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RURAL HOUSEHOLD SAVINGS BEHAVIOR IN SOUTH KOREA, 1962-1976

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RURAL HOUSEHOLD SAVINGS BEHAVIOR IN SOUTH KOREA, 1962-1976*

Savings behavior in high-income countries has drawn substantial attention from economists the past several decades. Analysis of aggregate or urban household information in these countries has led to development of very useful theories about savings behavior [Mikesell and Zinser]. Only recently, however, have a small number of studies been done on rural household savings in low-income countries [Adams, 1978]. Lack of appropriate data has slowed this analysis and made it difficult for researchers to apply new theories, such as the permanent income hypothesis, to the analysis of rural savings behavior. Those interested in this topic have been forced to use fragmentary, cross-sectional information, often collected for some other purpose in order to shed light on rural savings activities. Because of these data limitations, researchers also have been forced to relate savings behavior largely to current household income. The paucity of research on this topic has made it nearly impossible to confirm or dispel myths

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which pervade the development literature about rural savings behavior: e.g., rural households are too poor to save, rural households getting more income will engage in consumption orgies, rural households are not able to defer gratification by postponing consumption, and rural households are insensitive to savings incentives and opportunities.

Research on rural savings in low-income countries is further complicated by the adverse effects of many government policies on rural household incomes and low-income countries. These include concessional interest rate policies, product and input prices, taxes, and foreign exchange regulations which result in low incomes and weak incentives to save in rural areas. It is impossible to answer directly questions about what savings behavior would have been in a country if policies had provided more income and stronger savings incentives in rural areas. Only indirect answers are possible which are drawn from analysis of rural household savings performance in those few countries which have allowed rural incomes to grow substantially, and have also provided significant positive incentives and opportunities for rural households to save.

During the past dozen years, South Korea appears to have provided a positive environment for rural savers.[1/] South Korea also has assembled rural household data through representative Farm Household Economy Surveys since 1962 which are rich enough in detail and also reliable enough to justify careful analysis of savings behavior.[2/] A further advantage of this data is that time series as well as cross-sectional analysis can be done on individual households. This allows comparison of savings behavior results from cross-sectional analysis with time series data.

In the following discussion we attempt to do two things. The first objective is to document the extent of voluntary rural household savings in South Korea among Survey Households from 1962 to 1976. The second objective is to test a technique recently suggested by several researchers for estimating permanent household income from cross-sectional data [Bhalla]. If this technique proves to be reliable, it will allow more comprehensive analysis of savings behavior in countries where only cross-sectional data are available.

1/ Another of very few such examples is Taiwan [Ong and others].

2/ See Hyun for more details on these annual surveys carried out by the Ministry of Agriculture and Fisheries.

Rural Household Incomes and Savings

The Korean economy as well as the agricultural sector have grown substantially since the early 1960's. Gross national product has increased by almost 10 percent per year since 1962 and per capita income in real terms has gone up nearly six-fold. Growth in the agricultural sector has been less spectacular but none the less impressive, given the very limited land resources in South Korea. The real value of agricultural utput more than doubled from 1962 to 1976. Major financial market and foreign exchange reforms in 1965, and adjustments in pricing policies in the late 1960's and early 1970's have substantially improved farmers' incomes and their incentives to save [Brown].

As can be noted in Table 1, average net real income of the Farm Economy Survey households increased two and a half times from 1962 to 1976. In comparison with other more developed countries, however, rural incomes were still quite low throughout the period. In 1962, average rural farm household income was less than $600 per year. This only amounted to about $90 per capita. The substantial increase in income by 1976 raised household incomes to about $1460 and per capita incomes to about $260. By international standards these rural households are far from being affluent.

