



## AKTUAR MOLIYA VA BUXGALTERIYA HISOBI ILMIY JURNALI

Vol. 5 Issue 01 | pp. 101-108 | ISSN: 2181-1865

Available online <https://finance.tsue.uz/index.php/afa>

### MOTHERHOOD AND FEMALE LABOR FORCE PARTICIPATION REVISITED: EVIDENCE FROM INFERTILITY SHOCKS



Akhmedova Nodira Ruzimukhammad kizi

Visiting Practitioner at  
Westminster International University in Tashkent

**Abstract:** Over the last 50 years, the global increase in women's labor force participation has been accompanied by a substantial decline in fertility rates. While the negative correlation between fertility and female labor market engagement is well-documented, its extent and underlying causes differ across regions. In Central Asia, women's labor force participation increased modestly from 30% to 34% between 1990 and 2013, whereas fertility rates declined from 3.8 to 2.8 children per woman during the same period. This suggests that factors beyond childbearing may constrain women's entry into the labor market. This study investigates the causal impact of family size on women's labor force participation in Uzbekistan and Kazakhstan. Using infertility as an instrumental variable to address endogeneity in fertility decisions, the analysis builds on the methodology proposed by Agüero and Marks (2008). The research hypothesizes that patriarchal norms, particularly prevalent in Uzbekistan, inhibit women's labor market participation regardless of their fertility status. The findings are expected to contribute to the design of more effective policies aimed at promoting women's employment in Central Asia.

**Keywords:** Women's labor force participation, fertility rates, family size, Central Asia, Uzbekistan, Kazakhstan, patriarchal norms, employment constraints, endogeneity, infertility instrument, Demographic and Health Surveys (DHS), policy implications, education and labor force, rural-urban disparity, instrumental variable regression.

#### Introduction

The growing number of women in the global labor force has been an important trend for the past fifty years. Existing literature offers a number explanations, such as substantial reduction in the number of male population after the World War II (Mahoney, 1961), technological development and, social organizations which provide support and encourage female employment, changing employer attitudes towards working women (McGrattan & Rogerson, 2004).

As a result of women empowerment and increased female participation in the labor force, the last 45 years witnessed a dramatic global decline in fertility. Indeed, in 2010-2014 the fertility rate in the less developed parts of the world was 2.75 children per female, while this number was 5.41 in 1970-1975 (United Nations, 2014). The negative relationship

between birth rate and women's participation in the labor market is found across countries and believed to have a causal relationship by many researchers, albeit the extant results seem to be somewhat mixed. Particularly, women labor force participation rate in Central Asia increased from 30% to 34% during the period 1990-2013 (Asian Development Bank, 2015). While through the same years the total fertility per woman decreased from 3.8 to 2.8 (United Nations, 2013). The slow growth of the female labor force participation may suggest that the relationship between this rate and children is not very strong in Central Asia and there are other constraints, apart from the presence of children, which stop females from entering to the labor market. Therefore, it is important to estimate the correlation between children and women's participation in the employment market in order to make efficient policy implications which will increase the number of women in the labor market of Central Asian countries.

Early literature put forth a number of methodological propositions to examine this relationship, such as twinning (Bronars and Grogger 1994; Jacobson 1999) and sex composition of the first two children (Angrist and Evans 1998; Cruses and Galiani 2007) were employed as instruments for family size. However, these approaches were restricted to the effect of having an additional child on woman labor force participation. Moreover, those results are likely to suffer from the endogeneity of fertility. Specifically, a woman's choice on how many children to have is affected by her labor force participation. Therefore, the negative relationship between number of children and labor force participation may be potentially biased. To overcome this problem Agüero and Marks (2008) propose a new approach, to use infertility as an instrument for family size. Unlike previous strategies, using infertility as an instrument enables analysis of the differential labor supply between childless females and females with children. In contrast with the common belief in the literature, they find that children do not have a causal effect on female labour participation in six Latin American countries. Importantly, their results suggest that policies based on family planning cannot be efficient in increasing female labor participation in Latin American countries.

The proposed research aims to examine the presence of the causal effect of children on female labor force participation using DHS data for two Central Asian countries (Uzbekistan, Kazakhstan). To that end, we shall employ the methodology of Agüero and Marks (2008) to test for the negative relationship between the family size and women labor force participation, because of patriarchal attitudes (mostly in Uzbekistan) which in most of cases prohibit wife's labor force participation. In other words, the paper forecasts that there is no difference in the labor force participation between infertile and fertile women, as majority of husbands just do not allow their wives to work (Hammerle, et. al, 2008).

The research paper proceeds as follows: section 2 discusses practical contribution of the research. The next part introduces the hypothesis development. Section 4 represents literature review on the studies about the infertility instrument and female labor force participation. Section 5 outlines the data and methodology. The last part contains conclusion.

