Household Saving Behaviour in Pakistan

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I. INTRODUCTION

Household saving, which is a part of national saving, is expected to contribute to economic growth significantly. Its share in the total national savings of Pakistan, during 1960–90, was about 83 percent,[1] and in gross national product it varied between 6.6 percent and 10 percent, in the early 1980s.[2] This is a significantly high proportion considering the meagre total national saving ratio in Pakistan.

The analysis of savings is a controversial issue. First, there is no standard empirical definition of household savings. Should consumer durables be considered a part of household saving? Should human capital be considered a part of household saving? These are important questions. Answers to these questions will be useful for the analysis of consumer preferences and for public policy. The rationale for the inclusion of consumer durables as a part of household saving is that they are like productive assets purchased in order to provide for a flow of services. Similarly, human capital is expected to raise labour productivity and its future income and consumption. The second issue is the response of each component of saving to changes in economic and demographic factors.[3] For example, jewellery and assets may respond differently to changes in economic and/or social conditions. Third, since the theoretical literature defines saving as a residual there is no standard functional form of the empirical saving function. In this paper, we estimate different functional forms to analyse savings behaviour in Pakistan.

Earlier studies on savings in Pakistan are either outdated or they concentrate on urban households only except for the study by Burney and Khan (1992).[4] This study, based on 1985 survey data, covers urban and rural areas and incorporates economic and demographic variables. Our study differs from Burney and Khan (1992) in the following respects: First, Burney and Khan concentrate on a single year, i.e., 1985, whereas we are analysing savings behaviour for the years 1969–

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[1]See Burney and Khan (1992).
[2]See Ali (1985).
[3]In this study household saving include jewellery, assets, unconsumed goods, total consumer durable, and expenditure on education and health.
[4]For a brief review of these studies, see Burney and Khan (1992).

988 (separately for each year).[5] Second, Burney and Khan's definition of saving considers' appliances and education as part of household savings. But we disaggregate saving in the following categories: purchase of jewellery, assets, unconsumed goods, repair and insurance of housing, education, health, and total durables. We estimate savings function for each component separately and jointly, both. Third, unlike Burney and Khan we are not estimating savings functions for urban and rural areas separately. We will analyse this aspect at a later stage. Finally, while we are using grouped data Burney and Khan utilise Household Income and Expenditure Survey–1985 at the disaggregated level because disaggregated data for the earlier years are not available. We intend to explore savings behaviour at a disaggregated level for the year 1987-88 at a later stage.

We analyse the pattern of household savings in Section II. The methodology is discussed in Section III. Data sources and problems are discussed in Section IV. Section V reports the results and the final section concludes the paper.

II. PATTERN OF HOUSEHOLD SAVING

In most studies saving is estimated as a residual, i.e., the proportion of income (or total receipts) not consumed. If we estimate saving as the surplus generated in the household sector we see negative saving generation in the early 1970s. The level of negative saving is significantly higher among the lowest income groups.[6] Average savings of the household sector have declined over time. The coefficient of variation (CV) of saving varied across income groups though its variation has reduced over time. This pattern could be a result of:

(1) Declining saving and rising consumption orientation in the country;
(2) rising poverty; and/or
(3) data measurement errors and/or due to misreporting of data in *Household Income and Expenditure Survey* (HIES).

The average propensity to save (APS) varies between –0.31 percent (for S1) and 27.35 percent (for S4) for 1969.[7] However, APS varies between 1.12 percent and 14.42 percent for the year 1988. This confirms that, in Pakistan, the saving ratio has declined over time.

The literature identifies the following motives for household saving:

(1) Guard against rainy days;

(2) old age;

(3) investment in human capital of children and/or bequests;

(4) purchase of consumer durables (improve or enlarge business, build a house, or buy an automobile); and

(5) thrift.

These are universal motives for household savings. According to Bergan (1967) dowries, marriages, or pilgrimage are additional motives for saving in Pakistan and India. As expected, changing the definition of saving will alter the conclusions regarding the saving behaviour in Pakistan. Inclusion of jewellery and assets increases the level of savings. If education is the motive for saving then it has contributed a constant proportion of income to saving. However, the expenditure on health has increased steadily. The purchase of assets shows significant fluctuations over time, increasing until 1972, declining during 1972–85, and then rising. In this paper we analyse household saving behaviour by type of assets. This will help us to determine the sensitivity of different components of saving to changes in its determinants.

