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Fertility Transition And Female Rational Choices In Egypt

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Abstract

The study uses the 1995 Egypt DHS and the probit maximum likelihood method to study the relationships among three related fertility desires. Findings indicate that future fertility desires and contraceptive use are becoming endogenous to each other. The relationship between female employment and fertility desires is not typical of a country at post-transitional stage of fertility. The idea of wife's opportunity cost and rational choices is not yet valid. One should not expect further dramatic decline in fertility.

Keywords: Fertility transition, rational choice, opportunity cost, female employment, contraception, and Egypt.

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Introduction

Although the term fertility transition appeared in the literature in the early 1970s, all the literature confirm the diverse approaches to the causation of or change in the fertility transition stage at which each country has reached. As Kirk (1996) puts it, a better understanding of the transition theory is an equilibrium framework. One should not be limited to the analysis of the origins and extent of conscious control on marital fertility. There are other possible social adaptations to population size. The family size decision process includes other relevant factors, with fertility, such as contraceptive use and female employment. This line of thought includes many recent works (Freedman and Blanc 1992, Hirchmann 1994, Joshi and David 1996, Van de Kaa 1996, Mason 1997, Murphy 1997, Robinson 1997, Sathar and Casterline, 1998) that confirm our approach of studying family size decision process as a whole and not merely fertility or preferences.

During the 1980s and the 1990s, Egypt has been experiencing continuous and steady change in fertility-related decisions, especially fertility and contraception. Total fertility rate has reached a level of 3.59 live births in 1995 (El –Zanaty et al. 1995) compared to 4.85 in 1984 (Sayed et al. 1985). Even, fertility preferences have been changing towards smaller family size. It is clear that there has been a decline in the desired number of children by 0.5 children during the period 1984-1995, thus reaching 2.8 children in 1995. In addition, there has been an increase during the same period by 10 percentage points in the desire for no more children to reach 65 percent in 1995. Regarding contraceptive use, it is evident that more women, in relative terms, are using contraceptive methods. Current use has drastically jumped from 30.3 percent in 1984 to 47.9 percent in 1995. Knowledge of contraceptives has become universal. On the other hand, female employment is relatively very low around 16 percent among ever-married women in 1995. Changes since mid 1980s have been minimal.

The objective here is to estimate a model that attempts to approximate the relationships among three related fertility desires, namely future fertility desires, desires to use contraception and to work. The model and its results will be used to identify the position of fertility transition in Egypt. Some adjustments to the model are considered to test for residential and educational differentials. The study will first introduce model specification and method of estimation. This is followed by the data set used. Results are then discussed. Finally, some policy implications are drawn.

Model Specification

For a society that completed its fertility transition, one would easily expect that the three related fertility desire variables be highly associated together. More future fertility desires would induce less desire to use contraceptives. Desire to use any contraceptive method; as an indicator of current and past reproductive experiences; would shape future desires for children. Similarly, those who have positive desires to work are expected to have lower future fertility desires. The higher the future fertility desire is, the lower the wife's desire to work. At the same time, the desires to use

contraception and to work would positively affect each other. On the other hand, weak linkages would support the notion that the society is still undergoing its transition, where fertility related decisions are partly dominated by factors external to the couple's decision process. These relationships are studied after adjusting for several background variables that are thought to be important in the literature (Hirchmann 1994, Joshi and David 1996). The model includes variables that represent wives and husbands demographic characteristics, some socio-economic indicators, past reproductive experiences, and place of residence.

The model consists of three equations with three endogenous variables and a set of exogenous or background variables, which differ from one equation to the other for identification purposes. The three endogenous variables representing desires are latent variables. They are the desire for children during the next two years, the desire to use contraception, and the desire to work. These desires in their continuous nature are not observed. We only observe the desire in its discrete form. Future fertility desire is observed as a "yes" or "no" desire during the next two years. For contraception and female work, no direct questions for desires are available. Accordingly, the actual use of contraception is observed and not the desire to use. For employment, wife's actual involvement in an economic activity for cash is observed and not the desire to work. The responses are binary (with zero or one values). Thus, the probit maximum likelihood estimation method is used to estimate the model. The model is logically consistent (Bollen 1989).

Data Set

The sub sample used for the study consisted of those currently married women who were involved in the women's status module of the 1995 Egypt Demographic and Health Survey (EDHS-95) and had valid answers, especially with respect to their fertility preferences. Accordingly, our sub sample included 4,325 currently married women. 41 percent of women in the sub sample reside in urban areas, with median current age of 30 years and median years of education of 3 years. About 42 percent are illiterate. For husbands, median age is 37 years with median years of education of 6 years, and about 26 percent are illiterate. Wives have three children ever born on average with current use of contraception rate of 41 percent. Around 17 percent of currently married women in the sub sample desire children during the two years following the interview. Less than three-quarters of wives discuss family planning with their husbands while more than one-quarter have similar discussion with friends or neighbors.