### **Practical contribution of research**

Employment is an indicator of women's status. In comparison to an unemployed woman, employed woman is more likely to have and control own financial resources, to contact with people other than the family, to be more informed about the world outside the home and to be able to function in the nondomestic sphere. Moreover, employed females play an important role in the economic growth of the country. Therefore, empowerment of women in the labor market is one of the main issues of the government. (Kishor and Neitzel, 1996)

To apply proper policy which will improve female economic empowerment in Central Asian countries, first of all, the government should identify what constrains women from entering the labor force. If the research estimates that there is no causal effect between children and female labor force participation in the chosen four countries, a common belief that a female employment rate can only be increased by declining family size becomes inefficient. In other words, results will suggest that policies based on family planning are unlikely to make a significant contribution in the growth of female labor force participation.

In this case there are other barriers, such as husbands' negative attitudes toward wives' participation in the labor force, social norms that highlight domestic work as the primary responsibility of women, a labor market that discriminates and offers women lower wages and lower quality jobs, which constrain females from entering the labor market. Taking into consideration these obstacles, policies may suggest to create a more flexible and family-friendly workplaces, to develop the security and protection of female workers, to organize skill-trainings and to encourage women to demand better workplace conditions. (Asian Development Bank, 2015)

#### Hypothesis development

The research aims to test the following hypothesis:

- Is the relationship between the presence of children and female labor force participation mainly negative or vice versa for Kazakhstan and Uzbekistan? Clearly, at this stage, the nature of correlation is unclear. The negative relationship will suggest to develop family planning policy to increase women labor force participation rate in the countries, while positive or no effect one will inform that there are other issues, such as spouses' control, poor labor market which constrain women from entering the labor force
- Is the correlation between children and women labor force stronger for rural households or urban ones?
- Are infertile women more educated and skilled than fertile females? If yes, is the discrepancy between them really significant?

#### Literature Review

Female labor force participation shows the level of women's involvement in economic activities. Several factors affect women's decision about participation in the labor force. The presence and quantity of young children in the household is one of the important reasons of the lack of females' involvement in the labor force, as in most cultures, women are the main suppliers of household care needs (Moghadam, 2004; Piras and Ripani, 2005).

A negative relationship between the presence of children and female participation in the labor force is well analyzed and found across countries by many scholars (Bloom et al., 2009; Kögel, 2004; Schultz, 2008). However, the quantity of children a woman has can be influenced by her labor force participation. Also, there are unobserved factors that are likely to impact female labor force participation and fertility. For example, most of independent women may decide to have fewer (or no) kids and they may also be overrepresented in the labor force. Therefore, the negative correlation between children and labor force participation may be biased. (Agüero and Marks, 2008)

To remedy the above bias relationship scholars suggest to apply an exogenous source of variation in family size. Cruses and Galiani (2007) used the sex composition of the first two kids to analyze the relationship between family size and female labor force participation in Argentina and Mexico. Their results showed that females without desire to balance sex mix of their offspring, who are persuaded to have a third child are less expected to be in the paid labor force. Their strategy was criticized by Schultz (2008) who stated that in countries where dowries are required, the gender of children might have a wealth impact. While Caceres-Delpiano (2008) applied twinning on the first birth as an exogenous variation in family size and found that because of twins women are less likely to participate in the labor force.

Agüero and Marks (2008) mentioned that above strategies restrict the sample to females with at least one or two births and they are limited to the influence of having an additional kid on labor force participation. They introduced infertility shocks as an instrument for family size to estimate the causal impact of children on female labor force participation. Obviously, the infertility impacts the quantity of kids a woman can have. Also it is a random variable. Unlike previous approaches (twinning or sex mix), to use the infertility can explore the differential labor supply between females with children and childless women. (Agüero and Marks, 2008)

### **Methodology**

The paper uses cross-sectional data from the Demographic and Health Surveys (DHS) in Uzbekistan (1996) and Kazakhstan (1999). Females answered questions about their birth history, fertility preferences, contraceptive use, employment status, education, marital and health status. Main sample contains 9215 women between the ages 15 and 49.

Not all countries with a DHS III could be included in the analysis. To be included a survey had to meet the following criteria: (1) the survey had to include questions that were used to identify infertile women and these questions needed to be asked to the entire sample of women; (2) the infertility questions needed to include infertile, subfertile, subfecund, or unable to get pregnant as a standalone response; (3) the survey had to contain information about participation in the labor force and intensity of work in a consistent manner; (4) the data had to be publicly available

The paper identifies self-reported infertility in two ways. "The first is when women mentioned sub-fertility or infertility as their reason for not currently using contraceptives. In the second, when asked about their desire for future children, non-sterilized women responded that they are unable to have more children" (Agüero and Marks, 2008). In either

of both cases the research defines a woman as infertile. The estimation analysis excludes students, females, who were using contraceptives, sterilized women and the virgins.

