

DISCUSSION PAPER SERIES

IZA DP No. 17916

**Motherhood and Informality:
Empirical Evidence from Russia**

Arlan Musayir
G Reza Arabsheibani

MAY 2025

DISCUSSION PAPER SERIES

IZA DP No. 17916

Motherhood and Informality: Empirical Evidence from Russia

Arlan Musayir

Department for Education UK

G Reza Arabsheibani

London School of Economics and IZA

MAY 2025

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Motherhood and Informality: Empirical Evidence from Russia*

This paper investigates the causal impact of childbirth on women's likelihood of informal employment in Russia using twenty years of RLMS. We apply an event study framework following Kleven et al. (2019) to quantify child penalties in labour market outcomes and whether women are more likely to find themselves working informally following the birth of their first child. We find that childbirth significantly increases the probability of informal employment for women. The rise in informality is concentrated in only the first year after childbirth. For first-time mothers this transition is largely involuntary. Our findings align with recent evidence on Russia's relatively integrated but segmented informal labour market (Bargain et al. 2021).

JEL Classification: J13, J16, J46

Keywords: informality, female employment, fertility

Corresponding author:

G Reza Arabsheibani
Department of Management
London School of Economics
Marshall Building
Houghton Street
London WC2A 2AE
United Kingdom
E-mail: g.arabsheibani@lse.ac.uk

* The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the Department for Education or the UK government. A. Musayir thanks Natalia Zinovyeva for helpful comments and suggestions

1. Introduction

Empirical findings from various studies show that childbearing has profound effects on women's working lives, as it generates large penalties in women's labour market outcomes (Blau and Kahn, 2017; Bhalotra et al., 2022). Mothers often choose to leave employment or work less hours, change workplace or select more child-friendly occupations (Even, 1987; Eckstein and Wolpin, 1989; Heath, 2017; Adda et al., 2017). There is also evidence that women often face substantial wage penalties following the first birth that persist well into their working lives, even after the children grow up (Goldin et al., 2022). Overall, the effects of children on women's employment and earnings are well researched (e.g. Rosenzweig and Wolpin, 1980; Angrist and Evans, 1998; Pertold-Gebicka et al., 2016; Heath, 2017). There are several explanations for the mechanisms that drive these effects that have been advanced in the literature (e.g. Mincer and Polachek, 1974; Becker, 1975; Korenman and Neumark, 1992). Maternal labour supply, for instance, can be affected by nonmarket responsibilities. According to Becker's model (1985), married women and mothers often spend more time on nonmarket work, which may weaken a mother's labour market attachment or induce her to switch to a more "child-friendly" job, resulting in potential child and motherhood penalties in earnings that persist in the long run (Blau and Kahn, 2017: 823).

While the burden of childcare and domestic responsibilities that falls on women may act as a hard constraint by limiting their labour market choices, informal employment, in turn, can be an option that offers the flexibility required for women to remain attached to the labour market following childbirth (Berniell et al., 2021). A recent study by Schmieder (2021) highlights the role that the informal sector plays in relation to maternal labour supply, suggesting that women choose jobs in the informal sector due to inflexible working hours offered in the formal sector. Theoretical justifications for why individuals find themselves working informally have been discussed in several studies, which help explain whether working informally arises from necessity or voluntary choice. The former argument relies on the following traditional view: workers enter the informal sector due to lack of other employment opportunities and to escape urban unemployment (e.g. Fields, 1975). The latter stems from the belief that workers voluntarily choose informal employment as a result of weighing the private costs and benefits of operating informally (Banejee 1983, Maloney 2004; Arias and Khamis, 2008). For instance, non-pecuniary benefits, such as more flexible hours and the opportunity to 'escape taxing regulations and inadequate social protection systems' make informal work more appealing for married women (Arias and Khamis, 2008: 2). On the demand side, formal firms may hire workers informally to avoid payroll taxes and reduce labour costs (Chen, 2012).

Evidence from several countries has found that informal employment can be an important source of income for women, that it can play a key role in poverty reduction and that it has a major impact on gender equality (Kantor 2001; Chen 2012; World Bank 2013; Kanbur, 2017). Research on informality in the case of Russia is interesting in itself because of high prevalence of informal work, the informal sector being not strongly segmented but indeed integrated and 'relatively flexible' for both men and women. Furthermore, the share of informal salary workers in total employment for

women has been on the rise in the late 2010s (Bargain et al., 2021). And yet, to date there has been no attempt to measure the effect of having a child on informality for women in Russia. Such studies from an economics perspective help further the understanding of the causes of women's informal employment which can contribute to formulation of policies that target mothers in particular.

This paper attempts to fill this research gap by examining whether childbirth plays a significant causal role in the choice of informal work by mothers in Russia and whether this fertility event makes them seek occupations that provide flexibility. For this purpose, we apply a panel event study estimation design, as described by Kleven et al. (2019), using data from the 2002-2022 waves of the Russian Longitudinal Monitoring Survey (RLMS).¹ We also estimate how labour supply and earnings of women and men change to quantify 'child penalties' in terms of labour supply and earnings. This study also uses recently developed techniques to test whether the results are robust to treatment effect heterogeneity, making another contribution to the strand of empirical literature that applies panel event study methods in the same context.

Our empirical results provide a first indication of the long-term relationship between childbearing and maternal labour market outcomes in Russia. The results show that the arrival of children is associated with an increase in the likelihood of becoming an informal worker for women but not for men. Furthermore, we find no evidence of heterogeneity in the impact on informality across education levels for both fathers and mothers. Using information on the reason behind why women are informally employed, we find evidence to suggest that the effect on informality is motivated by necessity rather than choice. Our results also reveal that after giving birth, women tend to work in occupations (in both formal and informal sectors) with shorter average hours, although the effect is quite small.

The paper is organised as follows. Section 2 describes the contextual background on female employment and informality in Russia. Section 3 provides a review of the literature on the effect of children on female labour market outcomes as well as women's preferences for flexibility in employment. Section 4 describes the data, and section 5 lays out the empirical strategy. Section 6 presents the results. In Section 7, we address some potential limitations and conduct some robustness checks. Concluding remarks follow in Section 8.

2. Background

Female and Maternal Labour Force Participation

At around 90% in 1970, Soviet women had one of the highest labour force participation rates in the industrialised world and less than 1 percent of the Soviet female labour force were in part-time employment, with mothers having access to state supplied childcare that allowed them to remain attached to the labour market (Shapiro, 1992;

¹ Data can be obtained from <https://www.hse.ru/en/rlms/downloads>

Lokshin, 2004). Following the transition, labour force participation rate fell to 62% in 1998 and averaged around 69% in the 2010s (ILO, 2024).

Maternal employment rate in Russia varies with child's age and the gap between employment rates of mothers whose youngest child is in the 0–2 group *vis-a-vis* mothers whose youngest child is in the 3–6 group is wider than in most OECD countries, estimated at 25.7% and 78.4% respectively in 2014 (Kazakova, 2019: Figure 1). According to Kazakova (2019), low availability of part-time jobs may be a key factor in explaining the low levels of employment for women with children under the age of two.² In the mid-2010s, only 6.5% of working women were in part-time jobs. Part-time employment among Russian women has yet to reach the levels of Western Countries, and currently stands at 9 percent (ILO, 2024). It is worth mentioning that empirical research on maternal labour market outcomes is relatively scarce for Russia, as argued by Kazakova (2019) and supported by Lebedinski et al. (2023), and particularly so using longitudinal data.

Informality

During the 2000s and 2010s, informal employment in Russia trended upwards, and was estimated to range between 15.1 and 21.2 percent (World Bank, 2019). The rise is observed for both men and women and the latest figures show that informal rate averaged 17% for women between 2013 and 2023 (Bargain et al., 2021; ILO, 2024).

Interestingly, informality in Russia has some unique attributes when compared to emerging and transition economies (see: Slonimczyk, 2022). Using the 2002-2011 RLMS, Gimpelson and Slonimczyk (2013) find that informal employment is not persistent and that those who work informally are able to exit to formal employment in the future, indicating a high degree of integration between informal and formal sectors. Informal jobs in the Russian labour market play a dual function by keeping unemployment low and employment high (Gimpelson, 2019). In their analysis of the Russian labour market, Gimpelson and Kapeliushnikov (2015) highlight that most of the informal employment in Russia consists of wage workers rather than self-employed individuals. Informal workers in Russia are more educated compared to informal workers in other countries. One particularly interesting empirical finding of this research is that those who choose to be informal face a relatively small wage penalty.

