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SAVINGS-INCOME RELATIONSHIPS IN URBAN PAKISTAN: Evidence from HIES 1979

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This paper attempts to provide baseline estimates of savings propensities by various levels and few socio-economic groups from information on 7504 urban families contained in the Household Income and Expenditure Survey (HIES) of 1979. Fitting popular specifications in the literature to a current and residual measure of household savings does not reveal a consistent and unambiguous relationship of increasing marginal propensities with rising income levels. At mean level of income, estimates based on entire data set revealed that the household's marginal propensity ranged from 0.21 to 0.27. Average propensity to save at 0.056 across all specifications, was more robust. Excluding very low income households, which possibly overstate consumption (about 10 per.cent of the sample), all others displayed more robust marginal and average propensity estimates ranging from 0.18 to 0.21 and 0.077 respectively. Contrary to studies in India, renters (excluding the self-employed group) not only have lower average propensity but a smaller marginal propensity to save than home-owners although the former had an 18 per cent higher per capita income. Income-source criteria were employed to separate self-employed from employee head of households. Regression results indicated that the former's average and marginal savings propensities were higher than the latter's though this difference between the two groups was narrower than the one observed in some studies of the U.S.A. and India.

I. Introduction

Domestic savings are regarded as a crucial input into the growth process of developing countries [Lewis, (1955)]. In Pakistan, though concerted efforts have been made over the last three and a half decades to raise domes-

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tic savings, their outcome has not been very encouraging. The treatment of remittances as savings has helped to maintain our savings rate during 1974–83 in the range of 7.1 and 14.4 per cent. Excluding remittances, however, our domestic savings rate has declined from 9.0 to 6.9 per cent during the period 1970–80.[1] The need to mobilise domestic savings assumes added significance in the face of declining net aid inflows and remittances.

In Pakistan, as in many other developing countries, households remain the largest source of domestic savings. In the period 1975–84, their contribution to total national savings varied between 58 to 86 per cent. However, except for the time series on household savings generated and analysed by Qureshi (1981), not much work has been done on this subject for Pakistan. In the absence of any study on the savings behaviour of a cross-section of households in Pakistan, the Applied Economics Research Centre initiated research in this area. Tapes containing information on each of the 19900 households collected through a nation-wide Household Income and Expenditure Survey (HIES) in 1979, were obtained from the Federal Bureau of Statistics (FBS) for the purpose of the study. As a part of on-going work, the present paper reports findings on the savings-income relationship of 7504 urban households The effect of other variables, alongwith income on savings, is being analysed and their results will be published separately.

The policy relevance of this paper is twofold: (a) it will enlarge the empirical base for improved policy making whereby these estimates can be included in income re-distribution and domestic resource mobilisation policies in the country, (b) it will act as a springboard for more research in this area.

The paper is divided as follows: data base and definition of variables is introduced in section II. Empirical specifications and results of fitting some simple conventional savings-income relationships postulated in the literature, viz., Keynes, Klein, Landau and Singh, are given in Sections III and IV. The latter section also includes the savings propensity estimates obtained by fitting these formulations on a subset of the data and on restricted data. The savings propensities of four major groups, namely, homeowners, renters, self-employed and employees are presented and compared in sections V and VI. The summary and conclusions are presented in section VII.

II. Data and Definitions

The HIES (1979) covered 7654 households in urban areas of Pakistan.

[1] Pakistan Economic Survey, 1984-85. Statistical Appendix, pp. 32-33, Table 2.9 row 6.

Using a two-stage stratified sample[2] the survey collected data on household income by seventeen sources and on 270 items of expenditure. It also contained data on the socio-demographic profile, changes in assets, liabilities and the savings of households.

Unfortunately, the structure of the questionnaire used in the HIES 1979 has not changed at all since the sixties, when the "Quarterly Survey of Economic Conditions" was conducted by the Central Statistical Office. Bergan (1967) while discussing the questionnaire in depth also highlights its weaknesses. His comments on the survey of 1963/64 are equally valid for HIES 1979. One must also be aware of several other limitations of HIES 1979 when conclusions are drawn from our findings; which are as follows:

i) The survey, was not specifically meant to capture precisely the volume and form of household savings. In this respect it fell considerably short of similar surveys conducted regularly by National Council of Applied Economic Research (NCAER) in India or in the developed countries.[3]

ii) Data on wealth or on the net worth of a household was not collected. Consequently this important determinant of savings is conspicously absent from all our analysis.

iii) Gross household savings is derived by the current account method, also known as the residual approach. Using changes in net worth as a measure of savings by the respondents, would have reduced our sample size by 50 per cent.[4] However, recourse to the residual approach is not without pitfalls. The correctness of the current savings measure, depends crucially on how well defined and recorded are the various items of expenditure and income. As Bergan (1967) notes "savings figures are extremely sensitive to even relatively small errors in the observations of income and household expenditures". To overcome this shortcoming, one strategy would have been to check the plausibility and consistency of each income and expenditure item by listing them from the data tapes and then generating a new corrected data base. Given the enormity of the task, we adopted a more aggregative approach. A series of income and expenditure checks, varying with income levels, were designed to identify those households which showed excessive savings or deficits. Only

[2] A detailed description of the sample design and the method of conducting the survey exists in the FBS publication, FBS (1979).

[3] Primarily, the data made available through it was used to update the base year of CPI to the year 1978-79. Secondly, the collection of data on income, assets and debt was more in the nature of a routine exercise conducted every five years, and no advisory input was solicited from the end users of this data i.e., the economic researcher.

[4] The data on reported savings, assets and liabilities was sparse and poor.

about 2 per cent of the sample failed to meet these criteria, leaving us with 7504 households for the purpose of analysis.[5]

iv) For classifying occupation, employment status and industry of various members of a household, the HIES adopted the schemes used in the Labour Force Surveys. Consequently, we are constrained to adopt the same scheme, however imperfect and ambiguous they may be from the viewpoint of a savings study.

Despite the above deficiencies, two considerations encouraged us to utilise the HIES data for this savings study:

a) Unadjusted aggregate savings figures obtained from this survey were close to estimates of aggregate household savings figures of 1979, derived from the macro savings-investment identity in the National Income accounts.

b) A review of the literature revealed that it is not uncommon to infer about savings or its complement consumption behaviour of households from surveys containing expenditure information. For example, Modigliani (1960) used consumption expenditure from the US Bureau of Labour Statistics' survey of 1950 on 12500 urban households (known as the BLS-Wharton School study of expenditure, income and savings), to test the implications of life-cycle and permanent income hypotheses. Similarly, Kelley and Williamson (1968) used the residual approach on a sample survey of 490 families in a region of Indonesia to infer savings behaviour and test crudely the life-cycle hypothesis. ECIEL surveys [Musgrave, (1978)] of nine major cities in Latin America were employed to assess the consumption propensities of households.

Definitions

Given the shortcomings of the questionnaire and being wary of the various concepts of income used to generate savings estimates, we decided to define gross personal savings by subtracting total current expenditure on non-durable goods from gross personal (household) income.[6,7] The

[5] Details of various criteria and checks leading to a final sample determination are given in Akhtar (1986). Excluded households with income of Rs.300 per month and less constituted 26 per cent of all households in that category and 34 per cent (including 26 households with zero incomes) of the total excluded. Top income (i.e., Rs.3500 and above monthly income) households short listed, formed 4.2 and 9.3 per cent respectively by the above stated criteria.