TABLE 1: Average Household Income, Consumption Expenditures and Propensity to Save of Farm Economy Survey Households in Korea, 1962-1976

Year	Households	Net Household Income (1)	Household Consumption Expenditures[b] (2)	Gross Savings (3)=(1)-(2)	Average Propensity to Save (4)=(3)/(1)
	Number	(In 1970 Korean 1,000 Won[a])			
1962	1,163	177	150	27	.15
1963	1,161	201	177	24	.12
1964	1,172	204	173	31	.15
1965	1,173	166	157	9	.05
1966	1,180	177	157	20	.12
1967	1,176	190	170	20	.11
1968	1,181	212	176	36	.17
1969	1,180	241	197	44	.18
1970	1,180	259	218	41	.16
1971	1,180	333	235	98	.29
1972	1,182	352	263	89	.25
1973	1,170	369	270	99	.27
1974	2,515	366	242	124	.34
1975	2,517	373	271	102	.27
1976	2,516	444	298	146	.33

SOURCE: Ministry of Agriculture and Fisheries (MAF), Republic of Korea, Report on the Results of Farm Household Economy Survey, yearly reports from 1962 to 1976 (Seoul, Korea; MAF, various years 1963 through 1977).

[a] Adjusted to 1970 prices using Index of Wholesale Prices of Korea. In 1970, the average exchange rate of won for a U.S. dollar was 304.

[b] Includes household payments for taxes and interest.

Although not shown in Table 1, about 20 percent of household income was provided by off-farm earnings throughout the period. Changes in weather and government pricing policies were important factors explaining major changes in incomes in the mid-1960's, the late 1960's, and early 1970's. As might be expected, household consumption expanded with household incomes, but at a slower rate. This resulted in sharp increases in household gross savings, especially after the mid-1960's. The average propensity to save jumped from only .15 in 1962 to .33 in 1976. Despite relatively low absolute levels of income, rural households in South Korea have saved very large proportions of their incomes the past few years.

Without complicated analysis, one can conclude that a major part of this increase in expressed savings resulted from the expansion in real household incomes. As Wai has pointed out, however, incentives and opportunities to save are important factors which help explain part of savings behavior. Friedman and others have argued that the quality of household income flows also may help to explain this behavior. Quality may be indicated by the stability of the flow or by measures of permanent and transitory components of the flows. Still other researchers argue that changing characteristics of the household itself may influence consumption-savings behavior.

The household data used in this study do not include information which sheds much light on savings opportunities or incentives.[3/] The data do allow analysis of the effects on savings behavior of permanent income, and various household characteristics. Major emphasis will be placed in the following discussion on measuring the influence of permanent and transitory income.

Empirical Models

Friedman's permanent income hypothesis rests on several main tenets [Friedman, p. 222]. These include that a consumer's measured (observed) income (Y) and consumption (C) in a particular period may be separated into transitory and permanent income (Y_p). That is, marginal and average propensities to consume out of permanent income are independent of the level of permanent income. Also, that transitory and permanent components are uncorrelated. A number of empirical tests of this hypothesis have shown that the marginal propensity to consume (MPC) out of transitory income is greater than zero, but less than MPC out of permanent income [Ferber].

3/ Lee and others have argued that improved access to financial savings facilitates in agricultural cooperatives over the 1961-75 period was an important stimulant to voluntary rural savings in South Korea.

Friedman has proposed that permanent consumption be assumed equal to measured consumption (C). Statistically, the permanent income hypothesis can be stated as,

$$(1) \qquad C = b_1 Y + b_2 Y_p + e$$

where b_1 is the MPC out of transitory income, $(b_1 + b_2)$ is the MPC out of permanent income, and e is the random error.

Studies in low-income countries suggest that other household characteristics and returns to investments also affect consumption-savings behavior.[4/] Under the permanent income hypothesis it is argued that additional variables affect the MPC out of permanent income (b_2). Assuming the relationship is linear,

$$(2) \qquad b_2 = b_{20} + b_{21}LD + b_{22}SI + b_{23}RT + b_{24}LQ + b_{25}DP$$

Substitution into the consumption function (1) gives

$$(3) \qquad C = b_1 Y + b_{20} Y_p + b_{21} LD\ Y_p + b_{22} SI\ Y_p + b_{23} RT\ Y_p + b_{24} LQ\ Y_p + b_{25} DP\ Y_p + e,$$

where LD is hectares of cultivated land area, SI reflects source of incomes which is defined as the ratio of gross farm income to gross household income, RT is the rate of return to capital during the previous year, LQ is the value of liquid assets, and DP is the ratio of dependents to

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4/ Two comprehensive reviews of the consumption-savings literature in low-income countries are Snyder and Alamgir.

total family members.[5/] Following Girao and others, equation (2) is assumed to be nonstochastic.