With few barriers to entry, informal employment may offer an alternative for women in modern day Russia and may allow for more flexibility. According to Bargain et al. (2021), it is likely that formal employment entails rigid work contracts and informality offers flexibility. Based on their estimates on Russia, Bargain et al. (2021) report that informal employment work durations for women have more variance. Informal wage penalties for men and women are small, but only observed for less than 10% of informal workers. The authors also argue that informality within Russia may have the same role as unemployment in Western countries. This is true for the low-wage workers and for those for whom unemployment is simply not an option.

² Childcare, both formal and informal, also can play an important role. For a more in-depth discussion see: Morrissey (2017).

3. Literature Review

Motherhood and Labour Market Outcomes

A plethora of empirical studies have estimated the effects of children on various labour market outcomes across different countries. The study by Adda et al. (2017) examines the career costs associated with fertility over the life cycle by using simulated moments. Using data from Germany, they found that whilst men's daily wages rise with age, women's wages increase up to their late 20s and then fall. Their wages only begin to rise again in their late 30's but never catch up to men. Aguero and Marks (2011) use an IV approach to look at the effects of children across extensive (employment) and intensive (hours of work) margins of labour supply in 26 low- and medium-income countries. Their results show that an additional child has a negative marginal effect (2.1 percentage points) on labour force participation in paid (cash) work for women in low-income countries. They also find that the effect on women in middle-income countries is not statistically significant. However, the marginal effect is negative and significant (1.8 percentage points) for younger women (below the age of 35) in both low- and medium-income countries. The authors also argue that mothers in less-developed countries find it challenging to balance motherhood with formal employment. Using Mexican Census data, Schmieder (2021) finds that a rise in fertility beyond two children increases female employment in the informal sector by 4.3 percentage points, while having no effect on formal employment. This finding, according to the author, suggests that informal jobs provide greater flexibility for mothers in Mexico. The author follows the methodology of Angrist and Evans (1998) and uses parental preferences for mixed-sex sibling composition to instrument for fertility (from two to three or more children).

Another strand of literature relies on panel event study models to analyse the effect of parenthood on labour market outcomes in the years after childbirth. Within the event study methodology, the fundamental assumption is that the 'event' is not determined by the outcome variable. That is, childbirth is exogenous to labour market outcomes conditional on underlying determinants (Kleven et al. 2019). Angelov et al. (2016) apply the event study methodology to estimate average effects of parenthood on income and wages of couples using Swedish administrative data. Their sample consists of couples who had their first-born child together at any year between the period of 1990 to 2002. They observe a large dip in working hours of women after the arrival of the first child, which gradually causes their human capital to depreciate when compared to men. The latter, they argue, explains the gender differences in earnings and wages observed in the long run.

Using Danish administrative data, Kleven et al. (2019) estimate the effect of children on earnings, labour force participation, hours worked and wage rates for both men and women. The effect window spans 15 years around birth (between 1985–2003) and their sample covers around 470,000 births or around 15 million individual-year observations. Their results show that the labour market outcomes of Danish mothers diverge sharply after childbirth when compared to fathers. Women earn less than men with the gap being present even 20 years after childbirth. The 'child penalty' is also

observed in relation to labour force participation and hours of work, as well as wage rates and earnings.

Berniell et al. (2021), using a sample of 2,455 Chilean mothers and 1,924 fathers, estimate the effect of parenthood on labour supply, hourly wages, earnings and probability of having an informal job. Their sample covers the period 1997–2016 and includes mothers whose age at first childbirth is between 18 and 50 and who are observed at least once before childbirth and at least once afterwards. Overall, their empirical results show that becoming a mother for the first time causes a fall in employment, leads to reduced hours of work and reduces earnings. After birth, the likelihood of working in the informal sector rises only for mothers. And the presence of informal employment opportunities reduces the magnitude of the penalty on the extensive margin for women.

We are aware of only two papers that estimate penalties following childbirth in the Russian labour market using the event study framework. Using the 2002 and 2010 All-Russian Population Census data, a recent study by Kleven et al. (2023) shows that women's employment falls 21% behind men's after having children, which is lower than for women in Georgia (53%) and Latvia (35%) but similar to women in Belarus (20%) and Armenia (22%). Using the RLMS for the years between 1994 and 2018, Lebedinski et al. (2023) look at the penalties through a similar lens. The authors estimate the child penalty on wages and labour supply (at both the extensive and intensive margins) over a period of 9 years, starting from 3 years before childbirth to 5 years after. To increase sample size, they use higher-order births as well as first births. Their final sample consists of 620 mothers and 442 fathers. Their findings show that Russian mothers experience an earnings penalty when compared to men, explained by their weaker attachment to work after childbirth, but no penalty in terms of hourly wage rates. They also estimate a similar specification to that used by Kleven et al. (2019) and do not find any evidence of a decline in hourly wage rates or hours of work following childbirth (for both first- and higher-order births). They show that that 4 to 5 years after the birth, the employment rates of first-time mothers remain approximately 17 percentage points lower and that for higher-order birth mothers, the employment penalty is not present 3 years after birth.

In general, the event-study literature has found sizable child penalties on women's employment and earnings that persist. Men's and women's career paths diverge significantly after the arrival of children, with women experiencing long-term penalties in earnings and employment. And the extent of these penalties varies internationally, with smaller penalties on earnings in Denmark and Sweden and larger ones in Germany and Austria as well as the US and UK (see: Cortes and Pan, 2020). For mothers in Russia, penalty on employment is relatively high when compared to women in transition economies (see: Kleven et al., 2023). And the birth of the first child has a positive and significant effect on informal employment among women. Finally, there is evidence that women tend to move into self-employment and opt for more flexible but less secure jobs after childbirth (Bhalotra et al., 2022).

Workplace Flexibility

We begin this section by noting that ‘workplace flexibility is a complicated, multidimensional concept’ (Goldin, 2014: 1094). The concept can refer to workers in nontraditional jobs who have alternative work arrangements (e.g. Mas and Pallais, 2020) and it can also encompass flexible working arrangements, in which workers have control over where they work, their occupation and whether they are able to adjust their working hours. Flexible working arrangements are used ‘mainly by women (and among women, by mothers), who still perform the great majority of unpaid housework and care’ (Magda and Lipowska, 2021). In general, research shows that female workers are more likely to be found in occupations that offer greater work-place flexibility (Goldin and Katz, 2011; Goldin, 2014). According to Goldin (2006), the introduction of scheduled part time work was a key factor in easing constraints faced by married women in the 20th century. By allowing women to work part time, not only has it allowed them to enter the labour force, but also to remain attached to the labour market after becoming a parent.

The study by Mas and Pallais (2017: 3727) shows that women in the US, on average, have a higher willingness to pay for the option to work from home but they ‘do not tend to value flexible schedules’ and tend to avoid irregular work. This is especially the case for women who have young children. In their later study, using US data from the General Social Survey, they find no evidence that ‘women are more likely to be in jobs with more scheduling or work location flexibility’ and that it is more often the ability to work part-time that allows women to ‘achieve work-life balance’ (Mas and Pallais, 2020: 633). He et al. (2021), using experimental data from China, find that married women (who are more likely to have children) prefer flexible jobs, which may be due to factors such as responsibilities around the home and childcare. According to their results, married women are willing to trade off fully flexible jobs for 5,000 – 10,000 Chinese Yen per month.

It is therefore worth focusing on some of the causal linkages reported in the literature. On the supply side, jobs with flexible working conditions may not be easy to come by. For example, Magda and Lipowska (2021), using EU Labour Force Survey data, find that compared to men, female workers in some former transition economies (i.e. Bulgaria, Estonia, Poland, and Slovakia) who have children are less likely to be offered working time flexibility. Kleven et al. (2019) shows that childbirth pushes women towards public sector where more family-friendly occupations are found or towards part-time work. Berniell et al. (2021) argues that the informal sector can provide more flexibility than the formal sector. This may be a direct consequence of the fact that women are typically the primary caregiver within households. It is with these findings in mind, more specifically the occupational and sectoral transitions that women make in response to motherhood, that motivates this study to focus on the effect of childbirth on informality. The argument is that in the absence of better alternatives, women choose to work informally to obtain more flexible working arrangements.

4. Data, Variables and Sample

We use data from the RLMS that is collected by the Higher School of Economics (HSE). With the first wave collected in 1994, the survey is a nationally representative panel of Russian households which includes demographic, health and socioeconomic information at the individual and household level. Since 2002, every wave has included questions where individuals, those who work for an enterprise or organisation, are asked to state if they are employed officially. The RLMS, like other longitudinal surveys, has issues of non-random attrition. Individuals may no longer participate for a myriad of reasons: illness, death, refusal to continue participation and relocating to another area; and attrition can be temporary, where respondents may not be surveyed in certain waves (see: Gerry and Papadopoulos, 2015). However, according to Lebedinski et al. (2023), studies that use the RLMS argue that these issues are not significantly different to other survey data.