About 18 percent of wives are working for cash and 74 percent agree that woman's place is not at home. 55 percent think that girls are being educated to prepare them for jobs and not merely to be good wives and mothers. Almost half of employed wives are residing in urban areas. Less than one fifth of employed wives do not earn cash, and 55 percent of employed women have at least completed secondary education. About 70 percent of employed wives are working for non-relative, 18 percent are self-employed, and 12 percent are working for relatives. 55 percent of working wives are in clerical, professional, technical, or managerial occupations. More than one fifth are in the agricultural sector, around 13 percent are involved in sales or services, and 10 percent of employed wives are working in skilled labor, or in household or domestic activities. About 17 percent of employed wives, that have children less than six years,

take care of their children by themselves while working. Other relatives, of more than one third of employed women with young children, take care of these children, while immediate family members (husband, other sons and daughters) take care of young children of about 13 percent of working wives. Less than one quarter of these wives use nurseries or institutional child care providers. Percentage of working wives varies between 22-27 percent in Urban Governorates, Urban and Rural Lower Egypt, Urban Upper Egypt and Frontier Governorates, while only 9 percent of wives in Rural Upper Egypt are currently working

Future desire for children is defined here as the desire for children, as reported by wives, during the two years following the survey. Current use of contraception indicates whether the wife is using a contraceptive method. Finally, current employment reflects if the wife is working for cash. She may be taking up a job, selling things, having small business, or working on the family farm or in the family business. The reference category of the future fertility desire variable is the group of women who do not desire children during the two years following the survey. Non-contraception women and unemployed wives are the reference groups for use of contraception and female employment respectively.

Discussion

Table (1) presents the results of the probit maximum likelihood estimation of the model. The significant variables (at 0.05 level of significance) are the only ones included in the table. Findings clearly show that the relationships among the three endogenous variables are important. In the equation of future desire for children, the more the likelihood of a woman to contraception is, the less her future fertility desires in the two years following the survey. However, the higher the probability for a woman to be employed is, the higher her chances to desire children, a very surprising result for a country which is undergoing fertility changes. This is probably because employed women mainly live in environment where there are relatives who may take care of their children, as mentioned earlier, or the types of work they conduct do not prevent them from having more children. This result agrees with the findings of other studies (Amin and Lloyd 1998). The other variables in the equation have showed expected signs. Future desire for children decreases among those who are older, married younger, more educated, with more live births during the previous three years, with desired number of children close to their number of living children. Wives who communicate with their husbands on fertility preferences are expected to have lower future fertility desires. Rural women are more inclined to have positive future desires during the two years following the survey. On the other hand, women from families who own some type of transportation have negative future desires.

Table 1: Parameter estimates of the probit model

Variables	*Future Desire* for Children Equation	*Current Use* of Contraception Equation	*Current* Employment Equation	
Constant	-0.511	-0.880	-3.856	
Wife's age at marriage	0.047		0.058	
Age of wife	-0.032		0.040	
Wife's years of education	-0.015		0.101	
Age of husband		-0.006	-0.009	
Number of live births in previous 3 years	-0.597	-0.159		
Desired number of children less number of living children	0.255	-0.157	-0.044	
Spousal communication on fertility preferences	-0.145	0.171		
Discuss FP with friends or relatives		0.101	0.326	
Wife approves FP		0.254		
Woman's place is not only home but also work			0.339	
Place of residence	-0.191	0.181	-0.171	
Number of appliances		0.094		
	Availability of cooking room			**0.273**
Availability of means of transport	-0.284			
Water connection at home	0.143		-0.381	
Electricity at home		0.381		
Ownership of livestock		-0.172		
Ownership of residence		-0.216		
Future desire for children in following two years		-1.058	0.160	
Current use of contraception	-0.787		0.247	
Wife's current employment	0.222	0.294		
Goodness of fit test (X^2)	4302	4249	3952	
Degrees of freedom	4313	4310	4313	
P-value	0.544	0.743	1.000	

As expected for the current use of contraception equation, women who do not want children during the two years following the survey are using a method of contraception. In addition, employed women tend to use contraceptives. The results of the parameter estimates clearly support the idea that more spousal communication on fertility preferences or discussion on family planning with friends or relatives induce wives to use contraception. As expected, wives who approve family planning are expected to be using contraceptives. The less the number of children during the three years preceding the survey or the gap between desires and actual fertility are, the higher the probability for contraceptive use. Urban wives are using more contraceptives than their rural counterparts. Those with more number of appliances or with cooking room or electricity in their residence are expected to use contraceptives. This is probably because urban residence is mainly associated with this group of women, who have more number of appliances or have cooking room or electricity at home. On the other hand, less current use is associated with those who own livestock or their residence. Such ownership is more dominant in rural areas.

