GENDER ROLES AND EMPLOYMENT: HOW SOCIAL NORMS AND PARENTHOOD AFFECT THE PROBABILITY OF EMPLOYMENT

by

Olena Duka

A thesis submitted in partial fulfillment of
the requirements for the degree of

MA in Economic Analysis

Kyiv School of Economics

2025

Thesis Supervisor: _____ Professor Olga Kupets

Approved by _____
Head of the KSE Defense Committee, Professor

_____

_____

_____

Date _____

Kyiv School of Economics

Abstract

GENDER ROLES AND EMPLOYMENT: HOW SOCIAL NORMS AND PARENTHOOD AFFECT THE PROBABILITY OF EMPLOYMENT

by

Olena Duka

Thesis Supervisor: Professor Olga Kupets

The thesis investigates the impact of parenthood and social norms on the gender gap in employment, using data from the last three waves of World Values Survey (WVS). Despite global progress towards gender equality, there are still remaining stereotypes and gender roles, which become barriers for women employment. We utilize mixed-effects logistic regression model to estimate employment, incorporating coefficients for individual-level and family characteristics, and Social Norms Index as a proxy for social attitudes towards gender roles. Our findings confirmed that Social Norms Index has statistically significant effect of female employment. Women with more egalitarian views on gender roles are more likely to be employed, regardless of their education, age or marriage status. We have also found statistically significant presence of motherhood penalty: every additional child lowers the probability of woman to be employed. The obtained result might help to develop policies, reforms or social support programs, which would shape society views on genders and increase female employment levels.

TABLE OF CONTENTS

Chapter 1. INTRODUCTION 1

Chapter 2. LITERATURE REVIEW 5

Chapter 3. METHODOLOGY 11

Chapter 4. DATA 15

Chapter 5. ESTIMATION RESULTS 27

Chapter 6. CONCLUSIONS AND POLICY RECOMENDATIONS 28

WORKS CITED 31

LIST OF FIGURES

Number *Page*

Figure 1. Gender Gap in employment, p.p. 16

Figure 2. Correlation plot of variables describing gender role attitudes. 19

Figure 3. Marginal Effect of Number of Children on Employment by Sex 23

Figure 4. Marginal Effect of Social Norms Index on Employment by Sex 24

Figure 5. ROC curve for Mixed Effects Logistic Model 27

LIST OF TABLES

Number *Page*

Table 1. Descriptive Statistics 17

Table 2. Marginal effects of estimated coefficients (dependent variable: Employment) 22

Table 3. Robustness check. Marginal effects of estimated coefficients excluding interaction terms (dependent variable: Employment) 26

LIST OF ABBREVIATIONS

EU. European Union.

WVS. World Values Survey.

Chapter 1

INTRODUCTION

The topic of gender inequality has been raised many times and constantly gets a lot of attention from researchers, policymakers, and activists. While global gender gap is shrinking (UN-Women and DESA 2024), there are still a lot of unaddressed issues contributing to the disparities in the labor force.

Even in the XXI century, many women still face discrimination from employers' side: females are less likely to be hired or promoted at work, get managerial positions, have the same pay rate as men. There are still a lot of countries, which do not even provide equal legal rights, reinforced by religious beliefs, major political party or even within family views on gender roles (UN-Women and DESA 2024).

In challenging periods of history, the most vulnerable population groups usually struggle the most. Women are more likely than men to suffer from extreme poverty and food insecurity, especially in low-income countries or those facing crisis. Recall one of the recent examples of global turmoil – the COVID-19 outbreak. The pandemic highlighted problems occurring in the labor market, and particularly gender inequality. Besides health issues, one of the negative consequences was observed in the form of growing gender gap in work hours by 20-50%. Researches confirm that during quarantine women had to reduce their working hours in order to care for children, while for working fathers such reduction was almost five times less (Collins, et al. 2021).

Overcoming the problem of gender gap is not only about equal rights and opportunities for men and women in societies. It is also considered to be one of the issues, which are holding the world economy back. The global GDP is

predicted to have a boost by more than 20% if the gender gap would be closed, as it is stated in the recently published report by CARE (2024).

The current global unemployment rate amounts to 5,2% for women, while 4,8% for men. The gap seems to be quite narrow, but this metric can be misleading as it does not count all people who want employment, but do not have a job. Participation in the labor force better reflects gender inequalities in the world economy. In 2024, almost 92% of the male population were in the labor force, compared to only 63% of women (UN-Women and DESA 2024). These numbers are not aligned with actual preferences: according to the International Labor Organization report (2017) , 70% of women would prefer to have a paid job rather than to stay at home. Thus, at least a part of women, who want to be employed, are not participating in the labor force due to various reasons. While this gap is already big, new labor market trends contribute to the rise of this difference: women are more likely to have jobs at risk of being replaced by artificial intelligence.

Another problem we should not forget is the unequal pay: women are still getting 20% less than man (UN-Women and DESA 2024). One of the main reasons for such difference in pay is considered to be higher probability of woman having low-paid or non-wage work. Women are also experiencing so-called motherhood penalty, which measures difference in pay between mothers and childless women.

Gender Gap is believed to be one of the stoppers on the way to achieving Sustainable Development Goals (SDGs), the deadline for which is approaching in 2030. SDGs represent 17 targets, chosen by United Nations Member States, which are designated to end poverty, reduce inequalities, stop climate change and facilitate economic growth. Gender inequality issues are in tight connection with all goals, so SDGs cannot be fulfilled without overcoming these problems (UN-Women and DESA 2024).

CARE (2024) researchers believe that closing gender gap would take 152 years if the current rate persists, meaning that the world is far from reaching Sustainable Development Goals in time. Thus, the problem of women rights and opportunities is in high priority for global economy well-being.

Gender Gap reasons lie deeply in the history and biology: women of all times had to devote themselves to caring about children, firstly arising from breastfeeding needs. Females are spending a big part of their time on homecare unpaid work: between 3 and 6 hours per day on average. In the first place, this prevents some women from becoming a part of the labor force. Those having jobs end up working 2.6 hours more than men on average, if summing up paid and unpaid work (Esteban, Sandra and Max 2018).

