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TESTING FOR THE ONSET OF FERTILITY DECLINE: THE CASE OF EGYPT

Hassan Zaky

Department of Statistics

Faculty of Economics and Political Science

Cairo University

Giza, Egypt

Rebeca Wong

Ismail Sirageldin

Department of Population Dynamics

The Johns Hopkins University

615 N. Wolfe Street

Baltimore MD 21205

Abstract. This paper describes and illustrates how the economic household production model can be taken as a frame of reference to test the stage of the fertility transition for a given society. Egypt during the 1970's and early 1980's is taken as the setting to illustrate the test. Egyptian fertility trends from the mid-1960's to the early 1980's puzzled demographers and social scientists. It was unknown whether Egypt was at the onset of a sustainable fertility decline by the

early 1980's. The results show that the Egyptian household fertility behavior during this period fits poorly with the model specification corresponding to a post-transition society. We find that fertility by the end of the 1970's was not endogenous to other household decisions. We conclude that a sustained decline in fertility is unlikely without this endogeneity.

Introduction

The economic household production model assumes that households maximize utility under resource constraints, mostly time and income, and given a set of preferences. In essence, the household production model assumes that people behave rationally; that reproductive behavior in particular is economically rational within biological, psychological and normative bounds. Individuals and households respond to price signals and allocate their activities and resources within these set bounds. The premise is the ability of the household to assign its life-cycle time resource among three ends: activities that increase the household members' market wage (that is, human capital), market production, and non-market production including leisure. Accordingly, the model implies simultaneous decisions on fertility and other demographic and economic factors such as contraceptive use and female labor force participation.

Applications of the model include those in developed- as well as developing-country settings (DeTray 1974; Khan 1979; Michael 1974). As Easterlin (1975, p. 55) writes, "economics has clarified causal inter-relations, for example, few economists would speak of lower fertility 'causing' higher female labor force participation, or viseversa, but would view both magnitudes as simultaneously determined by other factors." It is argued, however, that one of the shortcomings of the household production model is that the outcome decisions modelled -- such as fertility, contraceptive use, and female labor force participation -- may not be a matter of choice for households in some societies[1]. Specially in pre-transition societies, many of these decisions present limited choices. The trade-off between fertility and other alternatives for time allocation by household members, may be highly limited. Hence in this context, the predictions of the household production model may not apply to all settings.

In the present paper, we argue that essentially three types of societies exist. One of stable high fertility where households do not perceive a trade-off among the various fertility-related household outcomes. The second society implies a post-transitional stage, where the household calculus of interdependent choices cover a wide range of economic and demographic behavior. The third is a transitional society. It is our thesis that we could use the household production model as a frame of reference to test the stage of the fertility transition for a given society. If fertility as well as other decisions on allocation of resources are simultaneous, then the society is in a post-transition stage. Alternatively, if the society is at pre-transition stage, fertility decisions are made mainly in the perceived context of mortality restrictions and their biological consequences. The third type is context-specific, where some, but not all, household decisions are perceived under allocative control. In this sense, the weakness of the household production model mentioned above, can yield useful statements on modelling fertility decisions for a given society: the conceptualization of fertility models is different if the particular society under study is either in pre- or post-transition stage.

Egypt during the 1970's and early 1980's can be taken as a setting to perfom the test. Egyptian fertility trends from the mid-1960's to the early 1980's have puzzled demographers and social scientists. The main puzzle is the steady decline in the crude birth rate between 1964 and 1972, followed by a steady rise through the early 1980's. Several factors can account for this reversal of trend. These include the presence of difficult economic and social factors, such as absence of husbands and reduced incomes during the inter-wars period 1967 to 1973. Such explanations, although fitting conceptually with the general prediction of the household production framework, lack an adequate explanation for the full phenomenon. Bucht and El Badry (1986) illustrated that the bulk of change in the crude birth rate could be due to the change in the age structure resulting from historical mortality and fertility experiences.

