

The Impact of Female Empowerment on the Fourth Birth

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Abstract: The Egyptian strategy aims at reducing the fertility rate from 3.5% children per woman to 2.4 % by 2030. Egypt is one of the most populous countries in the Arab world with a population of 93 million citizens in 2016, and it is set to grow to about 120 million by 2030 if the same fertility level continues (United Nations, 2017). According to the country's statistics agency CAPMAS (CAPMAS, 2018) Egypt saw the birth of almost 2.6 million babies per year, from 2012 to 2016. The aim of this paper is to investigate the relationship between women's empowerment and their fertility choices in order to identify how, if possible, can women's empowerment contribute to lowering their fertility preference in terms of the number of children ever born and thus lowering the total fertility rate. Due to issues with measuring the direct indicators of empowerment as revealed in the paper, special focus is given to women's education and work due to their role identified in the literature as key resources of empowerment. We estimate a Cox's hazard regression model to investigate the significant factors that related to having four children. We fit our model using data from the 2012 round of Egypt Labor Market Panel Survey. Results show that reaching replacement level of having two children is a big challenge to which policy makers must pay careful attention? females who less empowered have more children than those who are more empowered also.

I. INTRODUCTION

In the literature of female's empowerment, the concept of "empowerment" is defined using different and often interchangeable terms. The construct of female's empowerment encompasses many dimensions, including reproductive, economic, social, cultural, familial, personal, legal, political, and psychological, resulting in a wide variation in perception (Malhotra A, Schuler SR and Boender C, 2012). A large body of research demonstrates that a woman's strength is associated with reproductive outcomes, including contraceptive use (Woldemichael G, 2009). Empowerment is a major pathway through which education affects fertility (Jejeebhoy SJ, 1995). Woldemicael (2009) examined empowerment and ideal family size, he used the household decision-making index as a measure of women's empowerment. Low educational achievement is linked to high fertility. According to Samari (2019) education is an important factor in the process of women's empowerment, to decline the fertility level through gains higher education. In Egypt, the total fertility rate declined to 3 births per woman in 2006; However, the demographic transition reversed, and the total fertility rate remained higher at 3.5 births per woman in 2008. The population in Egypt increased by 11 million people between 2011 and 2018, (Karasapan & Shah, 2018). Increased fertility has contributed to rapid population growth and scarcity of

resources, threatening the health and well-being of Egyptians, and the population in Egypt is expected to rise from 88 million to 128 million by 2030 (Karasapan & Shah, 2018).

Female education is an important factor that can lead to increase in women's agency and personal and social achievements (Eger, Miller, & Scarles, 2018). Education is considered a key correlate of empowerment (Malhotra et al., 2005). Accomplishments are the achievement of goals or the result of the empowerment process, including participation in the labor market or good health (Richardson, 2018).

Women's education is linked to outcomes such as poverty reduction, economic growth, greater efficiency, and greater efficiency (Cornwall, 2016). It is widely recognized that higher education is associated with lower fertility and longer birth intervals (Kravdal, 2002). Relationship between fertility and education is depend on a life path perspective and the idea that female's reproductive and other life decisions are interrelated (Elder, 1998).

Educational attainment may lead to greater labor force participation as a behavior that competes with reproduction (Martin, 2000). The direct effect of socio-economic variables on conception risk is low, but female education and employment increase the cost of having children, which directly influences fertility levels (Balk, 1994). The socio-economic status of women affects a woman's ability to participate in decisions related to fertility. Also, women who have higher economic decision-making are more likely to share in family planning decisions and use of contraception compared to women without power (Do & Kurimoto, 2012). Also, women who participate in economic decision-making are more likely to contribute in family planning decisions and contraceptive use than women without power (Do & Kurimoto, 2012). The aim of this study is to examine the relationships between education, and fertility in Egypt where most research on women's empowerment has focused. Egypt is one of the largest countries in the Arab world, recognized by a high fertility rate and a youthful population (61% under 30 years old and 34.2% under 15 years old) (Bertoli & Marchetta, 2015; Karasapan & Shah, 2018; Samari & Pebley, 2018). In Egypt, the literacy rate for women is still lower than that of men (65% among women versus 82% for men

(USAID, 2017). However, education is increasingly becoming available to girls in Egypt. Female participation in the workforce remains low, with only 25% of all women in employment (Asaad, Hind, Lacy, and Yaseen, 2018). The paper investigates whether education affects fertility through women’s empowerment in Egypt, this study will explain the relationship between education and fertility. The paper assumes that higher education is negatively correlated with fertility levels.

