The Determinants of Savings Behavior: A Survey of the Evidence

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I. Introduction

Over the last quarter of a century, a considerable volume of theoretical and empirical work has been conducted into the determinants of saving. Among the numerous variables assumed to determine the level of savings, empirically the most widely studied has been income, following Keynesian wisdom concerning the consumption function. Consequently, economists attempted to establish empirically the validity of the underlying hypothesis that the level of saving was essentially a function of the level of income. When this was found to give an incomplete explanation of savings behavior, this hypothesis was elaborated by Friedman, Modigliani, Ando, Brumberg and others. Subsequently, other determinants of savings behavior have been the subject of empirical examination, notably interest rate, prices, wealth, direct taxation, as well as research on the theory of asset choices, stemming from theories of portfolio selection. The impact of cultural and institutional constraints on saving behavior have, only recently, been examined.

The theories which have emerged can be criticised for failing to pay sufficient attention to the dependent variable. Most of the theoretical and empirical work on savings behavior has concentrated on aggregate savings, since aggregate data are most readily available. Aggregate saving, however, is the net result of the saving of various sectors, each of which can be distinguished by the diverse motivations concerning its savings behavior. For example, business enterprises (both corporate and non-corporate) may save primarily for investing in
their own business, while households may save for such widely differing
goals as the purchase of a house, the provision for contingencies,
children's education, the purchase of consumer durables, etc. Further-
more, even within non-business households, motivations may vary between
rural and urban households, between salaried and wage-earners, between
professional and non-professional households, etc. Motivations cannot be
distinguished by aggregating the saving of these diverse groups and attempting
to specify the determinants of aggregate saving behavior. What, in fact, such
an exercise is not examining the determinants of saving, but the deter-
minants of investment since aggregate saving is the equivalent to
aggregate investment. The intersectoral flows (the financial claims of
one sector on another) have been netted out in the process of aggrega-
tion, so that the aggregate savings figure derived is equal to savings
in the form of physical assets, which is the equivalent of investment.
Ideally, what should be undertaken, is the examination of the behavior
of groups of savers, where the grouping of savers as well as the division
of saving into different instruments has, to quote Goldsmith, been

"... carried to the point where both groups and forms
become homogeneous. This point is reached when each
of the series that reflects the saving of one group of
savers through one form of saving is made up of cells...
which behave in a reasonably similar way, or at least
does not include groups of cells, large compared to the
total, behaving in distinctly different ways." 2/

1/ In this context an interesting analogy can be drawn to Kelvin Lancaster's
consumer theory (1966), which stresses that a good, per se, does not
provide utility, rather it is the characteristics of that good which
provide utility. In the same way that these characteristics depend upon
the objectives of the household, so saving can be interpreted as being
instrumental for different goals. As Strumpel (1975) has commented,
"Different people and nations, even those operating within similar income
constraints, can be shown to differ widely with respect to the intensity
of these goals, as well as the instrumental role of saving in reaching
these goals."

With these arguments in mind, the purpose of this paper is to critically assess the principal hypotheses regarding the determinants of savings behavior, paying particular attention to the dependent variable. Hypotheses dealing with the savings behavior of the household sector, which usually is defined to include both households and unincorporated enterprises, will be examined where possible, groups within this sector will also be analysed, and emphasis will be given to those studies dealing with developing countries. The empirical evidence supporting the hypotheses will be examined, and the current state of knowledge on this subject reviewed.

II. The Problem of Data

In practice, the problem of examining the behavior of homogeneous savers groups as suggested by Goldsmith, is one of data. The limitations which the poor quality of such data impose on any empirical analysis are well known. This is especially true of developing countries where reliable savings estimates, particularly of the household sector, are sadly lacking. There is also a marked absence of data regarding household saving preferences, wealth holdings, income expectations, the significance of social characteristics on saving, and the true importance of demonstration effects of different consumption standards.

The quality of available data on saving is so poor that it may critically affect the statistical results. For example, for some developing countries, an increase in aggregate saving rates may be attributed
to the way in which savings are estimated. Data problems are not restricted to unreliability. The lack of annual data of sufficient length and of quarterly data have made time series analysis of savings behavior extremely difficult. There are some exceptions where time series analysis have been undertaken but one approach which has become common in attempting to overcome these data constraints is the utilization of intertemporal cross-sections. In cross-section analysis one pair of observations of saving and an explanatory variable (e.g., income) is taken for each country, and combined into one regression of saving on income. The fundamental assumption underlying cross-section analysis when applied to savings behavior is that all the observations are generated by an identical saving function. In other words, such analysis implies that all countries have the same savings behavior.

This approach has several advantages over time series analysis on a country by country basis. Most importantly, the power of the test, as well as the range of the explanatory variable can be significantly increased since the number of countries for which data are available exceeds

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1/ One case in point is Turkey, which has exhibited a sharp increase in its average savings coefficient since the early 1950's. As has been pointed out, however, this can be attributed to the particular estimation procedure involved, whereby "a constant capital-output ratio is assumed, and from the data on changes in real output (and foreign capital inflow), domestic investment and savings are deduced. In such a case, a 'rising savings rate' may actually reflect, in greater or less degree, a falling aggregate capital - output ratio" (Leff, 1968, p. 620).

2/ See, for example, an interesting study on saving behavior in Greece by Pavlopoulos (1966).