The analysis of Bucht and El Badry questioned significant changes in fertility behavior during the three decades following World War II. Based on the 1980 Egyptian Fertility Survey, recent attempts to examine demographic responses to modernization did not give a clear picture of the Egyptian demographic transition (Hallouda, Farid, and Cochrane 1988). For example, husband and wife's education were non-significant in models of the determinants of demand for children (Cochrane, Khan and Osheba 1988). However, in the analysis of the determinants of contraceptive use, female education opportunities were significant while the analysis ".. demonstrated convincingly that measures of female employment show no net effects on use" (El-Deeb and Casterline 1988, p. 569). Easterlin, Crimmins and Osheba (1988) illustrated the importance of motivation in determining fertility regulation, while income "added surprisingly little" to the analysis of the impact of modernization on the motivation for fertility control (Easterlin, Crimmins, Ahmed and Soliman 1988, p. 671). Analyses of age at marriage and age difference among spouses found contradictions, leading Sokona and Casterline (1988, p. 129) to conclude "our understanding of the determinants of the age difference is poorly developed". In their analysis of the determinants of birth interval length, Trussell, Vaughan and Farid (1988, p. 152) emphasized the importance of biological determinants in Egypt. Their analysis ".. found that female education is not a significant determinant of the risk of pregnancy; this (lack of significance) is almost surely due to the effects of biological factors." Other findings on infant and child mortality illustrate the lack of consistent behavioral patterns (for example, Callum and Cleland 1988; Eid and Casterline 1988).

From this brief survey, it was unknown whether Egypt had been at the onset of a sustainable fertility decline by the early 1980's. The purpose of the present paper is to illustrate that we can test if this is the case using the approach described. The paper will present first, the specification of alternative models according to the stage of fertility transition (post- and pre-). Next, we describe the data set available to perform the test. We present the estimation techniques in the following section, followed by the empirical findings. At the end, we provide discussion and conclusions.

Model Specification

Our approach is to examine fertility as a long-term decision, instead of using a sequential decision-making approach. We condense a couple's life cycle to one period; changes occuring during the life cycle are ignored for the present investigation. Accordingly our focus is on couples who completed their desired family size by the end of the 1970's. Hence, we study fertility from a completed-family-size perspective, and we associate this variable with lifetime variables as well, such as indicators of wealth and lifetime income, attained education, ever-use of contraception, cumulative deaths, and ever-employment of the woman. We use the household production model as our frame of reference, and model a series of household-demand functions. We present below the empirical specifications of the two models post- and pre-transition. Other specifications are presented in Zaky (1989).

Post-Transition: Model I

For the transition from high to low fertility to become sustainable, the relationship among a significant set of family size decisions becomes integrated, re-enforcing, and simultaneously determined in a behavioral context. These family size decisions include fertility, contraceptive use, child mortality, female labor force, and income. Families are assumed to control their resource allocation decisions, subject to basic resource constraints. Under such household production regime, it is assumed that family size variables are choice variables, with fertility being one of them. This approach has long been recognized in the economic demography literature (Cochrane, Khan and Osheba 1988; Khan and Sirageldin 1975; Sirageldin et al. 1976; Schultz 1978). Studies have concluded that fertility determination should be estimated within a system of simultaneous equations. Hence, the post-transition specification considers that a group of family decisions are endogenous to the fertility decision. In our analysis these family decisions are:

contraceptive use, child mortality, female labor force, and income. The exogenous variables in our models include variables both at the household and community levels, capturing aspects of opportunity cost of time, relative prices, social norms and household preferences. A brief elaboration on the choice variables follows.

The decisions on income are assumed as endogenous to the fertility decision (Mueller and Short 1983), since husbands may work longer hours and increase their earnings as a response to more children. Also at post-transition, decisions on fertility are made simultaneously with those on the allocation of time towards market activities by women. Hence female labor force is endogenous to fertility decisions (Lee and Bulatao 1983; Schultz 1978). Child mortality is an important determinant of the supply of children (Bongaarts and Menken 1983), and it has been recognized as simultaneously related to fertility, where the effect of fertility on mortality is mainly biological, while the effect of mortality on fertility is assumed behavioral. Decisions on the use of contraception are assumed to be made in the context of fertility decisions as well (DeGraff 1991; Easterlin and Crimmins 1982; Wong 1987). An excess of number of children in relation to the desired number, would motivate the use of contraception.