Please, see Appendix for the preliminary descriptive statistics of the data.

#### *Estimation Strategy*

The main regression model is given by:

$$LFP_i = \alpha + \beta K_i + \sum_j \gamma_j AGE_{ji} + X'_i \delta + e_i$$

where  $LFP_i$  is a dummy variable and is equal to one if a woman is in the labor force, and zero otherwise.  $K_i$  is the number/presence of children living at home.  $X_i$  varies by model. Model 1 involves variables of educational attainment, age and country fixed effects. Model 2 is Model 1 and control variables that may affect labor force participation (marital status, age at first marriage, spouse's educational level). Model 3 represents all the variables of Model 2 and indicator of health status. (Agüero and Marks, 2008)

A typical concern with above equation is that OLS estimates of  $\beta$  may be biased due to the two elements: the correlation between the omitted variable and  $LFP_i$ , and its relationship with the variable of interest ( $K_i$ ). For example, if career ambition is the main reason for women to join the labor force and their ambition is correlated positively with the outcome variable  $LFP_i$ , while negatively with the quantity of kids, excluding the variable - ambition from the above equation biases the OLS estimates. To avoid the endogeneity concern, the paper uses infertility to instrument for  $K_i$  in the regression model (IV).

#### **Results**

Our baseline results based on 2nd stage method are reported in Table 1. We find that IV estimate for number of children at home is positive and statistically significant (at 1 % level), confirming that mothers tend to work more if they have more children. Our findings contradict findings of Agüero and Marks(2008), who mentioned females (with at least one or two births) are limited in labor force participation.

However, desire to have children and working hours of females are negatively and significantly associated with each other. Next important indicator is education level of females, and estimate for primary education is negative while for higher education is positive, both variables are statistically significant at 1 % level. This can be explained as women who have higher educational degree are more likely to work. Moreover, results for urban is significant which means that women in urban areas are more likely to work than their peers in rural areas.

**Table 1. IV results**

	worked_last_12_months
Children	0.123*** (0.032)
children_desired	-0.076***
no_education	0.119
primary_education	-0.394***
higher_education	0.343***
urban	0.144***

age_at_first_marriage	0.002
partner_no_education	0.159
partner_primary_education	0.054
partner_higher_education	-0.125***
Kazakhstan	-0.045
_cons	0.408***
N	3,932

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

### Conclusion

This study has investigated the possible relationship between children and female labor force participation by using infertility rate as an instrument for family size in Uzbekistan and Kazakhstan. The results show that there is a robustly positive link between mother's labor force participation and number of children at home. The positive association of female labor force with number of children preserves its sign and significance even after we introduce various control variables as indicated by the literature. Consequently, our results are not similar to the findings of other researchers, as it can be explained by other conditions related to only Central Asia. We document that our findings have strong policy implications for the improvement of women labor force participation rate in Central Asia.

In Column 5, we exploit having two separate survey questions that identify infertility and use each as an instrument to run a Hansen  $J$ -test for over identifying restrictions. Column 6 adds  $Infert4!Infert1*Infert2$  to the set of instruments for the Hansen  $J$ -test. Both GMM models again confirm our main finding of no causal impact of children on female labor force participation. The estimated  $J$  statistics cannot reject the joint null hypothesis of correct model specification and orthogonally of the instruments.

### Bibliography

1. Agüero, Jorge M., and Mindy Marks.,(2008). Motherhood and Female Labor Force Participation: Evidence from Infertility Shocks. *American Economic Review* 98(2):500–504.
2. Angrist, J., and Evans, W.,(1998). Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size. *American Economic Review* 88(3):450–577.
3. Asian Development Bank., (2015). Women in the workforce: an unmet potential in Asia and the Pacific. [online] Available from: <<http://www.adb.org/sites/default/files/publication/158480/women-workforce-unmet-potential.pdf>><Accessed 25 August 2015>
4. Bloom, D., Canning, D., Fink, G., and Finlay, J., (2009). Fertility, Female Labor Force Participation, and the Demographic Dividend. *Journal of Economic Growth* 14(2):79–101.