3/ This section draws on the work of Jouonson and Chiu (1968)
the number of years for which data are available for only one country, and so the number of observations in the regression can be much larger. Furthermore, the problems which are intrinsic to correlation of time series can be avoided.

However, if the underlying assumption of identical savings functions is ill-founded, then these advantages have little value. Keynes himself stressed "... in comparing one social system with another of a different type, it is necessary to take account of the manner in which changes in the subjective factors may affect the propensity to consume." Before any cross-section analysis can be undertaken, therefore, the validity of this underlying assumption should first be examined.

Besides data problems, studies on savings behavior in developing countries have come under increasing scrutiny regarding the relevance of the hypotheses adopted. The specification of savings was first undertaken in developed countries, and as data became available for developing countries, the savings functions which were hypothesised for developed countries were assumed relevant for those less developed. Serious questions have been raised on the applicability of such hypotheses to developing countries. Vanek, for example, has taken the position that "none of the existing theories of saving - whether the Keynesian, or that based on the so-called permanent-income hypothesis, or that based on the

1/ Keynes (1936), p. 91.
2/ Johnson and Chiu (1968) suggest that one procedure for examining this is to use an F test, where "we look for a significant difference between the variance of the slope coefficients and the pooled variance for each of the countries' respective slope coefficients themselves. If the pooled variance (within countries) is significantly smaller than among countries' variances the saving behavior can be said to differ as among countries." (pp. 332-333).
so-called relative-income hypothesis is really adequate to explain the phenomenon of savings in many, if not most, less developed countries.\(^1\) Malinvaud is of a similar opinion, and has suggested that these hypotheses "may perhaps be incapable of generalization to less wealthy countries."\(^2\) Ball and Drake have argued that even in developed countries the permanent income and life-cycle consumption theories "impose upon the individual consumer a rigorous course of intertemporal utility maximization, simple to assert, but difficult to execute."\(^3\) The whole problem of relevancy of hypotheses developed for savings behavior in more advanced countries to those less developed has been aptly summarized by Williamson: "If such calculus is difficult in an environment of stability, near certainty and near perfect knowledge, one certainly doubts its applicability to the less affluent environment of instability, uncertainty and highly imperfect knowledge."\(^4\)

It is imperative, therefore, that caution be exercised in attempting to transplant hypotheses which have relevance for developed countries to the economies of developing countries. However, there are numerous hypotheses which on a priori grounds do appear applicable to developing countries and which have a variety of policy implications for these countries. In the following section the empirical evidence supporting such hypotheses will be examined.

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2/ Malinvaud (1966), p. 117.
3/ Ball and Drake (1964), p. 63
III. The Empirical Findings of Studies on the Determinants of Household Savings

1. Income

Among the numerous factors assumed to determine the level of savings, empirically the most widely studied is the role of income. Empirical examinations of the saving-income relationship have mostly been undertaken since 1960, when the United Nations published national income estimates for a large number of countries on a conceptually consistent basis. Practically all of these studies corroborate that income is a significant determinant, however, there is some ambiguity regarding the exact form of the saving-income relationship.

a) Absolute Income Hypothesis

One of the most common formulations of the saving-income relationship is the Keynesian function, usually specified as follows;

\[ S = a_0 + a_1 Y \]

where

- \( S \) = gross domestic saving
- \( Y \) = gross national product
- \( a_1 \) = constant MPS

The absolute income hypothesis assumes that saving is a linear, stable function of current income, such that as the level of income rises, the average propensity to save (APS) will also increase. In other words, it is assumed that

\[ a_0 < 0 \text{ and } 0 < a_1 < Y \]
Empirical investigations of the relevancy of the absolute income hypothesis to the savings behavior of the household sector, do tend to support the hypothesis. Johnson and Chiu, for example, found that when household saving was regressed on household income, and private saving on private income for a sample of 30 countries (both developed and developing), a positive correlation was found in most of the results. In only two cases, however, were the coefficients significant. Gupta (1970) also looked specifically at household savings, and found that the simple Keynesian function fitted Indian data over the period 1950-51 to 1965-66 quite well. This was true both at the aggregate and the per capita level, although the explanatory power of the latter function was not high.

When countries are grouped according to per capita income levels there is some evidence that the MPS is an increasing function of income. Once again, however, the studies have mostly used per capita gross domestic saving as the dependent variable. Of the few studies which have specifically examined the household sector, Williamson (1968) found that the MPS was lower in the developing countries of Asia than in the more advanced countries.

1/ Several studies have been undertaken using gross domestic saving as the dependent variable; the results, however, are conflicting. Chenery and Eckstein (1970), for example, developed estimates of the simple linear savings function with gross domestic saving as the dependent variable and gross domestic product as the independent variable for 16 Latin American countries. For all countries except four, the MPS was found to be positive and between zero and 30 percent. A similar study by Mikesell and Zinser (1973) for the same group of countries but a slightly later time period, and using the same function also derived a predominantly positive MPS, varying between 3.5 and 30 percent. Neither study, however corroborates the Keynesian hypothesis that the MPS uniformly exceeds the corresponding APS. In fact there is considerable evidence of proportionality. The Chenery-Eckstein study (1970, p. 975) for example, found that the average savings rate for all Latin American countries surveyed increased marginally, from 16.3 in 1951 to 16.9 in 1964. Applying the same function to individual countries has produced conflicting results. Leff (1968), for example, found that in Brazil the long-run MPS was remarkably stable over the period 1939-60, while Flyth (1969) found a declining MPS in several South Pacific economies.
Similar results were found by Gupta (1970 Dec., pp. 578-9) and Blyth (1969, p. 310).