Pre-Transition: Model II

In traditional societies with relatively high fertility rates, fertility is only partly controlled, and dominated by factors external to the family decision process. These factors can be norms, culture, and biological constraints. In such regimes, the family decisions on fertility (family size, contraception, child mortality, female employment, and income) have not reached the stage of being family choice variables. They can be considered as ascribed decisions, and hence knowledge on fertility can be gained by a simple approach where only fertility and mortality are outcome variables. Hence, for the pre-transition stage, the empirical specification would be a system of two equations, one for fertility and one for mortality. As mentioned earlier, fertility decisions are made mainly in the perceived context of mortality restrictions and the biological consequences. In this stage, fertility and mortality are closely inter-related through biological factors.

Data Set

We use the Egyptian Fertility Survey (EFS), conducted in 1980 by CAPMAS (CAPMAS 1983). Questionnaires were completed for 8,788 ever-married women. A second phase of the EFS included a sub-sample of about one-third of the households interviewed in the first phase, covering a sample of 2,532 households. This second phase of the survey included an economic, a husband's, and community (for rural areas only) questionnaires. The data we use includes information from both phases. We also note that our data set is cross-sectional, failing to provide any time-sequence of events, especially among the endogenous variables. Hence we are confined to a study of association rather than causation.

Our sub-sample of analysis includes ever-married women between 35 and 49 years of age. We use this age group to get women with completed family size. We restrict the analysis to those couples who, by virtue of the wife's age, will have a low probability of having any more children. This group of couples, however, may include women who would want more children, producing a selection bias for our estimates. Accordingly, we further limit the analysis to those women who are fecund, in union, exposed to the risk of conception, and do not desire additional children. Our sub-sample includes 518 ever-married women who satisfy the previous conditions. In this group of women, as is shown in Table A1 in the Appendix, women have an average of 6.7 children ever-born, and have experienced 1.5 child deaths per woman. Ever-use of contraception is 71 percent, while only 18 percent of the women had ever-worked since marriage. Forty-seven percent of the women live in rural areas, they have an average of 2 years of education, and 82 percent have never been employed while in union. Their average age is 40 years and 48 years for the husbands. Appendix I presents a list of the variables used in our analyses.

Methods of Estimation

Model I

The specification of the model for fertility decisions under the post-transition regime represents a system of simultaneous equations. The specification corresponds to the one discussed in Khan and Sirageldin (1975). The model considers five variables as endogenous and includes 17 exogenous variables, as follows:

(1) FERTILITY EQUATION

CEB = f1(**EUSE**,**CHDD**,**WEMP**,**FAMC**,AGR,RES,PNRM,
MACH,PRES,AGEW,YSIN,AGEH,HMIG,WBML,

HEMP,YWUC,YHUC).

(2) CONTRACEPTIVE EQUATION

EUSE = f2(**CEB**,**CHDD**,**WEMP**,**FAMC**,AGR,WATE,
ELEC,TRAN,PRES,AGEW,YSIN,AGEH,HMIG,
WBML,HEMP,YWUC,YHUC).

(3) MORTALITY EQUATION

CHDD = f2(**CEB**,**WEMP**,**FAMC**,AGR,RES,PNRM,MACH,
TRAN,PRES,AGEW,YSIN,AGEH,HMIG,
WBML,HEMP,YWUC,YHUC).

(4) FEMALE LABOR FORCE PARTICIPATION EQUATION

WEMP = f4(**CEB**,**CHDD**,**FAMC**,AGR,PNRM,WATE,ELEC,
MACH,PRES,AGEW,YSIN,AGEH,HMIG,
WBML,HEMP,YWUC,YHUC).

(5) INCOME EQUATION

FAMC = f5(**CEB**,**WEMP**,AGR,RES,PNRM,WATE,ELEC,
MACH,TRAN,PRES,AGEH,HMIG,HEMP,
YWUC,YHUC).

The definition of variables is given in Appendix I.

The five endogenous variables include two count variables, children ever born and child deaths; two dichotomous variables, ever use of contraception and female ever employment; and a continuous variable, the lifetime income proxy.