[6] Current expenditure includes income remitted out to members of a household in other areas. According to the published tables by FBS (1983), expenditure on durables constituted only 4.6 per cent of total expenditure in 1979. They constitute nearly 40 per cent residual savings as defined in this study.

components or sources of income that constitute gross personal (household) income essentially remain the same as those used by Bergan (1967), in his definition of the variable. They consist of either monthly or yearly income. The former consists of wages, pension, income from boarders (food and lodging), professional fees and miscellaneous allowances. Interest, dividends, income from self-employment (i.e., agriculture, business, commerce, industry) land and property rents, gifts and charity in cash, bonus from employment, social security and insurance benefits and miscellaneous sources constituted yearly income.[8] No imputation was made for services provided by owner occupied houses and by other durable goods. Income in kind, e.g., the value of home grown goods or compensation paid in the form of goods and services is excluded.

III. Specifications of the Savings-Income Relationship

As investigation into the underlying theory of household savings behaviour is not our primary goal, we briefly introduce the various specifications to be estimated.[9] which have been developed earlier in the literature.

The first estimating equation captures the Absolute Income Hypothesis (AIH) postulated by Keynes.[10] It is extended to include nonlinearities in savings behaviour, as follows:

$$\text{Keynes: } S = \alpha_0 + \alpha_1 Y + \alpha_2 Y^2 \qquad (1)$$

Fitting the above functional form to actual data, however, leads to serious problems of heteroscedasticity i.e., unequal variance of errors across income classes, thus necessitating the use of the following function as our estimating equation.[11]

[7] We also decided to work with gross income rather than disposable income for the following reasons: (a) as did not have access to income tax returns for high income brackets, (b) to maintain comparability later on with rural data, as income tax is not levied on agriculture sector, (c) the effect on savings rates of high income groups may be marginal as income tax payment varied from 0.1 to 1.7 per cent of total expenditure for households with income above Rs. 1500 per month.

[8] For operational and conceptual problems related with some of these variables i.e., miscellaneous sources, income from self-employment etc., see Bergan (1967).

[9] Fitting popular specifications in the literature to the data is one of the many available options. Given a large data set, simple EDA (Exploratory Data Analysis) techniques could be employed to search for a specification based on actual characteristics of the data. An attempt has been made in this direction while fitting a modified Singh function.

[10] The well-known simple Keynesian savings function $S = \alpha_0 + \alpha_1 Y$ yields constant MPS. Observed empirical evidence of increasing MPS with income favours the above version.

[11] For detailed discussion on the effects of heteroscedasticity on estimates of alternate savings formulation see, Klein (1951). Goldfield-Quandt test for detecting heteroscedasticity was applied

$$S/Y = \alpha_0 (1/Y) + \alpha_1 + \alpha_2 Y + \mu \quad (1a)$$

To account for nonlinearity in the savings function Klein (1950) suggested the following alternative formulation for estimation purposes.[12]

$$S/Y = \alpha_0 + \alpha_1 \log Y + \mu \quad (2)$$

Equations (1a) and (2) have interesting implications for income distribution policies. A positive and significant value of α_2 in the former and α_1 in the latter would imply that policies towards more equitable distribution of income would tend to lower savings and increase consumption.

In suggesting aggregate savings-income relationships of a country through time, Landau (1971) combined the behavioural features of Keynesian and Friedman's permanent income hypothesis. Simply put, he postulated that savings rates vary according to a country's stage of development, measured by the per capita income level, as follows:

a) At very low levels of income per capita, the total savings is close to zero.
b) As income increases savings rates rise at a faster rate than that of the income. This stage can be described as a "middle-income range which incorporates the Keynesian contention that savings rates increase with income" [Bhalla, (1980)].
c) At still higher levels of income, the increase in savings slows down and gradually converges to a constant rate, thus incorporating Friedman's hypothesis. Ahluwalia and Chenery (1974) used a piecewise linear form of the Landau model to describe the savings potentials of low, middle and high income households in a hypothetical developing country. Landau suggested the following functional form to test his proposition about savings rates:[13]

$$S/Y = \alpha_0 + \alpha_1 Y + \alpha_2 (\log Y)^2 + \mu \quad (3)$$

to both corrected and uncorrected forms of Keynesian and Klein formulations. The F-value given by the former approach was not significant. Attempt to estimate magnitude of variance by Park-Glejser test was unsuccessful.

[12] Equation (2) is a derivative of the simple Keynesian function, and obtained from dividing by income per capita

$$S/Y = \alpha'_0(1/Y) + \alpha'_1$$

log Y is used instead of 1/Y "because the tendency of log Y to be normally distributed simplifies some of the underlying statistical theory", see [Klein, (1950)].

[13] Since equation (3) appears as a simple extension of Klein-Keynes savings function, the following

Singh (1972), while explaining the differences in savings rates across countries states that "the main question underlying the AIH is how big is the difference between MPS and APS, and how this *difference* varies with income". The following form suggested by him closely resembles Landau's formulation of savings behaviour.

$$\text{Singh: } S/Y = \alpha_0 + \alpha_1 \left[1/(\log Y)^2\right] + \alpha_2 \left[1/(\log Y)^4\right] + \mu \qquad (4)$$

If $\alpha_1 < 0$ and $\alpha_2 > 0$, then the MPS first increases and converges to the long-run APS given by α_0. Empirical results of fitting this form to household data of Pakistan, gave unsatisfactory results such as $\alpha_0 < 0$, $\alpha_1 > 0$ and $\alpha_2 < 0$. Further experimentation with powers of log Y established the suitability of the following modified version of the Singh function:[14]

$$S/Y = \alpha_0 + \alpha_1 \left[1/(\log Y)^7\right] + \alpha_2 \left[1/(\log Y)^8\right] \qquad (4a)$$

IV. Estimation Results

Table 1 provides a snapshot of the entire data in terms of a few key variables influencing savings or its complement, consumption.[15] Though the focus is on income as a major determinant of savings, selected socio-demographic characteristics of the household and of its head can enrich the partial view of savings behaviour provided by marginal and average propensities. Table 2 presents the OLS estimates of various formulations. All the variables are in per capita terms and parameter values relate to the unweighted sample.[16,17]

modification was estimated: $S/Y = \alpha_0 + \alpha_1 Y + \alpha_2 (\log Y)^2 + \mu$. This function also yielded results close to the specified Landau function.

[14] The experimentation with powers of log Y is suggested by the author himself. Singh [(1972), p. 43] states "The choice of the powers of $(1/\log X_1)$ was made on some experimentation". Further he states that: "the general version of the sixth form may be considered most flexible because by varying the powers of $(1/\log X_1)$ a wide range of forms for MPS-APS may be generated, . . ." (p. 45). Furthermore, the simulation exercise with extreme values revealed that estimated coefficients of the modified Singh function generated savings behaviour similar to that specified by Landau.

[15] The selection of the variables is by no means comprehensive. A recent study by Tiwari (1985) ranked (after income) education, household size, dependency ratio and age as 1st, 2nd, 3rd and 6th respectively in influencing consumption expenditure of households in urban India.