II. THEORETICAL FRAMEWORK

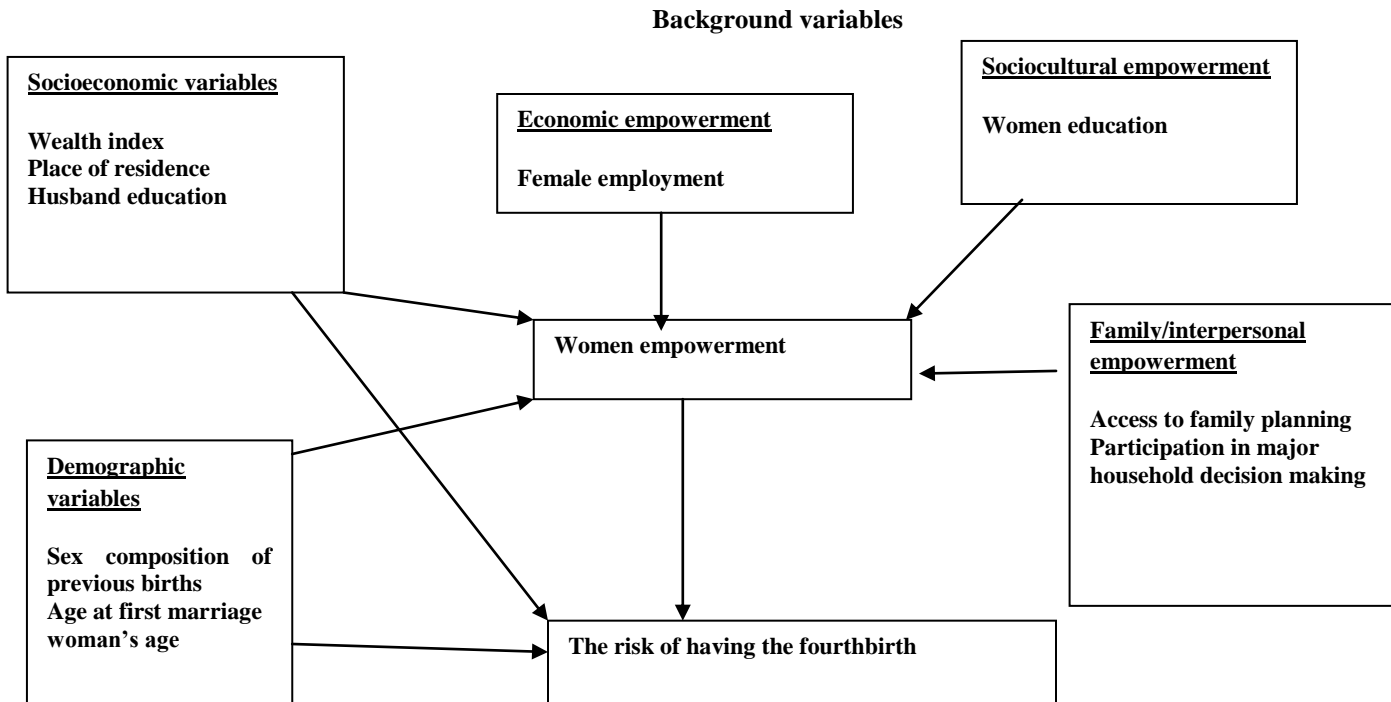
Measuring empowerment is not a straight forward task due to the complexity and multi-dimensional process. There was an emphasis on measuring family decision-making, financial control and social or family constraints. Several researchers argue that empowerment as a process can only be measured through proxy indicators, like education and employment.

The conceptual framework is used to investigate the interactive relationship between female’s empowerment and fertility preferences in Egypt in Fig. 1.