As a point of reference, we are interested in estimating the child penalty on labour market outcomes, including monthly earnings, employment, hours worked and hourly wages. This is done for the period between 2002 (when the informality question was asked for the first time) and 2022. In contrast to Lebedinski et al. (2023), we do not use higher-order births in our estimations to increase the sample size. When estimating the effect of having an additional child, women have already undertaken decisions related to their future career opportunities, as Kleven et al. (2019) highlight, such as investing less in education. Kleven et al. (2019) argue that past child dynamics may have significant impacts for future children. Therefore, we choose to avoid using higher order births in our estimations.

We follow Cortes and Pan's (2020) approach and consider parents who are observed at least once before and after first birth *and* whose labour market outcomes are observed at least four times over the fifteen-year window (5 years before and 10 years after the birth of their first child). For the year of birth, the time variable is set at $t = 0$, and we index all other years accordingly.

Next, we define mothers and fathers based on the relationship identifiers provided by the Higher School of Economics, which is available on their website in Russian (HSE, 2024).³ For each year of the survey, the RLMS provides the IDs of every relative in their household, which makes it possible to identify the birth year of the first child for each parent. We also restrict our sample to individuals who are between 18 to 55 years old, and mothers who gave birth to their first child between the ages of 18 and 45. Following these restrictions, the final sample used in the regression analysis consists of 757 men and 782 women and as the panel is unbalanced, we have a total of 16,222 observations: 7,834 for men, and 8,388 for women. Employment is defined as a dummy variable which takes the value of 1 if the person is currently employed and 0 otherwise. Overall earnings are based on the sum of money received in the last 30 days from the primary job and earnings are adjusted for inflation using CPI deflator as provided by the HSE (2022 = 100). Working hours are based on the sum of hours

³ See: <https://www.hse.ru/rlms/news/919640692.html>

worked in the last 30 days in the primary job and log hourly wages are calculated by dividing monthly earnings by working hours and taking logs.

Informal employment is defined as those individuals who are employed unofficially, that is, without a labour book, labour agreement or contract, at the main job. It is also possible to classify self-employed individuals within the RLMS as informal, using the 'productive' definition of informality. The definition focuses on the 'characteristics of the production unit (e.g. the scale of production, whether it is a legal entity independent of the owners, etc.)' (Slonimczyk and Gimpelson, 2013: 7). Alternatively, one can use unregistered self-employed. However, registration information is not uniformly available for these workers in RLMS. Hence, we define informality as equal to 1 for those individuals who are informal salary workers as well as the self-employed, and 0 otherwise (that is those who are employed officially).

According to Miller (2023), in the event study framework, a common choice is to omit one time period immediately before the event as a normalisation. However, Miller (2023: 211) suggests that a better practice is to make a 'judgement call', balancing the trade-off between "close enough to be the appropriate counterfactual baseline" and "more data for more precision". In our context, when taking a baseline of -1, some anticipatory effects of birth on informality are observed (see Section 7), suggesting that already two years before childbirth women begin to make choices regarding their career. Miller (2023) argues that in the situations where one can see a change in outcomes shortly before the event, it is best to avoid using that period as the counterfactual baseline as it may be part of the treatment period. Following that rationale, the event time dummy at $t = -2$ is omitted, so the event time coefficients measure the impact of children relative to two years before the first childbirth.

All individuals over the age of 18 have their primary job classified by occupation, which are categorised using ISCO-08 codes, and split into 436 occupations. Based on this information, we generate average hours worked within every occupation to proxy for its time intensity. To capture occupational work hour flexibility, we estimate variance of work hours for each occupation. We present our descriptive statistics in Appendix Table 1. Mothers are around two years younger on average, more educated, work less hours per week and report lower hourly wage. Employment and informality rates among men (85% and 20% respectively) are higher when compared to women (73% and 12% respectively).

5. Methodology

The empirical analysis in this paper uses an event study framework. The main assumption that is necessary for validity is that the timing of the first child's birth is not correlated with labour outcomes. Kleven et al. (2019) show that the method performs well in identifying both short- and long-run effects of children and has the added benefit of allowing to estimate the global effect of child, rather than LATEs estimated by instrumental variable approaches.

We outline the empirical specification below, which follows the event study approach in Kleven et al. (2019):

$$Y_{ist} = \sum_{j \neq -2} \alpha_j \cdot I[j = t] + \sum_k \beta_k \cdot I[k = age_{is}] + \sum_y \gamma_y \cdot I[y = s] + \mu_i + \varepsilon_{ist} \quad (1)$$

where Y_{ist} is the outcome(s) of interest for individual i in year s and at event time t , and ε_{ist} is an unobserved error term. The first term on the right-hand side is a set of leads and lags to the event of interest, grouped together as a set of event dummies, the second term is a full set age-in-years dummies, and the third term is year dummies.

Fixed effects for age and year are added (through dummies) to control for lifecycle as well as business cycle effects. Individual fixed effects are included to account for possible heterogeneity between mothers. Standard errors are clustered at the individual level. For the estimates on the effect on earnings, employment, hours working and hourly wages, we include five leads and ten lags, with the second lead omitted as the base category. We reduce this window to four leads and five lags (with again, the second lead omitted) for estimates on all the measures of informality and flexibility, with the last lag and lead accumulating the effects of years at each tail of the fifteen-year window. This approach is not new in the literature (e.g. Goodman-Bacon, 2018; Clarke and Tapia-Schyte, 2021; Schmidheiny and Siegloch, 2023) and the aim is to regain statistical power (Miller, 2023). It is worth noting that by omitting the second lead ($j = -2$), the estimates capture the impact of childbirth relative to two years before the birth of the first child⁴.

We use the specification expressed in Equation (1) to estimate the effect of first childbirth on earnings, labour supply, wage rates and informal employment. As Kleven et al. (2019) explain, short-run effect identification relies on smoothness of the average non-child earnings path, and the inclusion of age and year dummies is an attempt to reduce long-run effect bias. We estimate Equation (1) for fathers and mothers separately and present the estimated event coefficients, $\hat{\alpha}_t$, in a graphical format in line with the literature (see: Miller, 2023: 211).

Following Kleven et al. (2019), Equation (1) is specified in levels rather than in logs to be able to keep the nonworking respondents. A ‘child penalty’ is then estimated as a percentage by which women are falling behind men due to children at event time t . As per Kleven et al. (2019) we convert the estimated event coefficients by calculating $P_t \equiv \hat{\alpha}_t / E[\tilde{Y}_{ist} | t]$, for men and women, where $\tilde{Y}_{ist}$ is the predicted outcome when omitting the contribution of the event dummies ($\tilde{Y}_{ist} \equiv \sum_k \hat{\beta}_k \cdot I[k = age_{is}] + \sum_y \hat{\gamma}_y \cdot I[y = s]$). Thus, P_t captures the effect of children as a percentage of the ‘counterfactual outcome’ (that is, what would have happened if the individual had not had children) for a given event time, t . After estimating the impacts of children on women and men separately, we express the child penalty on women relative to men at event time t as $P_t \equiv (\hat{\alpha}_t^m - \hat{\alpha}_t^w) / E[\tilde{Y}_{ist} | t]$. Thus, when the outcome is, for example,

⁴ To generate our estimates, we use the Stata command ‘eventdd’ written by Clarke and Tapia-Schyte (2021). The same command is used to generate the event study plots

employment, the child penalty is expressed as a share of the employment level that one would expect to observe for women and men if they did not have children.

In addition to the aforementioned outcomes, we explore how the nature of employment for men and women in Russia responds to first childbirth. Specifically, we estimate whether having a child increases the likelihood of working informally, and if it affects the time intensity and flexibility of occupations (as measured by the mean and variance of work hours within an occupation). As mentioned before, informal status is a binary variable that is equal to one when an individual is informal (as defined in the data section) and zero otherwise.

