EUROPEAN POPULATION CONFERENCE 2012
13-16 June Stockholm, Sweden
Stockholm University

P-1:6

Socioeconomic Determinants of Fertility Level in Iran

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Introduction

It is well documented that the socio-economic characteristics of the families and societies play important roles in the determining the level of fertility. In International comparisons the wealthy and well developed countries have been enjoying lower levels of fertility compare to the developing and less developed countries.

In explaining fertility economically, a variety of variables are important in the life course of individuals. In theoretical and literature consideration Socio-economic explanations of fertility transition focus on the role of women schooling and education which encourage women to have jobs out of home. From this point of view the opportunity costs of women increase in many aspects including time, which are eventually considered as economic opportunities. Opportunity costs of children have therefore increased, and parents have been motivated to substitute child schooling for additional births.

Important relationship might be found between the rate of fertility and economic situation. This could be explained by the intermediate factors relating both economy and fertility, including the rise of education, different patterns of job selecting and consequently consideration of opportunity costs.

This study reviewing the economic based literature, aims at investigating the economic determinants of fertility level in Iran. In so doing economic factors explaining fertility are analyzed controlling for other socio-demographic factors.

To achieve this aim a multilevel analysis considering the relations in individual and provincial level has been utilized.

Method and Data

The study is an analytical one based on Household survey conducted in 2002 by the statistical center of Iran. The data include socio-economic characteristics of

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households along with demographic indicators of individuals. The sample size of the study includes, 4500 women of reproductive age.

The study makes use of bivariate and multivariate analysis in explaining the correlates of fertility. In doing so the economic variables including Income and Household expenditures are the main variables. Besides these variables one indicator as possession of modern appliances has been developed including Tape Recorder, Color TV, Frazer, Vacuum Cleaner, Washing Machine, Video, Computer and Cellular phone.

The dependent variable in the study is Children Ever Born (CEB); the number of children born to the women aged 15-49.

Literature Review

Economic explanation of fertility has been receiving much attention worldwide during the last century and before. In this context countless studies and inquiries have been in concern. In this context several studies has been regarded as the theoretical development of the body of the knowledge about the population growth, fertility level and changes.

In addition to these studies which are explained below, lots of studies making use of the conceptual framework have investigated on the relationship between Fertility and economic indicators.

Caldwell assume a high importance for income and economic wellbeing in fertility reduction when states "with rising national incomes and the world increasingly becoming a single economic and social system, all parts of the world seem likely eventually to experience most of the demographic changes".

Ehrlich and Kim (2005) argue that demographic transition toward low fertility and mortality rates has been taken place with a simultaneous persistent growth in per-capita income.

In a study in Egypt Cochrane (1990) examined the effects of economic variables on the fertility level. Of economic variables land ownership emerged as a significant variable in determining both husband's and wife's desired family size in all the rural regions and showed the positive effect.

Rios (1991) with an overview of Latin American Fertility trends states that increasing income will lead to fertility decreases as happened in Europe "Future economic development in Latin America will cause income to rise, improve the educational attainment of women, and future reduce the proportion of the population living in rural areas".

Beydoum (2001) in a study in Lebanon conclude that household's demand for a child is closely related to different services and utilities ascribed to that child. It also claims that fertility becomes positively associated with the household's income when the notion of child-quality is added to the model. Findings confirm the baseline

inverse association between an index of the household's socioeconomic status (HSES) and the cumulative fertility level.

Theoretical Concerns

In general, explanations of the fertility theory and related concepts can be classified in two major theoretical categories: first category is mainly based on the dynamic interaction between fertility level and economic growth in societal and national level. The second category of theories focuses on the microeconomic relations of fertility decline and family size.

Among the first group it was first Malthus to support the Idea that population growth is a potential determinant of output growth. He hypothesized that population growth depends on the economy's material conditions, especially its food supply; because mankind's biological capacity of reproduction exceeds its physical capacity to produce food (Ehrlich and Kim 2005). Extending Maltus's work researchers such as Mill (1965), Schumpeter (1954) and Smith (1976) developed the so-called "Classical" model. They adopt the view that economic growth is determined exogenously and population growth must adjust to it in the long-run values.

According to the neoclassical model economic growth is an endogenous variable that depends on population growth while fertility is still an exogenous variable. Becker in his studies develops a theoretical framework to explain that the relationship between the two variables depends on a number of socioeconomic factors such as the incentive for having children, the quality of children, the efficiency of private capital markets and the intergenerational transfers within the family. (Smith, 2004).

The main focus of literature in recent time is treating population growth and development as endogenous variables, simultaneously determined, rather than separate outcomes of different economic systems.

In this context some empirical studies have examined the effect of population growth and fertility on economic growth.

