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Household Consumption Behaviour and Fertility in Korea*

1. Introduction

ACCOMPANYING the rapid economic growth of the Republic of Korea during the last decade and a half, there have been profound changes in the social and cultural perception and activities of the people. Traditional values about consumption-saving, work-leisure activities, children, extended family, married females' outside activities, etc. have been undergoing a period of transition. The nature and process of these socio-economic and cultural transition have widely been acknowledged as the factors underlying the declining fertility in Korea during the sixties and the first half of the seventies.

Perhaps due to the relative lack of interest among Korean economists in demography and population, little or no attempt has been made to study the changing economic activities of households as the underlying determinants of declining fertility. Among economic activities related to fertility, it is to be specifically noted that during the period of Korea's rapid economic growth, there have been extensive changes in individual families' consumption, saving, work and leisure activities.

What is more significant is the fact that these changes are accelerating while economic growth has recently slowed down. However, these changes have not taken place among all families to the same extent. There exist today significant differences in the consumption and work-leisure behaviour pattern among urban and rural population, among different income groups and among people of different educational attainments. It is in this context that this study examines

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the conditions underlying differences in the consumption-saving and work-leisure behaviour among different socio-economic groups and relates them to fertility differentials among families.

There have been numerous studies in Korea and in other countries aimed at identifying and describing the conditions under which the value of children is formed (Lee and Kirn, 1979). The variables selected for studies are mainly socio-demographic background factors such as education, urban-rural living experience, employment history, age, sex, etc., as well as situational variables like income, current occupation, parity, etc. These factors have, then been hypothesized to contribute directly to the formation of the value of children and, thereby, to the determination of fertility behaviour.

The present study considers the formation of the value of children as the correlate of a family's consumption and work-leisure behaviour pattern. A family's perception of the value of children is viewed as a reflection of its overall consumption and work and leisure activities.

The objective of the study are : (1) to identify and describe the factors determining of the family's consumption-saving and work-leisure behaviour pattern: (2) to analyze the value of children and other correlates of a family's fertility determination within the context of the above behaviour pattern; and (3) to examine the causal relationship between the selected factors and consumption-saving and work-leisure behaviour pattern of individual families and that between these behaviour pattern and correlates of fertility.

2. Socio-Economic Development, Demographic Transition and Changes in Consumption Behaviour in Korea

A review of those aspects of Korea's population and socio-economic developments is presented which have a direct bearing on the changes in household consumption and fertility behaviour.

The decline in the birth and death rate and an increasing urbanization in Korea has been accompanied by now the familiar pattern of socio-economic developments- The per capita GNP of the Republic of Korea increased from 29V thousand Won to 1.2 million Won in 1980 price. This more than fourfold increase in per capita GNP is accomplished as the GNP increased about 6.8 times during the same period (See Table 1.)

The GNP growth has been accompanied also by the familiar pattern of sectoral change. During 1960 to 1984, the share of manufacturing sector in the economy increased from 12 to 32 percent, whereas the agricultural sector declined from about 43 percent to 16 percent. (See Table 2.)

The latest estimate, March, 1986, of the Republic of Korea's population is about 42 million, which is nearly a double of that of 1955. In population density, Korea ranks fourth in the world. Taking habitability and arability into account, Korea probably tops the ranking with 1,217 persons per square kilometer.

TABLE 1-GNP AND PER CAPITA GNP OF THE REPUBLIC OF KOREA, 1960-84

unit : percent

Year	GNP		Per Capita GNP	
	Amount*	Growth Rate	Amount**	Growth Rate
1960	7,271		290.7	
1965	9,846	6.3	343.0	3.4
1970	16,666	11.1	511.7	8.3
1975	26,113	9.4	740.2	7.6
1980	37,204	7.3	975.9	5.7
1984	49,168	7.2	1211.7	5.6

*unit : billion Won at 1980 price (U. S. $1 = 850 Won in 1985).
**unit : thousand Won at 1980 price.
SOURCE : National Bureau of Statistics, Korea Statistical Yearbook, 1985, and The Bank of Korea, Economic Statistical Yearbook, 1977.

TABLE 2—TREND OF SECTORAL CHANGES IN TERMS OF SECTOR OUTPUT, THE REPUBLIC OF KOREA, 1960-84

unit : percent

Year	Agriculture, Forestry and Fishery		Mining and Manufacturing		Social Overhead Cap and other Service	
	Growth Rate*	Percent of GNP	Growt!i Rate"	Percent of GNP	Growth Rate*	Percent of GNP
I960	—	42.7	—	12.1	—	18.7
1965	5.5	41.2	11.7	15.5	4.1	17.0
1970	4.1	29.8	14.8	22.8	7.3	14.2
1975	5.8	26.0	16.9	23.6	3.0	14,6
1980	1.3	15.8	12.8	30.2	4.4	12.6
1984	8.1	16.4	9.0	32.2	3.7	11.0

• average annual growth rate for the respective periods.
SOURCE : The Bank of Korea, Economic Statistical Yearbook, 1978, and National Bureau of Statistics, Economic Planning Board, Korea Statistical Yearbook, 1985.

This unenviable situation has come into being in spite of the fact that the rate of population growth has rapidly declined in the sixties from 3-03 percent per annum in I960 to 1.89 in 1970. Thereafter, there has been a less rapid but steady decline in the growth rate. In 1985, it is estimated at 1.57 percent per annum. (See Table 3.)