[16] Use of adult equivalency measures can yield a different set of consumption expenditures and thereby residual savings. A World Bank (1980) study, while comparing inequality indices based on expenditure per adult equivalent and per capita ranking for 5 countries i.e., India, Nepal, Sri Lanka, Peninsular Malaysia and Taiwan observes "Pending future research and experimentation with different weights, it can be concluded that although the ranking of households in terms of

TABLE 1
Mean characteristcs of households

			Income Per Capita	S/Y Ratio	Age	Hsize	Earners	Children below 14	Dependency ratio	Percent 10 Yrs > education	Percent house-holds
	<	300	113.66	– 17.97	45.8	2.98	1.04	1.08	0.26	5.2	4.40
300	–	400	127.81	– 17.65	41.2	4.14	1.07	1.78	0.35	5.7	6.70
400	–	500	132.61	0.19	39.6	4.83	1.13	2.23	0.41	10.8	10.50
500	–	600	140.42	0.27	40.4	5.39	1.23	2.41	0.41	14.7	9.60
600	–	800	152.68	3.16	42.2	5.97	1.34	2.71	0.42	17.0	18.10
800	–	1000	169.16	6.74	43.7	6.65	1.52	3.00	0.43	19.7	14.70
1000	–	1500	194.74	10.01	45.1	7.68	1.76	3.29	0.42	29.0	18.70
1500	–	2000	269.13	13.25	47.6	8.24	1.90	3.21	0.38	37.8	7.80
2000	–	2500	374.62	14.20	48.7	8.03	1.95	2.90	0.35	46.4	3.50
2500	–	3000	431.51	22.83	48.5	8.72	1.84	3.22	0.35	53.6	1.80
3000	–	3500	445.02	24.91	47.3	9.08	1.90	3.44	0.36	46.0	1.00
3500	–	5000	624.31	24.21	49.1	8.71	1.86	2.98	0.33	65.2	1.80
5000	–	10000	1010.95	29.27	51.9	9.15	1.76	3.14	0.33	66.6	1.20
		10000 >	1720.77	38.63	49.3	9.47	2.12	3.35	0.37	58.8	0.02
Overall			203.11	5.51	43.7	6.39	1.48	2.72	0.40	–	100.00

TABLE 2

Savings-income regressions

Keynesian	$S/Y = 0.2737 - 0.0000357Y - 27.38\ (1/Y)$	
	$(0.00002)^{**}\quad (0.7782)^{**}$	
	$R^2 = 0.1752$ SEE = 0.2794 F = 796.07	MPS = 0.2595
		APS = 0.0557
Klein	$S/Y = -0.6695 + 0.3304 \log Y$	
	$(0.0119)^{**}$	
	$R^2 = 0.0928$ SEE = 0.2930 F = 767.496	MPS = 0.1987
		APS = 0.0552
Landau	$S/Y = -0.9083 - 0.000196Y + 0.2287 \log (Y)^2$	
	$(0.00003)^{**}\ (0.01013)^{**}$	
	$R^2 = 0.1000$ SEE = 0.2918 F = 416.71	MPS = 0.2658
		APS = 0.0551
Singh	$S/Y = 0.1485 - 20.0374\ [1/(\log Y)^7] + 10.6489\ [1/(\log Y)^8]$	
	$(1.5684)^{**}\quad (1.8199)^{**}$	
	$R^2 = 0.2503$ SEE = 0.2663 F = 1252.50	MPS = 0.1985
		APS = 0.0556

** Significant at 99 per cent level.

The shapes of the aggregate savings-income function based on the estimates of these four formulations are plotted in Figure 1. Point, marginal and average propensities at selected income intervals are given in Table 3.

However, attempts to generalise about the trends in propensity to save of urban households in Pakistan from results in Tables 2 and 3 are affected by the following:

A) Sensitivity of results to the functional form used in the analysis.

B) Current income as a basis for inference of the long-term or even short-term savings-income relationship may be considered fragile and wanting.

per capita expenditure or income does not seem conceptually ideal, the resulting measures of inequality are not very different from those in terms of adult equivalent".

[17] Tobin (1957) has argued extensively that the use of weights is not required for estimates of the parameter of multi-variate distributions. In another study Klein and Morgan (1951) have obtained approximately similar estimates of saving relations from both weighted and unweighted data. This, of course, assumes that in the case of HIES 1979 data sampled household distribution is not widely off the population distribution.

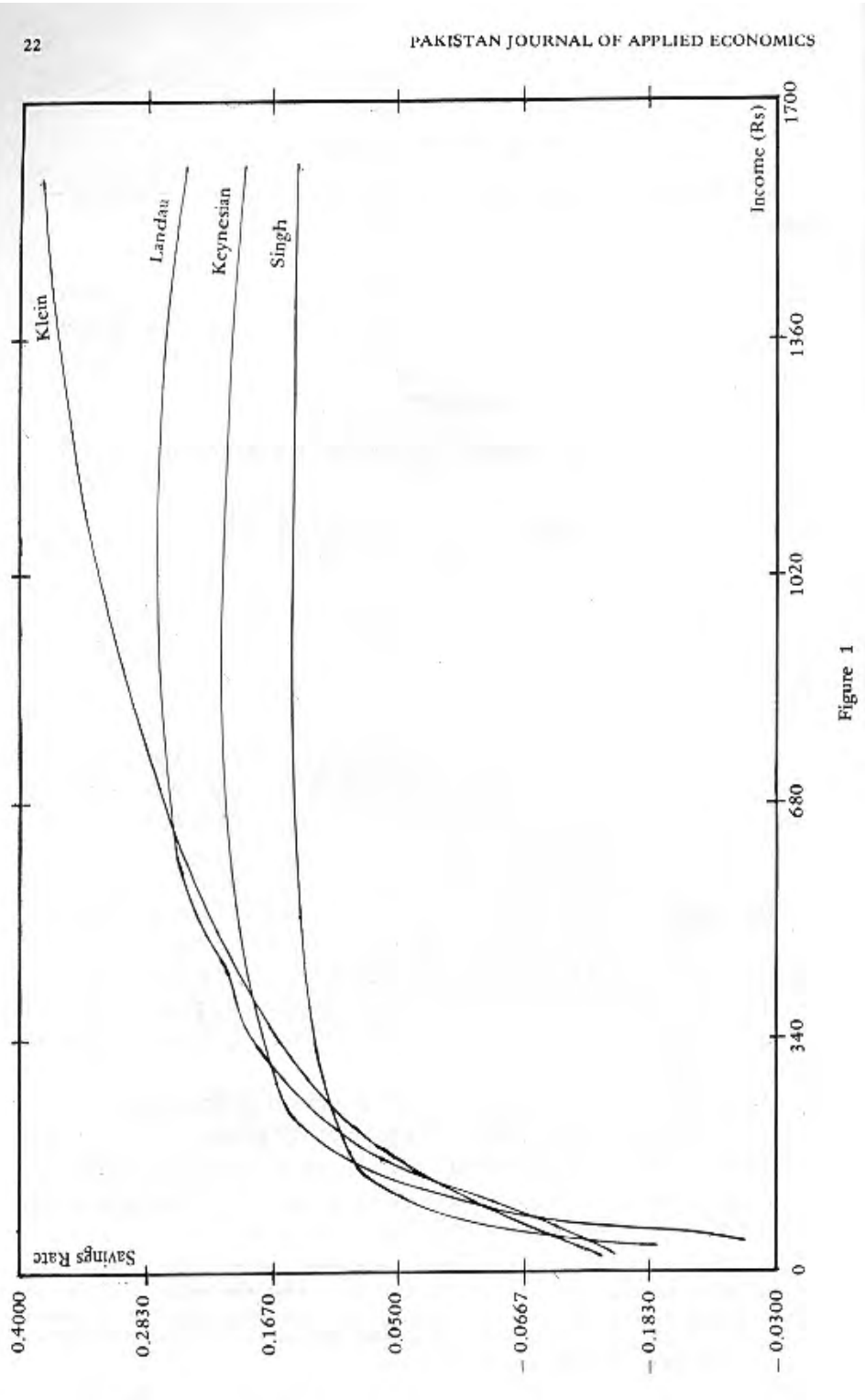
Saving Rate
0.4000
0.2830
0.1670
0.0500
- 0.0667
- 0.1830
- 0.0300
0
340
680
1020
1360
1700
Income (Rs)
Klein
Landau
Keynesian
Singh