Investigations of the absolute income hypothesis for long-run and short-run behavior of households have yielded conflicting results. A cross-sectional study by Kuznets (1960) examined the relationship between household saving and household income in the short-run and in the long-run. Using a large sample of countries, he found that when countries were grouped according to per capita income, that the long-run international average propensity to save tended to rise with income. His results, however, were far from conclusive.

1/ The cross sectional studies of Kuznets (1960) and Landau (1969) support these findings. Kuznets investigated the relationship between both gross and net saving to gross and net national products, and found that when countries were grouped according to per capita income, there was a tendency for those with a high per capita income to have high saving ratios, although the evidence was not entirely convincing. The cross section approach was also utilised by Landau (1969) to examine the relationship between per capita income and per capita gross domestic saving in 20 Latin American studies. He regressed the aggregate saving ratio S/Y on this logarithm of income per capita log (Y/P), and concluded that the relationship between S/Y and Y/P is non-linear when a wide range of levels of income is considered, and that savings ratios are, in fact, an increasing function of income. Studies by Singh (1971) and Yang (1964) corroborate these findings.

2/ Kuznets used U.N. National Accounts data. His sample consisted of two groups of 56 and 14 countries (both developed and less developed) which he sub-divided into seven categories according to per capita product.

3/ An unpublished study by Zohar (1967) looked only at developing countries, and reported similar results.
Houthakker (1961 and 1965) undertook similar studies but arrived at different conclusions. In its simplest form (following the notation of Snyder (1974)), Houthakker's model can be expressed as follows:

\begin{align*}
(1) \quad S_{ij} - S_{io} &= (Y_{ij} - Y_{io}) \\
(2) \quad S_{io} - S_{oo} &= (Y_{io} - Y_{oo})
\end{align*}

where subscript \(i\) represents countries and subscript \(j\) represents years, \(o\) represents a mean over all values of the subscript it replaces, \(S\) represents household savings and \(Y\) household income. The first equation explains the short-run relationship (year to year changes) or changes "within countries", while the second equation looks at long-run relationships, or those "between countries", explaining variations in country means.

1/ Houthakker also used the U.N. National Accounts data; his country sample, however, was much smaller (28 countries). Like Kuznets, this sample were a mixture of developed and less advanced countries.
While Houthakker's model does have serious limitations, the results are most interesting. It was found that in the long-run, household saving is approximately proportional to long-run income, while in the short-run, the marginal propensity to save is three or four times higher.

Although the evidence in support of the absolute income hypothesis is somewhat contradictory, it does indicate that there is a statistically significant relationship between household income and saving, and that, in the poorer countries at least, the MPS is an increasing function of income. The evidence also indicates that the short-run MPS is considerably higher than the long-run.

b) Relative and Permanent Income Hypotheses

The proponents of the relative and permanent income hypotheses disclaim the validity of the absolute income hypothesis, that the level of income is the prime determinant of the level of saving. They were encouraged by the findings of various consumer expenditure surveys clearly indicating

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1/ Houthakker himself explains various limitations of the model (1961, pp. 61-62), among which are the usual problems of interpreting in terms of cause and effect equations estimated by least-squares single-equation methods, and also the period of observation for the long-run (about 8 years) which may be insufficient to warrant Houthakker's interpretations. A more serious problem, not raised by Houthakker, concerns the choice of weights used in the equations, which, as one critic stated, "could be regarded as indices of the attractiveness of the behaviour of an average member of one nation for an average member of another, an index that depended on the population size of various nations. This was not a tenable hypothesis." (Professor Pesek, in Houthakker, 1961, p. 226)

2/ The arguments have been put forward by Godfrey and Howrey (1968, pp. 744-5) and by Williamson (1969, p. 72) that the conflicting results to testing the absolute income hypothesis may be attributed to errors in data and inconsistencies in the estimating procedure.

3/ See, for example, Shinohara (1959, pp. 589-91) for details of budgetary surveys of Japan.
that the absolute level of income was not the only determinant of the level of saving, since higher income groups tended to have a higher rate of savings than the lower income groups. Both these hypotheses, then, deal exclusively with the savings behavior of households.

According to the relative income hypothesis, first put forward by Brady and Friedman (1947), ¹ the propensity to save depends not on the level of income but on the relative position of the individual on the income scale, i.e.:

\[
\frac{S}{Y} = s_0 + a \frac{Y}{\bar{Y}}
\]

where
\[ S = \text{individual saving} \]
\[ Y = \text{individual income} \]
and
\[ \bar{Y} = \text{average income}. \]

Empirical investigation of this hypothesis has been hindered by the lack of adequate data on income distribution. According to Suits (1963), there are no studies relating the relative income hypothesis to saving in developing countries, and certainly this author has been unable to identify any such studies. There is, however, empirical evidence relating to developed countries provided by Modigliani (1949), Duesenberry (1949), Farrell (1952) and Brady and Friedman (1947), all of which support this hypothesis. Farrell found that the function describing the relative income hypothesis was capable of a greater predictive accuracy beyond the observation period than were various formulations of the absolute income hypothesis. The findings of Brady and Friedman are also noteworthy, since, by adopting the relative income approach they were able to reconcile the higher propensities to save which budget surveys had revealed in village families compared to city families belonging to the same income bracket.\footnote{See Ferber (1962), p. 24 for further details.}

The psychological rationale behind this hypothesis, originally expounded by Duesenberry (1949), is that people seek to maintain at least the highest standard of living previously attained. The implication of this is that the savings ratio is constant in the long-run and independent of the absolute level of income; in the short-run, however, the savings rate will depend on the ratio of current income to previous peak income (Ferber, 1962, p. 23).