Model II

The specification of the model for fertility decisions under the pre-transition regime is given by a system of two equations as follows:

(6) FERTILITY EQUATION

CEB = f1(**CHDD**,AGR,RES,PNRM,MACH,PRES
AGEW,YSIN,AGEH,HMIG,WBML,HEMP
YWUC,YHUC,EUSE,WEMP,FAMC).

(7) MORTALITY EQUATION

CHDD = f2(**CEB**,AGR,RES,PNRM,MACH,TRAN,PRES,
AGEW,YSIN,AGEH,HMIG,WBML,HEMP,
YWUC,YHUC,WEMP,FAMC).

The specification of the system of equations for both models implies identification, since the number of exogenous variables excluded from each equation in the model is at least as great as the number of endogenous variables included minus one. For both models I and II, we estimate the structural forms of the equations in a simultaneous system. We use tobit regression techniques for the fertility and mortality equations, probit for the contraceptive-use and employment equations,[2] and least squares for the income equation using a two-stage estimation procedure.[3] After presenting the two-stage estimates of the structural forms for Model I and II, we also present the single-equation estimates for the fertility equation in Model II. The latter, a single-equation specification, assumes that all explanatory variables are exogenous to fertility in the pre-transition stage.

Empirical Results

Model I

Table 1 shows the parameter estimates of the structural form of the five-equation system. Column 1 presents the estimates for the fertility equation, which included all the other endogenous variables (fertility, mortality, female labor force, and income). The results show no evidence of a significant relationship between the endogenous variables included in this equation and fertility. However, longer duration of marriage, ownership of residence, and higher crowdedness are associated with more children ever born. We note the lack of significance of the wife's education variable.

Column 2 of Table 1 shows the results for ever-use of contraception, with a specification including four endogenous variables as explanatory (fertility, mortality, female labor force, and income). The estimates reflect that the community variables, as well as ownership of agricultural land, availability of a means of transportation, and more wife's education, increase the probability of ever-using a contraceptive method. Among the endogenous variables included in this equation, children ever born is not significant, child mortality is positively related, and income is negatively related to contraceptive use. These are somewhat surprising results.

The results for the mortality equation are given in Column 3 of Table 1. This equation includes three endogenous variables (fertility, female employment, and income) and 14 exogenous ones. The results show that availability of a machine in the household and education of the husband are negatively related to child mortality, while longer duration of marriage leads to more child deaths, as expected. Surprisingly, no endogenous variables are significant.

For the labor force participation equation, the results are given in Column 4 of Table 1. Explanatory variables in this equation include 18 exogenous and three endogenous variables (fertility, mortality, and income). The results suggest that wife's education is not a significant determinant of female employment among these women. No significant endogenous variables are found, except child mortality. More child deaths decrease the likelihood of women to ever-work, agreeing with a priori expectations.

Column 5 of Table 1 shows the results for the income equation. This equation includes the endogenous variables corresponding to fertility and labor force participation. Higher income is associated with higher husband's age, more education of both spouses, a more-skilled husband's job, residence in urban areas, availability of a means of transport, machine and water in the house, and ownership of agricultural land. Neither of the two endogenous variables included are statistically significant.

(Table 1 about here)

Model II

The model includes a system of two equations: one for fertility and one for mortality, and each is contained in the other equation. In Egypt, a traditional society with relatively high fertility rates, we would expect the effect of fertility on mortality, mainly biological in nature, to be positive. The effect of mortality on fertility, mainly behavioral in nature, is expected to be positive. The estimation results shown in the first two columns of Table 2 reflect no significant effects from mortality on fertility or viceversa.

The third column of Table 2 shows the results of the single-equation estimation procedure for the fertility equation. This single-equation approach considers all explanatory variables as exogenous to fertility. The results show that ever-use of contraception, family income, and child mortality are positively related to completed fertility. This is in line with other empirical work (Schultz 1976).

(Table 2 about here)

The relationship between fertility and female employment (WEMP) appears as non-significant in the results of model I and model II. To a certain extent, this result is expected as female employment in its "formal" definition in rural Egypt is rare. Female labor participation is mainly confined to the family's farm and this participation is unrelated to fertility behavior. The positive association between ever-use of contraception and completed fertility supports the idea that contraception in Egypt is mainly used to stop having more children rather than to space births.