III. METHODOLOGY

Three theoretical models: the life-cycle hypothesis model, the permanent income hypothesis model, and the disequilibrium hypothesis model are developed to analyse consumers' behaviour.[8] This literature and the empirical studies identify economic and demographic factors as important determinants of saving behaviour. Economic factors include income, prices, wealth, distribution of income, occupation, urban-rural differences, and employment status as important determinants of saving. Demographic variables include population growth and changes in the age structure of the population or the dependency ratio. The empirical evidence from other developing countries suggests the presence of positive effects on changes in income and negative effects of changes in prices and dependency ratio. However, in most cases, the negative price and dependency effects are not statistically significant. The reason may be that changes in these factors affect the composition of saving not its level.

In this paper, we include income, the dependency ratio, and employment status as the major determinants of saving.[9] The changes in income are expected to affect the level of saving and saving ratio positively. If the average household is living above the subsistence level then the income effect is expected to be stronger. However, if society is becoming more consumption-oriented, the saving ratio may decline. Furthermore, the relation between income and saving ratio may not be

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[8]For details, see Marglin (1984).

[9]In order to obtain a robust model of household saving it would seem necessary to include the age and education of earners. However, data constraints are binding.

linear. The nonlinear effect of changes in income will be approximated by a quadratic income term in the saving functions.

The increase in the dependency ratio, either as a result of an increase in the proportion of the young population or due to a rise in the old population, is expected to have an adverse effect on saving. An increase in young dependent population will affect saving negatively if it increases the family's consumption expenditure. An increase in old dependent population may reduce saving if it eliminates a major motivation for saving. However, the empirical literature does not give us a consensus on this issue.

A rise in self-employment may have a positive effect on saving if it leads to capital formation in small businesses. The effect of this variable is expected to be positive in less developed countries due to underdeveloped capital markets.

Other variables which can affect saving behaviour, i.e., wealth, distribution of income, prices (interest rate and prices of consumption goods), are ignored due to nonavailability of comparable data. The occupational and industrial distribution of employed persons may affect saving decisions significantly. Since we are using grouped data, it is difficult to capture the effect of these variables. Furthermore, the study by Burney and Khan (1992) shows that the effect of occupational differences on household saving is not statistically significant.

We are estimating the following saving functions, for each year separately:

$$S_i = a0 + a1\ Y_i + a2\ De_i + a3\ Se_i \qquad \cdots \qquad \cdots \qquad (1)$$
$$s_i = b0 + b1\ y_i + b2\ De_i + b3\ Se_i \qquad \cdots \qquad \cdots \qquad (2)$$
$$s_i = c0 + c1\ in\ [Y_i] + c2\ De_i + c3\ Se_i \qquad \cdots \qquad \cdots \qquad (3)$$
$$s_i = d0 + d1\ Y_i + d2\ \ln\ [Y_i * Y_i] + d3\ De_i + d4\ Se_i \qquad \cdots \qquad (4)$$

where

'*i*' represents years 1969, . . ., 1988.
S = average household saving in *i*th year.
s = S/Y = average saving ratio.
Y = average household monthly income.
y = $1/Y$.
De = average dependency ratio = (HS-Earners)/HS.
Se = employment status of the earners. It is defined as the proportion self-employed in total employed labour force.
HS = household size.

Equations (1) and (2) are categorised as Keynesian saving functions in the literature. Equations (3) and (4) are specified by Klein and Landau, respectively.[10]

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[10]For details, on the specification of the saving function, see Burney and Khan (1992).

Equations (1) and (2) are simple linear saving functions, and the other two relationships test for nonlinearities on the saving function.

Since the data are reported as group averages with unequal observations in each group the disturbance term may be hetereoskedastic resulting in inefficient coefficient estimates. Therefore, we apply 'Weighted Least Squares–WLS' to estimate the saving function.[11]

IV. DATA PROBLEMS

We are utilising *Household Income and Expenditure Survey* data for the following years: 1968-69, 1969-70, 1970-71, 1971-72, 1979, 1984-85, 1985-86, 1986-87, 1987-88. Due to discontinuity in these surveys we are not pooling the cross-section and time-series data.

Data measurement problems related to the income variable are well established in the literature. The low-income households often report a negative surplus in their budgets. This could be due to low income and/or reporting/measurement errors. In order to avoid misleading results we can use total expenditure or the total household receipts as a proxy for income. However, the preliminary results show no significant difference in the estimated coefficients. Therefore, we choose the income variable in the final specifications.

The dependency ratio is defined as the ratio of non-earners to household size. We have mentioned earlier that the effect of old age dependency may be different from that of young age dependency, but we cannot differentiate between these two effects due to non-availability of data.