Why do women accept these rules? The roots of the gender gap problem underlie in the human minds: gender roles are determined by social norms and perceptions. A lot of countries still have laws that do not provide equal rights for males and females. UN Women (2024) reports that, still, in more than half of the world's countries there are restrictions not allowing women to do the same jobs as men.

The lower probability of being employed for females also arises from motherhood related factors: having a child leaves a substantial influence on women's health and decreases amount of time left for paid work.

This thesis aims to investigate impact of both motherhood and family gender roles on women's employment probability, find out how presence of children contributes to the gender gap in employment. Another focus of the thesis is to investigate impact of social norms and beliefs about gender roles on woman employment. The paper employs a mixed-effects logistic regression model using recent World Values Survey (WVS) data. To capture impact of gender roles believes, Social Norms Index is constructed as individual-level measure. The

mixed effects are applied to account for within country and within WVS wave variations.

Findings of the thesis can bring useful insights for policies implementation, aimed at closing the gender gap in employment. The study justifies the importance of comprehensive work with public attitudes and reforms, which are needed for the global economy development.

The paper consists of 6 Chapters and is organized as follows. Chapter 2 overviews relevant literature on the similar problematics, uncovering gender gap causation theories, and existing methods of research in this field. Chapter 3 describes the methodology applied, model functional form, including choice of the variables. Primary data source is presented in the Chapter 4 along with preliminary analysis and descriptive statistics of variables. Then obtained results are interpreted in Chapter 5, followed by conclusions, key insights and practical recommendations in the final Chapter 6.

Chapter 2

LITERATURE REVIEW

Gender inequality, gaps in income, employment rates and labor force participation are topics repeatedly raised by researchers during last decades. There are numerous studies investigating factors, which influence gender differences in labor market. These can include personal characteristics like age, education level, health status; family characteristics, such as gender role norms, household income and number of children; social norms and beliefs, religiosity and legal frameworks within the country.

While education is obviously an important predictor of whether the person would participate in the labor force, there is evidence that girls and women outperform boys in education, but still have worse position in the labor market (OECD 2024).

In one of the developing countries researchers observe U-shaped relationship between education and female labor force participation. Women with lowest and highest levels of education are more likely to be employed than those middle educated (Kanjilal-Bhaduri and Pastore 2017). Klasen, et al. (2021) investigated labor force participation factors in low- and middle-income countries, finding out that growing education levels and negative fertility trends increased participation rates. However, they discovered that increase of the household income has negative effects in poor countries, which could mean that most women work out of economic necessity.

More educated skilled women marry at a lower rate than unskilled ones (Bertrand, et al. 2021). This adds level of complexity into the research of parenthood effects. Authors state that skilled full-time working women are perceived as worse spouses and mothers, which could contribute to the gap between single women and those having children.

Religiosity is proved to make significant contribution to the gender gaps through building patriarchal societies, which lead to gender inequality in rights and opportunities (Iqbal 2022).

Significant contribution to the gender gap is associated with parenthood. Budig (2014) researched wage gap in the US from the aspect of having family and children. The author not only proved the existence of motherhood penalty, which women experience in the form of drop in wages after the birth of the child. Budig also found out that along with this phenomenon fatherhood premium occurs when men receive higher wages after having children. This effect has greater magnitude on men at leading managerial positions. Fathers are perceived by employers as more stable and showing greater commitment than single man. At the same time mothers are viewed as worse workers, as they may need longer leaves, and believed to focus more on family matters rather that work responsibilities. Motherhood penalty is also not evenly distributed among income groups: low-income women pay the biggest cost, while females on top career positions do not experience these gaps.

Findings of the previous author are also confirmed by the recent research of Adsera and Querin (2023), who used data available for European countries. They found out that woman and mothers more often choose service jobs, requiring contact with people, which are usually lower paid. At the same time men usually held jobs connected to machine use and leadership. Authors also discovered supporting evidence of fatherhood premium: higher-paid leadership jobs are more often held by fathers than childless man. Greatest gender gap in leadership jobs is observed in Southern European countries, while Eastern and Continental Europe show higher differences between mothers and fathers.

Cukrowska-Torzewska and Lovász (2017) also found proofs that the motherhood penalty is highest in Central and Eastern European countries. The

authors looked at cross-country differences in the gender wage gap in Europe and investigated at what extent children and parenting responsibilities contribute to the gap. They also took into account institutional elements, such as family policies. Authors made an attempt to decompose overall gender wage gap to three elements: motherhood penalty, fatherhood premium and gap between childless individuals. Their findings show that institutions matter, and good policy implications can help in closing the wage gap (at least motherhood penalty part). Women in Southern and Western EU countries experience low or no motherhood penalty, having higher child coverage, opportunities of flexible jobs and moderate length leaves. More institutional problems are revealed in Central and Eastern Europe countries, where women have longer maternity leaves, do not have enough opportunities of external childcare under the age of 3, and preferences for care within the family. Considering all these, mothers in these countries usually end up with long absences from the labor market. However, authors find that fatherhood premiums are present in all countries, unrelated to internal policies and cultural norms.

Grimshaw and Rubery (2015) summarized main reasons for motherhood penalty occurrence, critically reviewed methodological approaches to its evaluation and discussed measurement issues, gathering international evidence. Authors divide reasons for motherhood pay gap into three frameworks: rationalist economics, sociological and comparative institutionalist. From rationalist economics perspective main factors are considered reduced 'human capital' due to employment interruptions, and choice of family-friendly lower paid jobs. The sociological approach blames employers' stereotypes about mother's time and commitment to work, and low availability of childcare. This framework also admits undervaluation of women's work, meaning that jobs, which are mostly held by women, are treated unfair. The comparative institutionalists argue that the root of the problem lies in the institutions: countries provide different

opportunities for mothers in terms of maternity leaves and childcare provisions; cultural context and family views matter; gap magnitude depends on degree of inequality in the overall wage structure within country.