The positive association between income and fertility supports the hypothesis that more children may pressure families to work more and earn more (Mueller and Short 1983).

Discussion and Conclusions

We examine correlates of family size decisions in Egypt, using data on women who completed their desired family size by the end of the 1970's. We find that family size decisions had not yet reached the stage of being fully controlled within the family's allocative decisions. The perception of the household as utility maximizer may be correct, but many of the essential parameters in household production decisions are exogenous to fertility behavior. Income, female work, and ever-use of contraception are not perceived as under the control of the household decision maker(s), especially as part of their family size behavior.

The Egyptian household fertility behavior during this period cannot be represented adequately by a simultaneous system of equations. A single equation model performs better in representing our expectations and in identifying the determinants of fertility.

Often, conceptual differences between models I (post-) and II (pre-transition) are detected. In the fertility equation, the wife's education is insignificantly related to the number of children ever born under model I. The same relationship is negative and significant, as expected, under model II. In addition, all endogenous variables included in the fertility equation in model I are insignificant, while the same ones are significant (except for female employment) with the expected signs in the single-equation approach of model II.

To the extent that the coverage of the EFS data is sufficient for our purposes, that we can capture the main factors by proxy variables, and that we restrict the analysis to women with completed fertility, we can draw guarded conclusions from the analyses.

In conclusion, we have argued that it is possible to test the stage of the transition for a given society, and illustrated the point for Egypt. We find that in Egypt, given the data set used and the time frame the data represents, fertility by the end of the 1970's was not endogenous to other household decisions. Accordingly, we do not expect a dramatic decline in fertility without this endogeneity. The findings support the general conclusions of Bucht and El Badry (1986) and Trussell et al. (1988) on the importance of biological determinants of fertility. The predictions of the economic model of household production to model fertility do not apply to Egypt during the period of the analysis. This is probably because there were limitations to the choices offered to households: the economic costs of fertility were not perceived fully by the households as under their allocative control.

It seems that traditional roles within and between generations continued to be deeply rooted in the Egyptian society through the 1970's (Tuma 1988). To assess if the events of the late 1970's and the 1980's would lead to change this conclusion requires another test.

We also conclude that the specification of fertility models, specially for developing countries, should focus on more details of other outcome variables. The exogeneity of outcomes (such as contraceptive use and female labor force participation) can be better specified, as can the role of the determinants of these outcomes in the fertility model. If for example, contraceptive use is exogenous to fertility, then the price of contraception would not be an effective constraint for the household fertility decisions.

Notes

1. Duesenberry (1969) provided an early critique to the household production model.

2. In censored, truncated, and qualitative endogenous variables, the assumption is that the non-observed variables are continuous and with a normal distribution. For dichotomous observed variables, we use probit estimation techniques, while for polychotomous observed variables, we use tobit techniques.

3. The procedure when applied with tobit and probit techniques, is analogous to the two-stage least squares, and yields consistent and asymptotically normal parameter estimates. It has been suggested and applied, for example, by Amemiya 1974; Lee 1981; Nelson and Olson 1978; Wong 1987.

TABLE 1. ESTIMATES FOR STRUCTURAL FORM PARAMETERS OF MODEL I. EVER-MARRIED WOMEN AGES 35-49. EGYPTIAN FERTILITY SURVEY, 1980.

