Lakshmanasamy, T.: Demand For Children Among Rural Families: Children as a Consumption Utility. The Journal of Family Welfare. Dec 1991. 37(4). p.3-12.

Demand for Children among Rural Families: Children as a Consumption Utility

Dr. T. Lakshmanasamy

Introduction

In recent years, fertility has become an important subject of inquiry for economists. The decision to have children and their number and timing involve trade-offs which constrain the purchase and consumption of durables and other household items vying for the family's scarce resources. Moreover, resources are spent on products and services used in the prevention of childbirth and in child-rearing. Both the bearing and rearing of children are costly activities; goods and services invested on children have to be purchased in the market by paying a price. In addition, the time of parents, particularly the mother's time, is an important input in childbearing and rearing, and has an opportunity cost. In return, parents derive pleasure from having their own children [1]. This is termed as 'benefits' or utility from children. Parents allocate their resources among various items which yield satisfaction, including the number of children, such that they derive the maximum satisfaction. This is a typical choice problem. Thus, the decision to have children can be fruitfully modeled as an outcome of optimizing household production and consumption decision-making. In this process, important determinants of the demand for children are household income and the cost of children.

Objectives

This paper uses such an economic framework for analyzing the household demand for children [2]. Supply side variables and contraception have not been included, as the main focus is on demand side factors. Since contraceptive use is mainly an intervening variable, the income level of the family determines its use. Also, its effects are captured by the education variable, as better educated women tend to use more contraception. The main purpose of this paper is to analyze the economic determinants of parental fertility decision, which have so far been regarded more as a subject for demographers and biologists. The primary justification for the application of a micro-economic framework to fertility analysis is that many studies in both developed and developing countries indicate that childbearing and rearing have economic consequences for

families and that economic factors exert a considerable influence on a couple's reproductive decisions.

Methodology

The theoretical framework used in this paper is that of the 'new home economics' or the 'household production function' approach developed by [A] [B] and [3], where fertility is viewed as an economically constrained choice in which family income and price of children play important roles. Becker A proposed that children can be viewed as an economic good and that the demand for children be represented as a family decision process wherein the household chooses a family size that maximizes satisfaction, given the relative prices of commodities, tastes and total income. In simplified terms, the household derives satisfaction from 'commodities' which are not purchased in the market, instead, they are produced within the family by combining the market-purchased goods and services and the time of the family members. Then, the family is treated as a producing unit; producing various kinds of benefits for its members. In the literature, consumption utility represents the pleasure derived from having one's own children. If a family has a greater number of children than other families, it implies that the family derives more pleasure from having more children. Thus, various indices of the number of children measure the consumption utility of children. In this study, we use both 'fertility' and 'demand for children' synonymously to mean family size.

The family utility function can be written as:

$$U = u (N, Q, Z) \quad (1)$$

where N is quantity of children, Q is quality per child, and Z is other sources of satisfaction. Each 'commodity' is produced according to a household technology:

$$j = f (xj, tij) \; j = N, Q, Z \quad (2)$$

$$i = m, w$$

where xj represents market-purchased goods and services and tij, the tune input of the household members (husband and wife) that goes into the production of j. The production function implies that parents can increase their satisfaction by increasing the resources devoted to the production of each household commodity. Combining quality per child and the number of children, parents derive 'child services', a flow of services from children (C); i. e.

$$C = NQ = f (xe, tme, twe) \quad (3)$$

However, the productive capacity of the family is limited by the total time and total income available. The income constraint can be written as:

$$Y = H + Ww\ L + V = \text{å}\ Pj\ Xj \quad (4)$$

where Y is the lifetime money income, H is the husband's lifetime earnings, Ww is the average hourly wage rate of wife, L is the hours of work of the wife in the labor market, V is the non-labor earnings and Pj is the price of market-purchased goods and services used in household production. The time constraint of the wife can be written as:

$$T = L + t \quad (5)$$

where T is the wife's total available time and t is the wife's time available for home production. It is assumed that children are intensive in mother's time and that the male's time is mostly spent on market earnings. Now, the cost of producing household commodities can be written as:

$$p\ j = Pj\ Xj + Wi\ tij \quad (6)$$

where j is the shadow price of a unit production of household commodities. Thus, the shadow price of children is a function of the prices of market goods and services used in the production process and the wage rates of household members. Generally, the husband's wage is equated with family income and the wife's wage is treated as the price variable, because childrearing is intensive in female time and the wife's time has an opportunity cost in the market place. When income rises, the family can afford more of both C and Z services. This is called the 'income effect'. The demand for children, hence, is expected to increase with rising family income. If inputs into child services become more costly relative to inputs into other commodities, there may be a marginal shift in demand from children to other commodities. This is called the 'price' or 'substitution' effect. Thus, there should be a negative relationship between the costs of time and goods needed to raise children and the quantity and quality of child services demanded. The value of the wife's time is determined by the amount she could earn if she were to engage in income-earning activities. The opportunity costs of women's time have most often been estimated by human capital specification that is by education and experience (4). The family demand equation for children arising out of the model is (5):

$$N = f\ (Wm, Ww; Pj, V) \quad (7)$$

Data and Variables

To test the implications of the model, a recent, household-level data set from rural Tamil Nadu was, used with the Ordinary Least Squares method. The survey, conducted for the author's doctoral thesis, covered 670 rural households from 16 villages in the districts of Coimbatore, Pefiyar, Salem and Dharmapuri, between May and October 1985. The households were selected by multistage sampling. The Information collected related to motivations for having children, household size, fertility history and demographic variables, besides general socio-economic information.

Table 1 gives the mean and standard deviation of the variables used in the empirical analysis according to landholding status of the households. The partition of rural households into cultivators and non-cultivators enables the identification of differences in family behavior towards fertility decisions. The descriptive statistics indicate that fertility enhancing factors are stronger for landless families than for landholding families; and fertility and infant mortality are higher among landless families; on the other hand, fertility depressing factors such as male and female education are higher for landholding families.

Table 1: Descriptive statistics and definition of variables

Variable	Definition	All families		Landholding families		Landless families	
		Mean	SD	Mean	SD	Mean	SD
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CEB	Number of children ever born per couple	3.17	1.90	3.09	1.76	3.34	2.14
EDNM	Schooling of male (years)	4.26	4.60	5.13	4.71	254	3.85
EDNF	Schooling of female (years)	2.21	3.64	2.72	3.82	1.21	3.04
AGEM	Age of male (years)	39.77	13.06	40.67	13.60	38.00	12.90
AGEF	Age of female (years)	34.34	11.47	35.62	11.19	31.85	11.61
AGMF	Age at marriage of female (years)	17.59	2.85	17.69	2.59	17.38	3.14
INCOM ($x10^{-3}$)	Family income (Rs.)	15.93	20.22	21.03	22.91	5.92	5.47
NLNCOM ($x10^{-3}$)	Non-labor income (Rs.)	1.30	2.86	1.68	2.98	0.57	2.46
LWAGEM	Wage rate of male (Rs./day)	5.66	9.99	2.59	0.40	2.39	0.32
LWAGEF	Wage rate of female (Rs./day)	1.75	3.78	1.78	0.33	1.66	0.27
INM	Number of infant deaths	0.32	0.20	0.25	0.70	0.48	0.91
LAND	Land owned by the family (acres)	5.97	10.72	8.73	12.16	-	-

REGION	Regional dummy=1 if the family is in Coimbatore /Periyar dts., O otherwise	0.47	0.50	0.45	0.50	0.51	0.50
HHSN	Household dummy=1 if the family is nuclear; O otherwise	0.57	0.49	0.51	0.50	0.69	0.46
CASTV	Caste dummy=1, if higher caste, O otherwise	0.38	0.48	0.50	0.50	0.12	0.33
CASTT	Caste dummy=1, if lower caste, O otherwise	0.21	0.41	0.37	0.69	0.44	0.49
SIBSF	Number of siblings of female	3.24	2.04	3.18	0.25	3.33	2.01

Note: The wage rates of male and female are computed as follows:

$\log W_i = a + bH_i + cD_i + u_i$ = male, female, where $\log W_i$ is the logarithm of daily wage rate of the ith member; H_i is the human capital variables, such as age, education, health; D_i is a vector of variables influencing the demand for labor; such as local labor market conditions; a, b, c are the parameters to be estimated; and u_i is the error term.