Our definition of household saving (S) includes physical assets, i.e., jewellery, assets, unconsumed goods, total durables, and human capital, i.e., expenditure on education and health. We define saving in four different ways: S1 is surplus/deficit reported in the consumer budget; S2 is S1 plus unconsumed goods; S3 includes S1 and expenditure on education; and finally S4 includes S1, unconsumed goods, purchase of jewellery and assets, and total durables. The measurement and reporting errors in these variables may be significant but in the absence of other comparable statistics it is difficult to adjust data for these errors.

V. RESULTS

The results[12] for the disaggregated savings function show that all components of saving respond positively and significantly to changes in income, except for the purchase of jewellery in 1969 and 1971. Similarly, house insurance is not affected by changes in income. An interesting result is that the effect of the dependency ratio is negative but insignificant for most items. This shows that an increase in the dependency ratio reduces saving, though negligibly, in Pakistan. The negative effect

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[11]See Kmenta (1971).
[12]The table is available from the authors.

is significant for education in the later years. This shows that population pressure does affect savings adversely, particularly human capital formation. This indicates the need for an appropriate population policy in Pakistan. The effect of the rise in self-employment shows mixed results. The effect on assets is positive but its significance changes over time. The positive coefficient is an expected result, as small entrepreneurs will be willing to keep down present consumption and save more for future consumption. However, the coefficient is significant only for the later years.

Table 1 reports the results for alternative functional forms and for different definitions of savings.[13] The results show that, in general, the simple linear functional form, i.e., Equation (1), performs better (statistically). For 1969, S1 does not report any significant coefficient. However, the inclusion of 'unconsumed goods' in the definition of savings alters the results significantly. Income is the major determinant of the level of saving and of the average saving ratio. Population pressure does not affect either the level or the average saving ratio. The increase in self-employment raises the level of saving but the effect on the average saving ratio is negligible. The inclusion of human capital as part of saving, however, does not give a statistically significant result.[14] The inclusion of assets, jewellery, and total durables show a positive and significant effect of income on the level of saving and on the average saving ratio. The effect of demographic pressure is negative but insignificant. However, the rise in self-employment increases the level of saving. But, surprisingly, the average saving ratio either declines or remains constant implying that the proportion of income saved declines as self-employment rises. An interesting aspect is that the results do not support the presence of non-linearity with respect to income.

The results for 1988 show that savings behaviour has deteriorated over time. The negative impact of rising dependency becomes very prominent, particularly for the human capital component of saving, and for the unconsumed goods. The average savings ratio and the level of savings, decline as the dependency ratio rises. This confirms that the negative effect of population is beginning to emerge and population control is becoming important to promote savings. Similarly, the results also show presence of nonlinearity with respect to income.

Furthermore, the marginal propensity to save (MPS) varies between −0.008 (S1) and 0.455 (S4) for 1969 and between 0.02 (S1) and 0.234 (S4) for 1988. This shows that the MPS is very sensitive to the definition of saving. However, the range of the MPS is reduced over time, confirming our earlier assertion that the variation in savings has declined.

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[13]We are reporting the results for two years only, i.e., 1969 and 1988. The results for the remaining years uptill 1972 were not very different, in terms of statistical significance of the coefficients, from the results for 1969. Similarly, the results for the 1980s were not very different from the results for 1988. We will test whether the differences in results, over time, were statistically significant or not, in another study.

[14]This could be due to multicollinearity between the variables.