TABLE 3—TRENDS IN POPULATION, CRUDE BIRTH **RATE** AND DEATH RATE **OF** THE REPUBLIC OF **KOREA,** 1960-85

Year	*Population**	*Annual** Growth Rate*	*Crude Birth Rate*'**	*Crude Death Rate****	*Natural Increase Rate****
1960	24,987	3.03	42.0	13.0	30.0
1966	29,193	2.62	35.0	10.0	22.8
1970	31,466	1.89	27.0	7.6	17.7
1975	34,707	1.98	24.0	7.0	17.0
1980	37,436	1.53	23.4	6.7	16.7
1985	40,467	1.57	23.0	6.2	16.8

•unit : 1,000 persons, **unit : percent.
***unit : per 1,000 persons,
SOURCE : The Korean Institute for Family Planning, Statistics for Population and Family Planning, Vol. 1, 1977, and Ministry of Health and Social Affairs, Statistical Yearbook, 1985, and National Bureau of Statistics, Korea Statistical Yearbook, 1985, and Preliminary Report of 1985 Population and Housing Census, 1986.

The current policy calls for bringing down the growth rate to below 1 percent by 1994. The Republic hopes to achieve a stationary population of about 52 million by 2023.

The decline in the rate of population growth has been achieved by a rapid decline in birth rate, accompanied by a less rapid but steady decline in mortality rate. The crude birth rate declined from 42 per 1,000 population in 1960 to 23 in 1985, whereas the crude death rate declined from 13 per 1,000 to 6.2 during the same period.

The above demographic trend has been accompanied by a massive movement of people from the rural to urban area. In 1966, about the two-thirds of Korean people resided in the rural area. In 1985, it is in the urban area that a slightly less than the two-thirds resided. (See Table 4.)

The redistribution of population in such a massive scale in the last two decades has occurred in spite of the fact that the rural fertility rate has been substantially higher than the urban fertility rate during the same period. The total fertility rate for the rural area is estimated at 5.0 per eligible woman in 1973, it declined to 3.1 in 1975, and further to 2.3 in 1984. The total fertility rate for the urban area is 3.3 in 1973 and 2.4 in 1981. (See Figure 1.)

TABLE 4—TREND OF POPULATION FOR KOREA : URBAN-RURAL—1966-85

unit : 1,000 persons

Years	*Urban*		*Rural*	
	Population	*Percent*	*Population*	*Percent*
1966	9,781	33.5	19,379	66.5
1970	12,953	41.2	18,512	58.8
1975	16,793	48.4	17,910	51.6
1980	21,434	57.3	16,002	42.7
1985	26,458	65.4	14,009	34.6

SOURCE : National Bureau of Statistics, Economic Planning Board, Korean Statistical Yearbook, 1985, and Preliminary Report of Population and Housing Census, 1986.

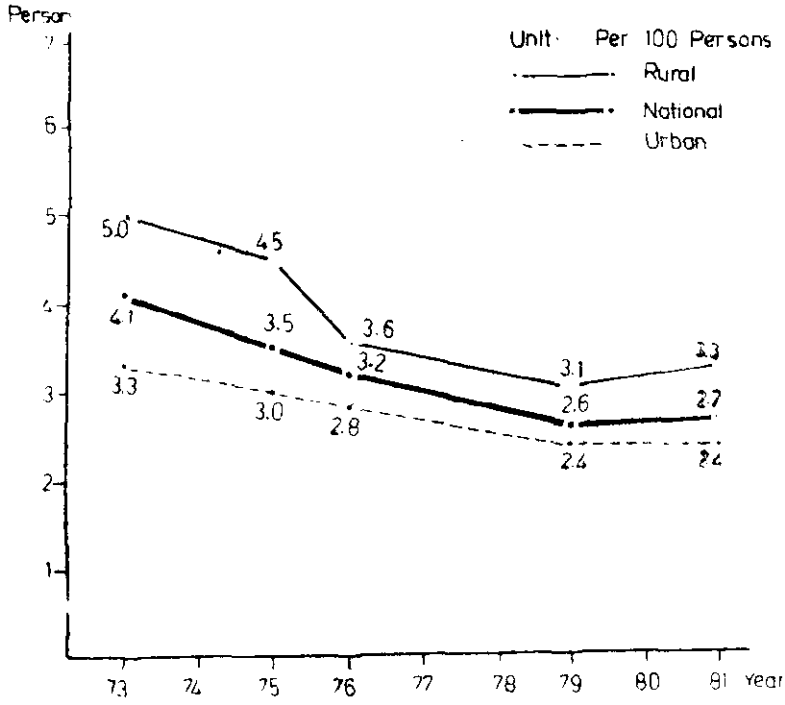

Fig. 1. *Changes in urban, rural and national total fertility rates of the Republic of Korea, 1973-81.*

SOURCE : KAP Survey in 1973 (KIFP) Preliminary Count of Population and Housing Census in 1975 (E. P. B) National Fertility and Family Planning Evaluation Survey in 1976 (KIFP) Korean Contraceptive Prevalence Survey in 1979 National Family Health Survey in 1981 (KIPH).

The consumer spending pattern in terms of Engel Curves also followed that shown in other developing countries. The household expenditure for food as percent of total budget decreased from 56.8 percent in the urban area and 53.1 percent in farming area in 1965 to 35.3 percent in urban and 30.4 percent farming in 1983. During the same period, the share of the expenditures for medical care, schooling and leisure activities increased about twofold, except for farming households expenditure for the schooling and leisure activities. It increased about threefold. (See Table 5 and Table 6.)