Since fertility is a decision issue in the economic analysis of family fertility behavior, the literature suggests that measures of actual family size may be used as the dependent variable. Ideally, one should use desired family size as the dependent variable. However, desired family size obtained from interview surveys is not suitable for vigorous quantitative analysis, because such 'imagined' measures may not resemble the typical family size of the respondent's socioeconomic stratum and may ignore fecundity impairment and contraceptive failure. Moreover, preferences are revised according to the couple's experiences. Desired family size may not correspond to the actual or realized fertility outcomes. For example, in our survey whereas the desired family size of couples is just two children, the realized number of children is more than three. Hence, completed family size and the probability of adding another child to the family at a given parity, could be better indices of actual fertility.

Completed fertility represents the culmination of a series of births, each of which may be affected by a different set of socioeconomic conditions. Thus, in this study, the dependent variable is the number of children ever born per couple (CEB). It is assumed that the couple plans a family size and executes the plan successfully to realize the desired size, given the market opportunities and resource constraints. The model allows for the specification of some predicted relationships between the erogenous variables and the dependent variables. Many studies, on female labor force participation and fertility show that economically active women have less children. Also, when wage rate increases,

women supply more working hours, hence, one can expect, by and large, a negative effect of female wage rate (IWAGEF) on the demand for children. Likewise, male wage rates (IWAGEM) can also display negative effects.

Educational attainments of females (EDNF) and males (EDNM) are assumed to capture the levels of household production efficiency, particularly contraceptive knowledge, and thus, they should display negative signs in family size equations. Schooling of females also changes norms and tastes for children versus other commodities. Female education further, enhances the ability of women in the family decision-making process. We have used the education variable primarily as a proxy for productive efficiency. However, education can have various effects on family size, and its modernizing effects are every important. It affects socio-cultural aspects with regard to age at marriage, value of children, contraceptive use and so on. Education changes the value of time, opportunity structure and preferences, and these changes, in turn, affect the above mentioned modernizing factors. Thus, the effect of education on age at marriage, value of children and contraception are included in this analysis indirectly. Education alters the opportunity structure of the family and this affects the utility from children.

The relationship between income and fertility is a much-debated issue. A change in income may have a variety of effects on parents' demands on children, depending on the sources and the nature of income change. However, in its simplest form, if children are normal goods, as income rises, so does fertility. If the current income measure is not well defined, a measure of permanent income, such as landholding, is often used as a proxy for family income. An unanticipated but permanent increase in non-labor income would increase the demand for children. Thus, current income (INCOM), non-labor income (NLINCOM), and the area of landholding (LAND), all measures of wealth, are expected to exert a positive effect on the family size decision.

The effect of infant mortality (INM) on family size should be positive due to the greater uncertainty of child survival in rural areas. Infant mortality increases the derived demand for births by increasing the number of births required to obtain a survivor, and thus, a greater quantitative effect on the number of children demanded can be expected. Age of female (AGEF) and male (AGEM) are introduced as linear controls for differences in both the experiences of birth cohorts and the variations in their life cycle. Their effects on fertility are likely to be positive. The variable of age at marriage of the female (AGMF) is expected to display a negative effect because as the duration of married life decreases or as the age at marriage increases, the probability of conception and the childbearing period decrease, resulting in fewer births.

Nuclear families (HHSN) will demand less children, and hence, its effect is negative. Higher caste (CASTV) households will have better access to education and contraception than lower caste (CASTT) households. Thus, the effect on fertility of CASTV will be expected to be negative, and that of CASTT will be positive. Lower caste households may also demand more children for income-earning activities. Females from larger families will experience problems of raising more children, and hence the number of siblings of the female (SIBSF) will be expected to display negative coefficients.

If the household is situated in an economically developed region (REGION), it will have access to better services; its effect can be expected to be negative. Thus, in general, variables measuring the price of children are expected to exert a positive influence on the couple's demand for children.