Figure 1

TABLE 3

Savings propensities at various income levels* (entire sample)

	Keynesian		Klein		Landau		Singh	
	MPS	APS	MPS	APS	MPS	APS	MPS	APS
50	27.0	−27.6	3.4	− 11.0	4.8	− 14.1	37.5	− 18.8
100	26.6	− 0.4	13.5	− 0.8	16.6	− 1.3	20.0	3.3
150	26.3	8.6	19.3	4.9	22.7	5.7	17.0	8.3
200	25.9	13.0	23.4	9.1	26.4	10.4	16.1	10.3
250	25.6	15.5	26.6	12.2	28.9	13.9	15.6	11.4
300	25.2	17.2	29.2	14.9	30.6	16.6	15.4	12.1
400	24.5	19.1	33.4	19.0	32.4	20.3	15.2	12.9
600	23.1	20.7	39.2	24.8	32.6	24.5	14.9	13.6
1000	20.2	21.1	46.5	32.2	27.0	26.8	14.8	14.1
1600	15.9	19.9	53.3	38.9	12.9	24.4	14.8	14.3

* Percentages.

The response of results to aberrations in current income may be specially pronounced at the bottom and top income levels. However, large number of observations at the two income tails may give substance to our interpretations.

Some tentative findings that emerge are:

i) The MPS and APS estimates at average income level are fairly consistent across hypotheses (Table 2) with MPS values ranging from 0.20 to 0.26.

ii) Families begin to save in the range of Rs. 125 to Rs. 150 per capita monthly income.

iii) The behaviour of average propensities from three out of four functions conform to *a priori* expectations and support the empirical findings in other countries. Starting with negative values, they continue to increase rapidly with income, and taper off to some constant value at higher income levels (Figure 1). In addition, estimates of the Landau form agree with the hypothetical savings rates of households in a developing country traced by Ahluwalia and Chenery (1974).

iv) The asymptotic values or long-run APS are sensitive to the functional form. APS of 15 per cent is given by the Singh function, while the Keynesian and Landau forms yield values between 20–25 per cent. If improved summary statistics are a criteria for choice among the

two APS estimates, the former would be more reliable.[18]

v) The trend of marginal propensities for various income levels presents an ambiguous view across functions: the estimates of the four functions have diverging policy implications. Rising MPS values obtained from the Klein and Landau functions support the widely held view that income redistribution will reduce savings in the economy. The falling MPS from the Keynesian and Singh functions suggest a slight improvement or at best no change in overall savings from income redistribution. This pattern of MPS may not be implausible in the context of a developing country like Pakistan, where an increase in income is swamped by a more than proportionate increase in consumption expenditure due to the demonstration effect, extended family or rising dependency ratio.[19]

vi) Only the profile of estimated MPS values from fitting the Landau function to the data are intuitively appealing i.e., they closely follow the trend in average propensities.

vii) The narrowing of the MPS-APS differences, a phenomenon essential for acceptance of alternate income theories, is strongly/weakly supported by Singh/Keynesian estimates.

A large sample size, alongwith sufficient observations in nearly all of the income categories, encouraged us to try these formulations on a more finely tuned definition of households. It was decided to test these hypotheses by excluding one person and two person households for the following reasons:

a) Possibilities of understatement of expenditure in the survey by migrants living in large cities and remitting a greater part of their income to families in rural areas.

b) Students or older parents living in urban areas and receiving substantial allowances, domestically or from abroad.

c) In an economy where joint family system or large size households prevail with an average dependency ratio of 0.40, the possibilities of one or two person households with young dependents is expected to be fairly small, thus affecting their expenditure pattern.[20] The mixed trend of APS and MPS profile across functions, observed from the

[18] High correlations among the independent variables may, however, still effect the coefficients in the Singh function, and thereby inflate the summary statistics i.e., R^2.

[19] Validation of this explanation would require looking at the expenditure and composition of goods consumed at various levels of income, a work outside the scope of the present study. However, the life-cycle pattern of the savings ratio does support this argument.

[20] To be definite one needs to look into the expenditure and demographic pattern of these households. Out of 455 two person households only 5.5 per cent had dependent with age less than 14 years.

entire sample continued to persist in the restricted sample. However, the change in propensity magnitudes at extreme income levels was significant for the Landau function.[21]

While the above variant excluded households with possibly understated consumption, another estimation exercise undertaken left out those with very low income per capita.[22] Given the structure of HIES, these households may have a strong tendency to overstate consumption.[23] Marginal and average propensities are summarised in Table 4 and detailed regression results are given in Appendix A. The summary statistics and the propensity estimates at the mean income level are now more consistent and robust. Moreover, an unambiguously positive trend of marginal and average propensities is reflected with rising per capita income across all the savings formulations. Compared to the estimates from the entire sample in Table 3, the propensities are consistently lower for per capita monthly income less than or equal to Rs. 400 and greater for higher incomes.

TABLE 4

Savings propensities at various income levels*

Per Capita Income	Keynesian		Klein		Landau		Singh	
	**MPS	APS	MPS	APS	MPS	APS	MPS	APS
100	18.3	1.2	12.3	1.9	12.8	1.7	12.6	0.8
200	19.8	10.2	19.5	9.1	20.1	9.3	22.8	10.4
400	22.9	15.8	26.7	16.3	26.8	16.6	24.1	17.0
600	26.0	18.7	30.9	20.5	30.1	20.6	24.4	19.4
1000	32.2	22.8	36.2	25.8	33.5	25.2	24.5	21.4
1600	41.5	28.1	41.1	30.7	35.1	28.7	24.6	22.6

* Percentages

** Excluding 786 households with Rs.75 or less per capita monthly income.

[21] Two sets of propensity estimates were obtained for each of the functional form: (i) excluding 271 one person households, (ii) excluding 726 one plus two person households. The detailed results are available in Akhtar (1983).

[22] Identification of per capita income level for excluding low income households is subjective and empirical. Based on findings of Cheema (1985), I have left out households with less than Rs. 75 per capita monthly income which is slightly more than half of the income per capita estimated for poverty groups.

[23] I am thankful to one of the referees of this journal for suggesting this particular experiment with the data.

The ambiguous results at the aggregate level led to a search for more consistent and acceptable hypothesis of savings-income relationships. The data was split by income per capita into three subsets. Families with monthly earnings of Rs.150 per capita or less were grouped as low income households. In a broad sense, they can be classified as a subsistence group.[24] The remaining households were classified into two categories with income per capita of ≥ Rs. 500 per month. The top group covered five per cent of the sample. The OLS results are reported in Table 5.[25] They indicate that:

i) APS estimates at the mean income are fairly robust across the three hypotheses in each of the income categories. The various functions also yield identical summary statistics.

ii) Except for the results of the Klein function from low and rich households, the MPS estimates are also fairly consistent across hypotheses within each income group.