Again for current employment equation, those women who have positive future desires for children in the two years following the survey are expected to be currently employed. This result agrees with the findings of future desire for children equation. On the other side, current use of contraception is positively associated with current employment, which agrees with the expectations. The other determinants show acceptable directions. Current employment status of the wife is positively associated with her age at marriage, current age, and years of education. The smaller the gap between desired and achieved number of children is, the greater the likelihood for the wife to work. Wife's attitude towards the notion of women's status at work and home is very crucial in shaping her employment activity. Those wives supporting the idea that woman's place is not only home but also work clearly have higher probabilities to be currently working. The surprising result among those determinants is related to place of residence. Urban wives are more inclined not to work when compared with rural women, probably since child-care assistance from relatives in urban areas is not widely available as in rural areas. In addition, urban mothers are more inclined to personally take care of their children.

Interaction with residence and wife's education

It is clear from the results that the dynamics between female employment and future fertility desires does not reflect the expected pattern for a country at the post-transitional stage of fertility. Accordingly, we attempt here to test the effects of contraceptive use and employment on future desires, and vise versa, after adding to the model interaction terms between the endogenous variables and place of residence and wife's education. This is done in an attempt to test whether the dynamics among the endogenous variables changes by residence or wife's education. Table (2) considers the

Table 2: Parameter estimates of the probit model including the Interaction with place of residence

Variables	Future Desire for Children Equation	Current Use of Contraception Equation	Current Employment Equation
Constant	-0.534	-0.880	-3.875
Wife's age at marriage	0.047		0.058
Age of wife	-0.032		0.041
Wife's years of education	-0.015		0.102
Age of husband		-0.006	-0.009
Number of live births in previous 3 years	-0.593	-0.159	
Desired number of children less number of living children	0.256	-0.157	-0.041
Spousal communication on fertility preferences	-0.148	0.170	
Discuss FP with friends or relatives		0.103	0.322
Wife approves FP		0.254	
Woman's place is not only home but also work			0.338
Place of residence	-0.134	0.252	-0.120
Number of appliances		0.093	
Availability of cooking room		0.274	
Availability of means of transport	-0.283		
Water connection at home	0.139		-0.385
Electricity at home		0.375	
Ownership of livestock		-0.167	
Ownership of residence		-0.220	
Future desire for children in following two years		-0.854	0.111
Current use of contraception	-0.636		0.311
Wife's current employment	0.184	0.384	
Place of residence x future desire for children in following two years		-0.469	0.103*
Place of residence x current use of contraception	-0.321		-0.126*
Place of residence x wife's current employment	0.076*	-0.156*	
Goodness of fit test (X^2)	4290	4227	3941
Degrees of freedom	4311	4308	4311
P-value		0.587	0.808 1.000

* P-value > 0.05

interaction with place of residence, while the interaction with wife's education is shown in Table (3), where the model includes the significant variables (at 0.05 level of significance) in addition to the interaction terms.

It is obvious from the findings that the effect of contraceptive use on future desire for children is greater, in negative terms, in urban areas than in rural areas. No significant effect is found for the interaction of place of residence with female employment. Similar result is reached for the same term in the equation of current use. Again, the effect of future desire for children on current use is greater in urban areas. For the current employment equation, both interaction terms indicate that the effects of future fertility desires and current use of contraception on female employment do not change by residence, as shown in Table (2).

The interaction terms between wife's education and the three endogenous variables in the model are presented in table (3), where the uneducated wives are the reference group. The results clearly show that the effects of these endogenous variables on each other do not differ between educated and uneducated wives.

Table 3: Parameter estimates of the probit model including the interaction with wife's education

Variables	Future Desire For Children Equation	Current Use Of Contraception Equation	Current Employment Equation
Constant	-0.433	-0.929	-4.322
Wife's age at marriage	0.043		0.106
Age of wife	-0.031		0.020
Wife's education	-0.150	0.122	0.246
Age of husband		-0.006	
Number of live births in previous 3 years	-0.598	-0.156	
Desired number of children less number of living children	0.252	-0.160	
Spousal communication on fertility preferences	-0.142	0.168	
Discuss FP with friends or relatives		0.102	0.402
Wife approves FP		0.251	
Woman's place is not only home but also work			0.369
Place of residence	-0.205	0.174	-0.146
Number of appliances		0.087	
Availability of cooking room		0.268	
Availability of means of transport	-0.315		
Water connection at home	0.135		-0.162
Electricity at home		0.372	
Ownership of livestock		-0.168	
Ownership of residence		-0.217	
Future desire for children in following two years		-0.854	0.340
Current use of contraception	-0.749		0.311
Wife's current employment	0.065	0.406	
Wife's education x future desire for children in following two years		-0.288*	-0.132*
Wife's education x current use of contraception	-0.070*		0.051*
Wife's education x wife's current employment	0.299*	-0.150*	
Goodness of fit test (X^2)	4273	4189	3921
Degrees of freedom	4311	4308	4313
P-value		0.657	0.901 1.000

