Perceptions of Socio-economic variables and its influence on fertility in Egypt

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ABSTRACT

Beginning in 2008, Egypt's overall fertility rate rose, reaching a peak of 3.5 births per woman in 2014. (Health and Population Ministry et al). Since higher levels of education are associated with lower reproduction, education is also crucial in determining women's empowerment. However, there are no studies that explore this avenue and show how education and reproduction are related in specific Middle Eastern contexts. In Egypt, both the duration of attendance at school and the age at first birth have increased dramatically. In our study, we present empirical proof of the two processes' endogeneity. We use data from the 2012 round of the Egypt Labor Market Panel Survey (ELMPS-2012), a sample of Egyptian families that is nationally representative, for 4,336 married women between the ages of 15 and 49. Both education and the event of birth are covered in detail by the survey. Simultaneous risk modelling was used to reduce the impact of unobservable traits that have an impact on both processes at once. One the one hand, leaving the school system raises the possibility of joining the first union. The s*imultaneous occurrence of both processes is also influenced by unobserved individual traits. The effect of* the finished education on the union's formation becomes slanted upward if these qualities are not controlled.

Keywords and phrases: birth, hazard regression, female education, Egypt.

INTRODUCTION

By limiting access to employment, education, food, and drinking water, as well as raising the health risks for women and children, high reproduction is projected to place a significant financial burden on Egypt. These changes may have an impact on family planning services or pose a threat to women's social status, driving them into marriage out of fear for their safety. Egypt's fertility has reached 3.5 births per woman, the highest level in the past 20 years after years of low fertility (Radovich et al., 2018). Due to the impact of social norms that create incompatibilities between the function of youth as a student and the implicit adult role by marital status, enrollment in school delays the entry into the first union (Liefbroer and Corijn, 1999). This delay is caused by both economic and social standards (Blossfeld and Huinink, 1991). These two choices, which have an impact on one process, may also have an impact on the other. As a result, it's crucial to consider the causal reciprocal relationship between each process and, at the same time, to account for the possibility of factors that affect both processes simultaneously. We also find evidence in the literature that fertility has a negative impact on academic achievement.

Indeed, research has indicated that joining a union increases a person's likelihood of dropping out of school (McLaughlin et al., 1986), with the consequences being more pronounced for women than for men (Teachman and Polonko, 1988). Once the links between the two processes have been considered, it is necessary to test for shared influences on both processes at the same time. In reality, it has been demonstrated that the processes are internal in the sense that there are unobservable characteristics that

simultaneously influence a person's choice of union makeup and educational attainment (Lillard et al., 1994). In this study, the processes of first birth and final educational exit are modelled using explanatory variables that include both individual and household characteristics. In order to account for the presence of unobservable elements affecting both processes, simultaneous hazard modelling (Lillard, 1993) is also used. We use data from the Egyptian household sample, which was nationally representative households collected for the 2012 round of the Egypt Labor Market Panel Survey (ELMPS-2012). For both countries, such information is provided in the form of standard data regarding household and individual factors that could have an impact on the processes being studied.

CONCEPTUAL FRAMEWORK

The literature has extensively examined the impact of individual and family traits on delivery procedures and academic development. There is a significant association between the two life pathways leading to the first unit and leaving school, but since our attention is primarily on the causal effects of each step on another, we will only cover this theoretical foundation in this part. We specifically presume that joining the First Union results in the early termination of education. Enrollment, on the other hand, causes a delay in the First Union changeover. We presume that unobservable factors may simultaneously influence both processes and that it is important to control them in order to gain an objective picture of the connection.

The impact of education on the event of the first birth

Higher levels of education, both individually and collectively, are known to be associated with lower fertility and longer gestational ages (Axinn & Barber, 2001; Kravdal, 2002). However, the reasons why education is linked to lower reproduction are more controversial, and there is very little data on how education and fertility affect MENA countries. Women's education and fertility can be related through a variety of processes. Education can compete with other resources in a woman's life, give her access to information about contemporary contraception, or give her authority (Mason, 1986). Social and economic factors don't significantly affect the likelihood of getting pregnant, but they do increase the expense of having children, This affects the results of fertility (Balk, 1994). A higher level of education may also increase access to and knowledge of contraception, which would reduce fertility (Cleland, 2002). Significant research backs up the link between women's educational attainment and increasing use of contraception (Al-Riyami et al., 2004).

