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Abstract:

Although fertility rates have been declining in the Middle East and North Africa (MENA) region, female labor force participation rates have remained low in the last few decades. This paper shows and discusses correlational evidence between the number of children and women's participation in the MENA region. It then discusses ways to estimate the causal effect of number of children on labor force participation.

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1. INTRODUCTION

Women in the Middle East and North Africa (MENA) region have experienced substantial change in their educational attainment. According to data by Barro and Lee (2013), 20 to 30 year old women in 2010 had nine years of education compered to two years in 1970. Besides, there was a significant reduction in fertility rates across the region (Majbouri 2015)[2]. These changes generally lead to higher labor force participation for women, but participation rates have remained puzzlingly stagnant in the last few decades at around 20%.

The little change in the low participation rate of women in the labor market in the MENA region has reinforced this argument that economic forces such as more education and lower fertility may have little impact, if any, on female labor supply in MENA. But is there really no relationship between these variables?

The answer to this question is particularly important in the context of MENA. Cavalcanti and Tavares (2008) suggest that if women's participation in Saudi Arabia increases to levels seen in the West, its GDP per capita almost reaches to the level of the US. Gender equality is not just important in terms of its economic impact and it can have many other transformational effects in the MENA region. Therefore, studying the reasons behind low female labor force participation (FLFP) in MENA and providing ways to increase it is particularly interesting. This study estimates the correlation between number of children and participation of mothers in the five countries in the MENA region: Egypt, Jordan, Morocco, Tunisia, and Turkey using Demographic and Health Surveys. It also offers solutions to estimating the causal impact of number of children on FLFP.

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[2]For detailed data on women's education and fertility, for each country in MENA, see Majbouri (2010, 2015a, 2015b).

Previous studies on the subject – which were pioneering in this field – looked at the correlation

between the number of children and female labor force participation and hence, could not show the

causal link. For example, Assaad and El-Hamidi (2002) found no correlation between the number

of children and female labor supply in Egypt. Salehi-Isfahani (2005) observed a negative correlation

only between children aged 0-3 and their mother's participation in the labor force in Iran (no

statistically significant correlation for older children). Using a larger data set, however, Esfahani and

Shajari (2012) showed a negative correlation between the number of children ever born and FLFP.

To avoid endogeneity issues, Majbouri (2010) only considered children aged 15 to 18 in the

household and found a positive correlation between the number of females in that age group and

FLFP in the household but found no correlation for the males of the same age in Iran. For Turkey,

Dayıoğlu and Kirdar (2010) estimate a negative correlation between FLFP and having children.

The next section discusses the data and methodology. Section 3 shows the results and discusses

Majbouri (2016a) that estimates the causal effect of number of children on mother's employment.

The last section concludes.

2. DATA AND METHODOLOGY

This study uses Demographic and Health Surveys (DHS) of countries in the MENA region from the

DHS programs website[3]. These include Egypt (1988, 1992, 1995, 2000, 2003, 2008, 2014), Jordan

(1990, 1997, 2002, 2007, 2012), Morocco (1987, 1992, 2003-04), Tunisia (1988), and Turkey (1993,

1998, 2003). DHS sample has mothers aged 45 and younger and their children. In DHS datasets,

whether a mother is currently working or not is observed but whether she is looking for a job (i.e.

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[3]http://www.dhsprogram.com/

being unemployed) is not recorded. Therefore, our outcome variable does not measure female

participation in the labor market. It only counts for whether mother is working or not. The summary

statistics of mothers in all these surveys (112,730 mothers) are reported in Table 1.

Table 1 – Summary Statistics of the Sample of Mothers (All countries)

Variable	Obs.	Mean	St. dev.	Min	Max
Working	113,986	0.20	0.40	0	1
Age	113,986	32.15	7.23	15	49
Years of education	113,986	8.02	5.50	0	27
Urban	113,986	0.60	0.49	0	1
Number of children	113,986	3.06	1.74	1	17

Note: Data are from Demographic and Health Surveys (DHS) of Egypt (1988, 1992, 1995, 2000, 2003, 2008, 2014), Jordan (1990, 1997, 2002, 2007, 2012), Morocco (1987, 1992, 2003-04), Tunisia (1988), and Turkey (1993, 1998, 2003). They are provided by http://www.dhsprogram.com. The individuals in the sample are mothers in households that 1) have only one mother, 2) the number of children present in the household is equal to the number of children ever born by the mother. The last condition is to make sure that all children are present in the household and their presence affect mother's decision to work. Working is a dummy equal to one if the mother was working at the time of the survey and zero otherwise. Urban is a dummy equal to one if the household resides in urban area and zero otherwise. The left panel has summary statistics for mothers whose first birth was not multiple (twin, triplet, etc.) The right panel only has mothers with gave birth to multiple babies in their first birth.