6. Empirical Results

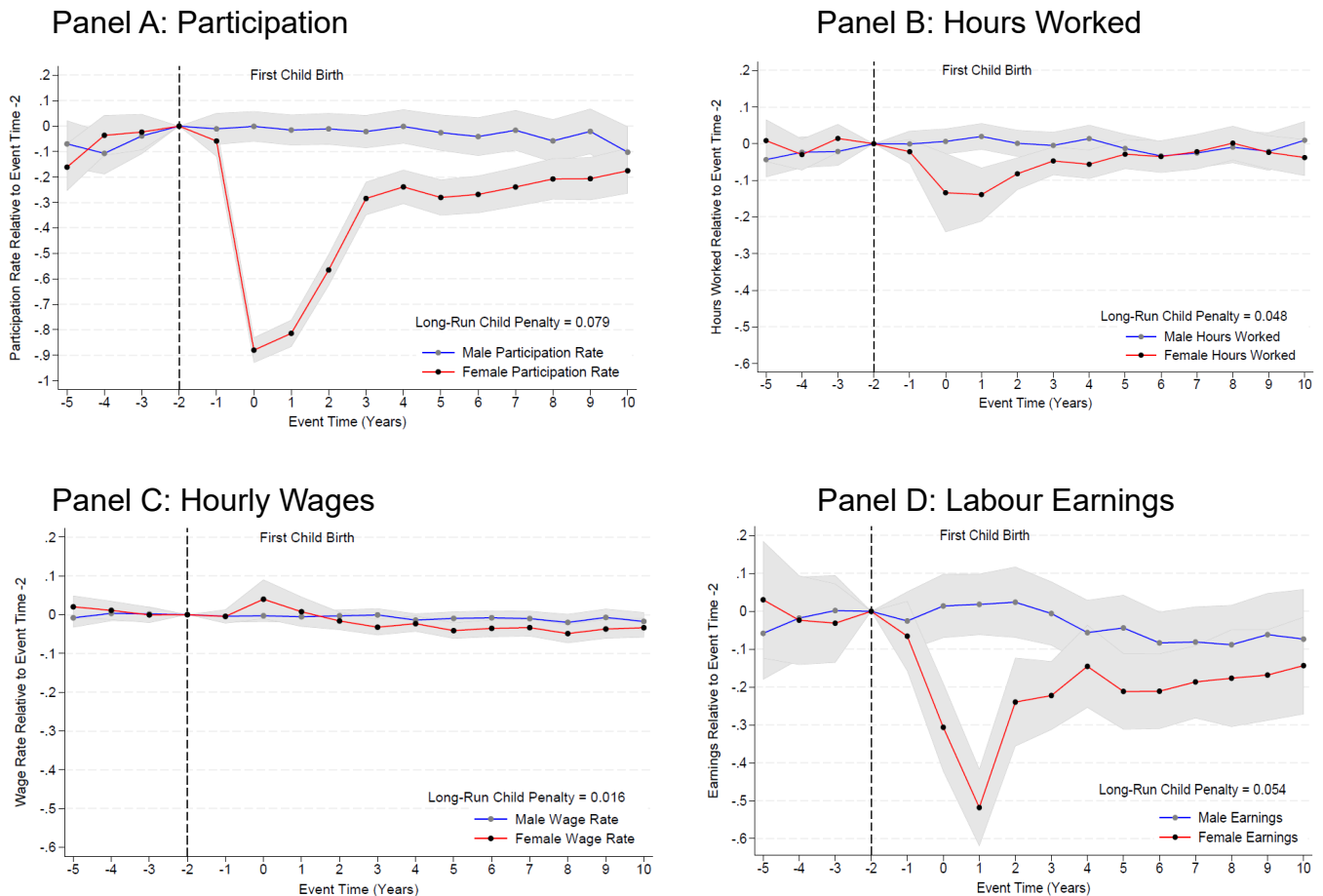
Baseline Results

Estimates of child penalties by gender across event time, controlling for the life-cycle and time trends, are shown in Figure 1. We plot the percentage effect of children on participation (Panel A), hours worked (Panel B), hourly wages (Panel C) and earnings (Panels D) relative to two years before giving birth. These impacts are measured relative to the counterfactual of outcomes absent children (for men and women separately) and are calculated by dividing the coefficients from the estimated equation by the expected value of the outcome in event time t . The latter is obtained by estimating the same equation without event time dummies. The graphical illustrations of the scaled event coefficients can be compared with the broader child penalty literature and previous empirical evidence on Russia. We also show 95 percent confidence bands based on robust standard errors.

Panel A shows that a large gap in participation is present after the arrival of the first child. For women, the likelihood of participation falls by 90% when compared to two years before the birth. There is no observable effect on participation for men. The gap in participation for women is statistically significant and narrows 3 years after birth but never reaches the pre-child levels in the 10 years after the birth of the first child. There is no observable effect on participation for men, suggesting that fathers are not affected. Hours of work decline by almost 15% for women after the first child, as shown in Panel B. Our results suggest that this penalty disappears only 5 years after (or when a child approaches school age). There is no penalty on hours of work for men during the pre-school years and small negative change around the school age. The results in Panel C illustrate a small rise in hourly wage rate for women in year zero but a gradual decline in over the period of 10 years after the first birth, with the hourly wages of men remaining flat over the same period. Finally, Panel D shows that earnings for mothers and fathers before the birth of the child display similar trends but diverge sharply in the post-birth period. For women, labour earnings erode by around 50% one year after birth *vis-à-vis* two years before the birth, although given the wide confidence intervals around the point estimates, our estimates are extremely noisy. Despite having a relatively small sample, the confidence intervals, except for our estimates for labour earnings, are relatively narrow. Overall, the response across all labour market outcomes appears to be quite muted for men, while having a pronounced effect on female earnings and participation. The results for earnings are statistically significant and indicate women experience a long-run penalty earnings ten years into the future.

Our results are broadly in line with the literature on Russia except for participation rates. The estimates display a greater fall in participation for women than those obtained using Russian Census data by Kleven et al. (2023). They are more comparable to the 77 percent fall in participation observed by Lebedinski et al. (2023). In contrast to Lebedinski et al. (2023), our point estimates of the effect of childbirth on wage rates, albeit small, are statistically significant.

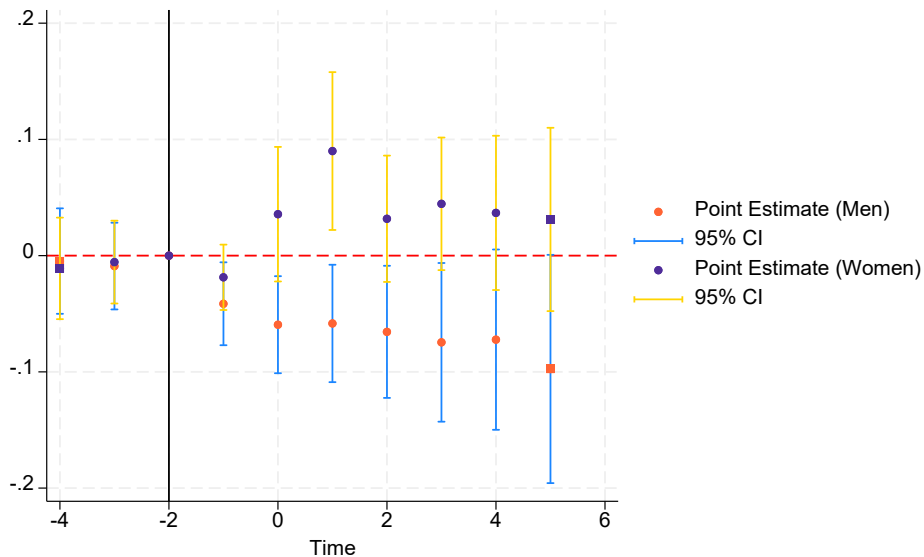
Figure 1.



We now turn to focus on the effect of childbirth on informal employment. Figure 2 shows event time coefficients estimated from equation (1) for men and women separately. The results show that following childbirth, the probability of becoming an informal worker for women increases. In the year following the birth of the child, women are approximately 9% more likely to work informally compared to two years before childbirth (we present tables with the results in terms of unscaled coefficients in the Appendix). The event study plot shows that this effect is present one year after childbirth and fades out and is no longer significant from two years after the birth event. The coefficients prior to the event are tightly centred on zero, suggesting that there are no anticipatory effects. That is, individuals do not appear to transition into informal employment prior to having a child. We also have visual evidence of parallel trends, as the coefficients are centred around zero for both men and women. Interestingly, the opposite effect is observed for men. That is, after the birth of their child, men are less

likely to be informal and the effect is statistically significant across the entire event window. As explained in the methodology section, the final point estimate denotes the accumulated effects from five years after childbirth.

Figure 2. Impacts on Informality for Men and Women



In Figures 3 and 4, we look at heterogeneity in the impact, using differences in observed human capital. Specifically, we examine whether the child effect on informality is different for working men and women with and without university-level education. For women, we find weak evidence to suggest that the effect of motherhood on informality depends on their level of education. In the case of men, those with lower levels of education experience a fall in the probability of becoming informal after the birth of their child. The effect is negative and statistically significant for the less educated group 5 years after the birth event, while we observe no effect for those with higher levels of education.