The impact of first birth on leaving school

Numerous studies have demonstrated that a child's likelihood of dropping out of school increases when they imitate familial habits typical of adult ages. As an illustration, Upchurch and McCarthy (1990) found that joining a union causes students to leave school early. Some research reveals that the impact of union formation on educational advancement varies depending on gender. According to the findings, women are more likely than males to be affected by union formation in this way. (Teachman and Polonko, 1988).

Getting married before finishing formal education usually goes against established sequencing standards (Marini, 1984). Partners will feel the strain of social standards that reflect the discrepancy between full-time educational enrollment and the establishment of the partnership, in particular if the union is created before marriage (Thornton et al., 1995). help hasten their exit from the school system and entry into the workforce. As a result, students have a higher chance of finishing their school sooner than they would have otherwise.

After marriage, both men and women benefit from dropping out of school, though for different reasons. Gender specialization in family activities optimizes the advantage from marriage (Becker, 1991). Men will perform better than their area of expertise in commercial activities, while women would perform better in household tasks. Both men and women gain from leaving the educational system and focusing in different

activities after starting their own families.

The variables influencing the duration of education and the event of the first birth

According to empirical studies on selection effects, individual value patterns can foretell events (Lesthaeghe and Vanderhoeft, 1997). Fertility and a variety of reproductive outcomes are linked to the agency of women in the home and their families (Prata et al., 2017). The organization is linked to decreased fertility, greater birth spacing, increased contraceptive use, preference for the ideal family size, fertility preferences, decreased risk of unwanted pregnancy, and increased access to maternity care (Upadhyay et al., 2014). Theories of how women's agency influences fertility are based on the idea that societal gender institutions, the gender context of the family, or women's socioeconomic status all have an impact on women's ability to engage in reproductive decision-making. In addition to being able to make strategic decisions, manage resources, and take part in family decision-making, especially those pertaining to fertility, agency gives women control over interpersonal concerns.. In addition, women who have more economic sway are more likely than less empowered women to participate in family planning decisions and use a form of contraception (Do & Kurimoto, 2012). Women's unmet need for contraception is correlated with their lack of agency in Egypt, as measured by their lack of participation in decision-making and their lack of freedom of movement (Samari, 2017c). The husband and wife's ability to decide together as a family whether to have children may rise with more agency inside the home. Women's agency is positively influenced by education, which gives them more power over their daily life (Kabeer, 1999). Additionally, women's independence in the home makes it simpler for them to achieve any new fertility goals they may have developed as a result of their years of schooling and growing aspirations (Basu, 2002). In Egypt, women may therefore gain household agency and experience lower fertility as they advance in their education.

STUDY OBJECTIVE

By 2030, the SDGs want to guarantee that everyone has access to family planning services and high-quality educational opportunities. The three facets of sustainable development—economic, social, and environmental—are reflected in the plan. The plan is a framework for accomplishing the Sustainable Development Goals as well as other national goals that serves as a national framework for developing policies and activities. Reducing the gender education gap is one of the main objectives. At all educational levels, Egyptian women have significantly closed the gender gap. However, the percentage of women who are illiterate is still significant (32% versus 16% for men). The disparity is widening at lower socioeconomic levels, highlighting the necessity of excluding aggregate data from the research. Additionally, there is a need to look more closely at signs of a widening gender disparity among underprivileged social groupings (UN Sustainable Development Goals, 2017). An important subject has been the connection between educational level, enrollment status, and becoming a mother.

The goal of the study is to identify if quitting school has an impact on the transition to a first birth or whether becoming a mother has an impact on enrollment in school. In this essay, we explore the connections between women's educational careers and the adjustment to motherhood, and we go into detail about the effects of events occurring in both associations as a result of shared elements that simultaneously affect both associations. We use the simultaneous hazard regression approach Lillard (1993) suggested as a modelling approach and value a collection of nation-specific model studies. We use the "Labor Market Panel Survey in Egypt" (ELMPS, 2012), which used retroactive data collection to gather information on education and birthdate in surveys of fertility and families.