The early theorists of fertility decline were the New Household Economists. Theodore W. Schultz created a basic analytical tool with his concept of human capital, which Gary Becker (1960) used to develop his economic analysis of the family. Becker later elaborated the concept of the value of people's time rising with their education or capitalization because it could be used to generate higher earnings. In a special issue of the Journal of Political Economy (Schultz, 1973) devoted to the new household economics, T. Paul Schultz argued that time has a monetary value and

hence a cost must arise from nonmonetized or nonearning activities such as staying outside the workforce to rear one's children.

about fertility decline in US after baby boom, Caldwell assume that the economy was expanding and it offered more jobs, so women could get job and stay out of home which encourages them not to have more babies.(Caldwell, 2004)

The second group of fertility theories can be classified into two major theoretical categories too: the conventional structural theories and recent ideational (or diffusion hypotheses). Although both hypotheses clearly recognize interdependence of the elements involved in both, they differ on the relative importance of different determinants in affecting fertility transition over time (Masih, 2000).

The conventional socio-economic structural hypothesis broadly includes, among others, microeconomic theories, the threshold hypothesis, the classical demographic transition theory and Caldwell's theory of integration flow of wealth. Microeconomic theories incorporate Easterlin theory emphasizing one's preference for the number of children is partly shaped during one's childhood, and Leibenestein's theory focusing on the social influence groups.

In ideational perspectives some elements play important role such as the perceptions, ideas, and attitudes toward fertility control trough institutions such as organized family planning, and mass elementary education. In the view of this theories a few years of schooling appear sufficient for shift in reproductive behavior is more likely to reflect changing perceptions, ideas, attitudes, and aspiration rather than changes in objective microeconomic realities.

Although the structural hypotheses recognize the important role that elements in ideational hypotheses play, it is emphasized that the ideational forces need to be preceded or at least firmly supported by a certain level of socioeconomic development in terms of the level of per head income, level of poverty, rate of urbanization and so on (Masih, 2000).

Results

The literature revealed that income enjoyed by the family or by husband and wife was correlated by level of fertility. In this section as mentioned above three economic variables including income, Family expenditures and possession of modern appliances are brought to examinations. Assuming the reporting of income is not reliable; Expenditures and Access to Modern Appliances are assumed as Proxy measures for economic situation. In the individual model the variables income and expenditures both will not be in the model due to non linearity observed. The possession of appliances is the only economic variable. In the

multivariate model in provincial level variable income is also omitted due to colinearity with variable expenditure. In doing so possession of appliances will be more concerned as an economic variable again.
In this section the Models in individual and provincial level are analyzed. The firs model examines the effect of age at marriage, education, expenditures and modern appliances. The results of examinations in individual level are illustrated in the table 1.

Table 1- Parameter Estimation for CEB in Individual Level

Parameters	Beta Value	S.E	T-test	P-value
Age at Marriage	-0.326	0.008	-21.99	0.000**
Education	-0.396	0.014	-27.14	0.000**
Expenditures	-0.016	0.000	-1.07	0.915
Modern Appliances	-0.215	0.015	-14.03	0.000**

The bivariate analysis indicates the importance of the age at Marriage as a social-cultural variable in the number of CEB. Education with a Beta Value of -0.211 has a reverse relationship with the CEB indicating that the more the Education is the lower the fertility of women will be. Variables household expenditures reveal now relation with the fertility.

In this model possessing Modern Appliances indicates the negative relation with fertility. That is women enjoying modern instruments in the house tend to have less children compare to the others. This economic variable can show the relation between fertility and economic situation of the family. The Beta value for this variable is -0.215, indicating the significant relationship between this variable and fertility by a t-value of 14.

Results of a correlation model, controlling for the age of the respondents are indicated in the table 2. As it is shown all the variables indicate the higher relations with the fertility when age is controlled.

Table- 2 Correlation Coefficients Controlling for Age of Respondents

Parameters	Correlation Coefficient	P-value
Age at Marriage	-0.495	0.000**
Education	-0.342	0.000**
Expenditures	-0.165	0.000**
Modern Appliances	-0.332	0.000**

In the model the variables household expenditures indicate negative relation with the fertility with beta values of -0.165. Although the relation is not high, indicate that the women in families with higher level of expenditures tend to have smaller size of parity. This is well fitted to the results of the studies indicating higher level of fertility in the poor circumstances.

In addition the correlation coefficient for the variable, modern appliances rises in the new model. In general it could be argued that if the age does not play any role in the model or if we suppose all women are the same age the economic variables will have more impact on the fertility.

Carrying of a new multivariate model to regress the fertility inform us of the approximately same results. The model show an R square of 0.117 indicating the weakness of the model in predicting the fertility. It shows that the only 0.117 of the variance in the fertility level could be explained by this model (model 1). By interring the age in the model the predicting power of model rises enormously. The coefficient of determination rises to 0.59 indicating that 60 percent of the variance in the fertility could be explained by this model.