Farm size (LD) is used as a proxy for farm investment opportunities. The coefficient b_{21} is expected to be negative [Kelly and Williamson]. The source of income ratio (SI) indirectly influences consumer behavior through investment opportunities, relative stabilities of various income flows, prices of industrial goods, and demonstration effects of urban consumption patterns [Adams and others, 1975]. If farmers have relatively unstable farm incomes the coefficient b_{22} is expected to be negative.

The rate-of-return to capital (RT) is used as a proxy for the profitability of all household investments. This variable also serves as the opportunity cost of current consumption versus future consumption. Theoretically, farmers who have high expected rates-of-return on capital will increase their investment in farm capital and also switch more of their current income to savings [Adams and others, 1975]. The relationship between the return to capital and MPC (b_{23}) depends on the source of the investment funds. If funds come from reduced consumption, the expected sign is negative. On the other hand, if funds come from increased borrowings or liquidating other assets to make investments, a positive relationships is expected.

5/ Detailed definitions of the variables used in the analysis are presented in the Appendix.

The value of liquid asset holdings (LQ) is a rough measure of wealth. Several empirical studies have suggested that liquid assets are important factors affecting savings behavior [for example, Mizoguchi]. The coefficient b_{24} is expected to be positive. The dependency ratio (DP) is a measure of the proportion of household members who do not contribute to household income. The coefficient b_{25} is expected to be positive because a higher DP increases consumption without changing income [Leff].

As an alternative against which to compare results of the permanent income consumption function (3), a Keynesian consumption function is estimated. It is of the general form

$$(4) \qquad C = a_0 + a_1 Y + \Sigma\, a_{0j} Z_j + \Sigma\, a_{1j} Z_j\, Y + e,$$

where Z refers to the set of the other variables expected to affect consumption behavior.

Measurement of Permanent Income

From an empirical point of view, the permanent income hypothesis is difficult to test because of the problem of measuring a consuming unit's permanent income. As mentioned earlier, due to the lack of data this difficulty is serious in low-income countries. Some empirical studies in low-income countries have used moving averages of the previous two or three year's

incomes, or cell means of income for grouped families as proxies for permanent income [Snyder].

In this study, two different measures of permanent income are used: predicted income from an income estimating function and a weighted average of past observed incomes. Bhalla recently used an "earnings function" to estimate the impact which permanent household characteristics have on the earnings of rural households in India. His analysis builds on earlier earnings function work by Gordon, Lillard and others. Following Bhalla, it is hypothesized that various permanent household characteristics, which have been used for tests of the permanent income hypothesis, explain permanent income through a functional relationship. Under this hypothesis, permanent income can be estimated with the statistical model

$$(5) \qquad Y = c_0 + c_1 LD + c_2 LQ + c_3 ED + c_4 FM + c_5 DP + c_6 SI + u$$

where ED is average years of schooling of household members more than six years of age, FM is family size, and other variables are as defined previously. The predicted values of income ($\hat{Y}$) are the values of permanent income for each household, and the residuals ($\hat{u}$) are the values of transitory income.

The advantage of this technique is that it can be estimated from cross-sectional data for a single year. The disadvantage is that it cannot account for cyclical changes which cause the total sample to deviate uniformly from expected income. However, if the explanatory variables in equation (5) measure the human and physical resources of households, the predicted incomes will at least reflect the relative permanent income status of households in the sample and can be used as measures of permanent income in consumption function estimation.