TABLE 5-HOUSEHOLD CONSUMPTION EXPENDITURE AS PERCENT OF TOTAL BUDGET IN CITIES, THE REPUBLIC OF KOREA, 1965 84

unit : percent

Year	*Food*	*Housing*	*Utility*	*Clothing*	*Medical*	*Sching and Leisure*	*Others*
1965	56.8	13.8	5.8	6-4	1.1	5.8	10.3
1970	40.5	18.4	5.5	10.1	3-1	8.5	13.9
1975	*43.6*	17-5	5.4	8.7	4.0	8.2	12.6
1978	43.9	9.5*	6,0	9.4	5.0	8.9	17.3
1980	41.3	9.2	7.4	8.8	6.1	8.5	18.7
1982	38.3	8.3	7.7	7.7	*6.1*	10.0	21.3
1983	35.3	9.0	7.0	7.3	6.7	10.1	24.6

*In 1978 Official Methods of Measuring the Urban Housing Costs Changed.
SOURCE : The Bank of Korea, Economic Statistical Yearbook, 1972, 1977 and 19S5.

TABLE 6~FARM HOUSEHOLD CONSUMPTION EXPENDITURE AS PERCENT OF TOTAL BUDGET, THE REPUBLIC OF KOREA, 1965 83

unit : percent

Year	*Food*	*Housing*	*Utility*	*Clothing*	*Medical*	*Sch'ing and Leisure*	*Others*
1965	53.1	*3.8*	*7.8*	*8.0*	*2-9*	5.0	19.4
1970	45,9	4.2	7.9	8.4	3.4	7.4	22.8
1975	47,3	7.0	6.3	6.9	3.8	6.8	21.9
1978	38,3	8.7	4.6	7.0	4.6	9.3	27.5
1980	36.9	6.8	4.7	6.2	4.5	11.1	29.8
1983	30.4	7.6	4.2	4.6	5.3	—	—

SOURCE : The Bank of Korea, Economic Statistical Yearbook, 1972, 1977 and 1985.

3. Theoretical Basis of Analysis

The framework of analysis is based on the theory of new consumer behaviour founded by Kevin Lancaster (Lancaster, 1966) and the economic theory of fertility formulated by Gary Becker, (1960). The cost of time in explaining consumption and work-leisure activities which is a brain-child of Gary Becker (Becker, 1965), forms an important basis for the model used in this study.

The conceptual framework of the analysis is shown in Figure 2. This study's main assumption is that individual families' socio-economic and demographic factors influence and shape their consumption and work-leisure behaviours and these behaviours in turn influence and reflect the correlates and proximate determinants of the family's fertility.

This conceptual **framework** of analysis is **constructed on the** basic **assumption and the new belief that looking** at **a** family's fertility **behaviour as a correlate of its consumption and work-leisure behaviour** is a useful way of analyzing the (proximate) **determinants of** fertility of individual families **and thai** such an approach **offers new** insight **into fertility** behaviour **of Korean** families.

In the traditional theory of consumer behaviour, a consumer is seen as being a utility maximizer with a given amount of income in purchasing goods and services. A consumer's role in a free market system is considered as that which *maximizes a utitity function* such as:

$$U = u\,(G,\ S) \tag{1}$$

where U represent utility, G and S goods and services purchased. The consumer's time in the consumption activities is not included in such a behaviour model.

According to the new theory of consumer behaviour, a household is viewed as being engaged in the production of utility. And the production of utility is carried out in two distinctive steps. First, the consumer goods and services are converted into "commodities." And this conversion requires a different time input of the consumer for each consumer good and service.

This process may be presented in the form of the following equation such as below which appears in Becker's book. (Becker, 1971, p. 45)

$$Z_i = f_i\,(X_1,\ X_2,\ \ldots,\ X_i,\ t_1,\ t_2,\ \ldots,\ t_v;\ R) \tag{2}$$

where

Z_i = commodities

f_i = production function for Z_i

$X_1, \ldots, X_i$ = inputs of different goods and services purchased into Z_i

$t_1, \ldots, t_v$ = input of different kinds of time required for conversion of X_i into Z_i.

R = other variables.