DATA AND METHODS

Egypt Labor Market Panel Survey (ELMPS)

Data from the "Egypt Labor Market Panel Survey" will be used in our analysis (ELMPS, 2012). It provides detailed standardized information about education history and birth history as a well as household formation. The ELMPS-12 is the only survey conducted in Egypt that has birth and employment histories, and hence allows us to look at the two processes simultaneously. The Egypt Labor Market Panel Survey of 2012 (ELMPS 12) collected a wealth of information on female education and birth histories in Egypt. 12,842 married women are included in the data. The women have one child ever born are 2,861. The women have at least two children ever born are 8674. More than two infants are born to almost all women. 36.49% of the uneducated women only one baby and 17.72% of women who completed university or above have two babies. 36.10% of the uneducated women only one baby and 13.42% of women who completed university or above have two babies. The ELMPS-12 provides information on education, and earnings. Collected data cover issues of household socio-economic and births. The availability of both birth and education histories has the advantage of allowing us to know the interactive relationship between educational attainment and the transition to motherhood. We analyze the married women from (15–49 years) with complete birth histories in 2012. Since fertility in Egypt is primarily a marital phenomenon (less than 1% of births occur outside of marriage), this restriction is justified. We may examine both processes at once using the ELMPS-12.

Hazard modelling and simultaneous modeling.

The value of concurrent process modelling in a system that enables the correlation of heterogeneity conditions for each process (Lillard, 1993). It is argued that this homogeneity represents a collection of unobservable personal traits that have an impact on individual decisions and can be characterized in terms of attitudes and value orientations. The finest explanation of the two processes and their relationship will be found in this essay using both methodologies.

The first step is to model each process using a hazard equation, configuring it for both the other process as well as for household and individual factors. Particularly, the following is modelled for the first birth.

where:

is a risk associated with having a first child. It is believed that first marriages put women at risk for having their first child.

: the constant term

is a consequence of ageing. A 20-year knot on a linear spline serves as a visual representation of it.

is an exogenous covariate vector for the first birth.

is the time-dependent covariate that indicates whether or not the person left the educational system at time t.

The following model represents the risk of leaving the educational system : the constant term is a risk associated with leaving school. Starting at the age of 17, it is deemed that women are at risk for education. is a consequence of ageing. It is shown as a linear spline with knots at ages 17 and 22. (regarding the expected dates that people should graduate from high school and college). for female education, is a vector of exogenous factors. They consist of the father's educational background and household income. is an endogènes binary variable that takes the value 1 if the woman has a first birth at time t and the value 0 otherwise.

Each process has a heterogeneity word added to it: for first birth and for exit from education. At the female level, and represent unobserved components. They have a normal distribution with a mean of 0 and a variance of and respectively. We fix the variance of each process and then estimate the correlation among the heterogeneity factors because we are interested in any potential link between the unobservable features that influence the two processes. The heterogeneity terms are thought to be constant across time. The models are estimated at maximum likelihood using the aML programme (Lillard and Panis, 2000). Intervals are measured in discrete years as the measuring unit.

RESULTS

Equations (1) and (2) are simultaneously fitted using AML to the model given in section 4.2 using data from the ELMPS-2012. Table 1 displays the outcomes. Discussion follows the results of simultaneous modelling. Age, mother employment, household wealth index, and region of residency are handled as exogenous variables that can alter the hazard of birth but are not affected by it when it comes to the risk of first birth. These covariates are employed in the model to account for this risk. A link between the unobserved variation in the two processes—fertility and out of education—is permitted by the simultaneous model, which treats exit from education as exogenous.

There is a clear age-related trend when it comes to the chance of first birth; the risk is higher between the ages of 18 and 24 and beyond 24. People are more likely to have their first child soon after getting married, in other words. When compared to the lowest quintile, households with high incomes had a lower likelihood of having their first child quickly.

Regarding the likelihood of finishing education, there is a distinct pattern according to age; rates of leaving the educational system are higher between the ages of 18 and 21 and after 22. In other words, people are more likely to stop their educational pursuits in high school and after earning a university degree. Once they have completed high school and chosen to enroll in college, they are less likely to stop learning. There is a large disparity in wealth between the lowest and second quintiles. On the other side, households with high income levels are less likely to abandon their educational pursuits. Both the risk of a first birth and the end of education are simultaneously determined by the analysis's model; in other words, they are both endogenous to the model. When endogeneity is disregarded, it is discovered that the reciprocal interaction between the two processes is typically stronger. When endogeneity of the processes is taken into account, the impact of first birth on educational attainment is lessened. In actuality, dropping out of school still significantly raises the risk of having a child. The result of giving birth enhances educational completion. The simultaneous processes model further shows that the unobserved heterogeneity components have a low standard deviation. The endogeneity of the two processes is thus demonstrated by this outcome. The unobserved heterogeneity components of the two processes have a strong positive relationship, as seen in the last row of Table 1, which compares them. In other words, women who are more likely to delay having their first child are also more likely to complete their degree, and vice versa. The degree of the reciprocal relationship was underlined by fitting a simultaneous processes model, which also revealed the effects of the feedback mechanisms and the correlated unobserved heterogeneity.