The most widely studied of the non-Keynesian hypotheses relating income and savings is certainly the permanent income hypothesis. Expounded originally by Friedman (1957), the hypothesis follows the assertion that there is strong resistance by households to any "departures from the preferred
The hypothesis claims that in any given year, permanent income is determined by two factors: the stock of wealth of the household, and the interest rate, or some weighted average of a set of interest rates \( r \). The stock of wealth of the household is measured as the discounted present value of a flow of future expected receipts, discounted by \( r \).

Following the notation of Johnson and Chiu (1968), this hypothesis can be expressed as follows:

\[
Y_p = rW
\]

where \( W = \sum_{t=0}^{\infty} X_t (1 + r)^{-t} \)

and \( Y_p \) = permanent income

\( W \) = wealth

\( X_t \) = expected receipts in year \( t \).

Friedman's hypothesis is that \( C_p = kY_p \)

where \( C_p \) = permanent component of consumption.

This clearly rejects the absolute income hypothesis, and asserts that the share of permanent income saved in any given period is independent of the income received, or of the consumer's resources during that period.

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Testing of the formulation expressed above is handicapped by data problems; measurement of permanent income according to Friedman's formulation, as well as distinguishing between the acquisition of tangible and financial assets, is extremely difficult. A much simpler formulation, and one adopted in several empirical studies, is the following simple linear equation:

\[ S_t = a_0 + a_1 Y_{Pt} + a_2 Y_{Tt} \]

where \( Y_{Pt} \) = permanent income in year \( t \)

\( Y_{Tt} \) = transitory income in year \( t \)

and permanent income = long-run expected income

transitory income = actual income \( (Y_t) \) minus permanent income \( (Y_{Pt}) \)

The precise specification of "permanent income" in this equation depends primarily on the available data. In the earliest study examining the relevancy of this hypothesis for developing countries, Friend and Taubman (1966) adopted a three-year moving average. By regressing the level of saving on income for twenty-one countries using time series data, Friend and Taubman estimated that the \( MPS_T \) to be much larger than the \( MPS_T \) \( (0.065 \) and \( 0.01 \), respectively). The results, however, are not entirely convincing, since the savings propensities were found to be extremely sensitive to minor modifications in the explanatory variables.

Despite its limitations, the Friend-Taubman model was one approach to the permanent income hypothesis which could be readily applied to other countries.
developing countries. Williamson (1968) adopted this approach in his study of household savings in Asian countries, and his findings, in general, support the conclusions of Friend and Taubman. He found that the permanent income hypothesis appeared particularly relevant to household savings behavior of Japan and Philippines, the \( MPS_p \) being approximately 1.5 to 2 times the \( MPS_T \) for these countries.\(^1\) Gupta (June 1970) also used a three-year moving average in his study on household savings in India, and found that at both the aggregate and per capita levels, the permanent income hypothesis was relevant. Gupta also found in a slightly later study (December 1970) that this hypothesis was more relevant to the savings behavior of the rural sector of India than the urban sector. The \( MPS_T \) was found to be significantly different from zero for the rural sector, but not for the urban sector. For the rural sector, the \( MPS_T \) was markedly higher than the \( MPS_p \) (0.025 and 0.025, respectively), whereas for the urban sector, the opposite held (\( MPS_p = 0.175 \) and \( MPS_T = 0.001 \)).\(^2\)

The permanent income hypothesis was not found applicable to savings behavior in Argentina in a study by Friend (1966). The derived \( MPS_p \) (0.25) was considerably larger than the corresponding \( MPS_T \).

\(^1\) MPS\(_T\) for Japan = 0.46 and for Philippines = 0.50; MPS\(_T\) for Japan = 0.29 and for Philippines = 0.30.

\(^2\) These results are in conflict with those derived by Williamson (1968) for India, and Gupta (1970) has illustrated that this can be attributed to the poor quality of the data used by Williamson. K. N. Raj (1962), for example, has sharply criticized the quality of this data.

\(^3\) A study by Roy Choudhury (1968) derived rather different results, although the time period covered was the same.
A different measure of permanent income was adopted in studies by Johnson and Chiu (1968) and Singh and Drost (1971). The former study used trend income as a proxy for permanent income, and by substituting trend income for current income in a simple linear regression of savings on income, he found an improvement in the relationship of predicted saving and actual saving for ten of the forty countries surveyed.\footnote{Johnson and Chiu (1968), p. 331.}

Using this time series data for eleven countries, Singh and Drost tested the applicability of the permanent income hypothesis using a non-linear least squares procedure to implement an errors-in-variables model. The derived results support the relevance of the permanent income hypothesis.

There have been relatively few studies examining the effects of permanent and transitory income on the various components of saving. One such examination was carried out by Taubman (1964) using data from a small sample of families in Philadelphia. He found that consumer durables and indebtedness were the only items of saving which were significantly affected by transitory income. A subsequent study by Crockett and Friend (1967) used much larger samples but a similar approach, and concluded that transitory income exerted a significant impact on liquid assets and that normal income had greater influence on contractual saving and total assets than transitory income.