5. Bronars, Stephen, and Jeff Grogger.,(1994). The Economic Consequences of Unwed Motherhood: Using Twin Births as a Natural Experiment. *American Economic Review* 84(5):1141–56.
6. Ca'ceres-Delpiano, J.,(2008). "Keeping the best for last. Impact of Fertility on Mother's Employment. Evidence from Developing Countries." *Economics Working Papers* 08-68 (32), Universidad Carlos III
7. Cruces, G., and S. Galiani., (2007). Fertility and female labor supply in Latin America: New causal evidence, *Labour Economics*, 14(3), 565-573.
8. Hammerle, Ch., Langreiter, N., Lanzinger, M., Saurer, E., (2008). *Gender Politics in Central Asia*. BöhlauVerlag GmbH & Cie.
9. Jacobson, Joyce, James Pearce III, and Joshua Rosenbloom.,(1999). The Effects of Childbearing on Married Women's Labor Supply and Earnings: Using Twin Births as a Natural Experiment, *Journal of Human Resources* 34(3):449–74.
10. Kishor, S., and Neitzel, K., (1996). *The Status of Women: Indicators for Twenty-Five Countries*. DHS Comparative Studies No.21. Calverton, Maryland: Macro International Inc.
11. Kögel, T., (2004). Did the Association Between Fertility and Female Employment within OECD Countries Really Change its Sign?, *Journal of Population Economics* 17(1):45–65.
12. Mahoney, T. (1961). Factors determining the labor-force participation of married women. *Industrial and Labor Relations Review*, 14
13. McGrattan, R. E. and Rogerson, R., (2004). Changing in Hours Worked 1950-2000. *Quarterly Review* 28(1).
14. Moghadam, M. V., (2004). *The Gender of Democracy: The Link between Women's Rights and Democracy in the Middle East*. Carnegie Endowment for International Peace, Arab Reform Bulletin, vol. 2, issue 7 (July).
15. Piras, C., and Ripani, L., (2005). *The Effects of Motherhood on Wages and Labor Force Participation: Evidence from Bolivia, Brazil, Ecuador and Peru*. Sustainable Development Department Technical Papers Series WID–109.
16. Schultz, T. P.,(2008). *Population Policies, Fertility, Women's Human Capital, and Child Quality*, In *Handbook of Development Economics*, Volume Four, ed. T. Paul
17. Schultz and John A. Strauss, 3249–3303. Amsterdam: Elsevier Science B.V.
18. United Nations, Department of Economic and Social Affairs, Population Division (2014). *World Urbanization Prospects: the 2014 Revision, Highlights*.
19. United Nations, Department of Economic and Social Affairs, Population Division (2013). *World Fertility Patterns 2013*.

**Appendix 1. Descriptive statistics of employed women****Infertile women**

Variable	Obs	Mean	Std. Dev.	Min	Max
worked_las~s	4,087	.5593345	.4965277	0	1
age	4,087	40.17127	7.649795	18	49
no_education	4,087	.0044042	.066226	0	1
primary_education	4,087	.0066063	.0810202	0	1
secondary_education	4,087	.8612674	.3457095	0	1
higher_education	4,087	.127722	.3338209	0	1
partner_no~ education	4,068	.002704	.0519363	0	1
partner_pr~ education	4,068	.0122911	.1101951	0	1
partner_se~ education	4,068	.7991642	.4006747	0	1
partner_hi~ education	4,068	.1858407	.3890259	0	1
children	4,087	4.291901	2.477148	1	14
children_age	4,087	3.065574	1.865682	0	9
age_at_first_marriage	3,862	19.6305	2.860919	12	37
number_children	3,734	4.020621	1.910915	0	15
urban	4,087	.4886225	.4999317	0	1
age_at_first_marrige	4,07	19.85455	3.081664	10	38
Kazakhstan	4,087	.4232934	.4941415	0	1
Uzbekistan	4,087	.5767066	.4941415	0	1

**Fertile women**

Variable	Obs	Mean	Std. Dev.	Min	Max
worked_las~s	240	.6083333	.4891429	0	1
age	240	40.40833	5.725223	25	49
no_education	240	.0041667	.0645497	0	1
primary_education	240	0	0	0	0
secondary_~ education	240	.8166667	.3877482	0	1
higher_education	240	.1791667	.3842933	0	1
partner_no~ education	238	0	0	0	0
partner_pr~ education	238	.012605	.1117975	0	1
partner_se~ education	238	.7142857	.452706	0	1
partner_hi~ education	238	.2731092	.4464955	0	1
children	240	3.133333	1.737759	1	7
children_age	240	2.279167	1.639338	0	6
age_at_first_marriage	229	19.59825	2.631656	13	27
number_children	218	3.775229	1.762364	0	10
urban	240	.5958333	.4917556	0	1
age_at_first_marriage	240	19.875	2.798872	13	28
Kazakhstan	240	.4958333	.5010275	0	1
Uzbekistan	240	.5041667	.5010275	0	1

Copyright: © 2024 by the authors. This work is licensed under a Creative Commons Attribution- 4.0 International License (CC - BY 4.0)