Ukrainian researchers also show interest in the topic of gender inequality. As already found by previous authors, Eastern European countries, including Ukraine, show high occurrence of motherhood penalty. Using Ukrainian evidence Nizalova et al. (2016) investigate motherhood penalty as one of the barriers to having more children, being concerned by low fertility rates in the country. Authors find that motherhood wage penalty is much lower in Ukraine, comparing to countries with similar social norms and institutional context. One of the insights from this research is observation that education, age at the birth of the first child and marital status have varying effects on the wage penalty.

One of the most important reasons for gender differences in employment are the social norms that shape the economy outcomes. Females are often constrained in their life choices and employment decisions by influence of societal views. Gender norms lead to inequality not only in the work division, but in access to education, political rights, and control over economic resources.

Researchers prove that there is a relationship between gender norms and the country's economic development. Although gender gap in employment is lower in developed countries, the differences still exist.

One of the most significant findings about this relationship was described by C. Goldin (1995). The author observed the existence of U-shape for female participation in the labor market. In low-developed agricultural economies women participation in production is high but declines as the workspace moves from family farms and small businesses to large industrial factories. It becomes harder to balance employment with household work, which in many societies is considered to be female responsibility. Besides, the manual work at industry is

often viewed as man job. As economies evolve and services sector arises, women labor force participation rates increase. There are few underlying reasons explained in the literature. Firstly, education levels grow, and women can have office white-collar jobs, which are perceived suitable for females. Another observed reason is drop in fertility levels (Jayachandran 2015). Smaller households require less time for caring responsibilities, so women have time to work outside home.

Gender norms are deeply rooted in history. Such norms shape beliefs about what is considered acceptable behavior for men and women. Several studies also show that historical context on early stages of societies development shapes current gender employment gaps. Alesina, Giuliano and Nunn (2013) reported that in countries where plough usage in agricultural production was common in the past, gender equality is lower. This fact is explained by the men's physical advantage for using ploughs, while women mostly worked with their hands. Such division of labor became historical heritage, which persists together with unequal beliefs about gender roles. Hansen et al. (2015) also confirm this hypothesis by exploring relationship between agricultural history and female labor force participation rates, as well as other measures of equality in contemporary gender roles.

Cross-national research shows that gender role attitudes are shaped by broader cultural values. Lomazzi and Seddig (2020) demonstrate that traditional gender roles are more common in societies emphasizing hierarchy and embeddedness, while egalitarian societies show more progressive views. Their study proves the importance of accounting for cultural differences when studying impact of gender norms on employment.

Despite quite extensive literature available on the topic of gender employment gap, there is still space for broader research on how parenthood and views on gender roles in families contribute to the problem. Previous research admit that

education is strongly connected to the employment probability, however the relation is not always linear. Having children leads to long absences from the labor market, health and knowledge depreciation, more unpaid care work, negatively contributing to the further labor participation. Social perceptions play highly significant role in the gender gap, as ideal mothers and ideal workers are different people from the employers' perspective. Evidence from some countries proves that good policies can contribute to the closing of gender gap, at least motherhood penalty factor.

Chapter 3

METHODOLOGY

To estimate probability of employment, while accounting for gender role attitudes, personal and family characteristics, the mixed-effects logistic regression is used. Mixed effects regression integrates both fixed and random effects in one model. Such models can be used for cross-sectional studies, which include repeated data, collected over time from participants from different countries (clusters). (Yamada da Silveira, Ferreira and Patino 2023)

Logistic form was chosen taking into account the fact that the dependent variable is binary. The model allows us to test not only the average effects of motherhood and gender norms on employment, but also how these effects differ across countries and survey waves.

In our model fixed effects part corresponds to variables, which describe individuals, such as sex, age, marital status, number of children, income level. Random effects are incorporated to measure the effect of different world regions and WVS waves. So that fixed effects are measured at the individuals' level, while random effects account for differences at the level of clusters of individuals.

The specification takes such form:

$$P(Employment_{ict} = 1) = \frac{\exp(X_{ict}\beta + Z_{ct}\mu)}{(1 + exp(X_{ict}\beta + Z_{ict}\mu))} \quad (1)$$

$$\begin{aligned} X_{ict}\beta = {} & \beta_0 + \beta_1 \cdot Sex_{ict} + \beta_2 \cdot Children_{ict} + \beta_3 \\ & \cdot (Sex_{ict} \times Children_{ict}) + \beta_4 \cdot SNI_{ict} + \beta_5 \\ & \cdot (Sex_{ict} \times SNI_{ict}) + \beta_6 \cdot PC_{ict} \end{aligned} \quad (2)$$

$$Z_{ct}\mu = \mu_{0c} + \mu_{1c} + \mu_{0t} \quad (3)$$

where:

- i – individual, c – country, t – WVS wave,
- Sex - binary variable (1 = female, 0 = male),
- Children - number of children,
- SNI - Social Norms Index (higher values = more egalitarian),
- PC – personal characteristics (age, education, settlement size),
- μ - random intercepts by region and WVS wave.

Social Norms Index (SNI) is a composite measure of gender role attitudes. The Index is calculated based on respondents' answers to related questions and can take values between 0 and 1. Higher SNI represents more progressive egalitarian views of the individual, while values closer to 0 mean traditional patriarchal attitude towards gender roles. More details on how SNI was derived can be found in the Data chapter. The index serves as a proxy for prevailing cultural environment of the individual, which shapes their beliefs about what is appropriate for men and women.

The hypothesis to be checked whether lower SNI (traditional views) is associated with lower probability of a woman to be employed. It is expected that the relationship for men would be the opposite: lower SNI corresponds to higher probability of being employed. That is because lower SNI values describe patriarchal views on the gender roles, which see women as caregivers and housewives, while men as breadwinners of the family. These gender expectations can influence individual labor market decisions, both through personal choices and external pressure from employers, family members or society in general.

Personal characteristics of the respondents include sex, age, education level, settlement size.

Age is usually added to the specification of the model along with age^2, as age and employment have non-linear relationship. Probability to be employed differs at different stages of life: at first, it increases with age, but at some middle-age point it starts to decrease as person becomes older. This represents reversed U-shaped relationship. Such pattern reflects real-life labor market dynamics, where younger individuals may not have enough experience, while older adults may retire early or exit the labor force due to health issues or caregiving.