A number of questions arise at this stage. To what extent are the above results from the piece-wise estimation in conformity with the ones obtained from the aggregate analysis? Do they enable one to meaningfully generalise about the aggregate savings-income relationships in urban Pakistan? The following observations can be made:

a) A trend of rising saving propensities across the three income groups is traced out if average group income is considered as an adequate representative of current income earned by the majority of the households in that group.[26]

b) The difference between MPS and APS is the least at the upper tail, foreshadowing a tapering off of the MPS towards some asymptotic APS value.

c) The marginal propensity estimates of middle and top income households, consisting of 45 per cent of the sample, are fairly similar. These results are suggestive that any redistribution of income between these two groups may have only a minimal impact on the marginal savings rate in the country.

[24] Wassay (1977) estimated the poverty group in Rawalpindi based on a household survey in 1975, to earn around Rs. 346 per month (household), while Cheema (1985) estimated it to be Rs. 122 per capit from aggregate data of the HIES 1979.

[25] The Singh function employed in the aggregate analysis was tried on each of the sub-samples. For low income households, the signs attached to $1/(\log Y)^7$ and $1/(\log Y)^8$ were incorrect, while in the other two subsets, high collinearity forced the SPSS package to drop one term in each of the equations, the results are therefore not reported here. However, obtaining more meaningful estimates by varying the powers of log Y for each of the subset cannot be entirely ruled out.

[26] The coefficient of variation of group means is 0.28, 0.35 and 0.60 for low, middle and high income groups respectively.

TABLE 5

Savings-income regressions by income group

	Constant	Y	1/Y	Log Y	Log $(Y)^2$	$\overline{R}^2$ SEE	MPS APS
A) Low income $Y < 150$ (N = 4121)							
Keynesian	1.16	− 0.0051	− 59.20	—	—	0.24	0.0938
		(0.0003)**	(1.86)**	—	—	0.30	− 0.0052
Klein	− 1.50	—	—	0.75	—	0.09	0.3206
				(0.03)**		0.33	− 0.0040
Landau	− 6.22	− 0.0158	—	—	1.97	0.17	0.0659
		(0.0008)**			(0.08)**	0.32	− 0.0042
B) Intermediate income $150 < Y < 500$ (N = 2992)							
Keynesian	0.17	0.000090	− 17.69	—	—	0.02	0.2169
		(0.00015)	(10.04)*			0.22	0.1149
Klein	− 0.40	—	—	0.22	—	0.02	0.2105
				(0.09)*	—	0.22	0.1156
Landau	− 0.65	− 0.00020	—	—	0.17	0.02	0.2152
		(0.0003)			(0.09)	0.22	0.1154
C) Rich Households $Y > 500$ (N = 384)							
Keynesian	− 0.03	0.00013	93.35	—	—	0.01	0.2234
		(0.00004)**	(54.40)*			0.26	0.2179
Klein	− 0.28	—	—	0.17	—	0.01	0.2918
				(0.075)**		0.26	0.2180
Landau	1.04	0.00018	—	—	0.17	0.03	0.2374
		(0.00007)**			(0.10)*	0.26	0.2180

*Significant at 90 per cent level.
**Significant at 99 per cent level.

(i) Only among the low income households does the marginal propensity to save continually decline. In the intermediate income category, it is almost constant, varying within a narrow range of 0.20 to 0.26, while among the rich households it is slowly rising. Thus the phenomenon of continually declining marginal propensities, yielded by the Keynes and Singh functions on the entire data, find little support from the sub-sample results.

Based on the above interpretations of the two-stage analysis, one can tentatively conclude that among the various formulations tested, the Landau function best portrays the aggregate savings-income relationship, existing in urban Pakistan.

Once the possibility of overstated consumption expenditures by the low income households is recognised, then similar estimation results from a restricted sample (excluding these households) render the selection of "the function" more difficult. Landau and Singh specifications depict equally well the savings-income relationship in urban areas of Pakistan.

How do the above household level savings propensities compare with time series estimates derived for Pakistan? Unfortunately, a paucity of studies on urban time series data prevents a meaningful comparison. Fitting various consumption functions and employing OLS and TSLS techniques on aggregate time series data, short run MPS estimates derived in Akhtar (1983) ranged from 0.13 to 0.42 with a majority falling between 0.32 to 0.33, while long-run MPS estimates of 6.8 to 8.5 are much closer to the household APS obtained in the present study. Calculations based on results from the entire urban household sample reveal that a one per cent increase in income leads to an increase of 2.58 per cent in savings, an estimate close to the figure of 2.94 obtained by Akhtar (1983).[27] Furthermore, the weak phenomenon of short-run reversibility of savings at mean level of income observed by Akhtar (1983) is further confirmed from the results of the present study. However, at low per capita monthly income i.e., Rs.100 or less, presence of the "ratcher" effect is confirmed.

V. Home-Owner and Renters

The justification for distinguishing savings behaviour of home-owners from renters is well established in the literature [Ramanathan (1969), Klein (1954)]. After a brief mention of issues related to grouping of these two categories, and a description of relevant indicators, we proceed to statistical estimation.

[27] A higher figure of 4.5 per cent increase in savings obtained in Qureshi (1981) probably reflects differences in specification and types of data.

As information gathered on the value of home owned was non-existent, households with positive imputed rental income were grouped as home-owners and the remaining as renters. Since imputed rental income was not reported separately for those owning homes and those living free, (the latter, a frequent phenomenon in developing countries), a third group consisting of the latter could not be identified. This weakness in categorization may exaggerate the housing stock of the lowest income households in our sample, as nearly ninety per cent of this category reported positive imputed rental income.[28] On the other hand, the assumption that homes in slum areas of towns and cities are mostly owned by the poorest sections of the population lends plausibility to this high figure.

A priori one would expect that a significant proportion of total expenditure or cash income would be devoted to payment of rents as households move up the income scale, partly because of an increasing desire to acquire better living conditions offered by high rent localities. The mean value of ratios: (a) monthly expenditure on rent to cash income and (b) rental expenditure to total expenditures, by fourteen income categories does not support such a scenario, either due to the existence of nominal rents in urban areas or to the low priority accorded by household members in shifting to better localities of cities and towns.

The savings-income relationships of the previous section are, therefore, extended to capture the effect of home ownership on the savings propensities of households. To capture the differences in average propensities, a dummy variable with a value of one for home owners, zero otherwise, is added. To test whether marginal savings rates are unequal, an interactive dummy variable with income is included.[29] The regression results are reported in Table 6 , while APS and MPS at the mean level of income are summarised in Table 7. The average propensity to save is significantly higher for home owners, a logical outcome of the construction of the cash income variable and gross savings rate.

The observed higher marginal propensity to save by renters in two out of the three estimates is puzzling. Moreover, the behaviour of MPS as income increases is unclear from the two hypotheses. The Keynesian formulation [equation (1)] suggests that the MPS increases with income[30] for home

[28] The definition of home-owner/renter is further weakened by the possibility of some households in the sample who own a house but rent it out and prefer to live in a rented house.

[29] The use of dummy and interactive dummies, though superior to Chow test techniques, assume constant variance across all groups. Violation of such assumptions may lead to regression errors.

[30] However comparing the magnitude of coefficients for home-owners and renters, the increase in MPS is negligible as income rises, thereby approximating the MPS to a constant value.

