (0.201)	-0.0492 (0.329)	-0.588 (0.459)	0.0141 (0.0894)	0.174 (0.117)	0.0742 (0.177)
Male	-0.287* (0.173)	-0.114 (0.189)	-0.0656 (0.207)	0.420*** (0.0714)	0.349*** (0.0776)	0.285*** (0.0830)
Age 35-54	0.922*** (0.223)	1.034*** (0.248)	1.013*** (0.271)	-1.034*** (0.0670)	-1.057*** (0.0719)	-1.004*** (0.0769)
Age 55+	1.898*** (0.231)	1.982*** (0.249)	1.962*** (0.272)	-2.041*** (0.101)	-2.035*** (0.107)	-1.937*** (0.113)
Secondary but less than higher	0.126 (0.194)	0.131 (0.204)	0.395* (0.237)	0.0175 (0.0815)	-0.0271 (0.0872)	0.0321 (0.0949)
Higher	-0.223 (0.266)	-0.179 (0.289)	0.0762 (0.320)	-0.0676 (0.101)	-0.129 (0.109)	-0.111 (0.117)
Urban	0.210 (0.201)	0.487** (0.214)	0.600** (0.253)	0.159** (0.0790)	0.101 (0.0843)	0.0869 (0.0910)
Industry	-0.965** (0.386)	-1.061*** (0.397)	-0.979** (0.446)	-0.0124 (0.177)	0.0663 (0.192)	-0.118 (0.201)
Market services	-0.715** (0.355)	-0.648* (0.361)	-0.666 (0.420)	-0.0272 (0.169)	0.0946 (0.184)	-0.0654 (0.193)
Public services & NGO professionals	- 1.007*** (0.367)	-1.099*** (0.372)	-1.102** (0.431)	-0.198 (0.175)	-0.0122 (0.189)	-0.200 (0.198)
technicians and associate professionals	0.0849 (0.376)	0.212 (0.421)	0.177 (0.440)	0.115 (0.149)	0.162 (0.162)	0.211 (0.168)
	0.126 (0.373)	0.0841 (0.420)	-0.0394 (0.451)	0.00554 (0.147)	0.148 (0.161)	0.205 (0.168)

clerical support workers	-0.184 (0.474)	-0.602 (0.549)	-0.597 (0.581)	-0.166 (0.186)	-0.0207 (0.202)	0.0773 (0.209)
service and sales workers	0.345 (0.373)	0.296 (0.421)	0.242 (0.458)	-0.209 (0.153)	-0.0844 (0.170)	0.0388 (0.181)
skilled agricultural forestry and fishery workers	0 (.)	0 (.)	0 (.)	-0.211 (1.054)	-0.803 (1.332)	-0.290 (1.510)
craft and related trades workers	-0.248 (0.412)	-0.301 (0.462)	-0.373 (0.499)	-0.151 (0.162)	0.000355 (0.178)	-0.0216 (0.191)
plant and machine operators and assemblers	-0.00546 (0.412)	-0.0877 (0.459)	-0.173 (0.493)	-0.120 (0.162)	0.00873 (0.176)	0.0425 (0.188)
elementary occupations	0.189 (0.416)	-0.108 (0.466)	-0.0604 (0.504)	-0.561*** (0.184)	-0.311 (0.202)	-0.268 (0.216)
11-100			0.471 (0.309)			0.0959 (0.114)
100+			0.381 (0.303)			0.234** (0.115)
40-49 hrs	-0.152 (0.187)	0.0203 (0.197)	-0.137 (0.216)	0.0122 (0.0888)	-0.0317 (0.0934)	-0.0299 (0.102)
50+ hrs	-0.180 (0.243)	-0.0219 (0.265)	-0.202 (0.303)	0.102 (0.104)	-0.0104 (0.114)	-0.00667 (0.126)
Net wages		-0.559*** (0.0975)	-0.641*** (0.101)		0.200*** (0.0560)	0.256*** (0.0636)
Paid vacation last yr			-0.0372 (0.199)			-0.118 (0.0874)
Work is harmful or dangerous			0.00566 (0.281)			-0.00835 (0.106)
Concern about job loss	0.203 (0.169)	0.165 (0.181)		-0.124* (0.0694)	-0.149** (0.0734)	

Any part of wages transferred off the record?	-0.00914 (0.308)	0.458* (0.274)		-0.219** (0.105)	-0.319*** (0.123)	
Constant	3.537*** (0.582)	1.383 (1.067)	1.744 (1.093)	0.691*** (0.251)	-1.298** (0.604)	-1.817*** (0.674)
Observations	5242	4662	4134	5247	4666	4137
Work conditions	N	Y	Y	N	Y	Y
Wages	N	Y	Y	N	Y	Y
Region FE	Y	Y	Y	Y	Y	Y

Source: Authors' estimation.