Respondent education level is also expected to be strong predictor of probability of being employed. Higher education levels are usually associated with higher employment, as good education opens access to more stable and better-quality jobs, so the risk of unemployment lowers. However, the magnitude of this effect can vary for men and women, especially in countries, where men are seen as better workers. In such cases, even highly educated women may face discrimination and therefore underemployment, as employers see females as less committed to work or less reliable. That's why higher education does not always guarantee equal opportunities on the labor market in terms of job offers and promotions, especially when women have to balance between work and family related responsibilities.

Family characteristics describe the household and family of the respondent, including variables such as marital status and number of children.

It is expected that married women would have lower probability of employment. The idea is that married women, especially in traditional societies, choose household work and caregiving responsibilities over paid work. If the spouse already brings enough income for the family, women may decide to be housewife, as there is no economic necessity to work for pay. Furthermore, social norms and

family expectations may put pressure on women to prioritize caregiving and household responsibilities, regardless of their education or career ambitions.

Increasing number of children is expected to correspond to lower probability of employment for woman. Women often have to stay at home to care for children, due to cultural norms or personal preferences, expensive nursery schools or country-specific laws. Childcare availability and affordability influence this relationship, so that number of children would have stronger effect in countries lacking family-friendly policies. It may be reasonable to test model specification including number of children and a squared component, as magnitude of the effect from having each additional child is probably decreasing.

Overall, the model incorporates individual and family related characteristics along with attitude measure of SNI. Model is aimed at understanding what factors influence employment decisions of women, while controlling for country differences.

Chapter 4

DATA

For the purposes of this research data from World Values Survey (WVS) (2022) was taken. World Values Survey is the largest non-commercial academic social survey, which investigates human beliefs and values across the world. It includes questions about gender roles, family, religion, education, cultural values, political views etc. WVS is organized in waves conducted every 5 years and collects data from 120 countries, claiming to represent 94,5% of the world population. This study uses data from the last 3 waves to investigate how effects change over time. The latest 7th wave of the survey was conducted during 2017-2022 years in 66 countries. 5th and 6th waves were held in 2005-2009 and 2010-2014 years with data from 58 and 60 countries accordingly. Excluding countries for which data from less than two of these three waves is available, we have 60 countries left. Combining several waves improves statistical power and at the same time allows for the exploration of temporal trends.

Gender gap in employment for each of these countries can be observed on the Figure 1. This metric was calculated as the difference between employment rate for man and women within the country. We can see that gender gaps in employment are widest in Latin America & Caribbean, and Middle East & North Africa regions. The best situation in terms of gender gap in employment is in North America region. Taking into account regional differences, it would be reasonable to add control for regions or countries in the model specification. Country fixed effect would help to account for unobserved macro-level factors, such as labor market structure, laws and family-related policies. Moreover, regional variation in gender gaps reflects institutional and cultural differences, so it cannot be omitted in the model.

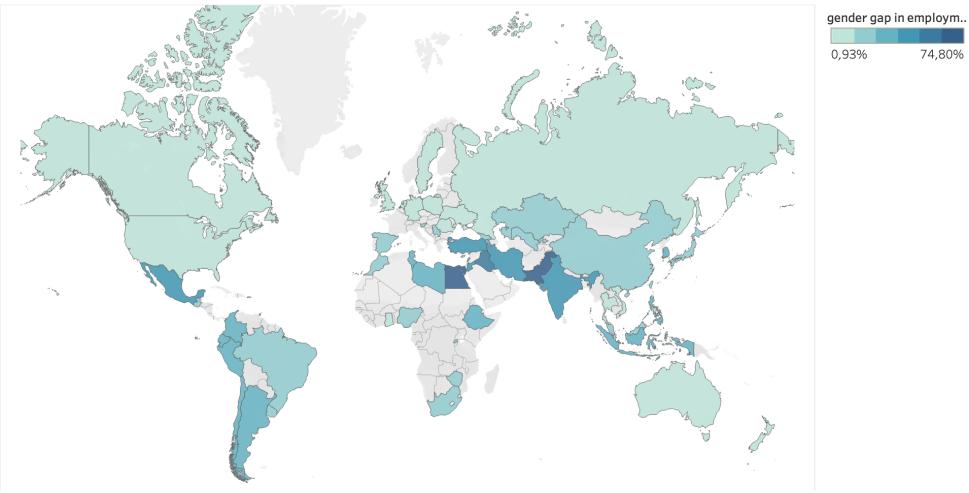

Figure 1. Gender Gap in employment, p.p.
Source: author's calculations, WVS (2022).

Descriptive statistics for original variables, used in the research, are presented in Table 1. The average age of the respondents is 42 years, ranging from 15 to 103 years. Share of women in the dataset is about 52% of all respondents. On average respondents have medium education level and most of them have full-time employment. Overall, the dataset is relatively balanced in terms of gender and contains sufficient variation in key individuals' characteristics for usage in regression analysis.

Looking at the mean values of statements, which reflect attitudes to gender roles, it can be observed that respondents' answers tend to more egalitarian views. For example, the average response about importance of university for different genders is close to 3, which indicates disagreement. However, it's important to note that the dataset may have underrepresentation of African countries, which are the least progressive in gender related views.

Table 1. Descriptive Statistics

Variable Code	Variable	Min	Max	Mean	Median	Mode	Range	St. Dev
X001	Sex	1	2	1.52	2	2	2	0.50
X003	Age	15	103	42.24	40	30	89	16.56
X007	Marital Status	1	6	2.70	1	1	6	2.17
X011	Children	0	5	1.76	2	0	6	1.55
X025R	Education Level	1	3	1.98	2	2	3	0.74
X028	Employment Status	1	8	3.30	3	1	8	2.13
D057	Being a housewife just as fulfilling	1	4	2.23	2	2	4	0.91
D059	Men make better political leaders than women do	1	4	2.54	3	3	4	0.97
D060	University is more important for a boy than for a girl	1	4	3.00	3	3	4	0.90
D061	When a mother works for pay, the children suffer	1	4	2.52	3	3	4	0.92
D078	Men make better business executives than women do	1	4	2.67	3	3	4	0.96
C001	Jobs scarce: Men should have more right to a job than women	1	3	1.78	2	2	3	0.71

Source: author's calculations, WVS (2022).