Here, we estimate the following regression to find the correlation between the number of children

and FLFP:

$$LFP_{irt} = \alpha_r + \delta_t + \beta N_{irt} + \gamma X_{irt} + e_{irt} \qquad (1)$$

in which LFP_{irt} is a dummy equal to one if mother i in region r at time t is working, α_r is the

region fixed effect, δ_t is the time fixed effect (time of the survey), N_{irt} is the number of children of

mother i in region r at time t and X_{irt} includes a series of variables for mother i in region r at time

t such as schooling, age and age squared, and marital status. The data sets are not panels and the

same mother is not observed over time. We estimate the above regression for each country

separately in Table 2.

Table 2 – Mother's Employment and the Number of Children

	Egypt	Jordan	Morocco & Tunisia	Turkey
Number of children	-0.019***	-0.022***	-0.024***	-0.014
	(0.003)	(0.001)	(0.002)	(0.008)
Years of education	0.022***	0.030***	0.025***	0.023***
	(0.003)	(0.002)	(0.002)	(0.002)
Age	0.028***	0.048***	0.016***	0.052***
	(0.005)	(0.012)	(0.005)	(0.011)
$Age^2 \times 10^{-2}$	-0.020***	-0.054***	-0.008	-0.066***
	(0.007)	(0.017)	(0.008)	(0.015)
Urban	-0.054**	-0.043***	-0.052***	-0.300***
	(0.022)	(0.012)	(0.020)	(0.011)
Region FE	Yes	Yes	Yes	Yes
Survey Year FE	Yes	Yes	Yes	Yes
Observations	58,090	31,738	10,654	10,932

Note: This table reports the estimates for Equation (1). The dependent variable is a dummy equal to one if the mother is working or not. The sample and summary statistics are described in Table 1. Regions are areas within a country. Heteroskedastic-robust standard errors corrected for correlation inside clusters are in the parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

3. RESULTS

The estimates for Equation (1), separately for each country, are reported in Table 2. These estimates

show the marginal effect of each variable on the dependent variable. The dependent variable is a

dummy equal to one if the mother is working and zero otherwise. The sample only includes mothers. The coefficient of the number of children is negative and highly significant for Egypt, Jordan, Morocco and Tunisia. It is, however, statistically insignificant for Turkey. The size of the coefficient in Egypt, Jordan, and Morocco and Tunisia is practically the same at about 0.02. This means every child is associated with a 2 percentage point reduction in the probability of mother working in the market. No surprisingly, education is positively correlated with working and age has a concave relationship with it. Urban is a dummy equal to one if the mother resides in the urban area and zero otherwise. Being in urban areas is negatively associated with the probability of a mother working. The size of the urban coefficient is almost twice as large as the coefficient for the number of children.

The results show that controlling for region and year fixed effects and mother's characteristics, having more children is inversely related to the probability of a mother working in the Arab countries in the sample. In Turkey, on the hand, no correlation between the two is found. Interestingly, Majbouri (2016b) finds that in Iran, having more children is positive correlated with the chance of a mother participating in the labor force, potentially because of omitted variable bias.

But in all these results, fertility and labor supply are choice variables and endogenous. Therefore, it is not possible to infer any causation from these associations in the data. Majbouri (2016a and b) investigate the causal link between fertility and female employment in Egypt, Jordan, Morocco, Tunisia, Turkey and Iran. Using an exogenous shock to the number of children a woman has, he studies the impact of having one more child on mother's employment status. The exogenous shock is having multiple births at first birth (twins, triplets, etc.). It is used as an instrumental variable for the number of children a mother has, to estimate the effect of children on mother's labor supply in the same countries represented in this study.

Previous work (Majbouri (2016a)) finds that this exogenous shock in the number of children does not have any impact on mother's employment in Egypt, Jordan, Morocco, and Tunisia. But, it reduces mother's employment in urban areas of Turkey. Interestingly, the result for Turkey is similar to the result for Iran found by Majbouri (2016b).

4. CONCLUSION

This study showed that in Egypt, Jordan, Morocco, and Tunisia, having more children is associated with lower levels of mother's employment while in Turkey, they are uncorrelated. But, despite the reduction in fertility rates in the last few decades, participation rates have remained stagnant in the MENA region (except Turkey). This requires a further understanding of the causal impact of number of children on FLFP. The evidence provided in Majbouri (2016a) shows that female labor supply in Egypt, Jordan, Morocco, and Tunisia is not affected by an exogenous shock to the number of children. In other words, women who participate in the labor force will participate in it regardless of this exogenous shock to their number of children. This implies that there are other more important and robust factors (such as cultural norms) that directly affect female participation and potentially overrule the effect of any other factor.

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