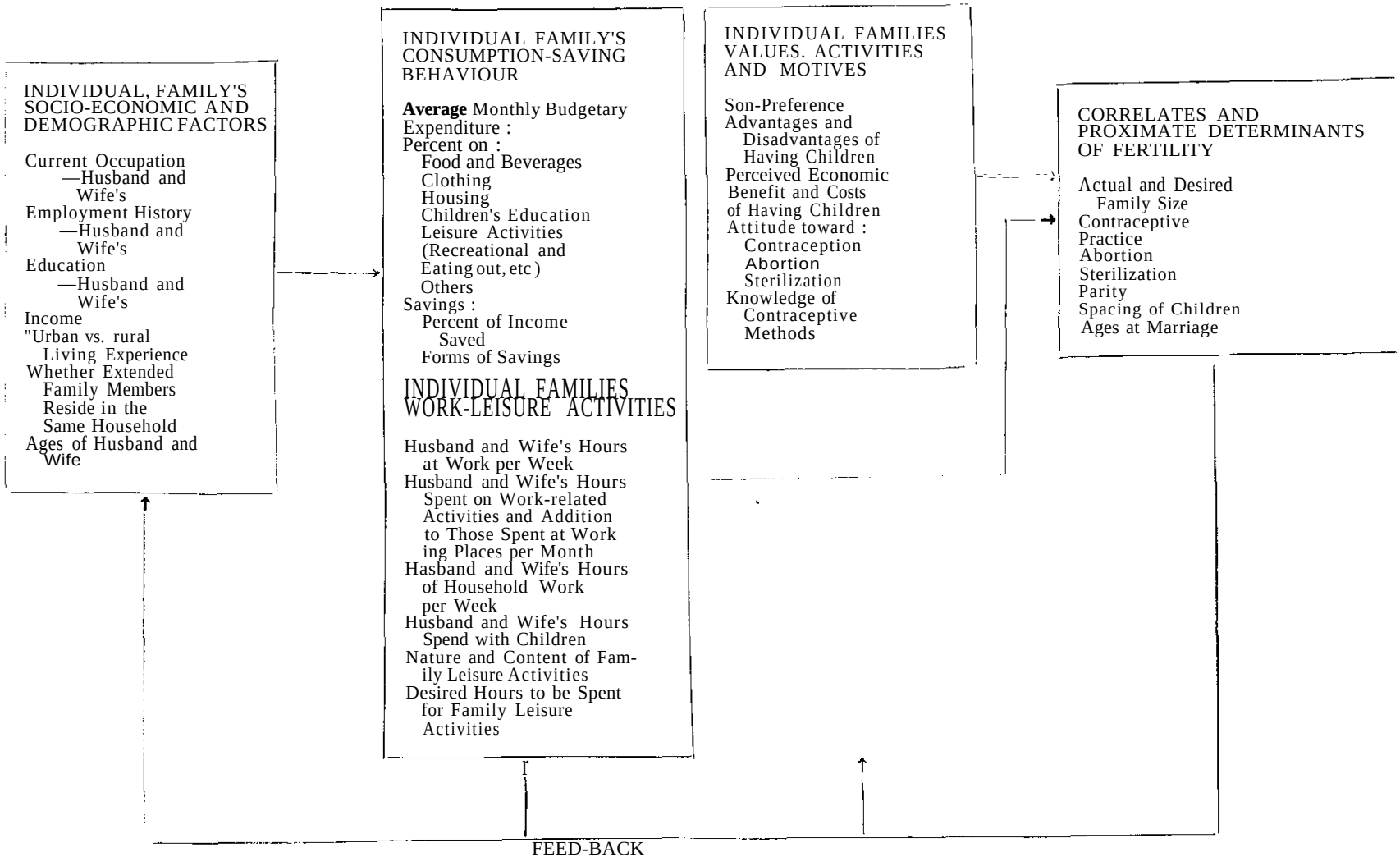

Fig. 2. Conceptual model.

The next step in the theory of household production of utility may be represented as:

$$U_i, =- u_i \ (\mathbf{z_i v}) \qquad (3)$$

where Z, is a set of commodities **produced** with x_i and t_i• under **environment of *R* and *V*** is other factors affecting U_i.

The above utility function may *be* used to formulate an economic theory of fertility. In the economic theory of fertility, the family is seen as making decisions on the number of children and quality of child so as to maximize its ordinal utility indicator such as the following; (Wills, 1973)

$$U = U(C,S) = U(N, Q,S) \qquad (4)$$

where

C : total amount of satisfaction the parents derive from children.

S : real consumption level of parents.

N : number of children.

Q : quality of children.

By dividing the utility the parents derive from children into the number of children and the quality of children, the theory provides a theoretical basis for formulating the basic hypothesis of this study about the relationship between the consumer and fertility behaviour. For example, those household which "produces" more utility from the quality of children vis-a-vis the quantity of children, and thereby, obtain more satisfaction from spending more time *(tt)* per child will spend a greater proportion of budget and a greater consumption time for leisure activities and other life's non-essential goods and services than those derive more satisfaction from the quantity of children.

Specifically, the following hypotheses of the study are formulated.

1. The situational factors such as socio-economic and demographic variables largely determine individual families' preferences, values, attitudes and motivation about upward mobility, women's status, married women's activities outside home, economic vs. non-economic gains, etc.
2. These attitudes, values and motivation largely determine individual families' consumption and work-leisure behaviour. This behaviour essentially involves the decision about the allocation of time of the husband and wife between income generating activities and income spending activities. Within the income generating activities, the decision about the allocation of time between at home and outside home activities is important.
3. **Individual families' consumption and work-leisure activities largely determine the correlate and proximate determinants of fertility.**

Additionally, this study also advances the following minor or sub-hypotheses. They are really specific points following from the general hypotheses.

(a) Families which spend a smaller proportion of their budget on the necessities of life have a fewer children than those who spend a greater proportion of their budget on them. Inversely, families with a fewer children spend a smaller proportion of their budget for a necessities of life such as food and housing than those with a greater number of children.

(b) A family whose work-leisure behaviour is such that the cost of time for both husband and wife is higher is likely to spend less time in child-bearing and child-raising by having a smaller number of children than a family whose cost of time is lower.

4. The Data

For 1980 population census enumeration, the whole country was divided into 44 strata, i.e., 35 cities and 9 non-city sectors demarcated by provincial boundaries. All Enumeration Districts except institutional or collective E.D.s were listed within each of the 44 strata by administrative units by E.D. code. There are about 100,000 E.D s in the nation, each containing about 70 to 110 households.

Data were obtained by the interviewing 1014 households, that is, almost all households in 12 selected Enumeration Districts. Eight E.D.s from urban areas and four from rural areas are selected. Four out of the eight urban E.D.s are areas populated mainly by managerial-professional people of upper middle income. The remaining four urban E.D.s are areas inhabited by labourers and venders of lower income people. The four rural E.D.s selected are predominantly farming areas.

The main purpose of choosing the above *1* Enumeration districts is to have three distinctive groups which have contrasting socio-economic characteristics between groups but have similar characteristics within each group. Each group consists of four E.D.s. This study is not a comparative study of fertility of different socio economic groups of people. However, it attempts to discover a pattern of consumption and work-leisure behaviour according to socio-economic groups and relate them to each group's fertility behaviour.

The second reason for choosing the above 12 E.D.s is that they enable us to conduct an almost 100 percent coverage of a chosen area by the survey. As mentioned earlier, the E.D. is the smallest district constructed by the National Bureau of Statistics where the homogeneity of population in many key variables within each E.D. is sought.