The dependent variable Employment is derived from respondents' answers to a question "Are you employed now or not?" (X028). Original answers are recoded by next logic:

- Employment=1, if answered: 1 - "Full time", 2 – "Part time", 3 – "Self-employed";
- Employment=0, if answered: 4 – "Retired", 5 – "Housewife", 6 – "Students", 7 – "Unemployed", 8 – "Other".

Some of the independent variables were also recoded. Sex was refactored as 0 for man and 1 for women. Marital Status was also mutated to be binary variable, being equal to 1 if the person is married or living together as married, while 0 captures situations of being single, divorced, separated or widowed. Such recoding helps to simplify the interpretation of the model coefficients.

Education level variable takes three values: low, medium and high. Children variable counts the number of children if there are less than 5 of them. For individuals with 5 or more children, the variable is always 5. This top-coding helps to reduce the influence of outliers and ensure better comparability.

To account for gender norms SNI was derived from next WVS questions:

- "When a mother works for pay, the children suffer",
- "On the whole, men make better political leaders than women do",
- "A university education is more important for a boy than for a girl",
- "On the whole, men make better business executives than women do",
- "Being a housewife is just as fulfilling as working for pay",
- "When jobs are scarce, men should have more right to a job than women".

Each of these questions could be answered in 4 options: 1 – "Agree strongly", 2 – "Agree", 3 – "Disagree", 4 – "Strongly disagree". The original values for each

answer were normalized to be on the scale from 0 to 1. Then SNI for each respondent was calculated as the mean of these values. This approach ensures that index reflects standardized scale, which is easy to interpret. Higher values represent more progressive views on gender roles, while lower values indicate more patriarchal attitudes.

Correlation plot of the original answers is provided below in Figure 2.

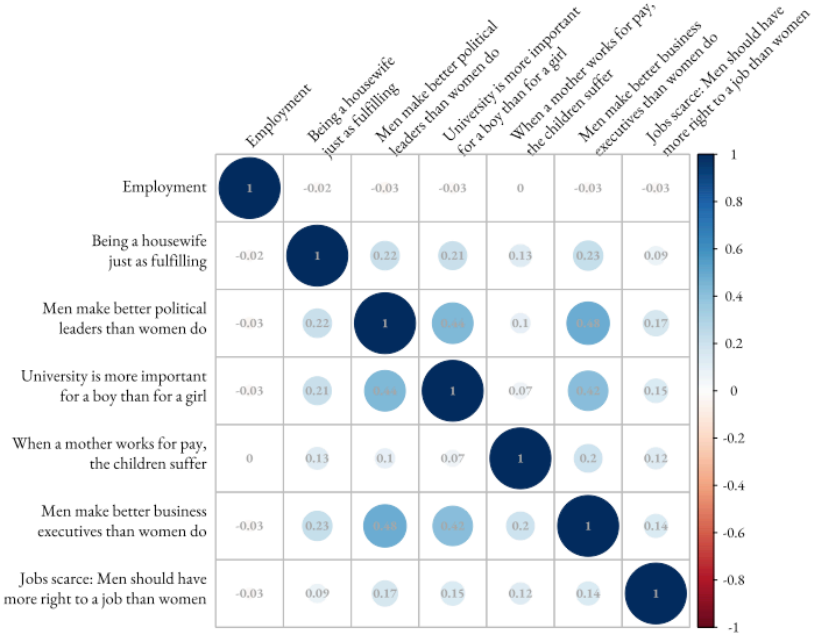

Figure 2. Correlation plot of variables describing gender role attitudes.

Source: author's calculations, WVS (2022).

We can observe strong positive correlations between statements, which describe man domination over women in politics and business and importance of higher education. "Being a housewife is just as fulfilling as working for pay" also shows correlation with these statements. Two other ones, which are left, describe attitude

to whether mothers can have paid work and whether employers should prioritize men over women when selecting individuals for work. These also show positive correlation with all other statements, however the magnitudes are lower. At the same time, we see almost no correlation of these with employment. When rerunning the same plot only for women, small negative correlations with the gender role attitudes can be observed.

Chapter 5

ESTIMATION RESULTS

This chapter presents estimation results for the mixed effects logistic model for employment. Table 2 provides marginal effects of estimated coefficients for the employment model. The first column includes results of the full pooled model with interaction terms, while second and third columns contain separate estimations for females and males.

All models include controls for WVS wave and country as random intercepts to control for unobserved heterogeneity across different periods and country-specific characteristics. Such modelling approach allows to isolate individual-level effects, while accounting for varied context in countries.

As expected, gender plays a significant role in employment prediction. Being a woman lowers the log-odds of being employed by -1.220 compared to men. This confirms the existing gender gap in employment, which cannot be explained with all the control variables.

Number of children affects males and females differently. From the full model we can observe that marginal effect of variable Children for employment is positive, while interaction term Sex*Children is negative. This means that additional child for a man increases employment probability, conversely, decreases for a woman. Figure 3 shows the opposite directions of marginal effects from having children by gender. Looking at separate models for males and females, number of children is negatively associated with females' employment, but has no statistically significant effect for men. Therefore, we can confirm the presence of motherhood penalty.