Figure 3. Impact on Female Informality by Education

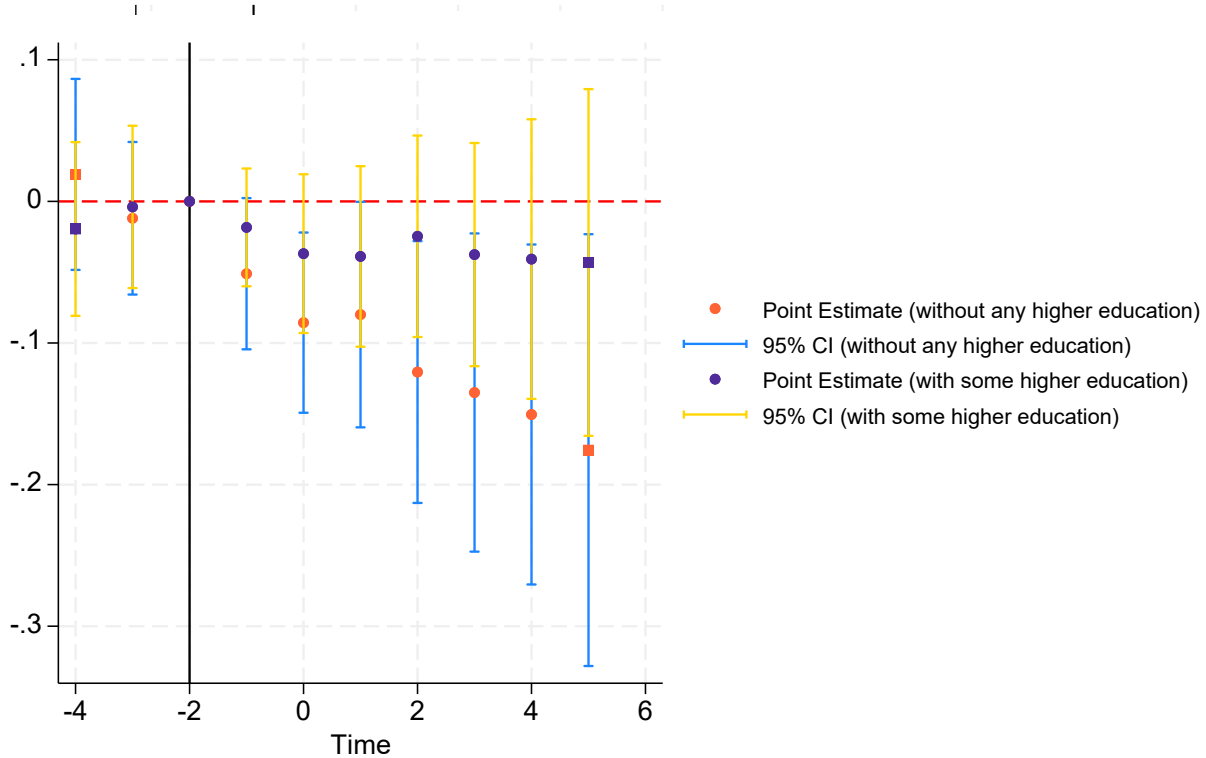


Figure 4. Impact on Male Informality by Education

In Figures 5a and 5b we look at the effect of childbirth on the types of occupation that individuals pursue, more specifically the time intensity of the jobs that men and women engage in after giving birth. We proxy time intensity by the mean and variance of hours within the occupation. Although the effects are small in magnitude, our results show that after women give birth, they engage in occupations with lower average hours of work. The effect is small, yet significant from three years after women give birth. We do not find evidence to suggest that women choose occupations with slightly more variance in hours in the post-birth period. These results suggest that women in Russia select less time-intensive occupations after having a child but do not necessarily select occupations with more flexibility in terms of working hours.

Figure 5a. Impact on Mean Hours within Occupations for Men and Women

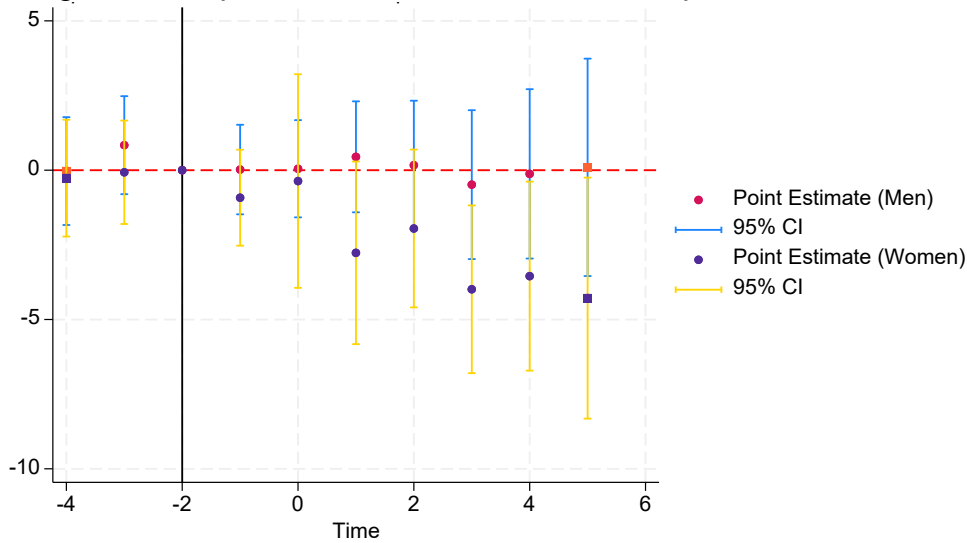
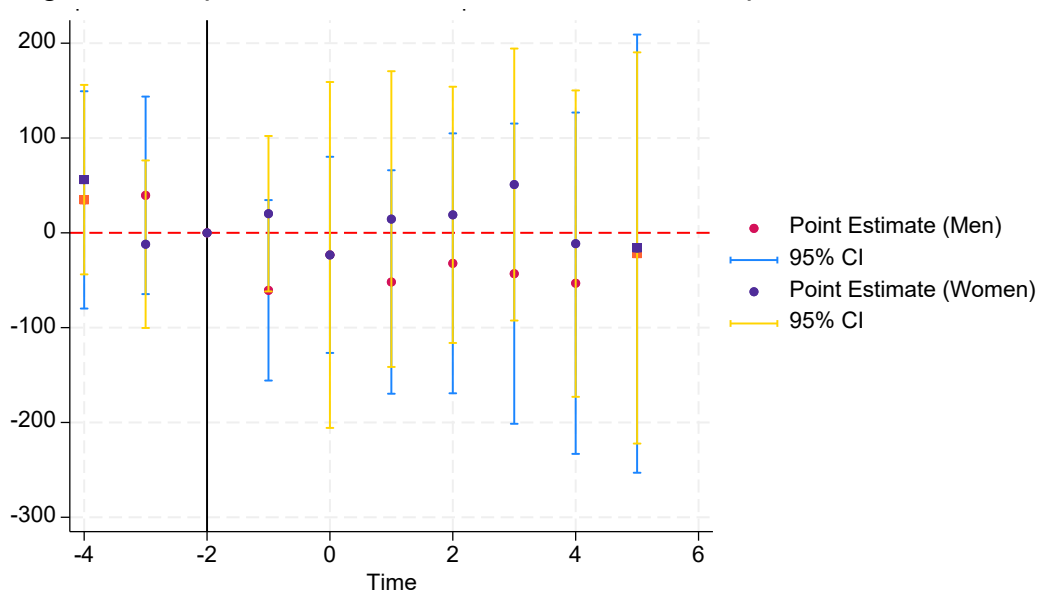


Figure 5b. Impact on Variance of Hours within Occupation for Men and Women

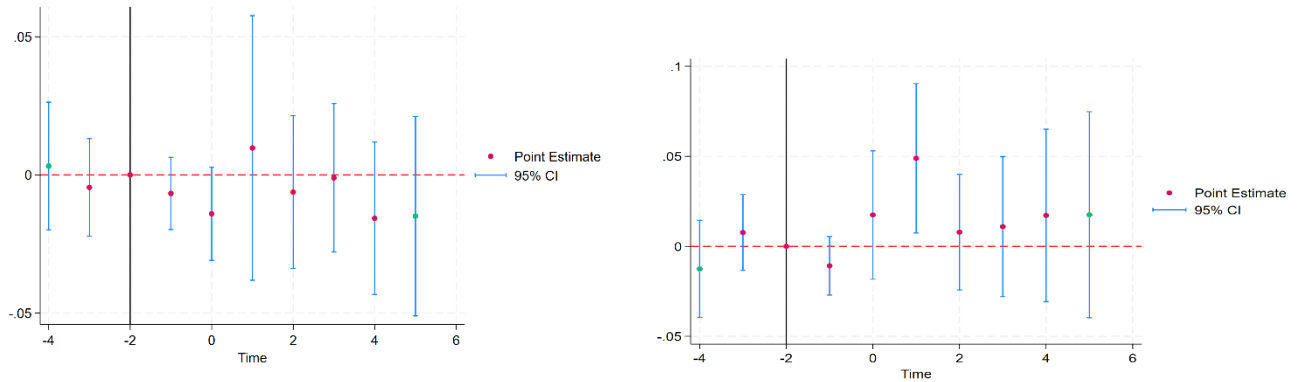


7. Considerations and Robustness Checks

Following Maloney (2004), we have so far treated informal employment as desirable and voluntary. Although this may be the case for certain individuals, for example those who participate in irregular activities or are self-employed, this is less likely to be the case for wage workers. Using RLMS data, one can distinguish between voluntary and involuntary informality by using a question that asks the wage workers whether informal employment is imposed on the individual by their employer, or whether it is the individual who prefers to work informally. If a respondent works unofficially (without a labour book, labour agreement, or contract), the follow up question is: “Why are you employed unofficially” with the following answer choices: 1) “I did not want”; 2) “Employer did not want”; 3) “Both employer and you did not want”. We use responses to this question to split informality by the two types of choices: ‘willingly’ (for answer choice 1) or ‘unwillingly’ (for answer choices 2 and 3). We estimate the equation for