* P-value > 0.05

Table (4) presents the results of the future desire for children equation, as part of the model [Note 1], after adjusting for region of residence. Findings support the analysis conducted on Egypt as a whole presented in table (1), i.e. the importance of current use of contraception, desired number of children less living children, number of children ever born during the three years preceding the survey. Age at marriage shows importance in Urban Governorates and Upper Egypt. Wife's education is mainly effective in Urban Governorates and Rural Upper Egypt. Spousal communication is crucial in Urban Lower Egypt and both regions of Lower Egypt.

Table 4: Parameter estimates of the future desire for children equation by region of residence

Variables	Urban Governorates	Urban Lower Egypt	Rural Lower Egypt	Urban Upper Egypt	Rural Upper Egypt	Frontier Governorates
Constant	-1.291	0.324	-1.045	-0.764	-0.292	-0.698
Wife's age at marriage	0.074			0.069	0.044	
Age of wife	-0.032	-0.043		-0.038	-0.035	
Wife's years of education	-0.034				-0.017	
Age of husband						
Number of live births						
in previous 3 years	-0.531	-0.567	-0.839	-1.043	-0.545	-0.422
Desired number of children						
less number of living children	0.490	0.343	0.496	0.294	0.208	0.205
Spousal communication						
on fertility preferences		-0.285		-0.214	-0.153	
Water connection at home			0.392			
Future desire for children						
in following two years						
Current use of contraception	**-0.896**	**-0.620**	**-0.595**	**-0.921**	**-0.604**	**-1.538**
Wife's current employment	0.193*	0.778	0.140	0.111	0.229	0.391
Goodness of fit test (X^2)	420	254	646	473	1760	196
Degrees of freedom	**638**	**344**	**680**	**560**	**1779**	**281**
P-value	1.000	1.000	0.819	0.997	0.621	1.000

* P-value > 0.05

The striking but expected result is related to the current employment of women. Wife's employment shows no importance in determining future fertility desires in Urban Governorates. On the other hand, the same relationship is influential and positive in other regions. This result may be due to the different nature of families in these areas. In Urban Governorates, family ties, relationships, and responsibilities are mostly within nuclear families, while in other regions of Egypt which are mostly rural, families live in extended

forms and working wives are mainly involved in agricultural activities. This clearly indicates that these types of family arrangements and activities, especially in Lower and Upper Egypt, make life easier for wives to be economically active and to have children as well.

Conclusions

The relationships among future fertility desires, female employment, and current use of contraception in Egypt within the framework of fertility transition are studied. Future fertility desires and use of contraception are becoming more and more endogenous to each other. The results support the notion that this relationship is mainly within the control of the family in the expected direction. On the other hand, the relationship between female employment and future fertility desires deserves some attention and future research. The link is missing in some instances and significant in others. This significance is not in the expected direction for a country undergoing its fertility transition. The dynamics behind such relationship is not yet that of opportunity cost and value of the wife's time, and how much she may lose by having children. The idea of rational choices and accordingly rational shifts in fertility is yet not valid in Egypt in the 1990s, given the data set used. This may explain why actual and desired fertility has been declining but at rates which are getting smaller across time. One should not expect dramatic decline in fertility, close to the levels of post-transitional societies in the absence of the dynamics of rational choice explanations.

The results have several policy directions. Programs aiming to decrease future fertility desires should focus more on wife's education and on increasing the awareness of quality, rather than quantity of children. Policies encouraging female employment without changing female status and attitudes may not decrease desires due to the role that is being played by other generations to assist in child-care. Family planning programs need to emphasize on decreasing the gap between fertility desires and achieved number of children. Spousal communication is essential in any family planning policy.

On a methodological level, the so called fertility transition theories ought to be more representative of the current status of the Developing Countries and not merely a reflection of how fertility shifted from one stage to another in the Developed World. The findings clearly disagree with the call by some to have a global fertility transition theory (Caldwell 1997 and 2001). The adequacy of the use of contraception, female employment, future fertility desires as proxies for the actual desires in the continuous form requires further investigation. Other measures for desires may be tested, such as intention to use contraception, attitudes towards work, desires for sons versus daughters. Finally, additional research is required to better define female employment, especially from survey data.

Notes

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[2] Results of the other two equations for contraception use and female employment are not presented to avoid repetition and to focus on the future desire for children equation.

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