Table 2. Marginal effects of estimated coefficients (dependent variable: Employment)

Variable	All	Female	Male
Sex	-1.220*** (0.012)	-	-
Children	0.146*** (0.011)	-0.174*** (0.011)	0.002 (0.013)
SNI	-0.089*** (0.012)	0.105*** (0.013)	-0.019 (0.014)
Age	-0.095*** (0.008)	-0.006 (0.011)	-0.245*** (0.013)
Age^2	-1.062*** (0.008)	-1.006*** (0.011)	-1.087*** (0.011)
Education	0.224*** (0.007)	0.342*** (0.009)	0.091** (0.010)
$Education^2$	0.061*** (0.007)	0.080*** (0.009)	0.033*** (0.010)
Married	0.123*** (0.014)	-0.200*** (0.018)	0.766*** (0.024)
Settlement Size	0.068*** (0.007)	0.064*** (0.009)	0.081*** (0.011)
Sex × Children	-0.427*** (0.012)	-	-
Sex × SNI	0.255*** (0.013)	-	-
Constant	1.800*** (0.094)	0.723*** (0.121)	1.447*** (0.093)
Observations	173 323	90 771	82 552
Log-likelihood	-92 161.74	-50 091.27	-39 656.07
Pseudo R^2	0.429	0.401	0.419

Note: Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '.' 1

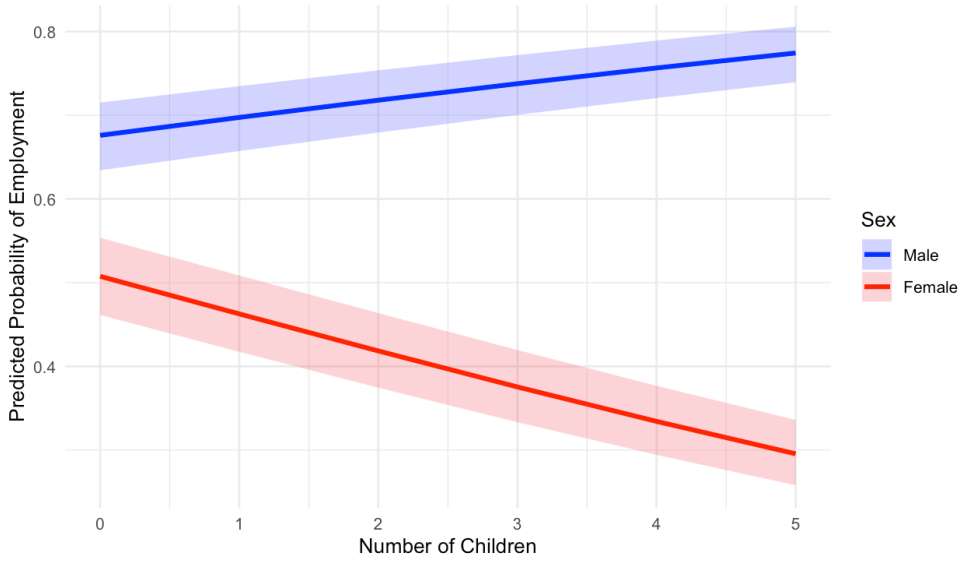

Figure 3. Marginal Effect of Number of Children on Employment by Sex

Social Norms Index coefficients also shows statistically significant effects on employment outcomes, which are again opposite for males and females, which can be observed looking at Figure 4. Higher SNI (more progressive views) is associated with positive relationship with woman's employment. We can conclude that traditional views on gender roles is one of the constrains on female employment. Interesting, that SNI coefficient is not statistically significant for man. This can either indicate that men are not influenced by social norms, or that these norms are so deeply rooted that men have to take the main breadwinner role regardless of egalitarianism. Our findings highlight the importance of social context and cultural attitudes in shaping women employment outcomes. There cannot be significant advances in female employment levels without shift in social views.

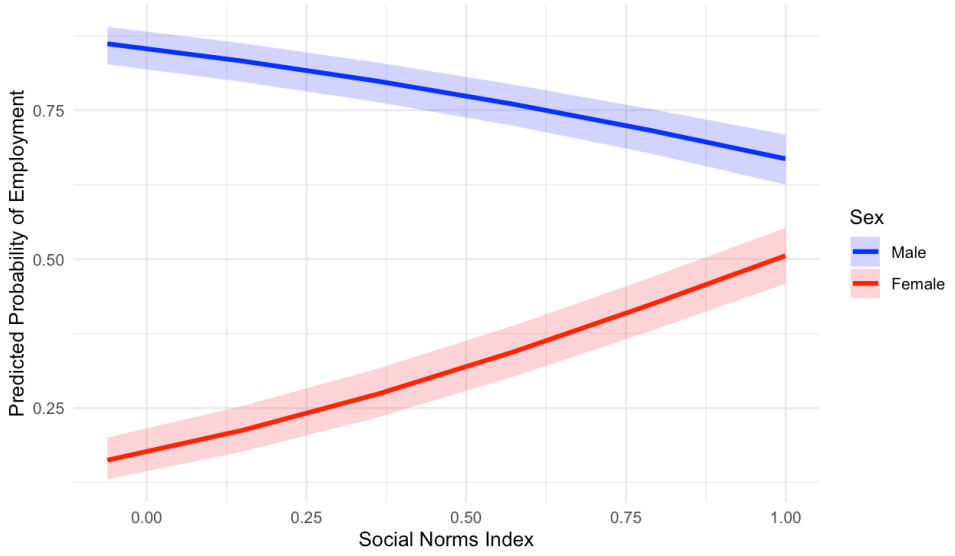

Figure 4. Marginal Effect of Social Norms Index on Employment by Sex

Marriage coefficients also behave as expected, showing negative effects for women's employment. Conversely, marriage for men is positively associated with employment. Such results confirm that the presence of traditional gender roles in families has effects on the labor market outcomes. Family responsibilities are still not equally shared in many families, so that marriage becomes one of the barriers towards career for many women.

Other variables indicate expected relationships with employment probability. Age shows inverted U-shaped effects on employment. Education increases employment probability for both genders, however the marginal effect is much higher in only female model. This can indicate that promotion of education for women can be one of the possible growth points for the employment levels.

Comparing calculated pseudo-R^2 for male and female employment models, we can observe lower value for females only specification. Such difference can mean that there are more unobserved factors influencing women employment, which are not

captured in the model. These can include caregiving responsibilities for older family members, employer discrimination, gender-specific policies or laws, or cultural attitudes, which are not easy to quantify. There is room for further research, incorporating variables, which would measure amount of unpaid household and caregiving work.