women and plot results which are presented in Figures 6a and 6b. Although the results have wide confidence intervals, a general pattern emerges. We find no evidence that having a child increases the probability of transitioning into informal employment willingly for women. On the other hand, having a child increases the probability becoming an informal wage worker ‘unwillingly’ for the first year after childbirth.

Figure 6a. Impact on Informality, Willingly Figure 6b. Impact on Informality, Unwillingly



It is important to mention that informal employment is heterogeneous, with several criteria used to define informal employment (Kanbur 2011), and hence empirical estimates may vary by the exact definition. The prevailing view in the literature is that those who are informal belong to one of two groups. The first are those who work informally by their own choice, and the second are those who are searching for formal employment but cannot afford to remain unemployed (Fields, 1975; Fields, 1990; Maloney, 2004). Overall, our results point to the conclusion that the arrival of the first child increases the probability of involuntary informal employment for women in Russia.

Recent advances in the DiD literature have looked at the effects of relaxing certain assumptions in canonical setup, and what effect that would have on inference. One such strand of literature finds that staggered treatment timing event studies when estimated with standard two-way fixed effects may lead to bias and estimates that diverge from the average treatment effect. Britto et al. (2022) highlight that this issue is particularly pertinent when the sample consists of mainly all treated individuals (with variation across event time). According to recent developments in the literature (see: Melentyeva, 2023), the fact that mothers have children (‘get treated’) at different times can cause heterogeneity of effects across cohorts and as a result one may wish to take greater caution in light of potential biases induced by heterogeneity. Hence, we follow the methodology proposed by Borusyak et al. (2024) for difference-in-differences estimations with staggered (with staggered in this case referring to the fact that women have children at different times) treatment adoption and heterogeneous causal effects to see whether heterogeneity of treatment threatens the validity of our results of the effect of childbirth on female informality. Their approach addresses two potentially relevant issues. Firstly, anticipation effects which can lead to under-

identification. Secondly, homogeneity of treatment effect that can lead to the spurious identification. We present our estimates using this technique in the Appendix Figure 1. The result obtained is similar to the event study specification outlined in the methodology which suggests that our result is robust to treatment effect heterogeneity.

8. Conclusion

Whether the birth of the first child makes working-age women in Russia take up informal employment was the central question that was addressed in this paper. The empirical results demonstrate only the first year after childbirth has a statistically significant effect on the probability of informal employment for women. Looking at the heterogeneity in impact across education, we find no relationship between the level of education that a woman reports and probability of becoming informal. We also examine whether the effect of childbirth is different depending on the type of choice decision (willing or unwilling) of informal employment. Our results show a positive and significant effect of motherhood on the probability of 'unwilling' informal employment among wage workers in the first year after childbirth. We find a small but significant effect for the average hours worked in the occupations that women pursue three years after giving birth, but statistically insignificant effects on the variance of hours within those occupations.

We reviewed several studies that examine childbearing from a labour economics angle and demonstrate that the birth of a child significantly impacts labour supply of mothers, as well as their earnings, and these effects are long lasting. Some women start working less hours in the post-birth years, while others leave employment, and pay the long run penalty in earnings (Angelov et al., 2016; Kleven et al., 2019). The estimated trends illustrate that mothers in Russia also face large penalties with the arrival of their first child. Relative to 24 months before the birth event, we observe a sharp fall in labour supply and labour earnings coinciding with the arrival of the first child. These effects are negative and significant across the entire event window. Although gender-specific results are not the main focus of this study, we argue that it is still useful to examine the effect of parenthood of men for comparative reasons. After the birth of the first child, we find that fathers' patterns of labour supply and earnings are largely unaffected whereas mothers reduce the likelihood of labour market participation and experience both earnings and wage rate penalties. For women, these child penalties, except for hours worked, stubbornly persist 10 years after birth.

Informal employment in Russia shows no signs of subsiding, averaging around twenty five percent since the turn of the millennium. Our study has shown that the effect of children on informal employment is short-lived but still significant and suggest that women are more likely to work informally in response to employer demands rather than by own or mutual (employees and employers' choice) shortly after the birth of a child. Thus, this study provides some useful insights into the potentially involuntary nature of informal employment in the case of working mothers in Russia. We unveil a

different lens through which to look at the possible rationale for becoming informal after childbirth, one that perhaps stems from a lack of flexible employment for women with young children and hence they are likely turn to informal employment in the absence of flexible alternatives, such as a part-time job or adequate social support while unemployed. It would be interesting for future research to estimate the effect of motherhood on different types of informality to see whether women are pushed (or pulled) into particular forms of informal employment after childbirth as well as look at the welfare implications of informality on mothers. Future research could also explore the reasons as to why certain women with children work informally and analyse to what extent is flexibility an important factor for their decision.

References

- Adda, Jérôme; Dustmann, Christian; Stevens, Katrien (2017). "The Career Costs of Children." *Journal of Political Economy*, 125(2), 293-337.
- Agüero, Jorge M.; Marks, Mindy S. (2011). "Motherhood and Female Labor Supply in the Developing World: Evidence from Infertility Shocks." *Journal of Human Resources*, 46(4), 800-826.
- Angelov, N., Johansson, P., & Lindahl, E. (2016). Parenthood and the Gender Gap in Pay. *Journal of Labor Economics*, 34(3), 545–579.
- Angrist, Joshua D.; Evans, William N. (1998). "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size." *American Economic Review*, 88(3), 450-477, June.
- Arias, Omar and Khamis, Melanie, (2008). "Comparative Advantage, Segmentation and Informal Earnings: A Marginal Treatment Effects Approach," IZA Discussion Papers 3916, Institute of Labor Economics (IZA).
- Banerjee, Biswajit (1983). "The Role of the Informal Sector in the Migration Process: A Test of Probabilistic Migration Models and Labour Market Segmentation for India", *Oxford Economic Papers*, 35(3), 399-422.
- Bargain, Olivier; Etienne, Audrey; Melly, Blaise (2021). "Informal Pay Gaps in Good and Bad Times: Evidence from Russia." *Journal of Comparative Economics*, 49(3), 693-714.
- Becker, Gary S. (1975). "Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education", Second Edition," NBER Books, National Bureau of Economic Research, Inc.
- Becker, Gary S, (1985). "Human Capital, Effort, and the Sexual Division of Labor," *Journal of Labor Economics*. 3(1), 33-58, January.
- Benard, S., Correll, S. and Paik, In, (2007). "Getting a Job: Is There a Motherhood Penalty?," Natural Field Experiments 00227, The Field Experiments Website.
- Berniell, Inés; Berniell, Lucila; Mata, Dolores de la; Edo, María; Marchionni, Mariana (2021). "Gender Gaps in Labor Informality: The Motherhood Effect." *Journal of Development Economics*, 150, May.
- Bhalotra, Sonia R.; Clarke, Damian; Walther, Selma (2022). Women's Careers and Family Formation, IZA DP No. 15639.
- Blau, Francine D.; Kahn, Lawrence M. (2017). "The Gender Wage Gap: Extent, Trends, and Explanations." *Journal of Economic Literature*, 55(3), 789-865.
- Borusyak, Kirill; Jaravel, Xavier; Spiess, Jann (2024). "Revisiting Event-Study Designs: Robust and Efficient Estimation." *The Review of Economic Studies*, 91(6), 3253-3285.