To conclude, therefore, the empirical evidence so far available does give considerable credence to the permanent income hypothesis; the only two instances where savings behaviour was found not to correspond to this hypothesis was Argentina and the urban sector of India. It should, however, be noted that Friedman's assumption of unitary \( MPS_t \) has rarely been corroborated by the empirical evidence.
2. Wealth

The saving behavior of a household is likely to be affected not only by the income it receives, but also by its accumulated stock of wealth. Empirical examination, however, has been rare, since holdings of wealth are extremely difficult not only to define, but also to measure. 

Empirical studies which have been undertaken have utilised various proxies for the wealth variable. The Friend and Taubman study (1966), for example, hypothesised that asset holdings by households critically affected their savings behavior. In the absence of data on asset holdings, past savings were used as a proxy. They found that the coefficients of the proxy variable were significant and negative supporting the hypothesis that those households with larger holdings of "wealth" would save less since the difference between the 'target' and actual asset holdings is smaller. Whether past savings is an adequate proxy for wealth holdings, however, is questionable, since it does disregard the initial coefficients of the proxy variable were significant and negative supporting the stock of wealth which households acquire or inherit, and takes only subsequent accumulations into account.

Williamson's findings (1969) derived using a stock-adjustment model and Asian time series data, support this hypothesis. A study of Gupta (April-June 1970), however, on Indian household saving found that wealth holdings were not a significant determinant of saving, although there is some ambiguity on the specification of wealth holdings in Gupta's study. This is not the case with Snyder's examination (1971) of the impact of wealth holdings on savings behavior in West African households.

See Lambert and Hoselitz (1963) and Arena (1963) for a bibliography of the theoretical and empirical work in this area.
In this study wealth is defined in terms of possession of consumer durables and housing. Snyder concludes that wealthier households save more, which is in conflict with the target wealth hypothesis. Clearly, the relevance of wealth holdings in determining household savings behavior needs further research, and the empirical evidence so far available is in inconclusive.

3. Interest Rates

Despite the vast amount of literature on the relationship between interest rates and saving, there appears no consensus of opinion on the exact nature of this relationship, either at the macro or at the micro level. Furthermore, the available empirical evidence does little to dispel this controversy.

Quantitive examination of the relationship between household savings and interest rate changes is handicapped by the very complexity of this relationship, since there are various ways the rate of interest can influence household savings behavior. An increase in the interest rate may encourage households to refrain from current consumption and add to their stock of financial assets for the purpose of future consumption. Consumption, especially of durable goods, may be discouraged if a rise in the interest rate implies restricted consumer credit. On the other hand, an increase in interest rates may have the effect of discouraging saving by providing a desired standard of living with the accumulation of less assets than would otherwise have been required. 1/

The problem of distinguishing between substitution and income effects

1/ See Friend (1963) pp. 672-74 for further discussion.
of changes in interest rates complicates quantitative examination.

1/ Khatkhate aptly summarises the problem: "If the effects of interest rates, arising from substitution of future for present consumption and wealth effects, stemming from changes in the real value of assets, remain strong, personal savings may possibly increase with a rise in interest rates, but these effects have to be even stronger than the income effects of the interest rate policy."

Even within the household sector, responses may differ to interest rate changes. Suits argues that the reaction of homeowners may be quite distinct from that of non-owners. For example, a lowering of interest rates may stimulate saving of homeowners through the repayment of mortgages. Responses of owners of unincorporated businesses may similarly differ from non-business households.

It is also unclear whether interest rates exert a more significant impact on the structural composition of saving (i.e., on the relative shares of financial and tangible assets held) than on the aggregate level of saving. The micro-relationships between the instruments of saving and interest rates are as diverse as between the groups of savers and interest rates, so that an increase in the level of

1/ Khatkhate (1972) p. 539.
3/ The interest-elasticity of the demand for tangible assets, for example, may be quite different from that for financial assets. Empirical studies for the U.S. have shown that interest rate changes provide a good explanation for non-business residential construction, with high interest rates prevailing late in the upswing of the business cycle. See, for example, De Leeuw (1964), Goldfield (1966) Sparks (1967) and Maisel (1965).
interest rates may result in a switching from one asset to one which has a higher yield, rather than any net addition to savings.

Empirical examination is hampered by data deficiencies. Time series of sufficient length for statistical examination are not usually available in developing countries. There is also the problem of what interest rate to use, since interest data are notoriously poor for comparative analysis, and reliable data on holding period rates of return on the full range of financial and tangible assets held by households may not be available.

In 1966, Klein stated: "No econometrician has ever found a significant correlation between consumption (saving) and interest rate when the correlation between consumption (saving) and income is taken into account." There has been little progress since then, and the empirical evidence so far available is inconclusive on the interest sensitivity of savings. For developed countries, earlier studies reveal that income and wealth appear to be more significant explanatory variables for savings behavior, although recent studies have yielded evidence of interest sensitivity. Weber (1970) for example, using US data for the period 1930-55 (omitting 1941-46) tested aggregate consumption functions derived under the assumption that individuals maximize utility over a


2/ For example, from an analysis of Goldsmith's annual data and the Commerce national accounts annual data, which together extend over the period 1897-1959, Friend (1963, p. 679) reports that the various relationships between household saving and interest rates, which he tested were generally not significant.
multiperiod horizon (an approach similar to Modigliani and Brumberg, 1954, except that the interest rate effects are incorporated into Weber's model). He found that interest rates were an important determinant of aggregate consumption, and that the income effect of a change in the interest rate is greater than the substitution effect. "When the rate of interest increases, consumers have an opportunity to maintain the same level of consumption in the future with less saving today. Consequently, they increase current consumption in response to the interest rate increase."