The variables are selected on the basis of the conceptual framework of analysis presented in Section I. For this study, all candidates for the variables are

grouped into three categories, namely, (1) situational variables, (2) household consumption and value-preference variables, and (3) fertility variables. Cross-tabulations between three sample groups and some of the key variables are shown in Tables 7 through 15.

TABLE 7-DISTRIBUTION OF ANNUAL INCOMES OF THE HOUSEHOLDS FOR EACH OF THE THREE SAMPLE GROUPS

unit : percent

*Income Level**	*Groups*			
	Urban Middle	*Urban Poor*	*Rural*	*Total*
under 5,000	10.0	93.3	90.7	65.1
5,000-10,000	53.3	3.8	9.3	21.8
10,000-15,000	22.5	3.0	—	8.4
15,000 and over	14.2	—	—	4.7

*unit: 1,000 Won; U.S.$1= about 850 Won in 1984 Chi-Square = 1105.67 (df = 6) Sig-O.

It had been expected that the urban low income group has a smaller amount of income than the rural group. (Sec Table 7.) The data indicate, however, the opposite. The reason why the average income of urban poor group has turned out to be higher than that of the rural group is that a few (3 percent) of the group are the middle income households who reside in the urban poor area.

As expected, the wives of urban upper middle income group has attained a higher level of schooling than the two other groups. (See Table 8.) Note that the urban poor have a higher educational attainment than the rural farmers.

TABLE 8—DISTRIBUTION OF EDUCATIONAL LEVEL OF THE WIFE FOR EACH OF THE SAMPLE THREE GROUPS

unit : percent

Level of Education	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural (farming')*	*Total*
No Schooling	—	11.2	28.2	13.1
Primary School	1-4	47.0	55.3	34.7
Middle School	44	30.4	12.0	46.8
High School	28.0	11.5	3.5	14.3
College	66.2	—	1.0	22.1

Chi-Square = 1336.77 (df = 8) Sig = 0.

When the occupation of the sample households' heads are examined, self-employed and white colour jobs bring a higher income and 98 percent of the urban upper middle income group hold these jobs. (See Table 9.) It is also surprising that 11 percent of the urban poor hold white colour jobs and 18 percent of them are self-employed. It is suspected that the white colour jobs held by the urban poor household's heads are the low paying ones. The self-employed urban poor are usually street vendors.

TABLE 9-DISTRIBUTION OF OCCUPATIONAL CATEGORIES OF THE HOUSEHOLD HEAD FOR EACH OF THE THREE SAMPLE GROUPS

unit : percent

Occupation	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural (farming)*	*Total*
Farmer	—	17.1	84.2	33.5
Labourer	0.6	40.4	2.6	15.0
White Color Jobs	53.9	10.9	3.5	22.6
Self-Employed	43.6	17.7	7.7	20.9
Unemployed	1.9	13.9	1.8	6.0

Chi-Square = 1532.93 (df = 8) Sig -= 0.

When the labor force participation of wives are examined, regardless of the income levels of household head, most of the urban wives have no outside jobs. (See Table 10.) In contrast, most of the farmers' wives appear to work on the field with their husbands and often with their children.

TABLE 10-LABOUR FORCE PARTICIPATION RATE OF WIVES FOR EACH OF THE THREE SAMPLE GROUPS

unit: percent

Participation	***Groups***			
	Urban upper Middle	***Urban Poor***	***Rural (farming)***	***Total***
Active	**12.2**	**9 9**	**84.2**	**33.0(11.0*)**
Inactive	**87.8**	**90.1**	**15.7**	**65.0 (89.0*)**

'*Exclude rural (farming)

Chi-Square = 70.28 (df = 2) Sig = .000.

When the data on the household expenditures for food and housing are examined, the rural households in the sample spend the greatest portion of the budget for these necessities of life and the urban upper middle income households the smallest portion. (See Table 11.) This finding does not exactly confirm to what is expected from the traditional theory of the Engel Curve. The urban poor was expected to spend the greatest proportion of their budget for food and housing because (the *urban-rural price* differences in these two items. The reason for this discrepancy from the theoretical expectation appears to be the fact that our urban poor households in our sample include many of those who live in unlicensed make-shift dwellings without paying any rent and those who receive free food hand-cuts.

TABLE 11-HOUSEHOLD FOOD AND HOUSING EXPENSES AS PERCENT OF TOTAL BUDGET FOR EACH OF THE THREE SAMPLE GROUPS

unit; percent

Level of Expenses	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural*	*Total*
under 10	27.2	12.0	14.0	17.6
10-20	30.6	12.0	11.5	18,1
20-30	17.1	17.8	14.3	16.4
30-40	13.1	24.0	23.3	20.2
40 and over	11.9	33.8	36.8	27.7

Chi-Square = 555.39 (df = 8) Sig = 0.

Another finding that appears not to confirm to the *theoretical* expectation is the fact that only 34 percent of the urban poor and only 37 percent of the rural households spend 40 percent or more of their budget for food and housing. For the urban poor, the reason for this spending pattern, which is expected of more for the middle income households than for the low income households is the free housing and food the latter receive. For the rural households, the reason seems to be the fact that many of them underestimated the value of food and housing (owner occupied) in kind they consume or utilize.

Next, the data on family value-preference are examined. As for parents' sex preference of offsprings, the preference for a son over a daughter is prevailing among all sample groups when having one child. As expected, the prevalence rate is the lowest among the urban upper middle income group and it is the highest among the rural group. (See Table 12.)