The second method of measuring permanent income is a weighted average of measured incomes for the most recent three years, including the year considered. As Friedman suggested, permanent income is usually measured by a weighted average of current and past values of measured incomes with weights declining exponentially. This method, however, requires fairly long time-series data. With only three years of income data available to us for this study, the weights were arbitrarily designated, and permanent incomes calculated as follows:

$$(6) \qquad Y_p = .5Y + .3Y_{-1} + .2Y_{-2},$$

where subscripts are numbers for lagged years.

Results of Model Estimation

The data used in the analysis come from panel households in the Korean Farm Household Economy Survey. There were 131 households which were surveyed each year 1968 through 1970. Analysis of this panel data for 1970 make up the main body of this section. The data for 1968 and 1969 are used only for calculating permanent income as specified by equation (6), the second measure of permanent income, and the rate-of-return on capital in the previous year.

The estimate of equation (5) from which household permanent income estimates are obtained is

$$\hat{Y} = Y_p(1) = \underset{(32.77)}{140.59} + \underset{(15.58)}{137.92}LD + \underset{(0.39}{0.146}LQ + \underset{(4.03)}{16.11}FM - \underset{(36.52)}{68.11}DP - \underset{(38.44)}{143.06}SI, \quad R^2 = 0.627; \quad F = 42.07;$$

where standard errors are in parentheses. The schooling variable (ED) was dropped; it had a negative coefficient which was not significantly different from zero. Summary statistics of the permanent (Y_p) and transitory (Y_{tr}) income estimates from statistical estimation of equation (5) and the weighted averages defined by equation (6) are presented in Table 2. The two measures of permanent income have similar standard deviations and a simple correlation of 0.945, indicating that they are providing

TABLE 2: Summary Statistics of Income Measures , 131 Korean Households, 1970 (1000 Korean Won)[a]

	Mean	Standard Deviation	Correlation Coefficients $Y_p(2)$	$Y_{tr}(2)$
Disposable Income (Y)	236.15	117.40		
Permanent Income (Y_p)[b]				
$Y_p(1)$	236.15	92.98	.945	
$Y_p(2)$	218.25	95.11		
Transitory Income (Y_{tr})[b]				
$Y_{tr}(1)$	0	71.68		.693
$Y_{tr}(2)$	17.90	41.64	.379	

a The official rate of exchange in 1970 was 304 Won for one U.S. dollar.

b The permanent and transitory income estimates (1) are from the statistical estimation technique and (2) from the weighted average technique.

similar measures of the permanent income status of sample households. In the consumption function estimates, $Y_p(2)$ for each household is adjusted upward by adding mean transitory income (17.9 thousand Won) to adjust for trend. This has the effect of increasing estimates of MPC out of permanent income because the consumption function is forced through the origin.

Consumption function estimates are presented in Table 3 and 4. The estimates in Table 3 are per capita functions while those in Table 4 are per household. All equations are statistically significant at the one percent level.

In Table 3, model A shows that the MPC out of permanent income is about 0.79, the sum of the coefficients of the two income variables. Since the coefficient of $Y_p(1)$ is statistically significant at the one percent level and the sum of the two coefficients is less than one, the result supports the permanent income hypothesis that MPC out of permanent income is greater than MPC out of transitory income, but less than one. The MPC out of transitory income is about 0.21, which is significantly greater than zero at the one percent level. This is consistent with empirical findings in other countries that MPC out of transitory income is greater than zero.

TABLE 3: Per Capita Consumption Function Estimates for 131 Panel Farm Households, 1970 (Standard Errors are in Parentheses)[a]

	Without Permanent Income		With Permanent Income			
			$Y_p(1)$		$Y_p(2)$	
	A	B	C	D	E	F
Y	.5997 (.0413)	.9338 (.1365)	.2117 (.0840)	.2266 (.0803)	.0375 (.0944)	-.0107 (.0912)
Y_p		--	.5788 (.0872)	.9629 (.1456)	.7086 (.0915)	1.1087 (.1341)
(Interaction With Major Income Variable)[b]						
LD		.0379 (.1951)		-.2005 (.1632)		-.1747 (.1435)
SI		-.3529 (.1951)		-.3439 (.1222)		-.3565 (.1092)
RT		-.0444 (.1008)		.0170 (.0968)		.0470 (.0788)
LQ		-.0007 (.0005)		-.0007 (.0004)		-.0005 (.0004)
DP		-.1066 (.1191)		-.0461 (.1078)		.1261 (.0911)
Intercept	9.654 (2.1890)	11.0058 (3.2135)		--		--
MPC at Mean[c]	.60	.57	.79	.83	.75	.81
R^2	.62	.65	.91	.92	.92	.93
S.E.	13.94	13.69	12.91	12.18	12.36	11.28

a Y, Y_p, LD, and LQ are in per capita terms.