EXPLANATORY VARIABLES AND EXPECTED SIGNS a/		DEPENDENT VARIABLE (1) FERTILITY (CEB)		(2) CONTRACEPTION (EUSE)		(3) MORTALITY (CHDD)		(4) FEMALE LABOR (WEMP)		(5) INCOME (FAMC)	
Constant		4.254***	(1.531)	-1.274	(1.235)	-0.727	(1.378)	-0.766	(1.308)	2.947***	(0.143)
AGR	+	0.379	(0.274)	0.548**	(0.234)	0.258	(0.356)	-0.234	(0.236)	0.235***	(0.046)
RES	+	0.942***	(0.255)			0.211	(0.274)			0.035	(0.045)
PNRM	+	0.283***	(0.085)			-0.121	(0.089)	0.147**	(0.060)	-0.008	(0.014)
WATE				0.904***	(0.287)			-0.648**	(0.265)	0.104*	(0.057)
ELEC				0.574***	(0.180)			0.311	(0.213)	0.018	(0.048)
MACH	?	-0.406	(0.332)			-0.560*	(0.298)	0.159	(0.279)	0.163***	(0.053)
TRAN\				0.893***	(0.357)	-0.000	(0.389)			0.217***	(0.054)
PRES	-	-0.312	(0.307)	0.414*	(0.217)	0.160	(0.322)	-0.021	(0.251)	0.106**	(0.054)
AGEW	?	-0.051	(0.034)	-0.003	(0.027)	0.018	(0.042)	-0.026	(0.031)		
YSIN	+	0.230***	(0.034)	0.026	(0.035)	0.146***	(0.037)	0.058	(0.038)		
AGEH	?	-0.019	(0.014)	0.007	(0.014)	-0.011	(0.021)	-0.035**	(0.015)	0.007***	(0.002)
HMIG	?	0.031	(0.196)	0.048	(0.184)	0.233	(0.237)	0.203	(0.196)	0.009	(0.041)
WBML	?	0.244	(0.966)	-0.310	(0.844)	0.563	(1.144)	1.976***	(0.219)		
HEMP	?	0.133	(0.256)	0.340	(0.208)	0.258	(0.310)	-0.430**	(0.218)	0.131***	(0.044)
YWUC	-	-0.065	(0.064)	0.125**	(0.052)	0.033	(0.082)	0.034	(0.049)	0.037***	(0.007)
YHUC	-	-0.042	(0.037)	0.052	(0.033)	-0.078*	(0.043)	-0.002	(0.033)	0.022***	(0.005)

TABLE 1. (cont.)

EXPLANATORY VARIABLES AND EXPECTED SIGNS a/	DEPENDENT VARIABLE (1) FERTILITY		(2) CONTRACEPTION		(3) MORTALITY		(4) FEMALE LABOR		(5) INCOME	
CEB b/			4.059	(4.118)	-3.882	(4.798)	3.633	(2.477)	0.067	(0.287)
EUSE + b/	0.816	(0.722)								
CHDD + b/	-0.940	(0.850)	1.394*	(0.845)			0.052	(0.989)		
WEMP ? b/	-0.297	(1.680)	-0.083	(1.352)	-0.325	(1.852)			-0.119	(0.085)
FAMC + b/	-0.006	(0.013)	-0.032**	(0.013)	-0.024	(0.020)	0.008	(0.010)		
PROCEDURE	TOBIT		PROBIT		TOBIT		PROBIT		LEAST-SQUARES	
LOG-LIKELIHOOD	-1059.90		-216.90		-836.22		-157.91		-229.35	
DEGREES OF FREEDOM	500		500		500		500		502	
N	518		518		518		518		518	

Standard errors are in parentheses

* 0.05 < P value < = 0.10

** 0.01 < P value < = 0.05

*** P value < = 0.01

a/ The expected signs refer to the direction of the expected effects of endogenous and exogenous variables on fertility

b/ Endogenous variable

TABLE 2. ESTIMATES FOR STRUCTURAL FORM PARAMETERS OF MODEL II.

EVER-MARRIED WOMEN AGES 35-49.

EGYPTIAN FERTILITY SURVEY, 1980.

EXPLANATORY VARIABLES AND EXPECTED SIGNS a/		TWO-EQUATION MODEL		SINGLE-EQUATION MODEL
		(1) FERTILITY (CEB)	(2) MORTALITY (CHDD)	(3) FERTILITY (CEB)
Constant		4.176***	-0.447	3.273***
AGR	+	0.278	0.018	0.314*
RES	+	0.923***	0.189	0.864***
PNRM	+	0.284***	-0.118	0.323***
MACH	?	-0.455*	-0.066**	-0.143
TRAN			-0.316	
PRES	-	-0.349	0.003	-0.252
AGEW	?	-0.052	0.004	-0.053**
YSIN	+	0.229***	0.142***	0.157***
AGEH	?	-0.022*	-0.014	-0.015
HMIG	?	0.022	0.213	-0.085
WBML	?	0.229	0.577	-0.003
HEMP	?	0.114	0.126	0.025
YWUC	-	-0.093***	-0.025	-0.084***
YHUC	-	-0.059**	-0.111***	-0.184
EUSE	+	0.585***		0.712***
WEMP	?	-0.211	-0.234	-0.123
FAMC	+	0.003	-0.002	0.004**
CEB			-4.101b/	
CHDD	+	-0.600b/		0.787***
PROCEDURE		TOBIT	TOBIT	TOBIT
LOG-LIKELIHOOD		-1056	-836	-937
DEGREES OF FREEDOM		500	500	500
N		518	518	518