Table 3 presents the robustness checks of the model, including reduced basic model without interaction terms (1). Model (2) includes only control for the motherhood effects (interaction Sex* Children). Model (3) is the full model with two interaction terms to control for both motherhood and social norms effects by sex. Comparing log-likelihood and pseudo-R^2 we can conclude that the full model provides the best fit. We have also run likelihood ratio test, which confirmed that addition of interaction terms increased the model fir statically significantly. So, we can prove the hypothesis that gender interactions with number of children and SNI influence employment outcomes, and their omitting would lead to model misspecification.

To evaluate model's predictive power, we have calculated the Area under the Receiver Operating Characteristics Curve, which can be seen on Figure 5. The ROC curve for the employment prediction model indicates good fit. AUC value of 0.808 indicates that the model can predict employment with 80,8% chance. High level of model predictive power indicates that it can be a useful tool for employment prediction and policymaking based on it.

Summing up, we have estimated the mixed effects logistic model for employment. The model incudes controls for country and WVS wave, but focuses on exploring effects of gender, parenthood, social norms and their interactions on employment.

Table 3. Robustness check. Marginal effects of estimated coefficients excluding interaction terms (dependent variable: Employment)

	Model Specification		
Variable	(1)	(2)	(3)
Sex	-1.162***	-1.194***	-1.220***
	(0.012)	(0.012)	(0.012)
Children	-0.099***	0.161***	0.146***
	(0.008)	(0.011)	(0.011)
SNI	0.062***	0.051***	-0.089***
	(0.009)	(0.009)	(0.012)
Age	-0.067***	-0.098***	-0.095***
	(0.008)	(0.008)	(0.008)
Age^2	-1.039***	-1.064***	-1.062***
	(0.008)	(0.008)	(0.008)
Education	0.242***	0.225***	0.224***
	(0.007)	(0.007)	(0.007)
$Education^2$	0.061***	0.060***	0.061***
	(0.006)	(0.007)	(0.007)
Married	0.164***	0.115***	0.123***
	(0.014)	(0.014)	(0.014)
Settlement Size	0.066***	0.068***	0.068***
	(0.007)	(0.007)	(0.007)
Sex × Children	-	-0.453***	-0.427***
		(0.012)	(0.012)
Sex × SNI	-	-	0.255***
			(0.013)
Constant	1.720***	1.808***	1.800***
	(0.093)	(0.094)	(0.094)
Observations	173 323	173 323	173 323
Log-likelihood	-93 096.88	-92 356.48	-92 161.74
Pseudo R^2	0.413	0.427	0.429

Note: Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '.' 1

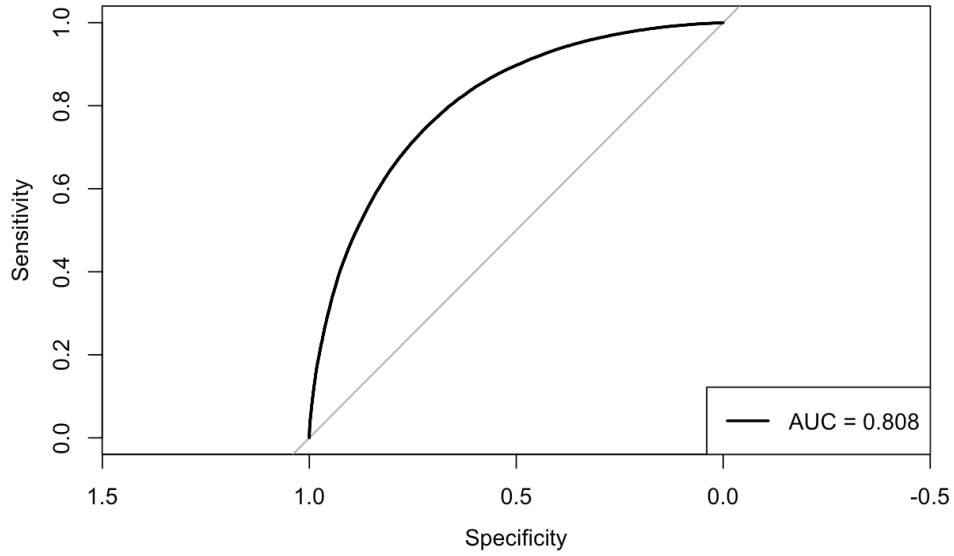

Figure 5. ROC curve for Mixed Effects Logistic Model

Our estimations results support the hypotheses that gender role beliefs and parenthood have statistically significant influence on female employment. The gender gap in employment persists: women are significantly less likely to be employed compared to men. Traditional gender roles distribution in families continue to keep barriers for female employment. We have also confirmed the presence of motherhood penalty, indicating that mothers are less likely to have a job. Education is a significant predictor of employment for both men and women, but its magnitude is higher for women. This means that making education available and affordable for everyone can be one of the growth points for employment levels.

Chapter 6

CONCLUSIONS AND POLICY RECOMENDATIONS

In this paper, we have investigated how gender norms and parenthood influence gender employment gap, utilizing data from the last three waves of the World Values Survey. This research firstly introduces usage of mixed effects logistic model to predict gender employment outcomes, controlling for social norms and individual level characteristics. The model includes random intercepts for countries and WVS waves, treating them as clusters, allowing to observe within country and within wave variations.

The model confirmed that Social Norms Index has statistically significant effect of female employment. Women with more egalitarian views on gender roles are more likely to be employed, regardless of their education, age or marriage status. However, men's employment is not affected by the social norms, which is not surprising as men are not the discriminated ones.

We have found statistically significant presence of motherhood penalty: every additional child lowers the probability of woman to be employed, while there is no statistically significant influence on males' employment. Caring responsibilities are still one of the biggest barriers for female employment. Patriarchal gender roles in families are confirmed by the marriage variable estimated coefficients. Marriage lowers the employment probability for woman, while significantly increases for men, indicating that men are taking the main breadwinner role.

We have also seen evidence that female employment can be less explained with observed variables, indicating that there are unmeasured factors (such can be employer discrimination, willing of being employed, which are not captured by WVS questions).

Education is significant predictor for women employment, uncovering possibility of policy implemented. Promotion of equal education for women and men can be one of the possible growth points for the employment levels. Of course, each country's context matters a lot, and such policies should be adapted.