b The interaction variable is Y for the Keynesian function and Y_p for the permanent income functions.

c MPC at sample mean of variables out of current income in B and permanent income in D and F.

TABLE 4: Household Consumption Function Estimates for 131 Panel Farm Households, 1970 (Standard Errors are in Parenthesis)

	Without Permanent Income	With Permanent Income	
		$Y_p(1)$	$Y_p(2)$
Y	.5494 (.1187)	.3870 (.0725)	.0084 (.1264)
Y_p	--	.5657 (.1299)	.9440 (.1647)
(Interaction With Major Income Variable)[a]			
LD	.0697 (.0474)	-.0406 (.0718)	-.0236 (.0398)
SI	-.1524 (.1292)	-.0375 (.1343)	-.1414 (.1291)
RT	-.0507 (.0728)	-.0219 (.0785)	-.1087 (.0716)
LQ	-.00002 (.00007)	-.00008 (.00007)	-.00009 (.00007)
DP	.0392 (.1103)	-.0266 (.1112)	.1070 (.1075)
Intercept	73.5189 (14.7865)	--	--
MPC at Mean[b]	.49	.83	.81
R^2	.55	.93	.93
S.E.	60.08	59.10	57.65

a The interaction variable is Y for the Keynesian function and Y_p for the permanent income functions.

b MPC at sample mean of variables out of current income in the Keynesian function and permanent income in the permanent income functions.

The estimated MPC out of permanent income from the model E is about 0.75, which is very close to that estimated from model C. The MPC out of transitory income is essentially zero, supporting Friedman. Overall, it can be concluded from both consumption function estimates that MPC out of permanent income is around three quarters, and is much greater than the MPC out of transitory income. In comparison, the simple Keynesian model A shows that the MPC out of current income is about 0.60. The standard error of the regression (S.E.) is higher for model A than for models C and E. This comparison suggests that in the consumption models used here, permanent income variables provide better estimates of consumption savings behavior than the simple Keynesian formulation.

In models B, D, and F of Table 3, the additional variables expected to affect consumption behavior are added. In Table 4 estimates of the same consumption functions are presented using per household variables instead of per capita variables. The Keynesian estimates exclude the shift variables ($\Sigma a_{0j} Z_j$ in equation 4); when both shift and interaction variables are included the MPC is small, e.g., 0.28 at the sample mean in the per capita equation. The estimated MPC out of permanent income at the sample mean of all variables is about 0.83 for $Y_p(1)$ and 0.81 for $Y_p(2)$ in both the per capita and household consumption functions.

functions. These estimates are within one standard error of the simple consumption function MPC estimates in models C and E. The MPC out of current income from the Keynesian functions are 0.57 from model B in Table 3, and 0.49 in Table 4.

The results of the additional variables are mixed. Farm size (LD) has the expected negative relationship with MPC in all permanent income equations, but is not statistically significant in any equation. The income source ratio (SI) has the expected negative coefficients in all equations. It is highly significant in the per capita equations of Table 3, but not significant in the household equations of Table 4. The larger magnitude of the coefficients of LD and SI in the per capita equations than in the household equations presents a puzzle. There may be an interaction effect among LD, SI, and family size, but an examination of correlation coefficients and alternative equation estimates did not reveal a solution. In one alternative, where Y and Y_p are per capita, but LD, SI, and LQ are per household, the coefficients of LD and SI are similar to those in the household functions.