Note: Columns (3) and (6) exclude self-employed informals.

This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their self-assessed health, measured as good or poor health, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed).. Poor health is defined as bad or very bad health (out of a 5-point scale). Good health is defined as good or very good health. All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 11. Logit regression of life satisfaction on informal employment and other characteristics

Dependent variable:	Dissatisfied with life			Satisfied with life		
	(1)	(2)	(3)	(4)	(5)	(6)
Informal in primary job	0.390*** (0.0963)	0.332** (0.131)	0.324* (0.188)	-0.388*** (0.0850)	-0.262** (0.112)	-0.218 (0.170)
Male	-0.270*** (0.0828)	-0.193** (0.0923)	-0.305*** (0.100)	0.196*** (0.0675)	0.118 (0.0747)	0.113 (0.0801)
Age 35-54	0.335*** (0.0817)	0.342*** (0.0898)	0.368*** (0.0984)	-0.357*** (0.0651)	-0.337*** (0.0705)	-0.348*** (0.0760)
Age 55+	0.291*** (0.105)	0.220* (0.114)	0.304** (0.124)	-0.197** (0.0860)	-0.103 (0.0931)	-0.147 (0.0990)
Secondary but less than higher	0.0137 (0.0912)	-0.0113 (0.0986)	-0.0651 (0.107)	0.0668 (0.0766)	0.0258 (0.0824)	-0.00358 (0.0895)
Higher	-0.240** (0.120)	-0.190 (0.131)	-0.274* (0.140)	0.179* (0.0948)	0.0296 (0.104)	-0.0190 (0.111)
Urban	0.0527 (0.0931)	0.197* (0.102)	0.229** (0.111)	0.0769 (0.0751)	-0.0148 (0.0815)	-0.0868 (0.0878)
Industry	-0.336* (0.200)	-0.297 (0.210)	-0.205 (0.233)	0.136 (0.170)	0.0656 (0.180)	0.0387 (0.190)
Market services	-0.195 (0.188)	-0.172 (0.197)	-0.114 (0.220)	0.0675 (0.163)	0.0582 (0.172)	0.0837 (0.183)
Public services & NGO	-0.389** (0.197)	-0.346* (0.205)	-0.243 (0.229)	0.0930 (0.167)	0.0437 (0.176)	0.0388 (0.187)
professionals	0.367* (0.191)	0.241 (0.210)	0.129 (0.214)	-0.373** (0.146)	-0.168 (0.159)	-0.105 (0.164)
technicians and associate professionals	0.186 (0.191)	0.0167 (0.211)	-0.158 (0.217)	-0.369** (0.144)	-0.106 (0.159)	-0.0584 (0.165)
clerical support workers	0.0321	-0.324	-0.426	-0.420**	-0.0694	-0.0436

	(0.238)	(0.266)	(0.274)	(0.178)	(0.195)	(0.204)
servece and sales workers	0.553*** (0.193)	0.324 (0.216)	0.146 (0.227)	-0.626*** (0.150)	-0.295* (0.167)	-0.194 (0.176)
skilled agricultural forestry and fishery workers	0.0891 (1.296)	0.360 (1.294)	0.651 (1.536)	-1.056 (0.986)	-1.865 (1.191)	-1.053 (1.117)
craft and related trades workers	0.387* (0.202)	0.180 (0.223)	0.108 (0.234)	-0.633*** (0.158)	-0.361** (0.173)	-0.325* (0.184)
plant and machine operators and assemblers	0.493** (0.203)	0.369* (0.222)	0.360 (0.232)	-0.558*** (0.158)	-0.346** (0.172)	-0.393** (0.182)
elementary occupations	1.066*** (0.210)	0.718*** (0.234)	0.485** (0.246)	-1.107*** (0.175)	-0.678*** (0.195)	-0.610*** (0.206)
11-100			0.0484 (0.133)			-0.119 (0.108)
100+			0.122 (0.135)			-0.0633 (0.109)
40-49 hrs	-0.0599 (0.100)	0.0119 (0.108)	-0.101 (0.117)	-0.0645 (0.0842)	-0.140 (0.0909)	-0.0835 (0.0978)
50+ hrs	-0.124 (0.119)	-0.0333 (0.132)	-0.159 (0.145)	-0.0503 (0.0986)	-0.145 (0.110)	-0.0517 (0.120)
Net wages		-0.382*** (0.0622)	-0.343*** (0.0681)		0.381*** (0.0634)	0.400*** (0.0699)
Paid vacation last yr			-0.243** (0.104)			0.107 (0.0850)
Work is harmful or dangerous			-0.106 (0.136)			0.130 (0.105)
Concern about job loss	0.677*** (0.0882)	0.698*** (0.0952)		-0.465*** (0.0666)	-0.452*** (0.0708)	
Any part of wages transferred off the record?	0.173	0.173		-0.294***	-0.326***	