The empirical evidence which is available for developing countries is almost exclusively derived from the experience of Asian countries. The findings, however, are inconclusive. Williamson, (1968) for example, in his examination of six Asian countries, concluded that the rate of interest was either negatively correlated with aggregate saving, or the relationship was insignificant. Williamson's conclusions regarding savings behavior in India, however, have come under attack by Gupta (June 1970) who came to the opposite conclusion that in India the interest rate exerts a positive influence on personal savings. Looking at per capita savings, Gupta found that the real rate of return on long-

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1/ Weber (1970) p. 600. Results obtained by Wright (1969) also offer evidence that savings of the U.S. are interest sensitive. Wright makes the interesting point that many economists conclude that savings are unresponsive to rate of interest changes because of a constant saving/income ratio during periods when the interest rate has fluctuated considerably. Wright emphasises that the constancy of this ratio may have been the consequence of a substitution effect which offset the income effects present when interest rates were changing. The evidence provided by Wright (see p. 293-94) indicates a substantial substitution effect.

2/ In 7 of his regressions, the coefficient for real interest rates was not significant at the 10 percent level of confidence (Williamson, 1968, p. 202).
term government bonds is significant both when used with the simple Keynesian function and with the Friend-Taubman model. Similarly, the rate of return on short-term Treasury Bills also has coefficients greater than their standard errors.¹/

Both Williamson's as well as Gupta's study illustrate the problems of selecting appropriate interest rates for the savings functions, and the close scrutiny necessary in interpreting such results. Williamson's choice of using an index of return on all available financial assets as a proxy for the interest rate has a critical impact on the results. Gupta's decision to use individual interest rates is also open to criticism, since, in the case of India, the "rates of interest on short-term treasury bills as well as long-term government bond rates in India do not respond to market conditions and hence are national and virtually managed... Treasury bills are sold almost wholly to financial institutions thorough moral suasion, while individual holdings of government bonds are very small. In fact, as far as personal savings in India are concerned, both the treasury bill rates and the long-term bond rates are simply irrelevant."²/

The lack of success in demonstrating that interest rates are significant explanatory variables for savings behavior in developing countries may be partly due to the limited variability and generally low levels of interest rates in most developing countries. One of the few such countries which has adopted a high-interest rate policy is Korea.

¹/ Gupta (June 1970) p. 217.
³/ See El-Kokhadem (1973) - p. 53) on this issue.
Brown's study (1971) of Korean monetary reform examined the relationship between the real interest rate payable on time and savings deposits and twelve different measures of savings. These included household, private, and domestic savings, ratios of average savings rates to both GNP and disposable income, and marginal savings rates. He found that the results were generally statistically significant (the only exception was the equations involving the marginal savings rates), and the correlation coefficients good. Changes in average private savings were found to be the most highly correlated with interest rate changes, the latter 'explaining' 92 percent of variations in the former.

Brown's findings, however, have been sharply criticised. Khatkhate (1972), for example, has pointed out that Brown has confused the decision to invest with the decision to save. By explaining the derived high positive correlation between income and interest rates on the grounds that high rates of interest had resulted in a high rate of savings, and this had resulted in a high rate of investment, Brown had "overlooked the fact that it is the decision to invest savings that raised incomes, and not the decision to save. Therefore, Brown's explanation for the high correlation between income, and interest rates does not seem to be valid."  

The evidence on the relationship between interest rates and savings behavior is, therefore, quite inconclusive. Moreover, the various criticisms of the procedure involved in those studies which have been undertaken indicate the extreme caution which is necessary in interpreting the results of such empirical studies.

1/ Khatkhate (1972) p. 538.
4. The Price Level

The impact of changes in the price level on household savings is not clearly specified in the theoretical literature. A change in the price level affects variables such as interest rates, the composition of consumption between durable and non-durable goods, the supply of liquid assets, income distribution, expectations, etc., and though these variables, prices exert an influence on savings. Since changes in these variables may have a positive and a negative impact on savings, the net effect of a change in the price level cannot be determined on a priori grounds, it must be examined empirically.

Of the few studies which have undertaken such an empirical examination, Diwan (1968) found that price increases have a negative effect on savings of the urban household sector in India. A study by Williamson (1968), however, arrived at a different conclusion. He found that price changes exerted a positive effect on savings in both Japan and the Philippines. Durdag (1973) found that in the case of private savings in Turkey, the effect on savings of the absolute level of prices was negative at both the aggregate and per capita levels; the change (both absolute and relative) in the price level, however, exerted a positive effect on savings. A key question here is one of definition. It is likely that a rise in prices would encourage the consumer to spend more

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1/ This section draws in the work by Diwan (1968) and Durdag (1973).
2/ i.e. both household and corporate sectors.
on consumer durables, particularly so should he expect further price rises.

How this affects saving depends on whether or not consumer durables are included in the definition of saving. In the Diwan study, they were excluded; in other works cited, their inclusion or exclusion is not specified.