Table 1

Results: Alternative Functional Forms

	Equation (1)	Equation (2)	Equation (3)	Equation (4)
		1969		
Saving=S1				
Const.	−242.797	0.172	−0.015	−0.055
	(1.28)	(1.92)	(0.09)	(0.36)
Income	−0.008	−1.4E−6	−	−4.0E−6
	(1.12)	(0.45)		(1.61)
Dep.	−2.015	−0.002	−0.0014	−0.002
	(0.90)	(1.31)	(1.02)	(0.002)
Se	−2.012	−8.0E−4	−0.0002	−1.4E−4
	(1.64)	(1.31)	(0.14)	(0.12)
$1/Y_i$	−	12.785	−	
		(1.14)		
$\ln(Y_i)$	−	−	0.016	−
			(0.71)	
$\ln(Y_i*Y_i)$	−	−	−	0.013
				(1.20)
R^2	0.24	0.70	0.604	0.701
F	0.93	4.58	4.58	4.68
Saving=S2				
Const.	−507.660	0.066	−0.164	−0.061
	(0.4)	(0.41)	(0.51)	(0.23)
Income	0.263	1.1E−4	−	1.E−4
	(13.22)	(2.07)		(2.38)
Dep.	−7.267	0.001	−0.002	−0.001
	(1.14)	(0.15)	(0.72)	(0.46)
Se.	14.487	0.002	−0.002	−0.001
	(4.16)	(1.24)	(0.07)	(0.13)
$1/Y_i$	−	3.405	−	−
		(0.17)		
$\ln[Y_i]$	−	−	0.049	−
			(0.51)	
$\ln[Y_i*Y_i]$	−	−	−	0.011
				(0.60)
R^2	0.97	0.88	0.80	0.88
F	88.69	14.06	11.71	14.73
Saving=S3				
Const.	227.50	0.166	−0.003	−0.049
	(0.84)	(1.71)	(0.02)	(0.32)
Income	0.011	−3.E−5	−	5.E−5
	(1.10)	(0.85)		(1.84)
Dep.	−1.447	−0.001	−0.001	−0.002
	(0.445)	(0.63)	(0.79)	(1.19)
Se.	−2.641	−0.002	0.001	−0.001
	(1.51)	(2.19)	(0.53)	(0.56)
$1/Y_i$	−	−7.231	−	−
		(0.59)		

Table 1 – *(Continued)*

	Equation (1)	Equation (2)	Equation (3)	Equation (4)
ln [Yi]	–	–	0.017 (0.72)	
ln [Yi*Yi]	–	–	–	0.014 (1.30)
R^2	0.65	0.83	0.80	0.86
F	5.51	10.07	11.77	12.01
Saving=S4				
Const.	−722.53 (1.35)	0.12 (0.76)	−0.057 (0.15)	0.081 (0.30)
Income	0.455 (22.96)	1.E−4 (2.46)	–	2.E−4 (3.10)
Dep.	−10.23 (1.61)	0.002 (0.87)	−0.001 (0.40)	−5.E−4 (0.02)
Se.	20.03 (5.78)	−0.004 (3.06)	−0.002 (0.76)	−0.003 (1.12)
1/Yi	–	13.534 (0.69)	–	–
ln [Yi]	–	–	0.051 (0.98)	–
ln [Yi*Yi]	–	–	–	0.009 (0.43)
R^2	0.99	0.96	0.90	0.96
F	5.78	44.94	27.89	43.37
		1988		
Saving=S1				
Const.	72.10 (1.28)	0.145 (3.21)	0.088 (1.97)	0.027 (0.48)
Income	0.02 (16.55)	−1.E−6 (4.76)	–	−2.E−5 (1.60)
Dep.	−1.32 (2.02)	−0.002 (0.74)	−0.001 (2.54)	−0.001 (3.11)
Se.	0.07 (0.32)	−0.001 (1.25)	−0.001 (2.48)	−2.E−3 (0.76)
1/Yi	–	−9.85 (0.42)	–	–
ln [Yi]	–	–	0.001 (0.25)	–
ln [Yi*Yi]	–	–	–	0.006 (1.56)
R^2	0.99	0.95	0.94	0.96
F	366.71	35.53	44.5	40.54
Saving=S2				
Const.	92.35 (1.76)	0.168 (3.49)	0.099 (2.01)	0.016 (0.29)
Income	0.03 (22.36)	−2.E−6 (0.37)	–	−3.E−5 (2.15)

Table 1–(Continued)

Dep.	−1.55 (2.54)	−0.002 (2.39)	−0.001 (2.40)	−0.001 (3.58)
Se.	−0.02 (0.09)	−4.E–3 (1.42)	−0.001 (2.57)	−2.E–3 (0.68)
$1/Y_i$	–	−10.748 (1.31)	–	–
$\ln[Y_i]$	–	–	0.001 (0.25)	–
$\ln[Y_i*Y_i]$	–	–	–	0.008 (2.06)
R^2	0.99	0.96	0.95	0.97
F	698.55	40.75	47.59	53.05
Saving=S3				
Const.	180.27 (1.68)	0.322 (3.81)	0.154 (1.70)	−0.037 (0.45)
Income	0.057 (24.74)	−3.E–6 (0.30)	–	−6.E–5 (3.44)
Dep.	−3.092 (2.49)	−0.003 (2.51)	−0.001 (1.88)	−0.003 (4.47)
Se.	−0.021 (0.05)	−0.001 (1.61)	−0.001 (2.79)	−3.E–3 (0.06)
$1/Y_i$	–	−24.47 (1.69)	–	–
$\ln[Y_i]$	–	–	0.004 (0.50)	–
$\ln[Y_i*Y_i]$	–	–	–	0.019 (3.43)
R^2	0.99	0.97	0.96	0.99
F	854.11	63.26	67.14	121.73
Saving=S4				
Const.	−203.06 (0.65)	0.477 (3.86)	0.136 (1.27)	0.192 (1.25)
Income	0.234 (35.18)	6.E–5 (3.87)	–	2.E–5 (0.53)
Dep.	−3.553 (0.99)	−0.003 (1.85)	−0.003 (4.30)	−0.003 (2.61)
Se.	5.047 (4.01)	−0.002 (2.74)	−0.001 (2.50)	−0.002 (2.06)
$1/Y_i$	–	0.008 (2.06)	–	–
$\ln[Y_i]$	–	–	0.040 (4.41)	–
$\ln[Y_i*Y_i]$	–	–	–	0.014 (1.41)
R^2	0.99	0.99	0.99	0.99
F	1403.65	176.05	292.06	199.41