Results and Discussion

The OLS estimates of the fertility equation for household behavior under the consumption utility framework are presented in Table 2.

Table 2: Regression on children ever born among rural families

Independent variable	All families		Landholding families		Landless families	
	1	2	3	4	5	6
LWAGEM	-1.002	-1.083	-1.010	1.184	-0.023	-0.131
	(1.29)	(1.56)	(1.25)	(1.38)	(0.4)	(0.10)
LWAGEF	-1.017	-1.028	-1.008	-1.457	-0.015	0.027
	(1.36)	(1.34)	(1.50)	(1.52)	(0.30)	(0.02)
INCOM ($x10^{-3}$)	0.003	-	0.004	-	0.020	-
	(0.70)		(0.92)		(1.06)	
LAND	-	0.009	-	0.010	-	-
		(1.58)		(1.70)		
NLINCOM ($x10^{-3}$)	0.003	0.002	0.004	0.033	0.034	0.024
	(1.14)	(1.02)	(1.33)	(1.38)	(0.75)	(0.62)
EDNM	-0.035	-0.052	-0.004	-0.052	-0.028	-0.010
	(2.24)	(1.90)	(2.43)	(1.76)	(0.94)	(0.49)
EDNF	-0.009	-0.093	-0.006	-0.115	-0.009	-0.009
	(0.46)	(1.51)	(0.26)	(1.50)	(0.25)	(0.10)
INM	0.883	0.883	0.804	0.807	0.928	0.917
	(12.44)	(12.54)	(8.56)	(8.71)	(8.73)	(8.57)
AGEM	0.027	0.030	0.020	0.022	0.042	0.005
	(2.96)	(6.08)	(3.65)	(3.80)	(5.22)	(5.36)
AGEF	0.048	0.055	0.033	0.043	0.069	0.069
	(4.23)	(4.58)	(2.35)	(2.83)	(4.05)	(3.99)

HHSN	-0.026	-0.042	-0.009	-0.064	-0.105	-0.144
	(0.23)	(0.37)	(0.74)	(0.50)	(0.50)	(0.68)
CASTV	-1.323	-0.903	-1.246	-1.044	-0.330	-0278
	(7.71)	(6.46)	(8.05)	(6.30)	(1.08)	(0.90)
CASTT	0.323	0.354	0.409	0.352	0.537	0.523
	(2.14)	(2.35)	(1.72)	(1.50)	(2.61)	(1.98)
SIBSF	-0.031	-0.019	-0.244	-0.013	-0.032	-0.031
	(1.14)	(0.71)	(0.74)	(0.36)	(0.68)	(0.65)
REGION	0.146	0.450	0.238	0.597	0.004	0.007
	(1.38)	(3.09)	(1.70)	(1.36)	(0.03)	(0.01)
Constant	1.85	5.46	2.42	6.81	0.96	1.18
R^2	.47	.48	.42	.44	.61	.61
N	**670**		**444**		**226**	

Note: Absolute 't' values in brackets

The significance level is set at 5 per cent level

The, table shows separate estimates for landholding and landless families. In columns (1), (3) and (5), current income (INCOM) is included as a measure of family income. In columns (2) and (4), current income is omitted and a measure of permanent income, the size of landholding (LAND) is included because of the ambiguity in the current income measure. In both specifications, non-labor income (NLINCOM) is included. It can be seen that there are certain variations among cultivators and non-cultivators in deciding family size. Most of the variables influence the demand for children as predicted and in the same manner in all the equations.

The effect of income is positive in all specifications, but is not statistically significant. This result is in accordance with the expectation viz., positive income effect, suggesting that children are not inferior goods in rural households. Both current income (INCOM) and landholding (LAND) coefficients are smaller in magnitude. The coefficients of non-labor income (NLINCOM) is also weak. In rural agricultural settings, the neglect of income in kind may depress measured income compared to real income.

The coefficients of male education (EDNM) and female education (EDNF) are negative in all specifications, as expected. If schooling of the male and female are proxies for productive efficiency, additional schooling increases household efficiency in production and consumption, and thereby reduces fertility. Male education is significant in columns (1) and (3), however, female education is not significant in any of the specifications. The low educational level of rural women (mean 2.21 years) may not strongly influence household decisions [3].