According to the framework, a woman’s empowerment is measured by three dimensions. The first-dimension is

economic empowerment, which includes female employment (Atake, Gnakou, 2019). The job characteristic is created as a composite index of job stability of job, economic sector, social security, and working in or out in the establishment. Factor analysis is used to construct the job quality index, which is then categorized into three levels: low, medium and high. Three other categories are then added to include women who never worked, women who previously worked but were not currently working, and women who do unpaid-work. The second-dimension is sociocultural empowerment, which includes women education (Batana, Ali, 2017). The last dimension is family/interpersonal empowerment, which includes access to family planning and participation in major household decision making. Also, we create an index called women’s role in household-based decision-making, which include family planning and participation in major household decision making. Each of the two variables is categorized as a dichotomy. Socioeconomic variables include wealth index, place of residence, and husband education (Upadhyay, Karasek 2012). Demographic variables include sex composition of previous births, and woman’s age (Canning, Raja, 2018). The response variable is the risk of having the fourth birth.

Figure.1 Proposed Conceptual Framework for the relationship between empowerment factors and fertility outcomes.



The framework presented in Figure 1 is a conceptual framework according to previous literatures. We can be used to model the risk of having the fourth birth and women empowerment. In addition to the outcome variable, several of the variables in the proposed framework are time-dependent

variable; which means that their values could change with the passing of the analysis time. These include woman’s age, and the job characteristics index.

III. DATA

Data used to fit the Cox's hazard regression model comes from the 2012 round of the Egypt Labor Market Panel Survey [ELMPS-12], which provides detailed information on female employment and their birth histories. The data of the survey includes birth histories for 9,337 ever-married the respondents of female aged between 15 and 49 years. Among this sample, 2,088 women have three children ever born, and 2,659 have four or more children ever born. The risk of having a fourth birth is fitted using the sample of women who have given birth to at least three children. Women with exactly three children ever born are considered as censored cases. The model for the risk of employment is fitted using data on all ever-married women who have both work and birth histories. The survey collects information on job characteristics, work history, mobility, and earnings. The survey include data about household socio-economic characteristics, and demographic characteristics. The women empowerment variables include, three boxes as we explained in the conceptual framework. For example, we analyze female employment in our paper using the job characteristic. It is created as a composite index of job stability of job, economic sector, social security, and working in or out in the establishment using. Factor analysis to construct the job quality index, which is then categorized into three levels: low, medium and high. Three other categories are then added to include women who never worked, women who previously worked but were not currently working, and women who do unpaid-work. We investigate the characteristics of women who have four children compared to those with three children.

IV. METHODOLOGY

Research has focused on several aspects of fertility like fertility preference, unmet need for contraceptive, contraceptive use and the number of children ever born. We study the characteristics of women having three children (censored cases) and those having four births (failure cases). The paper tries to explore if there are significant differences between women having three children and those having four since reaching replacement level of two children is the target for a stable population. The characteristics of women having four or more children are also studied and compared to those having three.

The study uses survival analysis techniques, namely Cox's hazard regression model with time-dependent covariates. The proportional hazards model was first introduced by Cox (1972) and then developed and utilized by Breslow (1972, 1974). The proportional hazards model is used when the variable of interest is the length of time t until an event occurs. When t refers to birth interval, the hazard is called "the force of childbearing."

Cox's (1972) proportional hazards model assumes that the explanatory variables affect the hazard function in a multiplicative way specified by:

$$h(t, x) = h_0(t). \exp(X'\beta),$$

Where,

$h(t, x)$: is the hazard of having a fourth birth.

$h_0(t)$ is the baseline hazard function, an unspecified nonnegative function of time t ; it corresponds to the hazard function for individuals whose explanatory variables are all zeros.

$\beta' = (\beta_1 \ \beta_2 \ \dots \ \beta_k)$: is a vector of regression parameters corresponding to the vector of explanatory variables.

$\exp(\beta_i)$: is interpreted as the relative change in the hazard when X_i changes by one unit.

V. RESULTS

This section includes the output of Cox's model to investigate the significant factors that related to having three or four children. The aim is to identify the variables that contribute most to the choice of having fewer children and more specifically to having three children. Table 1 gives the results of the hazard regression model.

Model fits all variables together. The studied model includes socioeconomic, demographic variables, work-related variables, and direct measures of empowerment.