	(0.125)	(0.148)		(0.100)	(0.118)
Constant	-1.563*** (0.301)	1.721** (0.668)	1.526** (0.731)	0.617** (0.243)	-2.880*** (0.661)
Observations	5255	4672	4143	5255	4672
Work conditions	N	Y	Y	N	Y
Wages	N	Y	Y	N	Y
Region FE	Y	Y	Y	Y	Y

Source: Authors' estimation

Note: Columns (3) and (6) exclude self-employed informals.

This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their likelihood of being satisfied or dissatisfied with their life, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively.

Table 12. Informal employment and the probability of household income of being in the bottom quintile

Dependent variable: family members at bottom quintile of income distribution			
	(1)	(2)	(3)
Informal in primary job	0.346*** (0.0956)	0.284*** (0.105)	0.0663 (0.167)
Male	-0.183** (0.0786)	-0.0895 (0.0927)	-0.205** (0.101)
Age 35-54	-0.0565 (0.0833)	-0.0935 (0.0845)	-0.0243 (0.0927)
Age 55+	-1.161*** (0.145)	-1.304*** (0.150)	-1.329*** (0.165)
Above general secondary but less than higher	-0.364*** (0.0900)	-0.334*** (0.0940)	-0.281*** (0.106)
Higher	-1.105*** (0.111)	-0.943*** (0.129)	-0.837*** (0.140)
Urban	-1.168*** (0.0830)	-1.045*** (0.0876)	-1.175*** (0.0966)
Industry		-0.763*** (0.199)	-0.821*** (0.209)
Market services		-0.664*** (0.187)	-0.827*** (0.199)
Public services & NGO professionals		-0.453** (0.194)	-0.576*** (0.202)
technicians and associate professionals		0.184 (0.245)	0.177 (0.256)
clerical support workers		0.298 (0.239)	0.335 (0.251)
service and sales workers		0.659** (0.273)	0.679** (0.286)
skilled agricultural forestry and fishery workers		0.573** (0.240)	0.605** (0.256)
craft and related trades workers	1.446 (1.184)	0 (.)	0.747*** (0.267)
plant and machine operators and assemblers	0.461* (0.249)	0.386 (0.270)	0.623** (0.248)
elementary occupations	0.672** (0.262)	0.721** (0.282)	0.461* (0.249)

11-100		-0.00942	
		(0.133)	
100+		-0.109	
		(0.138)	
40-49 hrs	-0.482***	-0.359***	
	(0.108)	(0.122)	
50+ hrs	-0.482***	-0.231	
	(0.127)	(0.143)	
Constant	-0.0858	0.223	0.303
	(0.160)	(0.325)	(0.362)
Observations	5326	5280	4695

Source: Authors' estimation using RLMS

Note: Columns (1) and (2) include all observations, Columns (3) excludes self-employed informals.

This table shows the estimated coefficients from logit regressions that estimate how informal and formal workers differ in their likelihood of being in the bottom quintile of the per capital household income distribution, controlling for other factors. Using RLMS, the authors define informal employment as workers that are employed at an enterprise without a contract in their primary job and workers employed in firms with no more than one employee (i.e., self-employed). Workers with a secondary job or in no job but in irregular economic activities are not included. All specifications include region dummies. Omitted groups are age group (25-34), education (below secondary), sector (agriculture), occupation (managers), firm size (1-10) and hours worked (<40 hours). Armed forces are dropped from the sample. All observations are weighted using the individual weight. *, ** and *** indicate significance levels at 10 percent, 5 percent and 1 percent, respectively

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