Notes: For description of variables see Table 1.
Y_i = income.
The figures in parentheses are t-values.
2.E–4 = 0.00002. Read other numbers with E–.. in the same way.
S1 = average household deficit/surplus.
S2 = S1 + UG.
S3 = S1 + average monthly expenditure on education.
S4 = S3 + UG + TD + He.
UG = Unconsumed goods.
TD = Expenditure on total durables.
He = Expenditure on housing.

VI. CONCLUSIONS

The preliminary estimates which are presented in this paper give very interesting results. First, each component of saving responds differently to changes in income, population pressure, and self-employment. Unconsumed goods and assets, as compared to jewellery, are more responsive to changes in income. Second, the results show the emerging strong negative effects of rising population on the average savings ratio, particularly on human capital formation. This indicates an urgent need for an appropriate population policy. Third, nonlinearities in the savings function become statistically significant in the later years implying that the form of the savings function differs over time.

We intend to extend this study to examine the issue of functional form in detail. We will also analyse household saving behaviour at a disaggregated level for the year 1988, and compare it with the results based on 1988 grouped data. This will help us to capture the effect of additional variables, i.e., age and education, at a disaggregated level and to draw more meaningful policy implications.

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Comments on
"Household Saving Behaviour in Pakistan"

The results of the paper are preliminary and in very raw form. I wonder if commenting on them at this stage is appropriate. Perhaps the paper was turned in hastily. As I gather the basic objectives of the paper were:

- To model HH saving behaviour with revised definition of savings; the authors do not seem to be satisfied with the existing definitions, the residual approach or components of expenditure conventionally taken as saving.
- Responsiveness of various components of saving to changes in economic and demographic factors.
- The authors believe that there is no standard functional form of the empirical savings function; so that they wanted to estimate alternative functional forms of HH savings function.

To achieve these objectives, the authors postulate the basic model of HH saving being determined by HH income, dependency ratio and proportion of people self-employed in the group, and use weighted least squares on grouped data to estimate regressions of which over one hundred are reported in the paper. Naturally the reported coefficients are over five hundred and it becomes hard to assimilate these results. The income variable comes out significant but the remaining two variables mostly remain insignificant. But even for the income variable, the range of coefficients is too large to be of any use, e.g. MPS –0.008–0.455 for 1969, 0.02–0.234 for 1988, APS: –0.0031–0.2735 for 1969, 0.0112–0.1442 for 1988.

What did the paper achieve in terms of the foregoing objectives and understanding HH savings behaviour? I doubt any thing; it rather confused more than clarified any thing. Where did it fail? Several areas can be suggested to achieve more meaningful results and for improvement.

- Have a more focused framework (reasonable objectives, sound model and methodology) and abstract from the morass of data with a view to get conclusive results. Transformations on data should be thoughtful with a view to give better understanding of HH savings behaviour. Still one may fail to get significant results worthy of reporting in a journal or a forum like this.
- I did not see saving in the form of cash, bank deposit or investment in stocks, etc. Has it been left out or included somewhere. By the way the authors need to explain more about the variables namely 'assets', 'unconsumed goods',

'repairs', 'insurance' and 'total durables'. Specifically what is included in them.

– Similarly, the authors do not define the data sufficiently and basic information like number of observations or DF is not given. No information on group sizes is there so that I am not able to judge the wisdom of using the weighted least squares technique. Unnecessary use of the technique may spoil rather than improve the results.

– Do not promise too much for future or digress too much on unworkable ideas or the data. The reader is generally not interested in complaints.

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