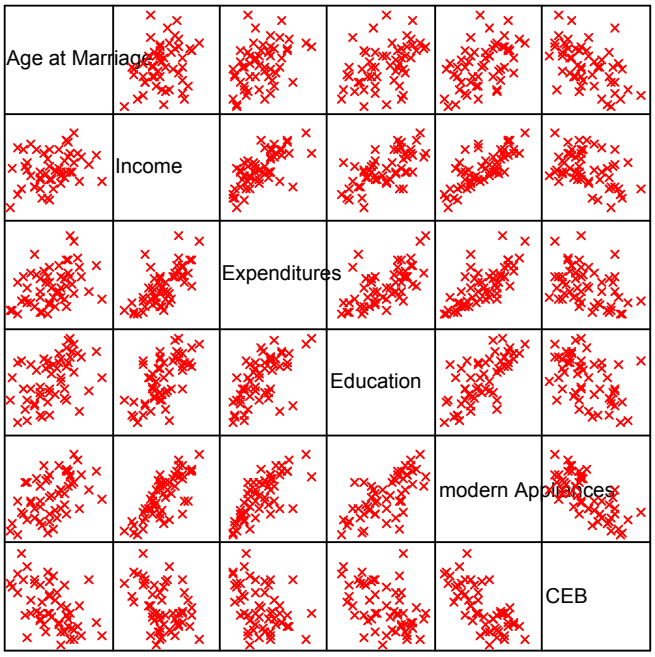
The estimates of the beta coefficients indicate that the age is most important variable in the model. The beta for the age at marriage is -0.383 indicating negative effect of age at marriage on the fertility. After age at marriage possession of modern appliances is other important variable in the model with a beta value of -0.248. Education and expenditures do not play important role in predicting the fertility. The beta for expenditures is positive but not significant, which indicate no prediction power in the model.

Table-3 Multiple Regression Analysis for CEB

Parameters	Beta Value	S.E	T-test	P-value
Age	0.728	0.003	59.8	0.000*
Age at Marriage	-0.383	0.006	-30.94	0.000*
Modern Appliances	-0.246	0.012	-17.02	0.000*
Education	-0.081	0.02	-4.302	0.001*
Expenditures	0.016	0.00	1.154	0.248

Provincial Level

The relation between mean fertility of provinces and their economic situation is well illustrated in the correlation Matrix in the figure 1.



As it is shown in the figure above and table 4 Modern Appliances has the highest relationship with the fertility. The beta value for this variable is -0.720 which is significant at a t-value of -7.49. It indicates that by 1 unit increase in the modern appliances the fertility will come down by 0.75. The R square for this variable is more than 0.5 which indicates that the 0.5 percent of the variance in the fertility of provinces is explained by this variable.

Age at marriage takes the second order in the model with a beta value of -0.509. This indicates that an increase of 1 unit on the age at marriage decreases the CEB by 0.5. The R square of 0.25 indicates that 25 percent of variance in the fertility level in the provinces is explained by this variable.

Education and Expenditures are also important in the explanation of fertility differential in provinces. The beta values for these variables are -0.461 and -0.386 respectively indicating moderate relation between these variables and CEB.

Table-5 Parameter Estimate for CEB in Provincial Level

Parameters	Beta Value	S.E	T-test	P-value
Modern Appliances	-0.720	0.056	-7.491	0.000*
Age at Marriage	-0.509	0.087	4.26	0.000*
Education	-0.565	0.073	-4.93	0.000*
Expenditures	-0.386	0.000	-3.022	0.004

In general, the relations indicate that the provinces enjoying better economic situation and higher level of education have the lower level of CEB. To control the interaction effects of variables a multiple regression is carried out. The Results of multiple regressions are indicated in table 5. The R value of the model is 0.794. The R square of the model is 0.63 indicating that the model could explain the 63 percent of the variations in the dependent variable.

Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.777[a]	.603	.571	.47483

a. Predictors: (Constant), HAZINE_1, AGEATMAR, EDU, MODERN_1

b. Dependent Variable: CEB

The Beta value for the Modern Appliances is still the highest one about -0.946. The beta value for the age at marriage is -0.172 which is not significant in the model. The effect of education is also very small.

Table 5- Parameters of Multiple Regressions in Provincial Level.

Parameters	Beta Value	S.E	T-test	P-value
Modern Appliances	-0.946	0.9	-6.05	0.000*
Age at Marriage	-0.172	0.07	-1.641	0.107
Education	-0.057	0.111	-0.430	0.897 *
Expenditures	0.272	0.000	1.96	0.055

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