# Motherhood penalty in Russia. Evidence from RLMS data[1]

Many empirical studies reveal such thing as the motherhood penalty — the gap in employment and wages between women with children and childless ones which cannot be fully explained by demographic, social or family characteristics (Harkness & Waldfogel 1999, Lundberg & Rose 2000, Pal & Waldfogel 2016, and others). The motherhood penalty might be partially generated by employers expecting lower productivity and mobility or frequent absence due to child healthcare or schooling, and therefore discriminating women with children while hiring or assigning wages. Apart from that, there might be selection of less career-oriented or less educated women into motherhood (Wetzels & Zorlu 2003, Pal & Waldfogel 2016). In addition, women with children might actually be less productive at work compared to their childless colleagues due to higher burden of family- and housework.

This paper aims to estimate motherhood penalty in Russia and to compare its size across groups of women with different educational levels. Existing studies reveal relatively high motherhood penalty in Russia: the difference in wages of women with children and their childless compatriots comprised nearly 8% in 2003-2005 (Arzhenovskiy & Artamonova 2007). According to our raw estimates based on the 2014 Russian Longitudinal Monitoring Survey data, net differences in wages of women with children under 18 years old and childless women aged 20-44 mounted up to 9,7% and between those having grownup children and childless — 4,5%. For women aged 20-29 the wage gap for women with children under 18 years old makes up to 13,3%[2].
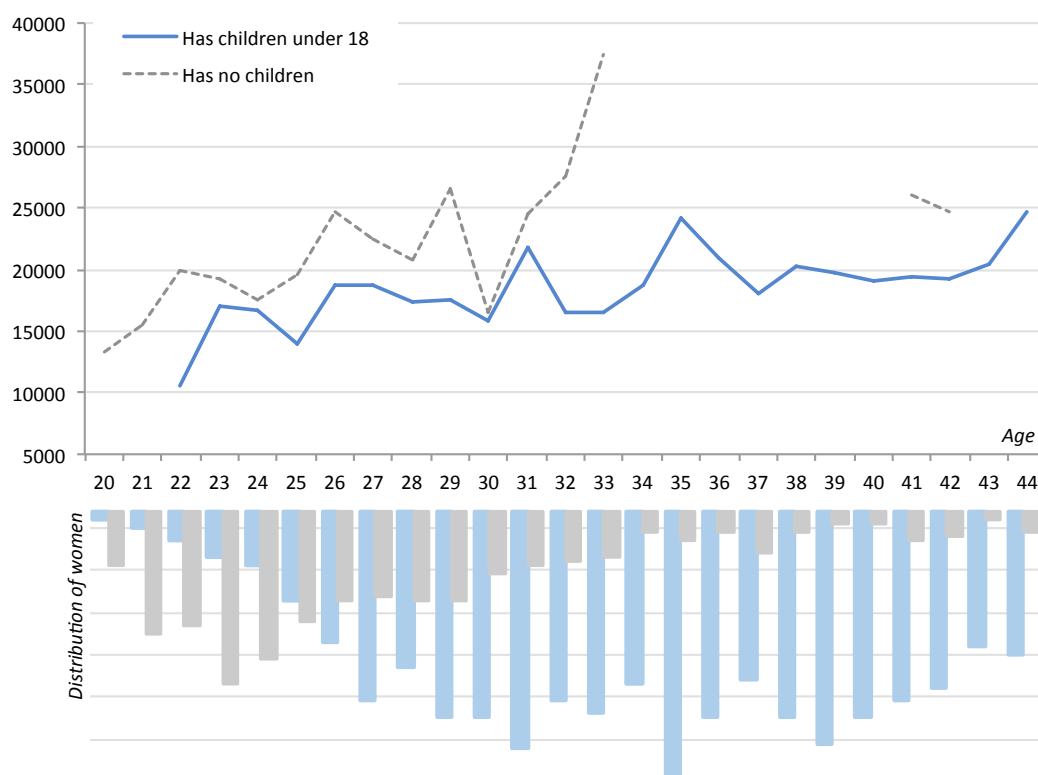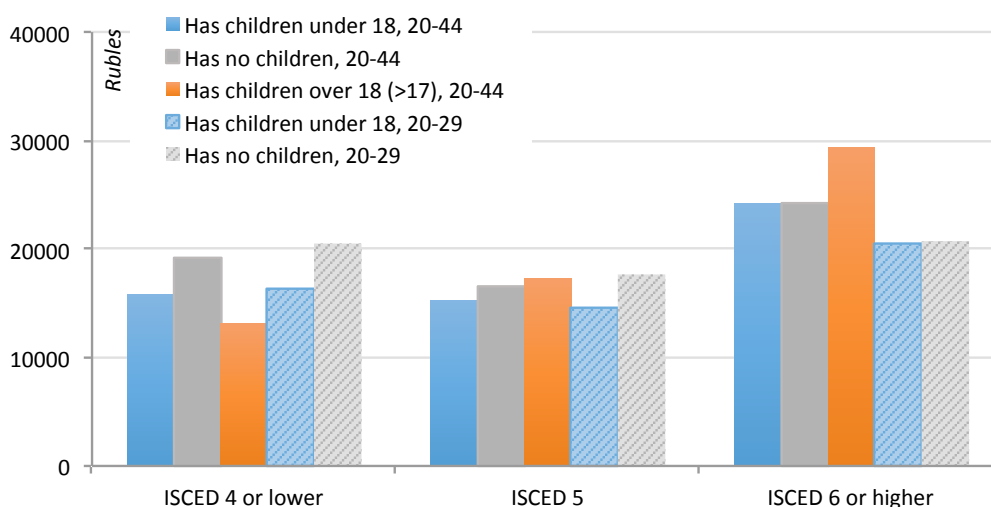

Figure 1. Average wages of women with children under 18 years old and childless women. Russian Longitudinal Monitoring Survey 2014, representative sample, employed women aged 20-44
Averages are not estimated for groups of 5 observations or smaller

[2] Childlessness in Russia is still relatively rare among women aged 30-35 or older [see Figure 1 and (Biryukova & Tyndik 2015)], which is why we observe sharp changes in the average wages estimated for one-year intervals, and for some descriptive statistics we limit the sample to women aged 20-29.