In many developing countries, the gender roles are deeply rooted from the early childhood. Girls are raised only for marriage, children, serving her partner and doing household work. For such cases, access to education is not enough as many girls would still be forced to choose marriage over education and career. In such regions, policies should firstly work with society views, promoting gender equality through media campaigns, support programs and local public opinion influencers.

Changes in female employment levels cannot be done without shifting public attitudes. It's important to provide equal possibilities from the early childhood, as well as work with social context, challenging traditional stereotypes about genders. One way to do this is introduction of dialogues on gender equality with children and teenagers in schools. Young generations' views are easier to reshape than their parents', so the attitudes to gender roles learned at school can be pursued in their lives. Girls should understand that they can enter university and start a career in any field. Boys, who were taught gender equality would be more loyal to their wives' desire to work outside home and divide household responsibilities.

Moreover, women should be encouraged to pursue career after completing education. It's important to make policies, which would help women overcome common obstacles, such as caring responsibilities at home and employers' discrimination. It may be reasonable to introduce a support program for women, who want to return to workplace after the birth of the child. This can include affordable public childcare for all, introducing gender quotas in companies, legal protection against discrimination at workplace, encouraging flexible hours or

remote work. Such measures would help women combine career with the burden of family and household responsibilities.

Summarizing everything above, this research one more time confirms the presence of barriers to women employment, indicating that social norms and roles in families matter. There is no simple solution to closing the gender employment gap. It is the question, which requires comprehensive approach, which would cover education system and labor market policies, reshaping society views on genders and transformation of social norms, introduction of female support programs.

WORKS CITED

Adserà, Alícia, and Federica Querin. 2023. "The Gender Wage Gap and Parenthood: Occupational Characteristics Across European Countries." *European Journal of Population*.

Alesina, Alberto, Paola Giuliano, and Nathan Nunn. 2013. "On the Origins of Gender Roles: Women and the Plough." *The Quarterly Journal of Economics* 128 (2): 469–530.

Bertrand, Marianne, Patricia Cortes, Claudia Olivetti, and Jessica Pan. 2021. "Social Norms, Labour Market Opportunities, and the Marriage Gap Between Skilled and Unskilled Women." *The Review of Economic Studies* 88 (4): 1936–1978.

Bruijn, Anna de, and Emily Janoch. 2024. *The Cost of Inequality. Why the Global Economy Cannot Afford to Leave Women Behind*. https://www.care.org/wp-content/uploads/2024/11/Cost-of-Inequality_11.22.24_FINAL.pdf.

Budig, Michelle J. 2014. *The Fatherhood Bonus and The Motherhood Penalty: Parenthood and the Gender Gap in Pay* . Third Way.

Collins, Caitlyn, Liana Christin Landivar, Leah Ruppanner, and William J. Scarborough. 2021. "COVID-19 and the gender gap in work hours." *Gender Work Organ*, 549–560.

Cukrowska-Torzewska, Ewa, and Anna Lovász. 2017. "“The impact of parenthood on the gender wage gap: A comparative analysis of 26 European countries." *Budapest Working Papers on the Labour Market No. BWP - 2017/15*.

Esteban, Ortiz-Ospina, Tzvetkova Sandra, and Roser Max. 2018. *Women's Employment*. https://ourworldindata.org/female-labor-supply.

Gallup, Inc., International Labour Organization (ILO). 2017. "Towards a better future for women and work: Voices of women and men."

Goldin, Claudia. 1995. "The U-Shaped Female Labor Force Function in Economic Development and Economic History."

Grimshaw, Damian, and Jill Rubery. 2015. *The motherhood pay gap: a review of the issues, theory and international evidence*. Geneva: International Labour Office.

Hansen, Casper Worm, Peter Sandholt Jensen, and Christian Volmar Skovsgaard. 2015. "Modern gender roles and agricultural history: the Neolithic inheritance." *Journal of Economic Growth* 20 (4): 365-404.

Inglehart, Ronald, Christian Haerpfer, Alejandro Moreno, Christian Welzel, Kaie Kizilova, José Diez-Medrano, Marta Lagos, Pippa Norris, Evgeny Ponarin, and Bogdan Puranen, eds. 2022. "World Values Survey: All Rounds – Country-Pooled Datafile Version 3.0." Madrid, Spain & Vienna, Austria: JD Systems Institute & WVSA Secretariat.

Iqbal, A., Hassan, S., Mahmood, H., & Tanveer, M. 2022. "Gender equality, education, economic growth and religious tensions nexus in developing countries: A spatial analysis approach." *Heliyon* (Heliyon).

Jayachandran, Seema. 2015. "The Roots of Gender Inequality in Developing Countries." *Annual Review of Economics* 7: 63-88.

Kanjilal-Bhaduri, Sanghamitra, and Francesco Pastore. 2017. "Returns to Education and Female Participation Nexus: Evidence from India." Institute of Labor Economics.

Klasen, Stephan, Janneke Pieters, Manuel Santos Silva, and Le Thi Ngoc Tu. 2021. "What Drives Female Labor Force Participation? Comparable Micro-Level Evidence from Eight Developing and Emerging Economies." *The Journal of Development Studies* 417-442.

Lomazzi, Vera, and Daniel Seddig. 2020. "Gender Role Attitudes in the International Social Survey Programme: Cross-National Comparability and Relationships to Cultural Values." *Cross-Cultural Research* 54 (4): 398-431.

OECD. 2024. *Education at a Glance 2024: OECD Indicators*. Paris: OECD Publishing.

Tamara, Sliusarenko, Shpak Solomiya, and Olena Nizalova. 2016. "The motherhood wage penalty in times of transition." *Journal of Comparative Economics*, 56-75.

UN-Women and DESA. 2024. *Progress on the Sustainable Development Goals: The Gender Snapshot 2024*. New York: UN-Women and DESA.

Yamada da Silveira, Leda Tomiko, Juliana Carvalho Ferreira, and Cecilia Maria Patino. 2023. "Mixed-effects model: a useful statistical tool for longitudinal and cluster studies." *J Bras Pneumol* (49(2):e20230137).