TABLE 12-SEX PREFERENCE WHEN HAVING ONE CHILD FOR BACK OF THE THREE SAMPLE GROUPS

unit: percent

Sex Preference	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural*	*Total*
Son	**49.4**	**65.9**	**74.0**	**65.2**
Daughter	**11.6**	**5.7**	**2.3**	**5.8**
Indifferent	**39.0**	**28.4**	**23.7**	**29.0**

Chi-Square = 72.95 (df = 4) Sig = .000.

When having two children, however, by far a majority, 65 to 78 percent of sample groups prefer having both a boy and a girl to having either two boys or two daughters. About 10 percent of the sample groups prefer to have 2 boys over having either a boy and a girl or two girls. What is somewhat surprising is the finding that there are no substantial difference in the sex preference of offsprings when having two children among the three sample groups. (See Table 13.)

TABLE 13-SEX PREFERENCE WHEN HAVING TWO CHILDREN FOR EACH OF THE THREE SAMPLE GROUPS

unit: percent

Sex Preference	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural*	*Total*
Two Sons	6.2	10.5	10.8	9.7
I Son I Daughter	77.6	64.8	77.5	72.3
Two Daughters	2.0	2.5	1.2	1.9
Indifferent	14-3	22.2	10.5	16.1

Chi-Square - 45 38 (df = 6) Sig •= .000.

Those who expressed preference for a son over a daughter are asked to give reasons for it. The reasons differ by the group. For the urban upper middle income group, it is "psychological" meaning that they derive more enjoyment in bringing up a boy than a girl or they have an undefinibie sense of satisfaction having a boy more than having a girl. (See Table 14.) For the urban

TABLE 14 REASON FOR SON-PREFERENCE FOR EACH OF THE THREE SAMPLE GROUPS

unit : percent

Reason	*Groups*			
	Urban upper Middle	*Urban Poor*	*Rural*	*Total*
Old Age Security	3.6	16.5	12.5	12.2
Maintaining Family Lineage	25.8	43.9	67.3	48.6
Psychological Reason	70.6	39.7	20.2	39.3

Chi-Square = 276.70 (df = 4) Sig = 0.

poor, 44 percent prefer to have a boy because a boy can maintain family lineage (name) and a slightly smaller number, 40 percent, of them gave the "psycological" reason for the son preference. For the rural residents, by far the majority, 67 percent, have given maintaining family lineage (name) as the reason. Somewhat surprisingly, the old age security as the reason for son preference is given by only 4 to 17 percent of all households.

Lastly, the data on fertility of three sample groups are examined. As expected, the urban upper middle income group have the fewest number of children, the mode being two. (See Table 15.) The rural residents have the largest number of children and the mode is four children. What is interesting to note is that, although the urban poor on the average have a greater number of

TABLE 15- DISTRIBUTION OF THE NUMBER OF CHILDREN **IN** THE FAMILY FOR EACH OF THE THREE SAMPLE GROUPS

unit : percent

Number of Sons	*(Groups*			
	Urban upper Middle	*Urban Pour*	*Rural*	*Total*
0	3.6	3.2	2.5	3.1
1	13.9	17.5	5.7	12.8
2	42.5	27.4	11.9	25.2
3	28.9	25.4	19.0	23.9
4	10-3	13.8	22.3	16.0
5 and more	0.8	12.5	38.6	19.0

Chi-Square = 179.11 (df = 8) Sig = 0.

children than the urban upper middle income group, the mode is two children also.

5, Statistical Methods

Two kinds of multiple regression analyses are carried out. First, ordinary least squares (OLS) analysis is undertaken where fertility variable is the dependent variable and the situational and household consumption and family value variables arc independent variables.

The other type of regression analyses conducted is two-stage least squares (TLS). In TLS, for the first-stage least squares analysis, the following type of equation is used.

$$Y_i = a + b_1X_1 + b_2X_2 \ldots + b_nX_n + e \qquad (5)$$

where 7) is the dependent variable representing household consumption behaviour and individual families' value, attitudes and motives. They are variables about the proportion of budget spent for consumer items, the son-preference, the reason for son-preference, importance of child raising, etc. *X,* represent situational variables, i.e., individual families* socio-economic and demographic variables. For example, they are variables about income, employment, occupation, education, etc. Since most of the dependent variables and some of the independent variables are ordinal variables, where appropriate, dummy variables are used.

For the second-stage analysis, the household consumption behaviour and family values variables estimated by equation (5) are inserted as the independent variables and the variable representing individual families' fertility variable as the dependent variable. The following equation is used.

$$Y = a + b_1\hat{X}_1 + b_2\hat{X}_2 + \ldots + b_n\hat{X}_n + e \qquad (6)$$

where *Y* is variable representing family fertility variable described above and $\hat{X}$, are the household consumption behaviour and family value variables estimated by the first-stage equation (5). It is a hypothesis of this study that a family's attitude and values about children affect and shape its work-leisure activities and consumption behaviour.

The rationale for using two-stage regression analysis is that it is an appropriate method of avoiding a simultaneous equation bias (Johnston, 1984).

The third and last type of "cause-effect" analysis is carried out through path analysis. This analysis supplements the two stage regression analysis. The advantage of path analysis is that it can be used to show the direction of cause-effect interaction. For this study, path analysis is used to examine what situational variables affect the fertility variables by influencing what kind of household consumption behaviour and family value variables in what manners.

6. Results of Analyses

1. *The Result of (OLS) Regression Analysis*

The result of the first OLS regression is shown in Table 16. Only those independent variables whose fl-coefficients are significant at 0.1 level arc included in this regression. These variables are chosen by the stepwise regression which selects each variable in order of the magnitude of its contribution to *R* squares.