- Britto, D.G.C., Pinotti, P. and Sampaio, B. (2022), The Effect of Job Loss and Unemployment Insurance on Crime in Brazil. *Econometrica*, 90: 1393-1423.
- Blundell, Richard; MaCurdy, Thomas (1999). "Labor Supply: A Review of Alternative Approaches." In *Handbook of Labor Economics*, Vol 3, 1559-1695.
- Chen, M. (2006). "Rethinking the informal economy: Linkages with the formal economy and the formal regulatory environment." In *Linking the Formal and Informal Economy: Concepts and Policies*, edited by Guha-Khasnobis, B.; Kanbur, R.; Ostrom, E., Oxford University Press, Oxford.
- Chen, M.A. (2012). "The Informal Economy: Definitions, Theories and Policies." WIEGO Working Paper No. 1, http://wiego.org/sites/wiego.org/files/publications/files/Chen_WIEGO_WP1.pdf.
- Clarke, D.; Tapia-Schythe, K. (2021). "Implementing the Panel Event Study." *The Stata Journal*, vol. 21(4), pages 853-884.
- Cortés, Patricia; Pan, Jessica (2017). "Cross-Country Evidence on the Relationship Between Overwork and Skilled Women's Job Choices." *American Economic Review*, 107(5), 105-109, May.
- Cortés, Patricia; Pan, Jessica (2020). "Children and the Remaining Gender Gaps in the Labor Market." NBER Working Papers 27980, National Bureau of Economic Research, Inc.
- Eckstein, Z.; Wolpin, K.I. (1989). "Dynamic Labour Force Participation of Married Women and Endogenous Work Experience." *The Review of Economic Studies*, 56(3), 375-390.
- Even, W. (1987). "Career Interruptions Following Childbirth." *Journal of Labor Economics*, 5(2):255-277.
- Fields, G.S. (1975). "Rural-Urban Migration, Urban Unemployment and Underemployment, and Job-Search Activity in LDCs." *Journal of Development Economics*, 2(2), 165-87.
- Fields, G.S. (1990). "Labour Market Modelling and the Urban Informal Sector: Theory and Evidence." In *The Informal Sector Revisited*, edited by Turnham, D.; Salome, B.; Schwarz, A., Organisation for Economic Co-operation and Development, Paris.
- Fitzenberger, B.; Sommerfeld, K.; Steffes, S. (2013). "Causal Effects on Employment After First Birth – A Dynamic Treatment Approach." *Labour Economics*, 25, 49-62.
- Gebicka, B.; Pertold, F.; Datta Gupta, N. (2016). "Employment Adjustments Around Childbirth." IZA Discussion Paper No. 9685.
- Gerry, C.J.; Papadopoulos, G. (2015). "Sample Attrition in the RLMS, 2001–10." *Economics of Transition*, 23, 425-468.
- Gimpelson, Vladimir (2019). "The Labor Market in Russia, 2000-2017." IZA World of Labor, ISSN 2054-9571, Institute of Labor Economics (IZA), Bonn.

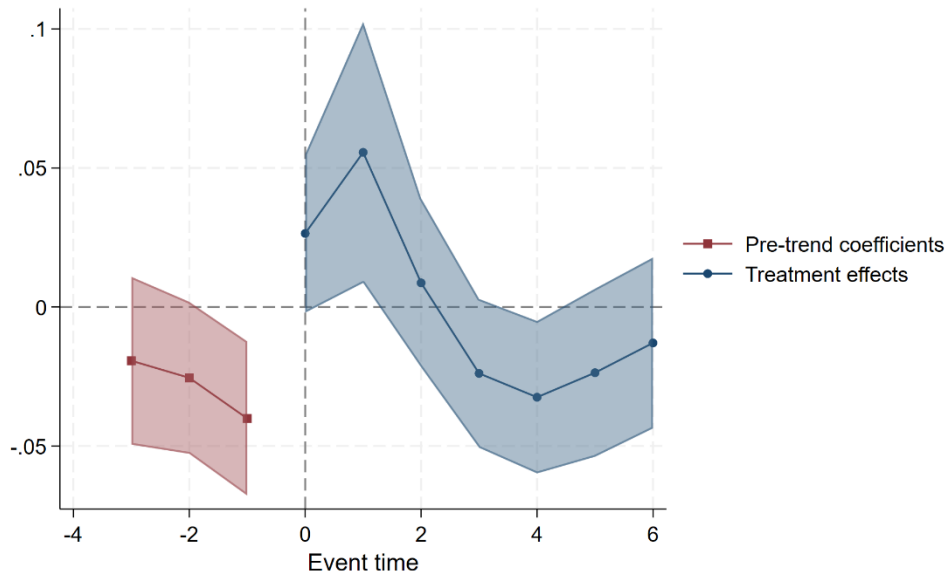
- Gimpelson, V.; Kapeliushnikov, R. (2013). "Labor Market Adjustment: Is Russia Different?" In *The Oxford Handbook of the Russian Economy*, edited by Weber, S.; Alexeev, M., Oxford University Press, 693-724.
- Gimpelson, V.; Kapeliushnikov, R. (2015). "Between Light and Shadow: Informality in the Russian Labour Market." In *Challenges for Russia's Politicized Economic System*, edited by Oxenstierna, Sussane, Routledge, pages 33-58.
- Goldin, Claudia (2006). "The Quiet Revolution That Transformed Women's Employment, Education, and Family." *American Economic Review*, 96(2): 1–21.
- Goldin, Claudia (2014). "A Grand Gender Convergence: Its Last Chapter." *American Economic Review*, 104(4), pages 1091-1119, April.
- Goldin C, Katz L.F. (2011) "The Cost of Workplace Flexibility for High-Powered Professionals". *The Annals of the American Academy of Political and Social Science*, 638 (1), 45-67.
- Goldin, Claudia; Kerr, Sari Pekkala; Olivetti, Claudia (2022). "When the Kids Grow Up: Women's Employment and Earnings across the Family Cycle." NBER Working Paper No. 30323.
- Goodman-Bacon, Andrew (2018). "Public Insurance and Mortality: Evidence from Medicaid Implementation." *Journal of Political Economy*, 126(1), 216-262.
- He, Haoran; Neumark, David; Weng, Qian (2021). "Do Workers Value Flexible Jobs? A Field Experiment." *Journal of Labor Economics*, 39(3), pages 709-738.
- Heath, R. (2017). "Fertility at Work: Children and Women's Labor Market Outcomes in Urban Ghana." *Journal of Development Economics*, May, 126, 190-214.
- International Labour Organization (2024). "Wages and Working Time Statistics Database (COND)." ILOSTAT
- Ionimczyk, Fabian; Gimpelson, Vladimir (2013). "Informality and Mobility: Evidence From Russian Panel Data." IZA Discussion Papers 7703, Institute of Labor Economics (IZA).
- Kanbur, R. (2011). "Avoiding Informality Traps." In *Reshaping Tomorrow: Is South Asia Ready for the Big Leap?* Edited by Ghani, E., Oxford University Press, Oxford, 260–278.
- Kanbur, R. (2017). "Informality: Causes, Consequences, and Policy Responses." *Review of Development Economics*, 21, 939–961.
- Kantor, P. (2001). "Promoting Women's Entrepreneurship Development Based on Good Practice Programmes – Some Experiences From the North to the South." SEED Working Paper No. 9, ILO, Geneva.
- Kleven, Henrik; Landais, Camille; Søgaaard, Jakob Egholt (2019). "Children and Gender Inequality: Evidence from Denmark." *American Economic Journal: Applied Economics*, 11(4), 181-209, October.

- Kleven, Henrik (2022). "The Geography of Child Penalties and Gender Norms: Evidence from the United States." Working Papers 2022-20, Princeton University, Economics Department.
- Kazakova, Yuliya (2019). "Childcare Availability and Maternal Labour Supply in Russia." ISER Working Paper Series 2019-11, Institute for Social and Economic Research.
- Korenman, Sanders and Neumark, David (1992). "Marriage, Motherhood, and Wages," *Journal of Human Resources*, 27(2), 233-255.
- Lebedinski, L., Perugini, C. & Vladislavljević, M. (2023). "Child Penalty in Russia: Evidence from an event study". *Review of Economics of Household*, 21, 173–215.
- Lehmann, H.; Zaiceva, A. (2015). "Re-defining informal employment and measuring its determinants: Evidence from Russia." *Journal of International Development*, 27(4), 464-488.
- Lokshin, Michael (2004). "Household Childcare Choices and Women's Work Behavior in Russia." *Journal of Human Resources*, 39(4).
- Magda, Iga; Lipowska, Katarzyna (2021). "Flexibility of Working Time Arrangements and Female Labor Market Outcome". IZA DP No. 14812.
- Maloney, W.F. (2004). "Informality Revisited." *World Development*, 32(7), 1159–78.
- Mas, Alexandre; Pallais, Amanda (2017). "Valuing Alternative Work Arrangements." *American Economic Review*, 107(12), 3722-3759, December.
- Mas, Alexandre; Pallais, Amanda (2020). "Alternative Work Arrangements." *Annual Review of Economics*, 12(1), pages 631-658, August.
- Miller, Douglas L. 2023. "An Introductory Guide to Event Study Models." *Journal of Economic Perspectives*, 37 (2): 203–30.
- Mincer, Jacob and Polachek, Solomon, (1974). "Family Investment in Human Capital: Earnings of Women," *Journal of Political Economy*, 82(2), pages 76-108.
- Perry, G.E.; Maloney, W.F.; Arias, O.A.; Fajnzylber, P.; Mason, A.D.; Saavedra-Chanduvi, J. (eds) (2007). "*Informality: Exit and Exclusion*." The World Bank, Washington, DC.
- Rosenzweig, M.R.; Wolpin, K.I. (1980). "Life-cycle Labor Supply and Fertility: Causal Inferences From Household Models." *Journal of Political Economy*, 88(2), 328-348.
- Roth, Jonathan (2022). "Pretest with Caution: Event-Study Estimates after Testing for Parallel Trends." *American Economic Review: Insights*, 4(3), 305-322, September.
- Schmidheiny, Kurt; Siegloch, Sebastian (2023). "On Event Studies and Distributed-Lags in Two-way Fixed Effects Models: Identification, Equivalence, and Generalization." *Journal of Applied Econometrics*, 38(5), 695-713, August.