TABLE 6

Home-owners and renters regression results

S/Y = 0.5966	− 0.00048 Y	− 66.69 (1/Y) +	0.00054DY +	46.43D(1/Y)	− 0.389D
	(0,0003)**	(1,834)**	(0,00004)**	(2,0115)**	(0,216)**
	R^2 = 0.2344	SEE = 0.2692	F = 460.08		
S/Y = −0.8120	+ 0.3773 log Y	− 0,9487Dlogy + 0.1564D			
	(0,0249)**	(0,0284)			
	R^2 = 0967	SEE = 0.2923	F = 268.76		
S/Y = − 1.7181	− 0.00068Y +	0,4244 log $(Y)^2$ +	0,00057DY −	0.2252 Dlog$(Y)^2$ +	0.9320D
	(0,00006)**	(0,0246)**	(0,00007)**	(0,0270)**	(0,1089)**
	R^2 = 0.1129	SEE = 0.2897	F = 191.85		

**Significant at 99 per cent level.

TABLE 7

Propensities to save

	Home-owners		Renters	
	MPS	APS	MPS	APS
Keynesian	0.2319	0.0653	0.4010	− 0.0123
Klein	0.2080	0.0652	0.1795	0.0156
Landau	0.2160	0.0654	0.2360	0.0055

owners but falls for renters while the Landau function [equation (3)] depicts falling MPS with income for both categories, though it is steeper for the renter class. Some tentative explanations for higher MPS of the renter class are as follows:

a) The mean per capita income of renters is 18 per cent higher than the average for the entire sample, though the variation in income is smaller as compared to home-owners.

b) The existence of greater proportion of self-employed in the renter class which makes it difficult to separate business and personal savings for this group. The desire or necessity to self finance business, super-

ceding the need to own a home, influences the asset portfolio and the savings behaviour.[31]

The latter presumption was tested by excluding the observations with a self-employed head of household. The MPS and APS estimates obtained from the three hypotheses are presented in Table 8, while regression results are in Appendix B.

TABLE 8

Propensities to save
(excluding self-employed, N = 4099)

	Home-owners		Renters	
	MPS	APS	MPS	APS
Keynesian	0.2382	0.0612	0.2306	0.022
Klein	0.2131	0.0600	0.1604	0.028
Landau	0.2210	0.0589	0.1911	0.023

The marginal propensities for the renter class are now significantly lower than for the home-owning class. A similar result for the U.S. was obtained by Klein (1954) for non-farm, non-business, renters and home-owners. It is to be noted that MPS estimates for home-owners are not affected by the exclusion of the self-employed. A tentative inference emerging from these results is that the self-employed renter is saving more at the margin than the self-employed home-owner either to provide self-financing to his business operations or, in fact, to build up his wealth for subsequent investment in housing.

Wealth Proxy

As mentioned earlier, information on the net worth or on the liquid assets of households is lacking in the survey. Thus, the effect of the two most important determinants of savings behaviour cannot be directly mea-

[31] The distribution of renters and home-owners by employment status, however, revealed that 36 and 48 per cent were self-employed in respective groups. This distribution by household head may differ from the one that may be obtained by alternate classification e.g., classification of households by sources of income or number of persons in any category.

sured. Imputed rental income is chosen as a proxy for this missing information on households. We can assess how closely it resembles the behaviour of liquid assets or net worth in extended savings-income equations. Consequently, we were constrained to use only the home-owners for this estimation exercise. A few words about the suitability of imputed rental income as a proxy for liquid assets or net worth are needed. It would be difficult to assert that there is perfect correlation between the three variables. However, a strong case can be made that the imputed rent, as mentioned by the respondents, may have some stable, proportionate and significant relationship with the value of the home, durable goods and liquid assets held by the household. The observed falling trend in the means of ratio of imputed rental income to cash income by income groups was similar to the one observed for the ratio of liquid assets to income by Klein (1950) and Ramanathan (1969). It is equally probable, that households reporting high imputed rent may have a small amount of liquid assets, few durables and net worth, or *vice versa*, but on the average a positive relationship among these three attributes can be hypothesized. The equations we fit to the data are based on the well-known Klein-Morgan hypothesis of interaction between income and wealth (1954). The effect of assets on savings is ambiguous as the following two opposite forces may be at work: (a) assets as an enabling factor, more relevant at low incomes, are positively associated with spending and negatively with savings, (b) assets as an indicator of past savings habits, true for high income groups, is related positively with savings. Thus wealth and income interact to effect savings. The result of the following formulation and its few variants are presented in Table 9.

$$S/Y = \alpha_0 + \alpha_1 (1/Y) + \alpha_2 Y^2 + \alpha_3 R + \alpha_4 (R/Y) \qquad (5)$$

If $\alpha_4 < 0$ and $\alpha_3 > 0$, the marginal asset effect is greater (negatively) for lower than for upper income groups. In terms of the signs attached to coefficients, our proxy variable i.e., imputed rent of the household (R) and imputed rent income as proportion of household income (R/Y) conforms with signs of net worth and liquid assets variables employed by Ramanathan and Klein-Morgan. If we accept the assertion that imputed rent income is a strong and meaningful indicator of the wealth position of households, its inclusion shows us that the larger ratio of liquid assets or net worth to income would be associated with a smaller value of a savings-income ratio in the context of Pakistan. However, the presence of assets is conducive to increased savings out of income. Though Table 9 gives the numerical values of MPS, APS and marginal asset effects at mean values, they are not representatives of values that may be obtained by including actual values of liquid assets or net worth.

TABLE 9

Regression results, home-owners, N = 5853

S/Y =	0.2637	+	0.000052Y (0.0002)**	–	19.44 (1/Y) (0.75)**	+	0.0000432R (0.00002)**	–	0.391 (R/Y) (0.028)**	
	R^2 = 0.1884 SEE = 0.2431 F = 341.47								MPS = 0.2916 APS = 0.0589 MPR = –0.3827	
S/Y =	0.2616	+	0.0000755Y (0.00002)**	–	19.57 (1/Y) (0.7462)**	–	0.3474 (R/Y) (0.0226)**			
	R^2 = 0.1884 SEE = 0.2431 F = 452.71								MPS = 0.2907 APS = 0.0590 MPR = –0.3474	
S/Y =	–0.5927	+	0.3292 logY (0.1385)**	+	0.000014R (0.00002)	–	0.3882 (R/Y) (0.02845)**			
	R^2 = 0.1530 SEE = 0.2483 F = 353.41								MPS = 0.2681 APS = 0.0550 MPR = 0.3855	
S/Y =	–0.7122	+	0.3683 log Y (0.01414)**	–	0.00042R (0.00009)**	+	0.00011 (RlogY) (0.00003)**			
	R^2 = 0.1280 SEE = 0.2519 F = 287.31								MPS = 0.2223 APS = 0.0550 MPR –0.0313	
S/Y =	0.7123	–	0.00012Y (0.00002)**	+	0.1973 [log (Y)]^2 (0.0096)**	+	0.000039R (0.00002)**	–	0.412(R/Y) (0.0288)**	
	R^2 = 0.1563 SEE = 0.2478 F = 0.272.00								MPS = 0.2762 APS = 0.0573 MPR = –0.4080	

** Significant at 99 per cent level.

VI. Self-Employed and Employees

Several economic reasons have been given to expect a higher savings rate from self-employed or entrepreneurial groups as compared to employees [Klein (1954), Kelley and Williamson (1968)]. We test the validity of this proposition for the self-employed group in urban Pakistan. First, let us see how well the definition of self-employed used in HIES Survey fits in with the definitions and concepts used in other studies [Klein, (1960)]. The survey defines self-employed as "a person who, though owner of an enterprise, does not employ any person but may have others working for him/her without pay such as unpaid family helpers". This definition, is grossly inadequate, weak and restricted when compared to definitions of self-employed which include "sole proprietors of unincorporated businesses, members of business partnerships, independent professional workers, independent artisans and owners of small closely held corporations" [Klein, (1960)]. The HIES definition is heavily biased toward family enterprise, single owner-operated shops, traders, middle-men, professional workers and independent artisans. Even in these cases it is difficult to visualize professional workers of family enterprise, without being run by some form of paid help. A person who employs one or more persons to assist him in his enterprise is classified as an employer. Surprisingly, these constitute, only 0.7 per cent of the sampled households and are therefore ignored for purposes of analysis. Consequently, given the poorly structured definition, it is difficult to study or compare the savings behaviour of a self-employed business with other self-employed or government employees with private employees. Furthermore, the practice of classifying households on the basis of the occupation or the employment status of the head, in the presence of extended family containing multiple earners with different occupations, diminishes the importance of these attributes as major determinants of differential savings rates.