5. Demographic Characteristics and the Life Cycle Hypothesis

Intuitively one of the most plausible hypotheses regarding household savings behavior is that it is affected by such demographic characteristics as the size of the household, its age structure and the age of the head of the household. Such characteristics would affect the current and expected income stream received by the household, as well as the current and expected expenditure pattern. A recent article by Kuznets (1976) corroborates this intuition. Drawing on household budgetary surveys of the U.S., Germany, Taiwan and the Philippines, Kuznets makes several significant observations. He finds a strong association between the size of the household unit and the age of the household head within the life cycle, so that when income differences are observed between families, this "may reflect, in substantial part, the differences in such income within the life cycle of a given family or household rather than differences among families or households in total lifetime income." In other words, "if we are interested in long-term levels of income... the conventional cross-section distribution in income among families or units, by income per

1/ This is a controversial issue - see Goldsmith (1959) p. 413.
2/ Kuznets (1976) p. 50
family, per person or per consumer, is unrevealing. It is affected by income disparities among units of differing size and/or among families with different ages of head, disparities that reflect phases within the life cycle that are easily compatible with perfect equality in total lifetime income.

The implication of these findings for household savings behavior is that the "long-term" income received by a household, and hence the saving/expenditure pattern of that household is critically affected by the size of the household and by the age of its head. Kuznets found in all five countries studied a strong negative correlation between the size of the family or household and per person income, but that when households are grouped by size of income, the higher income classes were dominated by the larger households, and the lower income classes by the smaller households.

The empirical examination of the impact of these demographic characteristics is severely constrained by data availability. Besides Kuznets' study, the few empirical works that have been undertaken have tended to examine only one particular demographic attribute - the age of household head or the household size - and not the interrelationships of attributes which Kuznets was concerned with. On household size, the few studies available indicate that this attribute does not have a significant influence on both the volume and composition of household saving (e.g. Iyengar, 1967, and Gupta, 1969, both using Indian data). The life cycle hypothesis, relating

age structure of the household to its savings behavior, has received considerable attention, both theoretically and empirically, in developed countries. The origins of the life-cycle hypothesis can be traced back to what was essentially a wealth-savings model by Modigliani-Brumberg-Ando (MBA), and which was subsequently elaborated (Modigliani 1966) to incorporate the idea that saving during an individual's productive years will be motivated by the desire to provide for the expected needs of retirement. Modigliani (1966) examined this hypothesis for a cross-section of thirty-six countries, and found that the aggregate saving/income ratio is independent of the level of income per capita, but is strongly correlated to the rates of growth of population and of total income.

1/ Among the literature on the life-cycle hypothesis as related to developed countries the following should be mentioned: Fisher (1956); Friend and Jones (1960) pp. 388-436; Kurihara, e.d., (1954) pp. 388-425; Lydall (1955); Modigliani and Ando (1957) and (1963).

2/ The MBA hypothesis claims that the household decides "the amount available for consumption over life, which is the sum of the household's net worth at the beginning of the period... plus the present value of its non-property income... minus present value of planned bequests." (Modigliani and Ando 1960). The amount which the household allocates for consumption is a certain share of these resources, and actual consumption will differ from this amount of "transitory expenditures and by certain stochastic factors." (R. Farber, 1962, p. 27).

3/ In Harrod's terminology, "lump saving." The rationale for such behavior has been aptly expressed by Fisher: "Our present behavior can only be affected by the expected future, not the future as it will turn out but the future as it appears to us beforehand through the veil of the unknown." (1956).
The relevancy of the life cycle theories to developing countries, however, has been questioned, and the studies which have empirically tested this hypothesis in a developing country are so few in number that the questioning remains hypothetical. One of the few such studies is that by Kelley and Williamson (1968), which studied the effect of household age structure on household savings in Indonesia. By comparing actual household saving to that predicted by the life cycle hypothesis, they conclude that the hypothesis, without modification, has little applicability for the Indonesian household. They do suggest, however, that if education is included in the explanatory variables, the function would give a much better fit.

6. Socio-Economic Characteristics

As emphasised earlier, the lack of data on either the size or the age structure of the household has limited the empirical investigation of an intuitively plausible determinate of household saving. An alternative approach would be to examine socio-economic groups, such as salary earner, wage earner, rural household,

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1/ Modigliani (1965, pare III) himself stated: "The life cycle model does not purport to represent a universal theory of individual and aggregate saving formation and wealth holding, but is instead basically designed to apply to private capitalistic economies in which at least the bulk of income, consumption, and accumulation transactions occur through markets." See also Landau (1971), p. 303, who points out that in LDC's the proportion of retired individuals in the total population is smaller than in advanced nations, and there is also the custom prevalent in many LDC's that family members will support elderly people.

2/ Kelley and Williamson (1968) p. 397.
non-corporate household enterprise, and professional groups. It is reasonable
to assume that each group would have its norm for family size and age structure,
so that these socio-economic groups could be used as a proxy for Kuznets' size-specific, age-specific households, since within each group these size
and age differences of households would average out. This is, of course,
an over-simplification, but it is true to say that distinct motives for
saving can be associated with socio-economic groups, and that each group is likely
to have demographic characteristics particular to that group.