The positive relationship between infant mortality (INM) and fertility is consistent with the replacement hypothesis; with greater uncertainty about the survival of children in rural households, parents tend to increase the number of births, and this behavior is very strong as the parents' goal is to have a greater number of surviving children. The coefficients of age of male (AGEM) and age of female (AGEF) are positive and statistically significant in all equations. The coefficient of female age at marriage (AGMF) is also significantly negative in all specifications, confirming the prediction that woman married at a young age will have more children and that long exposure to family life results in more children.

As expected, the coefficients of male wage rate (LWAGEM) and female wage rate (LWAGEF) are negative in all specifications, except female wage rate in the second specification of landless families. However, none of them are statistically significant. This shows that, even though there is some price effect, it may not be strong enough to influence household decisions with regard to fertility. Especially in rural families, childcare is compatible with agricultural works, and this might simultaneously have weakened the price effect.

Test variables, such as nuclear household (HHSN) and siblings of female (SIBSF) are negative in all specifications. Higher caste dummy (CASTV) is also negative and statistically significant in the case of all families and landholding families. Lower caste dummy (CASTT) is positive and significant in all families and landholding families. These results indicate that lower caste families in rural areas need more hands to support the family and higher caste families prefer more quality from fewer children. The region dummy is positive, contrary to expectations, but statistically insignificant. The presence of many small-scale industries in these districts may encourage child labor and hence there is an incentive to have more children.

The erogenous variables included in the empirical analysis explain about 42 to 61 per cent of the variations in children even born in rural families, a reasonably good fit.

Summary and Conclusion

In this paper, we have tried to analyze the family building behavior of rural couples, treating children as a source of consumption utility to parents. A household production model has been used and the implications have been empirically tested, using the OLS method and a recent household level data set from rural Tamil Nadu. The results, in general, support the expectations of the model, but are not strong enough to influence parental behavior. The empirical results show that the coefficients of wage rates are consistently negative,

however, significant in any of the specifications. On the other hand, male education has some effect on fertility behavior. The effect of income is also weak. It seems that parents' valuation of children as a source of satisfaction (consumption utility) has limited value. In fact, children's pecuniary (monetary) contributions seem to influence parental decisions to a considerable extent in rural families.

Acknowledgements

The paper is based on a chapter of the author's doctoral disseration "Economics of Farm Families: An Econometric Analysis of the Demand for Children" submitted to the University of Madras, 1987. He sincerely acknowledges the helpful comments and guidance of Prof. A.M. Nalla Gouden, Department of Econometrics, University of Madras.

Notes

[1] The idea that own children is a source o.' satisfaction to parents is not new; the Tamil classic 'Thirukkural' refers to the high quality of pleasure desired from children and 'Naladiyar' refers to the economic value of children.

[2] This paper is not concerned with either life cycle profiles or inter-generational aspects. Children are assumed to provide only consumption utility and not any other form of utility. Supply side factors are also not given explicit consideration.

[3] Leisure-time is included in home production.

[4] Equation (7) does not include the complete set of demand functions; only the demand for children is estimated.

[5] In order to find the possible non-linear effect of education, we estimated a separated equation. The estimates are:

LCEB = 2.44 + 0.136 AGEF + 0.130 AGEFSQ - 0.115 EDNF

(0.58) (3.33) (0.59)

- 0.281 EDNF2 - 0.119 EDNFSQ R2 = 0.20

where EDNF1 = female; primary educated

EDNF2 = female; secondary educated

AGEF = age of female

and AGEFSQ and EDNFSQ are the squares of AGEF and EDNF respectively

In this case also the coefficients of female education are negative, and none of them are significant.

References

1. Becker, G.S.: "An economic analysis of fertility" in Demographic and Economic Change in Developed Countries, Universities - National Bureau Conference Series No. 11, Princeton University Press, Princeton, USA (1960).

2. Becker, G.S.: "A theory of allocation of time", The Economic Journal, 75: 229 (1965).

3. Willis, R.J.: "A new approach to the economic theory of fertility". Journal of Political Economy, 81 (2): 2 (1973).