Despite the above shortcoming, and for lack of any other alternate definition, we study the savings behaviour of these groups under two alternate criteria. The survey classification of employment status is adopted to derive the average and marginal propensities to save for self-employed and employees. For second criteria, households are grouped as "employee households" or "self-employed households", based on whether 60 per cent or more of their total cash income is derived from wages or business and trading. Wages, pension and bonus from employment are categorised as wage income, while income from professional fees, agriculture, business, commerce and industry is considered as self-employment income. Households not falling in either of these categories are denoted as mixed house-

holds.

Table 10 presents summary statistics on some additional characteristics of these groups using the above two criteria. It will be noted that employee households are headed by younger heads and their average household size and dependency ratio is smaller as compared to self-employed head of households. Average per capita income is higher for employees under HIES definition, while lower under our categorisation scheme. The average number of earners and the percentage educated are higher in households headed by an employee than by the self-employed. Despite the observation that these averages, *a priori*, should favour a higher savings rate, we note a smaller savings rate. However, the results of the two sample t-test indicates that, statistically speaking, the mean savings rate of employees is not different from the self-employed. The lower savings rate of employees may be explained in the context of life-cycle earnings. Table 11 gives the breakdown of the average savings rate by age brackets for these two groups. The savings rate of employees is lower than that of self-employed till the age

TABLE 10

Basic economic and demographic characteristics

	HIES 1979 Data			
	Self-employed	Employed	Self-employed	Employed
Savings rate	6.00	5.32	5.34	5.16
Per capita income	194.00	202.00	200.39	196.96
Coeff. of variation	1.17	1.00	1.26	1.01
Household size	6.73	6.00	6.69	6.03
Age of head	44.29	40.66	44.34	42.27
No. of earners	1.44	1.53	1.34	1.59
Dependency ratio	0.41	0.39	0.42	0.38
Education*	14.50	32.40	15.10	29.40
No. of Observations	3398. (45.4)	3245 (43.4)	2894. (38.6)	3864 (47.4)

(1) HIES 1979 Definition,
(2) Categories by source of income (See Text),
* Heads with 10 years and above education.

Table 11

Mean savings rate acrosss groups

Age	Self-employed	Employees
<25	7.48	5.62
25 – 34	6.84	4.27
35 – 44	3.80	3.54
45 – 54	6.49	7.44
55 – 64	7.53	11.07
65 >	6.82	5.68

of 44 and then rises faster than the self-employed for the next two age brackets, dipping below their rate for the age 65 and above bracket. A significant t-value indicated that these groups come from populations with different mean age. Combining the result of Table 10 with the observation that households with head of age 35–44 save the smallest proportion of their income, while the savings rate in the 45–54 age bracket is twice that of the former, a smaller savings rate by employees as compared to self-employed category is highly plausible, even with these favourable ratios.[32]

Regression results and propensities at the mean level of income, according to the HIES scheme of classification are given in Appendices C and D.[33] The evidence that savings propensities are statistically higher for the self-employed group is not borne out strongly by these results.

The estimation results obtained by classifying occupation of household by source of income, are given in Tables 12 and 13.[34] The Klein and Landau function strongly support the *a priori* hypothesis that average and marginal savings rates for self-employed are higher compared to households whose 60 per cent or more cash income comes from wage employment. Households with mixed sources of income, however, exhibit the

[32] The impact of age on savings rates will be analysed in greater detail, while testing the life-cycle hypothesis. A higher savings rate of employee household in the age bracket 45–65 may be due to lower dependency ratio and greater pressure for younger members to join the labour force.

[33] A Dummy variable taking a value of one for self-employed, zero for employee head of household and its interaction with income are included to test for different intercept and slope for self-employed group.

[34] Now there were 2894 self-employed, 3564 employees and 1039 mixed households. The mean savings rate for these groups were 5.34, 5.16 and 7.20 respectively, with insignificant F-value.

TABLE 12

Regression results classified by sources of income

S/Y =	0.3337	−	0.0000075Y	−	34.3461(1/Y)	−	0.000061SDY	+	2.9117SD(1/Y)	+	0.0001668EDY	+	17.34ED(1/Y)	− 0.0135SD − 0.1697ED
			(0.00004)		(1.784)**		(0.00005)		(2.09)**		(0.00005)**		(2.258)**	(0.024) (0.0264)**
R^2 =	0.1840		SEE = 0.2778		F = 212.30									
S/Y = −	0.8850	+	0.4265 log Y	−	0.0900 S logY	−	0.1343E log Y	+	0.2063SD		+ 0.2971ED			
			(0.0302)**		(0.0356)**		(0.0350)**		(0.0801)**		(0.0788)**			
R^2 =	0.0941		SEE = 0.2928		F = 156.75									
S/Y = −	1.5288	−	0.00051Y	+	0.3829 $[\log (Y)]^2$	+	0.000315SDY	−	0.150SD $[\log (Y)]^2$	+	0.0004015EDY	−	0.2057ED $[\log(Y)]^2$	+ 0.6058SD + 0.8247ED
			(0.00007)**		(0.0286)**		(0.00008)**		(0.0322)**		(0.00009)**		(0.03314)**	(0.1294)** (0.1323)**
R^2 =	0.1040		SEE = 0.2912		F = 109.78									

EDY, ED (1/Y), ED: Interactive Dummies and Dummies for Employees.
SDY, SD (1/Y), ED: Interactive Dummies and Dummies for Self-Employed.
** Significant at 99 per cent level.

Table 13

Savings propensities

	Self-employed		Employees		Mixed	
	MPS	APS	MPS	APS	MPS	APS
Keynesian	0.2872	0.0662	0.2013	0.0520	0.3032	0.0540
Klein	0.2033	0.0574	0.1799	0.0530	0.2357	0.0505
Landau	0.2217	0.5910	0.1845	0.0519	0.2763	0.0473

highest APS and MPS. The Keynesian function, however, supports the view that employee households do have statistically lower marginal and average rates, compared to the other two groups, but the savings behaviour of the self-employed is statistically not different from that of mixed households.[35]

Tentative conclusions that emerge from this analysis are: (i) the scheme of classification adopted by HIES Survey needs to be modified considerably in order to bring out clearly the distinction between these two groups, (ii) in the presence of households with multiple earners and the interaction of occupation and source of income, classification of households by source of income is more appropriate to reveal the differences in savings propensities, and (iii) the results on Pakistani data do support the hypothesis that the self-employed have higher average and marginal savings rates than households headed by employees, though the difference is not as large as obtained in studies on India [Ramanathan, (1969)] or the U.S. [Klein, (1960)].