CONCLUSIONS

The sustainable development strategy (SDS) of Egypt seeks to advance human development resources through two key pillars: health and education. By 2030, there will be a focus on providing high-quality education that is available to everyone (without discrimination) within a successful institutional framework. This educational approach will help create a confident individual with a well-rounded personality that is encouraged to fulfil its potential. SDS's primary objective was to eliminate all forms of illiteracy (7 percent).

We have concentrated on the processes of first birth and withdrawal from education in this study, on their causal linkage, and on the existence of unobservable factors impacting both processes at the same time. Moreover, we consider the possibility that there may be unobserved personal traits that affect both the first birth and the completion of education. It is especially important to consider the dynamics of these two processes.According to the findings, both processes are influenced by the qualities of the individual and the home. Particularly when the person has completed their academic career and has a high level of education, the likelihood of the first union forming increases. Low marriage rates are found among those with high incomes. If an individual has a high level of study satisfaction, their decision to stop attending school is postponed. Early first births are more likely to occur if you live in lower or upper Egypt. Be sure to account for the qualities that aren't visible but could nonetheless have an impact on both processes at once.

In this study, processes seem to be endogenous in the sense that unobserved individual qualities that are explained in terms of changes in values and attitudes influence them in the same way. having a first child and finishing school early. People who succeed in their scholastic endeavors and discover a path to self-realization are less likely to drop out of school. Additionally, they are less likely to join a union, maybe because they want to put more money into their professional careers after investing heavily in their academic ones. Another crucial factor is the processes' endogeneity. It is crucial to model schooling as an endogenous process when simulating the first birth in order to produce objective outcomes.

The best policy settings focus on both objectives at once, as in the case of initiatives that advance women's education through increased educational attainment and reproductive health promotion. These programmes would gain from utilising the reinforcement mechanisms that are implied in the reciprocal relationship and endogeneity of the two processes: the transition to the first birth and educational completion.

Table 1: the piecewise-Gompertz hazard model's summary findings for the ELMPS-2012 study's piecewise-Gompertz hazard model for the simultaneous transition to first birth and end of education.

Variables	simultaneous	
I. Hazard of having first birth		
	par	**se**
constant	-5.615	0.613**
18-24 years old (linear spline)	0.721	0.314***
More than 24 years old (linear spline)	0.176	0.049***
Background variables		
Mother employment status		
Not employed	(Reference)	
Employed	-0.658	0.231**
Household wealth index		
Lowest quintile	(Reference)	
Second quintile	0.441	0.121
Middle quintile	0.324	0.131
Fourth quintile	-0.403	0.104***
Highest quintile	-0.605	0.106***
Region of residence		
Greater Cairo	(Reference)	
Alexandria and the Suez Canal cities	0.52082	0.0318

Urban Lower Egypt	**1.173**	**0.0443****
Urban Upper Egypt	**1.215**	**0.0831****
Rural Lower Egypt	**1.38**	**0.0787****
Rural Upper Egypt	**1.561**	**0.2324****
Exited from education	**1.432**	**0.581*****
University degree	**0.812**	**0.315****
II. Hazard of out of Education		
Constant	**-3.312**	**0.457****
17-21 years old (linear spline)	**0.999**	**0.158*****
21-22 years old (linear spline)	**0.165**	**0.038****
More than 22 years old (linear spline)	**0.267**	**0.032*****
Household wealth index		
Lowest quintile	**(Reference)**	
Second quintile	**0.191**	**0.035**
Middle quintile	**-0.182**	**0.033****
Fourth quintile	**-0. 543**	**0.129****
Highest quintile	**-0.814**	**0.151****
Father's educational level	**-0.658**	**0.335*****
Indicator of first birth		
No	**(Reference)**	
Yes	**0.346**	**0.011*****
Sigma first birth	**0.182****	
Sigma education	**0.235****	
Rho	**0.734**	**0.338*****
ln-L	**-4842.79**	

Significance: **=5%; ***=1%

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