TABLE 16-OLS REGRESSION WHERE THE DEPENDENT VARIABLE IS THE NUMBER OF CHILDREN **IN** THE **FAMILY**

Independent Variable	ß *Coef.*	*Std. Err.*	*Sip.*
Rural Residence (Vs. Urban Residence)*	1.374	.107	.000
Age of Wife, under 30 (Vs. 41—)*	-2.218	.127	.000
Age of Wife, 31-35 (Vs. 41—)*	—1.165	.139	.000
Age of Wife, 36-40 (Vs. 41-)*	—.165	.130	.000
Wife, Unemployed (Vs. Employed)	.769	.316	.015
Son Preference when having one Child	.225	.946E-1	.017
Food and Housing Expenses**	-102E-1	.604E-2	.091
Leisure Expenses*'	—.226E-1	.131E-1	.084
Medical Expenses**	—.282E-I	-692E-2	.000
Clothing and Utility Expenses**	—.189E-1	.597E-2	.002
Constant	4.204	.287	.000

*Dummy Variables.
**As Percent of total Budget.
R Square = .477 Adj R Square = .471 *F* = 78.96 SIG = .000.

The result shows that the hypothesis about the relationship between the consumption behaviour and fertility is supported with a varying degree of significance level. Those who spend a greater proportion of their household budget for food and housing tend to have a greater number of children than those who do not. Those who spend a greater proportion of the budget for a more discretionary items such as leisure, clothing, utility and medical care tend to have a fewer number of children than those who do not. As expected, those who expressed preference for a boy over a girl tend to have a greater number of children than those who do not.

Rural-urban residence of family appears to have the greatest impact on the number of children. The magnitude of its -coefficient is greater than that of any other variables inserted except that of the age variable. Note that the difference in fertility among the age groups are partly due to the fact that some of the young wives have not completed their child bearing.

The hypothesis about the effect of the cost of time on fertility is supported by the relationship between female labor participation and the number of children. Note that wives who do not have jobs tend to have a greater number of children than those who do. It is to be recognized, however, that the number of children in a family also determines whether the housewife gets a job or not.

The model of the determinants of fertility rate as represented by the regression is a relatively good one in that it has adjusted *R* square of .471 with the model significance level of .000. Note that regression run with micro data usually have a smaller *R* square than those run with macro (grouped) data. (Cramer, 1964.) It is also to be noted that selecting only those independent variables whose ß-coefficients are significant at .01 tend to meximize *R* squares (Haitovsky, 1968).

2. *The Result of Two-Stage Least Square Regression Analysis*

In the first-stage regression, the situational variables are used as the independent (or instrumental) variables. The household consumption and work-leisure behaviour and family value variables are inserted as the dependent variables. The results of the first-stage regressions are not presented here. In the second stage least squares, the household consumption behaviour and family value variables estimated in the first-stage regressions are inserted as the independent variables. As the dependent variable, the number of individual family's children is inserted. (See Table 17.)

The result shows that two-stage least squares yields a less satisfactory result than the ordinary least squares in two ways. First, the adjusted *R* squares decreased from .471 to .220 indicating a corresponding decline in the model performance (or fit).

Second, when the consumption behaviour variables, which are estimated in the first-stage regressions, are inserted into the second-stage regression, only two other variables representing opinions of the household are found to be influencing fertility significantly (at .1 level). Although the findings as revealed in Table 8 have these shortcomings, they reinforce the findings made by the ordinary regressions.

The household who spends a relatively greater proportion of its budget for the necessities of life such as food and housing has a greater number of children. Corollary to this, the household who spends a relatively greater proportion of its budget for the discretionary items such as clothing, utility and medical care has a smaller number of children.

TABLE 17-SECOND STAGE REGRESSION WHERE THE DEPENDENT VARIABLE IS THE NUMBER OF CHILDREN IN THE FAMILY

Independent Variable	*ß Coef.*	*Std. Err.*	*Sig.*
Son Preference when having Two Children*	2.264	1.326	-088
Lineage as the Reason for Son Preference*	3.284	.412	.000
Food and Housing Expenses'*	.116	.206E-1	.000
Medical Expenses**	—919E-1	.416E-1	.028
Clothing and Utility Expenses**	-.186	.295 E-l	.000
Constant	8-419	1 141	.000

'Dummy Variables Etimated in the First Stage.
**As Percent of Total Budget.
R Square = .224 Adj *R* Square - .220 *F* = 72.34 Sig. = .000.

As expected, those who expressed preference for a boy over a girl, even when having two children, tend to have a greater number of children. And among those who have son preference, those who stated keeping the family lineage as its reason for the preference for male over female offspring tend to have a greater number of children.

3. *The Result of Path Analysis*

For path analysis, all variables are divided into three categories according to the conceptual framework of analysis presented in Section II. The three categories consist of (1) situational variables, (2) household consumption and work-leisure behaviour and family value variables, and (3) final output (fertility) variables.

The result of path analysis, where the number of children in the family is the dependent variable, is presented in Figure 3.

If the results of the path analysis were summarized, seven situational variables significantly influence the final output variable, namely, fertility, through four consumption behaviour-family value variables. Of the seven situational variables, four variables significantly influence the final dependent variable directly as well as indirectly through the behaviour-value variables. Of the four behavior-value variables, son preference variable influence the dependent variable through another behaviour-value variable, namely, leisure expenditure as percent of total budget.