For region, the model shows that, there is no significant difference between respondents living in greater Cairo, Alex, Suez, and urban lower Egypt.

However, respondents living in rural lower Egypt have 65% higher relative risk of having four children compared to those residing in greater Cairo, those living in urban and rural upper Egypt are 2.2 and 3.3 more times the risk of having four children compared to those in greater Cairo respectively.

The model shows that, as the wealth index increases the relative hazard of having four children compared to having three decreases with respondents having the highest level of the wealth index are at 45% lower relative risk compared to those at the lowest level of the index.

For the education of woman, the results show that, having secondary education or higher is associated with lower relative risk of having four children compared to having three children. Respondents who have secondary education have almost 40% lower relative risk of having four children compared to those who have no education while those with higher education have 50% lower relative risk compared to females who have no education.

Respondents who employed have 87% lower risk of having four children compared to those who do not work at all. This result supports improvement in women's status in terms of education and employment were associated with decreased percent of women having four children.

Participation in some decisions regarding daily household purchases is associated with a 76% lower risk of having four children while participation in decisions about their own

children is associated with a 69% lower risk of having four children.

For the demographic variable, the model shows that age at first marriage between 20-24 and 25 or more years differs significantly from marriage under 20 in terms of the risk of having four children compared to having three.

Table 1: Cox's hazard regression model for having four children (base category is having three children)

	Hazard ratios EXP (B)	p-value
Region		
Greater Cairo	(Reference)	
Alex & Suez	1.250	0.289
Urban Lower	1.151	0.479
Rural Lower	1.654	0.007**
Urban Upper	2.181	0.001*
Rural Upper	3.287	0.000**
Wealth Index		
Lowest	(Reference)	
Second	0.690	0.032*
Third	0.662	0.020*
Fourth	0.555	0.002**
Education		
No	(Reference)	
Primary	0.903	0.620
Preparatory	0.830	0.431
Secondary	0.597	0.003**
Higher	0.501	0.005**
Age of mother	1.15727	0.000**
Age at 1st marriage		
15-19	(Reference)	
20-24	0.352	0.004**
25+	0.229	0.000**
Mother employment status		
Not employed	(Reference)	
Employed	0.131153**	0.000**
Decision's index		
Low	(Reference)	
High	0.244014**	0.000**
Child-related decisions index		
low	(Reference)	
high	0.311178**	0.000**

Model is significant at $\alpha = 0.05$

* Significant at $\alpha = 0.05$

** Significant at $\alpha = 0.01$

VI. CONCLUSION

This study investigates seriously the effect of women's empowerment on fertility. The paper tries to analyze how female education affects on fertility among the Egyptians. Also, the paper investigates the effect of female's participation in the workforce, and women's participation in decision-making on the risk of having the fourth birth. The study estimates a proportional hazards model to investigate the significant factors that related to having three or four children. We fit our model using data from the 2012 Egypt Labor Market Panel Survey. It is a nationally representative, large, longitudinal sample of married women. Results show that reaching replacement level of having two children is a big challenge to which policy makers must pay careful attention? Also, empowerment programs should focus on improvements in women's education and job characteristic quality for women in Egypt to lower fertility.

This paper has identified three main pathways in which women's empowerment affects women's fertility. Three aspects of women's empowerment generally found to have effects on women's fertility include female education, the participation of women in the workforce, women's participation in decision-making. Increased female empowerment is often associated with lower levels of fertility, while patriarchal cultural factors are often associated with lower level of female empowerment and higher fertility.

Policies to reduce TFR should change their media campaigns and consider passing through the early stages of groups with fewer children as a goal as the message currently adopted about having two children does not appear to be well received by the population. the target, and the difference between having two or three children does not appear to have a health effect nor is it related to poverty This is evident as reported by approximately equal proportions having two or three children through different respondent characteristics. Reducing the respondent's percentage of with four or more children would have an influence on the TFR but would not help to reach the replacement level.

The programs of empowerment should focus on improvements in female's education and changing women's intrinsic agency in Egypt, to reduce fertility. Thus, providing females with potential sources of empowerment; Education and employment opportunities can help to decrease the fertility level under certain conditions related to the educational level obtained and the type of work provided.