- Schmieder, Julia (2021). "Fertility as a Driver of Maternal Employment." *Labour Economics*, 72(C).
- Shapiro, J. (1992). "The Industrial Labour Force." In *Perestroika and Soviet Women*, edited by Buckley, M., Cambridge University Press, Cambridge, pages 14-38.
- Shapiro, D.; Mott, F. (1994). "Long-Term Employment and Earnings of Women in Relation to Employment Behavior Surrounding the First Birth." *Journal of Human Resources*, 29(2):248-275.
- Sigle-Rushton, W. and Waldfogel, J. (2007). Motherhood and Women's Earnings in Anglo-American, Continental European, and Nordic Countries. *Feminist Economics*, 13(2), 55–91.
- Slonimczyk, Fabián (2022). "Informal Employment in Emerging and Transition Economies." *IZA World of Labor*, Institute of Labor Economics (IZA), Bonn
- Roth, Jonathan, Sant'Anna, Pedro H.C., Bilinski, Alyssa and Poe, John, (2023). "What's Trending in Difference-in-Differences? A Synthesis of the Recent Econometrics Literature," *Journal of Econometrics*, 235(2), 2218-2244.
- World Bank (2013) *World Development Report 2013*. The World Bank, Washington, DC.

Appendix:

Appendix Figure 1. Robust Event Study estimates



Appendix Table 1. Summary Statistics for sociodemographic and labour market variables at Event Time $t = -2$.

	Fathers	Mothers
Year of birth	1983.8 (5.96)	1986.0 (5.39)
Age at first child	28.59 (5.05)	26.30 (4.21)
With some college education	0.32 (0.47)	0.43 (0.50)
In the labour force	0.86 (0.35)	0.78 (0.42)
Employed	0.85 (0.36)	0.73 (0.45)
Monthly earnings (2022 Russian Rubles)	24517 (24178)	18271 (20028)
Hours worked per week	38.08 (21.54)	31.85 (19.91)
Hourly wage (2022 Russian rubles)	119.55 (125.39)	104.16 (121.65)
Informal worker	0.201 (0.401)	0.1222 (0.327)
Avg. hours within occupation (monthly)	184.372 (16.35)	172.71 (20.86)
Variance of hours within occupation	1620.64 (1234.6)	1062.10 (952.16)
N	757	787

Appendix Table 2. Regression Coefficients (Fathers)

Variables	Informal	Informal (Without Degree)	Informal (With Degree)	Willingly Informal	Unwillingly Informal	Average Hours in Occupation	Variance of Hours in Occupation
lead4	-0.0047 (0.0231)	0.0191 (0.0343)	-0.0273 (0.0321)	-0.0102 (0.0114)	0.0030 (0.0122)	-0.0293 (0.985)	34.72 (65.98)
lead3	-0.0090 (0.0190)	-0.0119 (0.0274)	0.0080 (0.0271)	-0.0025 (0.0117)	0.0008 (0.0117)	0.838 (0.777)	39.53 (47.54)
lead1	-0.0414** (0.0182)	-0.0511* (0.0272)	-0.0305 (0.0235)	-0.0191* (0.00984)	-0.0150 (0.0106)	0.0218 (0.716)	-60.63 (47.47)
lag0	-0.0594*** (0.0213)	-0.0856*** (0.0324)	-0.0465 (0.0288)	-0.0103 (0.0118)	-0.0273** (0.0119)	0.0489 (0.854)	-23.23 (57.61)
lag1	-0.0584** (0.0257)	-0.0799** (0.0405)	-0.0499 (0.0342)	-0.0143 (0.0126)	-0.0390*** (0.0136)	0.448 (1.009)	-51.85 (65.80)
lag2	-0.0656** (0.0290)	-0.121** (0.0470)	-0.0255 (0.0386)	-0.0132 (0.0141)	-0.0309** (0.0156)	0.167 (1.120)	-32.18 (77.94)
lag3	-0.0746** (0.0348)	-0.135** (0.0572)	-0.0308 (0.0431)	-0.0113 (0.0163)	-0.0337* (0.0177)	-0.483 (1.315)	-43.07 (93.73)
lag4	-0.0723* (0.0395)	-0.150** (0.0611)	-0.0281 (0.0537)	-0.0203 (0.0181)	-0.0296 (0.0193)	-0.123 (1.482)	-53.14 (106.2)
lag5	-0.0975* (0.0500)	-0.176** (0.0776)	-0.0337 (0.0677)	-0.0194 (0.0231)	-0.0457** (0.0231)	0.0953 (1.860)	-21.96 (139.3)
Constant	0.00850 (0.133)	-0.118 (0.145)	0.261 (0.323)	0.00638 (0.0298)	0.110 (0.0960)	178.5*** (5.350)	1,702*** (291.9)
N	6,544	3,340	3,118	6,111	6,128	6,518	6,499
R ²	0.519	0.527	0.568	0.282	0.307	0.562	0.572

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 3. Regression Coefficients (Mothers)

Variables	Informal	Informal (Without Degree)	Informal (With Degree)	Willingly Informal	Unwillingly Informal	Average Hours in Occupation	Variance of Hours in Occupation
lead4	-0.011 (0.0222)	-0.001 (0.0456)	-0.0244 (0.0223)	0.0032 (0.0118)	-0.0126 (0.0137)	-0.2650 (1.050)	56.10 (57.42)
lead3	-0.0060 (0.0182)	-0.0163 (0.0304)	-0.0083 (0.0199)	-0.0050 (0.0090)	0.0080 (0.0107)	-0.0702 (0.814)	-12.01 (39.62)
lead1	-0.0186 (0.0143)	-0.0141 (0.0271)	-0.0283* (0.0162)	-0.007 (0.0067)	-0.0108 (0.0083)	-0.921 (0.698)	20.18 (39.10)
lag0	0.0357 (0.0295)	0.0886 (0.0579)	-0.0200 (0.0317)	-0.0141 (0.0086)	0.0174 (0.0181)	-0.364 (1.952)	-23.34 (83.36)
lag1	0.0900*** (0.0346)	0.0929 (0.0588)	0.0459 (0.0441)	0.0097 (0.0244)	0.0489** (0.0211)	-2.767 (1.869)	14.50 (80.91)
lag2	0.0317 (0.0277)	-0.0227 (0.0525)	0.0419 (0.0336)	-0.0062 (0.0141)	0.0078 (0.0163)	-1.952 (1.499)	18.96 (83.76)
lag3	0.0446 (0.0291)	0.0278 (0.0588)	0.0147 (0.0326)	-0.0011 (0.0137)	0.0109 (0.0198)	-3.988** (1.842)	50.93 (84.70)
lag4	0.0368 (0.0338)	0.0200 (0.0703)	0.0041 (0.0390)	-0.0157 (0.0141)	0.0172 (0.0244)	-3.547* (2.074)	-11.40 (93.10)
lag5	0.0311 (0.0402)	0.0135 (0.0858)	-0.0025 (0.0449)	-0.0149 (0.0184)	0.0175 (0.0291)	-4.284* (2.543)	-15.96 (119.4)
Constant	0.250*** (0.0957)	0.320** (0.145)	0.211 (0.198)	0.0080 (0.0656)	-0.0103 (0.0655)	157.7*** (4.955)	1,563*** (199.2)
N	4,527	1,880	2,542	4,286	4,310	4,528	4,516
R ²	0.502	0.517	0.564	0.282	0.363	0.694	0.552

Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1