* 0.05 < P value < = 0.10
** 0.01 < P value < = 0.05
*** P value < = 0.01
a/ The expected signs refer to the direction of the expected effects of endogenous and exogenous variables on fertility
b/ Endogenous variables

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APPENDIX I. DEFINITION OF VARIABLES

CEB : Total number of live births

EUSE: Dummy variable with a value 1 if the wife has ever used a contraception method and zero otherwise.

CHDD: Total number of child deaths under five years of age.

WEMP: Dummy variable with a value 1 if the wife has ever worked while in union and zero otherwise.

FAMC: Current monthly family expenditure in Egyptian Pound (L.E.).

CUSE: Dummy variable with a value 1 if the wife is currently using a contraception method and zero otherwise.

AGR : Dummy variable with a value 1 if the family owns an agricultural land and zero otherwise.

RES : Dummy variable with a value 1 if the family owns their current residence and zero otherwise.

PNRM: Number of persons per room in the residence.

WATE: Dummy variable with a value 1 if the source of drinking water is a faucet located in the residence or outside the residence but inside structure and zero otherwise.

ELEC: Dummy variable with a value 1 if there is electricity in the residence and zero otherwise.

MACH: Dummy variable with a value 1 if there is a radio set, or television, or gas stove, or water heater, or telephone, or sewing machine, or refrigerator in the residence and zero otherwise.

TRAN: Dummy variable with a value 1 if there is a bicycle, or a motorcycle, or a car in the residence and zero otherwise.

PRES: Dummy variable with a value 1 if the current place of residence is urban and zero otherwise.

AGEW: Wife's age in completed years.

AGWG: Wife's age at first marriage.

YSIN: Years in union.

AGEH: Husband's age in completed years.

HMIG: Dummy variable with a value 1 if the place of birth of husband is different from PRES or whether the husband is working abroad and zero otherwise.

WBML: Dummy variable with a value 1 if the wife was working before marriage and zero otherwise.

HEMP: Dummy variable with a value 1 if the occupation of husband is professional, or clerical, or sales, or skilled labor and zero otherwise.

YWUC: Education of wife in years.

YHUC: Education of husband in years.

TABLE A1. DESCRIPTIVE STATISTICS OF MAIN VARIABLES.

EVER-MARRIED WOMEN AGES 35-49.a/

EGYPTIAN FERTILITY SURVEY, 1980.

VARIABLE	MEAN	STANDARD DEVIATION
Children ever born	6.75	(2.51)
Ever use of contraception	0.71	(0.45)
Current use of contraception	0.48	(0.50)
Child deaths	1.51	(1.63)
Female employment	0.18	(0.38)
Monthly family expenditure	54.35	(41.70)
Ownership of agricultural land	0.23	(0.42)
Ownership of current residence	0.60	(0.49)
Number of persons per room	2.59	(1.41)
Availability of water	0.49	(0.50)
Availability of electicity	0.74	(0.44)
Availability of durable goods	0.82	(0.39)
Availability of means of transport	0.18	(0.34)
Place of residence	0.53	(0.50)
Wife's age in years	39.88	(3.81)
Wife's age at marriage in years	17.27	(4.02)
Years in union	22.15	(5.15)
Husband's age in years	48.12	(7.27)
Husband's migration history	0.24	(0.42)
Pre-marriage wife's employment	0.14	(0.35)

TABLE A1. (cont.)

VARIABLE	MEAN	STANDARD DEVIATION
Husband's employment	0.50	(0.50)
Wife's education in years	2.30	(3.74)
Husband's education in years	3.91	(5.20)
Sample size N	518	

a/ The sample includes women who are ever-married, aged 35-49 years, fecund, in union, exposed, and do not desire additional children.