The seven situational variables, which significantly influence the fertility variable indirectly or directly, could be categorized as income, occupation,

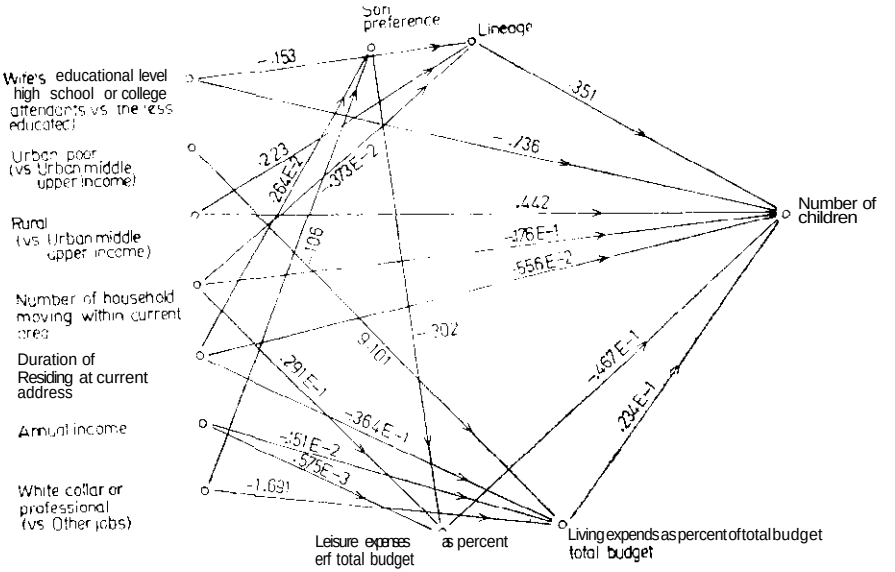

Fig. 3. Path analysis where the final dependent variable is the number of children in the family.

education, the place of residence (urban or rural), and the frequency of household movement. Of these, the income variable (annual income of the household) has an effect of reducing fertility by increasing the proportion of budget spent for leisure activities and by decreasing the proportion spent for essential living expenses (food, housing and clothing). As expected, the greater proportion of the household budget one spends for essential living expenses and the smaller proportion for non-essential leisure activities, the smaller number of children the household has.

The professional and white colour job holders spend a smaller proportion of their household budget for essential living expenses and prefer a son over a daughter to a less extent than other categories of job holders. In the path analysis, the son preference does not lead to a greater number of children directly but indirectly by reducing the proportion of budget spent for leisure activities.

The households where wives attended a high school or college tend to have a fewer number of children than the less educated and prefer a son over a daughter for the reason of keeping family lineage to a lesser extent than the less educated. Those who prefer a son over a daughter for the reason of keeping family lineage, tend to have a greater number of children than others.

As expected, rural residents prefer a son over a daughter for the reason of keeping family lineage to a greater extent than urban dwellers and, because of this preference, they have a greater number of children than city residents. **In**

addition, rural living apparently tends to increase fertility directly by the virtue of rural living environments.

As for the effects of frequency of household movement on fertility, it has an effect of reducing the number of children directly or indirectly by increasing the proportion of budget spent for leisure activities and also by reducing the son preference for the reason of keeping family lineage.

In conclusion, the results of path analysis confirm and supplement the findings made from the previous regression analyses. In addition, it shows that the situational variables such as education, income, occupation, the place of residence, etc., influence fertility by affecting consumption behaviour and family beliefs expressed through sex preference of their off-springs and the reasons for their children's sex preference.

7. Conclusions

The results of our data analyses confirm the major hypotheses of the study and lead to the following conclusions with a varying degree of statistical significance.

Consumption behaviour in terms of the allocation of family budget among competing needs is significantly related to and causes a distinctive pattern of fertility behaviour.

The household which spends a great proportion of family budget for the necessities of life such as food and housing tends to have a greater number of children than the household which spends a smaller proportion of budget for the necessities of life. This could be interpreted as a case of a large family spending a greater proportion of the budget for food and housing out of necessity because there are more people to feed and house. In order to avoid such a case of dependent variable (fertility) influencing the selected independent variables, two stage least squares (TLS) analyses have been conducted. The results reject the likelihood of reverse causation.

A case can be made that this finding is simply the result of income effect. Studies of Engel Curves show that the high income household tends to spend a smaller proportion of budget for food and other necessities of life than the low income household. Thus, above effect of consumption behaviour on fertility may be interpreted as revealing a negative income effect of demand for children.

Julian Simons (Simons, 1974) and others (Schultz, editor, 1973) have shown that children are not "inferior" goods. The above finding of consumption-fertility behaviour relationship, therefore, can not be dismissed as negative income effect. In this study, in addition to income; education, occupation, the place of residence (rural or urban) and female labour participation are all turn out to be influencing consumption behaviour.

One interpretation of the above consumption-fertility behaviour relationship

is that each family makes decision on the allocation of time between income earning market activities and non-market leisure activities, and with a given amount of the leisure time, the allocation of time among various leisure activities. This family decision is based on the family's relative utility derived from time-intensive vs. Commodity-intensive consumption, the quality vs. quantity of children, future vs. present consumption, etc.

It is our inference of the above finding that, for a given amount of income, those who derive a relatively greater amount of satisfaction (utility) from time-intensive (leisure) consumption activities than from commodity-intensive consumption activities tend to derive a greater amount of satisfaction from the quality of children than from the quantity of children.

This inference is supported by the fact that those who expressed preference for a son over a daughter for the reason of keeping family lineage tend to spend a greater proportion of budget for the necessities of life and tend to have a greater number of children.

As for those factors which influence the relative amount of satisfaction (utility) the family derived from the various market and non-market activities and therefore the decision on the allocation of time between these activities, this study supports the hypotheses advanced here and sociological studies of family value formulation (process). Those factors are education (particularly wife's level of education), occupation, the place of residence (rural vs. urban), how often the household moves, etc.

A high level of wife's education, a higher occupational position (managerial and professional job), urban living environment and household mobility tend to foster a value system which attaches a relatively greater amount of satisfaction-utility to time-intensive over commodity-intensive consumption and to the quality over the quantity of children.

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