VII. Summary and Conclusions

The purpose of this paper was to study the savings-income relationships existing in a cross-section of urban households of Pakistan. The analysis was based on the Household Income and Expenditure Survey (HIES) of 7504 households conducted by the Federal Bureau of Statistics (FBS) in 1979. The results reported in this paper are part of an on-going research, utilising the above data, on the savings behaviour of urban households in Pakistan. The main focus in this paper was to provide base line, unweighted

[35] To test whether the result was robust, another variant of this criteria was employed. Instead of 60 per cent, 75 per cent of cash income from wage or business income was set to separate the 3 types of households. The results, similar to those in Table 13 are available in Akhtar (1983). The MPS calculated from the Landau function estimates were 0.2514, 0.2197 and 0.1874 for mixed, self-employed and employee households respectively.

estimates of average and marginal propensities to save, for various income levels and for four major socio-economic groups, i.e., home-owners, renters, self-employed and employees.

Using the residual approach to measure savings, gross personal savings were defined as gross personal (household) income minus current expenditure on non-durable goods. Functional forms present in the literature viz., Keynesian, Klein, Landau and Singh were tested on the Pakistani data. The objective was to verify the consistency of various propensity estimates and provide clues for savings behaviour of households at both the aggregate and disaggregate level. Some important findings are:

1. At the aggregate level, MPS and APS estimates at average income level were fairly consistent across hypotheses, with MPS values ranging from 0.20 to 0.26.
2. The results indicate that families begin to save in the range of Rs. 125 to Rs. 150 per capita monthly income.
3. In three out of the four functions i.e., Keynesian, Landau and Singh, APS starts with negative values and levels off to a constant value at higher income levels. The asymptotic values of long-run APS were sensitive to the functional form. An APS of 15 per cent was given by the Singh function, while the Keynesian and Landau forms yielded values between 20–25 per cent.
4. A consistent trend of MPS values does not emerge from fitting the four functions to the entire sample. The estimates of the Klein and Landau function support the widely held view that income redistribution will reduce savings in the economy. The falling MPS values obtained from the Keynesian and Singh function suggest slight improvement or at best no change in overall savings from income redistribution.
5. The narrowing of the MPS-APS difference, a phenomenon essential for acceptance of alternate income theories was strongly/weakly supported by Singh/Keynesian estimates.
6. The propensity estimates at the aggregate level changed only marginally by exclusion of one and two person households.
7. The above hypotheses were also tested on each of the three subdivisions of the entire data. Consistent and robust set of MPS and APS values, at mean income level were obtained for all the three income categories. For middle income households i.e., with per capita monthly income between Rs.150 and Rs.500, MPS and APS were 0.21 and 0.11 respectively. For rich households the corresponding values were 0.23 and 0.21. While average savings rate among low income households i.e., with per capita income of Rs.150 or less per month, was close to zero, marginal propensity varied between 6 to 9 per cent.

8. The combined evidence from both stages of analysis, was less ambiguous. At the aggregate level, savings-income relationship in urban Pakistan can best be generalised in terms of the Landau function, rather than the other three formulations, i.e., Keynes, Klein or Singh.
9. In the absence of any information on the value of homes, imputed rental income was used to categorise home-owners and renters. The estimation results from the entire sample indicated that the APS of home owners and MPS of renters was higher, a result partially supported by studies in other countries. However, the results obtained by excluding the self-employed from these two groups, revealed that renters not only exhibited a lower APS, but also lower MPS as compared to home owners.
10. Savings propensities of households headed by self-employed and by employees were compared under two alternate definitions. Inconclusive results were obtained for these two groups on the basis of the HIES scheme of categorisation. Under the alternate definition, households were classified as self-employed, employee or mixed, based on the ratio of source income (i.e., agriculture, business, industry, trade or wage) to total income. Results from this definition confirmed that self-employed savings propensities were higher than employee households, though less than those obtained for mixed households. However, the difference though statistically significant was not as substantial as that found in studies on India or the U.S.A.

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APPENDIX – A

Savings-income regressions*

Keynesian	$S/Y = 0.1674 + \underset{(0.00001)^{**}}{0.00000774Y} - \underset{(1.1124)^{**}}{16.24\,(1/Y)}$		
	$R^2 = 0.07862$ SEE = 0.2119 F = 287.26	MPS = 0.2014	APS = 0.0772
Klein	$S/Y = -0.4576 + \underset{(0.0101)^{**}}{0.2386 \log Y}$		
	$R^2 = 0.0768$ SEE = 0.2121 F = 559.62	MPS = 0.1810	APS = 0.0774
Landau	$S/Y = -0.5038 - \underset{(0.0002)}{0.000031Y} + \underset{(0.0092)^{**}}{0.1311[\log (Y)]^2}$		
	$R^2 = 0.0770$ SEE = 0.2121 F = 281.20	MPS = 0.1913	APS = 0.0774
Singh	$S/Y = 0.2514 - \underset{(19.71)^{**}}{179.32\,[1/(\log Y)^7]} + \underset{(36.79)^{**}}{296.49\,[1/[\log(Y)]^8]}$		
	$R^2 = 0.0776$ SEE = 0.2120 F = 283.23	MPS = 0.2113	APS = 0.0788

* Excluding 786 households with Rs.75 or less per capita monthly income.

** Significant at the 99 per cent level.

APPENDIX — B

Regression results

Home-owners and renters

(excluding self-employed), N = 4099

1) S/Y	=	0.2723	− 0.000099 Y (0.00004)**	−	30.59(1/Y) (2.39)**	+	0.000181 DY (0.00005)**	+	9.279 D (1/Y) (2.66)**	−	0.0687 D (0.0279)**
		R^2 = 0.1664			SEE = 0.249		F = 163.46				
2) S/Y	=	0.6399	+ 0.3031 log (Y) + (0.0269)**		0.0495 D log (Y) (0.0314)	−	0.078 D (0.071))				
		R^2 = 0.1281			SEE = 0.2552		F = 200.55				
3) S/Y	=	− 1.1744	− 0.0004 Y (0.0007)**	+	0.2905 $[\log (Y)]^2$ (0.029)**	+	0.00025 DY (0.00008)**	−	0.0673 D $[\log(Y)]^2$ (0.0306)**	+	0.28 D (0.123)**
		R^2 = 0.1377			SEE = 0.2536		F = 131.89				

**Significant at 99 per cent level.

APPENDIX – C

Self-employed vs employees

N = 6643

S/Y	=	0.1772	+	0.000067 Y (0.0003)**	–	18.137 (1/Y) (1.33)**	–	0.00016 DY (0.00004)**	–	13.14 D(1/Y) (1.657)**	+	0.1492 D (0.0189)**
R^2	=	0.1850		SEE = 0.2614		F = 302.59						
S/Y	=	0.5968	+	0.2958 log Y (0.0173)**	+	0.035 D log Y (0.024)	–	0.064 D (0.053)				
R^2	=	0.903		SEE = 0.276		F = 220.74						
S/Y	=	0.7737	–	0.00015 Y (0.0004)**	+	0.1952 $[\log (Y)]^2$ (0.0163)**	–	0.000039 DY (0.00006)	+	0.0320 D $[\log (Y)]^2$ (0.0211)	–	0.1187 D (0.0841)
R^2	=	0.094		SEE = 0.2753		F = 142.71						

** Significant at 99 per cent level.

APPENDIX – D

Savings propensities

	Self employed		Employees	
	MPS	APS	MPS	APS
Keynesian	0.2896	0.0639	0.2037	0.0489
Klein	0.2058	0.0501	0.1786	0.0376
Landau	0.2239	0.0640	0.1903	0.0505

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