REFERENCES

- [1] Assaad, R., Hendy, R., Lassassi, M., & Yassin, S. (2018). Explaining the MENA paradox: Rising educational attainment, yet stagnant female labor force participation. IZA Discussion Paper, No. 11385.
- [2] Atake, E.H., Gnakou Ali, P. (2019). Women's empowerment and fertility preferences in high fertility countries in Sub-Saharan Africa. BMC Women's Health 19, 54 <https://doi.org/10.1186/s12905-019-0747-9>.

- [3] Balk, D. (1994). Individual and community aspects of women's status and fertility in rural Bangladesh. *Population Studies*, 48, 21–45.
- [4] Batana YM, Ali PG. An analysis of married Women's empowerment in sub-Saharan Africa. 2015. https://ideas.repec.org/p/aer/tpaper/tp_293.html. Accessed 18 Jul 2017.
- [5] Bertoli, S., & Marchetta, F. (2015). Bringing it all back home – return migration and fertility choices. *World Development*, 65, 27–40.
- [6] CAPMAS (2018). Statistical Yearbook. Tech. rep., Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt.
- [7] Canning D, Raja S, Yazbeck AS. (2018) “Africa’s demographic transition: dividend or disaster?” <https://openknowledge.worldbank.org/handle/10986/22036>. Accessed 05 Dec.
- [8] Cornwall, A. (2016). Women's empowerment: What works? *Journal of International Development*, 28, 342–359.
- [9] Do, M., & Kurimoto, N. (2012). Women's empowerment and choice of contraceptive methods in selected African countries. *International Perspectives on Sexual and Reproductive Health*, 38, 23–33.
- [10] Eger, C., Miller, G., & Scarles, C. (2018). Gender and capacity building: A multi-layered study of empowerment. *World Development*, 106, 207–219.
- [11] Elder, G. H. (1998). The life course as developmental theory. *Child Development*, 69, 1–12.
- [12] Martin, S. P. (2000). Diverging fertility among U.S. women who delay childbearing past age 30. *Demography*, 37, 523–533.
- [13] Malhotra, A., Schuler, S. R., & Boender, C. (2005). Women's empowerment as a variable in international development. *Measuring empowerment: Cross-disciplinary perspectives*. Geneva: World Bank.
- [14] Malhotra A, Schuler SR and Boender C, (2012) “Measuring Women's Empowerment as a Variable in International Development”, Washington, DC: World Bank, June 28, 2002, http://hdr.undp.org/docs/network/hdr_net/GDI_GEM_Measuring_Womens_Empowerment.pdf.
- [15] Karasapan, O., & Shah, S. (2018). Egypt's population: Boom then bust? Future development. Washington, DC: Brookings Institute.
- [16] Kravdal, Ø. (2002). Education and fertility in sub-Saharan Africa: Individual and community effects. *Demography*, 39, 233–250.
- [17] Jejeebhoy SJ, (1995) “Women's Education, Autonomy, and Reproductive Behaviour: Experience from Developing Countries”, Oxford: Clarendon Press.
- [18] Richardson, R. A. (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research*, 137, 539–557.
- [19] Samari, G., & Pebley, A. R. (2018). Longitudinal determinants of married women's autonomy in Egypt. *Gender, Place & Culture*, 25(6), 799–820. <https://doi.org/10.1080/0966369X.2018.1473346>.
- [20] Samari, G. (2019). Women's empowerment in Egypt: The reliability of a complex construct. *Sexual and Reproductive Health Matters*, 27, 1. <https://doi.org/10.1080/26410397.2019.1586816>.
- [21] UNITED NATIONS (2017). *World Population Prospects: The 2017 Revision*. UN Department of Economic and Social Affairs, New York.
- [22] Upadhyay UD, Karasek D. (2012) “Women's empowerment and ideal family size: an examination of DHS empowerment measures in sub-Saharan Africa”. *Int Perspect Sex R H.*; 38(2):78–89.
- [23] USAID. (2017). *Gender equality and Women's empowerment*. Washington, DC: USAID.
- [24] Woldemicael G, (2009) “Women's autonomy and reproductive preferences in Eritrea”, *Journal of Biosocial Science*, 41(2):161–181.