The descriptive analysis of the data showed that size of the wage gap between mothers and childless women varies significantly across groups with different educational levels. Women with basic post-secondary education (ISCED 4) or lower face the biggest differentiation of wages by their motherhood status (see Figure 2). In this group, women having children under 18 years old on average receive 17,1% lower wages than their childless colleagues, and the gap for those with grownup children is even wider, it goes up to 31%. Women with professional post-secondary education (ISCED 5) have on average 8,2% lower wages if they look after children under 18 years old but 4,4% higher if their children are older. Finally, for high-educated women (ISCED 6 or higher) we do not observe any difference in wages between childless women and women with children under 18 years old, while women with grownup children receive 21,3% higher wages than their childless colleagues.

Figure 2. Education gradient of average wages of women with children under 18 years old, childless women and women with children over 18 years old. Russian Longitudinal Monitoring Survey 2014, representative sample, employed women aged 20-44 (solid columns) and 20-29 (dashed columns)

The observed wage gaps should be partially attributed to the differences of the educational groups in terms of their age structure, average characteristics of job positions, etc. To embrace all these effects and to get estimates of the wage penalty associated with motherhood, we shift to the regression analysis.

To account for possible selection effects we start with estimating a binary logit regression with independent covariates including age, educational level, partner status, and type of settlement, and calculating a conditional probability of being a mother for each woman in the sample, which is then used to calculate inverse probability treatment weights for observations in the following analysis. At the second stage of the regression analysis, to reveal the size of motherhood penalty we estimate a weighted log-linear model with the logarithm of the monthly wage serving as the dependent variable, controlling for woman's motherhood status and using the same list of independent covariates extended with controls for type and sphere of employment.

Having seen the differences in the wage gap calculated for mothers and non-mothers in different educational groups, we estimate a general model for the whole sample (column A in Table 1), and then check similar separate models for women with higher education (column B) and those without higher education (column C).

Generally, we observe significant motherhood penalty in all three models. Average penalty for the whole sample comes up to 4,2% of monthly wage for women with children under 18 years old compared to non-mothers. The highest effect is observed for women with higher education who face 8,4% wage penalty if they have children under 18 years old. At the same time neither high-educated

women nor women with lower education incur any significant reduction (or premium) in wages if their children are older.

Table 1. General log-linear model estimates. Russian Longitudinal Monitoring Survey 2014, representative sample, employed women aged 20-44

Parameters of the model		Coefficients (Std. Error)		
		A	B	C
		General model	Model for women with higher education (ISCED >= 6)	Model for women without higher education (ISCED <= 5)
Motherhood status	Not a mother	REF	REF	REF
	Mother, has children under 18	-.042*** (0.010)	-.084*** (.017)	-.025** (.012)
	Mother, has children over 18 (>17)	-.022 (0.021)	-.036 (.041)	-.002 (.024)
Education	No higher education	REF	REF	REF
	Higher education (ISCED 6+)	0.171*** (0.010)	-	-
Age	20-24	.030 (.018)	-.181*** (.034)	.042** (.021)
	25-29	-.045*** (.015)	-.169*** (.024)	.059*** (.019)
	30-34	-.040*** (.014)	-.062** (.024)	-.026 (.018)
	35-39	.032** (.014)	-.043 (.026)	.090*** (.017)
	40-44	REF	REF	REF
Area of living	Big city	.134*** (.013)	.118*** (.027)	.151*** (.015)
	Small city	.069*** (.014)	.040 (.028)	.089*** (.016)
	Small town (semi-rural area)	.077*** (.025)	.072 (.049)	.068** (.028)
	Rural area	REF	REF	REF
Partner status	No partner, never been married	-.030** (.013)	-.054** (.022)	-.026 (.016)
	No partner, was married previously	.000 (.014)	-.010 (.024)	.000 (.017)
	Has a partner / Married	REF	REF	REF
Job contract	No (unofficial employment)	-.016 (0.020)	.044 (.060)	-.045** (.021)
	Yes (official employment)	REF	REF	REF
Job sector	Industry, business and commercial services	0.081*** (.010)	.043*** (.016)	.106** (.021)
	Social and government services[a]	REF	REF	REF
Model significance		***	***	***
R-squared		.180	.108	.151

[a] *This category includes women employed in spheres of education, army services, public administration, education, science, culture, social services, housing and utilities, which are concentrated in the public sector of economy.*
Note: Intercept is included in the models but omitted from the table
*Significance levels are marked as follows: *** p < 0.01, ** p < 0.05, * p < 0.1*

We suppose that at least part of the revealed penalty might be explained by temporary income loss in several years following the childbirth rather than by systematic lifelong discrimination at the labor market. In the further studies we are planning to withdraw a panel sample from the RLMS data to follow the dynamics of women's wages in the years preceding and following the childbirth.

References

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