The coefficients of RT, LQ, and DP are not statistically significant. The coefficients of RT (rate of return

to capital), which did not have the expected sign, are mixed. More detailed information on returns to current investments may have yielded different results. The coefficients of LQ (liquid assets) are negative in all equations, while the expected sign was positive. The dependency ratio (DP), which had an expected positive relationship with MPC, has coefficients of both signs.

Conclusions

At least two interesting findings emerge from this study. The first is that farm households in South Korea have saved voluntarily a remarkably large part of their incomes since the early 1960s. During the late 1960s these households saved, on the margin, about one-fifth of their permanent incomes and about four-fifths of their transitory incomes. The second finding is that useful measures of permanent and transitory incomes can be estimated from cross-sectional data, and that these estimates can be helpful in better understanding savings behavior.

Much of the development literature assumes that significant amounts of voluntary savings will not emerge from low-income households. Unfortunately, the data used in this study were not rich enough in detail to allow us to shed much light on why this assumption appears not to hold for South Korea. We can only conjecture on reasons for the relatively high marginal propensities to save

out of permanent income. At least three possible explanations merit further analysis. The first might be related to unique cultural traits. Some observers have argued that the surprisingly high savings propensities among rural households in Japan, Taiwan and South Korea are the result of parsimonious cultural traits unique to some oriental societies. If this is true, there is very little for other countries to learn from the South Korean savings experience. Scattered reports of substantial voluntary savings by rural households in some places in India, Latin America, and Africa cast serious doubt in our minds about the strength of this argument.

A second explanation might relate to the lack of reliable data on rural household savings behavior in most low-income countries. It may be that substantial unrecorded voluntary savings is taking place in rural areas of other low-income countries. Most rural household savings do not move through formal markets where they can be measured with secondary data. Also, as mentioned earlier, rural household income, consumption, asset and savings activity information is difficult and costly to collect. Most rural surveys in low-income countries do not include sufficient reliable and detailed information to document actual savings

behavior. The remarkable savings performance in Japan, Taiwan and Korea may reflect better measures of household savings, rather than unique cultural traits.

A third explanation might focus on differences in opportunities and incentives to save. Clearly, the ability to save, as reflected by level of absolute income, is important in explaining savings behavior. We agree with Wai, however, that providing households with strong positive incentives to save, plus offering them additional convenient forms in which to hold their savings can also stimulate savings. While difficult to prove statistically with the data available, it appears that South Korea was very effective in providing savings incentives and opportunities. Policies which gave these incentives and opportunities to save ought to be largely transferable to other low-income countries.

The results of our analysis lead us to be optimistic about the possiblities of mobilizing voluntary savings in rural areas of low-income countries. Policy makers might be pleasantly surprised by the results of well designed rural savings mobilization programs, especially in those times and places where rural household incomes are growing substantially. Spurts in income may result in household incomes with significant transitory

components which are highly susceptible to saving opportunities and incentives.

APPENDIX

Definitions of Terms

Consumption (C): all household expenditures not directly related to production activities during the calendar year. It includes an imputed value for in-kind consumption, and also purchases of consumer durables (1000 Won).

Disposable Income (Y): the sum of net farm income and net non-farm income less tax and interest payments realized by the household during the year. Farm income does not include an adjustment for capital depreciation, but does include an estimated value of in-kind household consumption and inventory changes in products (1000 Won).

Farm Size (LD): the total hectares of cultivated land included in the farm enterprise. Most of this land is owner-operated.

Source of Income Ratio (SI): the ratio of gross farm income to total gross household income.

Rate-of-Return to Capital (RT): the ratio of gross household income to total assets of the previous year. Ratios for the previous year are used since investment deicisions are likely heavily influenced by recent returns to investment.

Liquid Asset Holdings (LQ): the values of product inventories, small animals, and cash and quasi-cash holdings such as deposits and money lent at the beginning of the year (1000 Won).

Dependency Ratio (DP): the ratio of family members less than 15 or over 60 years of age to total family members.

Family Size (FM): the total number of individuals who resided in the household during most of the calendar year.

Education (ED): the average years of schooling of household members more than six years of age.

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