Theoretically, there is considerable support for the hypothesis
that savings motives and their intensity differ according to socio-economic
groups. The desire to accumulate capital has long been recognised as a
distinctive trait of the capitalist society$, and one which has been particular-
ly associated with the bourgeoisie class. Schumpeter expressed this aptly:
"The bourgeoisie worked primarily in order to invest and it was not so much a
standard of consumption as a standard accumulation that the bourgeoisie struggled
for." While this may have been the dominant motive for this socio-economic
group, others may have different motivations.

Looking specifically at socio-economic groups identified by sources
of income, both the theoretical and empirical literature support the notion
that savings behavior is influenced by the source of income. Robinson (1956)

1/ The desire to accumulate savings for their own sake can, in itself, be a strong
motivation, explainable by the prestige or distinction value of private wealth
in capitalist societies, where social recognition of performance has strongly
economic connotations. This motive, however, has tended to be overlooked by
economists. Scitovisky has summed thus up well, claiming that the desire to
accumulate savings for their own sake "...was usually regarded as a mild (though far
from innocuous) form of insanity until the Protestant ethic and the rise of
capitalism placed the stamp of respectability on saving for its own sake...
It is something of a paradox that, of all people, the economist alone should have
failed to make room in this world for the likes of Anselm Rothschild and John D.

and Kaldor (1964) both stressed that the propensity to save out of profits exceeds that out of wage income. Schumpeter (1939) argued along similar lines. 1/

Lewis (1954) also assigned a critical role to the connection between savings and profits. He assumed that in developing countries most saving is done by these economic units whose income originates in profits or rent, and that the reason the savings rate is relatively low in these countries is not because they are so poor but because their capitalist sector is so small; and that "if they had a larger capitalist sector, profits would be a greater part of their national income, and saving and investment would also be relatively larger. 2/

The empirical evidence on the relationship between savings behavior and the functional distribution of income, while not extensive, does tend to support these hypotheses. One of the few models which was incorporated the source of income into the savings function is that of Houthakker (1965) which incorporated a breakdown of income into wage and salary income (including net transfers to households) and property income (derived from property as well as entrepreneur activity). Utilising a cross-section approach, he found that the MPS out of income from wages and salaries was much lower than that for income from property and entrepreneurship. One of the explanations for this phenomenon offered by Houthakker relates to the return on invest-ent available to different groups of people. "Employees usually can invest only through inter-

1/ To quote Schumpeter (1939) "...the bulk (of saving), whether done within the sphere of business or the sphere of households, flows from revenues or elements of revenues which could not exist at all in a stationary state, namely from profits, or from other incomes created or swelled by previous economic change."

2/ The Lewis model applies only to developing countries, and only so long as there exists a labor surplus. The rationale for this is that Lewis hypothesised that the share of profits in the national income will increase so long as there are unlimited supplies of labor available at a constant real wage rate. Once the supply of surplus labor declines (as the country becomes more developed), so there will be pressure to increase the real wage so squeezing the share of capitalists' profits in the national income. With the disappearance of the labor surplus, the Lewis model is no longer applicable. See Landau (1971); p. 302, for further elaboration of the Lewis model; also Fei and Ranis (1964) for a more detailed analysis of the relationship between savings behavior and "surplus economy" development models.
mediaries such as banks, while entrepreneurs in particular can invest directly and shareholders in equities. The latter two types of investment typically have high rates of return.\(^1\)

Williamson's findings (1968 and 1969) using Houthakker's model and panel data for selected Asian countries corroborates these results, as do those of Kelley and Williamson on (1968) for Indonesia.\(^2\) A similar study by Friend and Kravis (1957) on U.S. savings behaviour also came to the same conclusion: that the MPS out of wage/salary income is less than that out of entrepreneurial income and that entrepreneurial personal saving amounted to 70 percent of total personal saving. Shinohara (1959) arrived at a similar conclusion in his examination of the savings behaviour of Japan during the period 1949-56. From budget surveys, Shinohara points out that the "saving ratio from property income and non-farm proprietors' income is surprisingly high. The share of property owners and non-farm proprietors' saving in total personal saving was especially high in 1951 and 1952 (81.9 and 78.1 percent, respectively) and was around 60 percent in the succeeding years."\(^3\)

Considering the promising results cited here, together with the implications which can be drawn from such studies (e.g. as a proxy for demographic characteristics) relative ease in collecting the necessary data, this does seem to be one area suitable for further research.

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\(^1\) Houthakker (1965) p. 217. This explanation relates to a discussion later in this paper concerning the significance of the financial structure and the availability of savings instruments on savings behavior (see pp. 33-36).

\(^2\) The model used by Kelley and Williamson is slightly different from Houthakker's, the former distinguishing between the entrepreneur (self-employed) and all other households. For the theoretical justification of this, see p. 386.

\(^3\) Shinohara (1959) p. 590.
7. **Financial Structure**

The argument that large amounts of voluntary savings are not mobilized because of the "inadequacy" of the financial institutions has, until recently, received surprisingly little attention. "Inadequacy" may be in terms of the structure of financial institutions, the types of services they offer, or the cost of such services. Some of the earlier proponents of this argument such as Hirschman (1963, p. 37-50), Aubrey (1955, p. 40-415) and Liebenstein (1960, Chapter 9), argued that the low rate of savings in developing countries can be attributed to deficiencies in the demand for investment. The decision to invest, they contend, is constrained by the ability to invest, i.e., by such factors as the lack of suitably attractive investment opportunities, inexperience in investing and risk aversion on the part of the potential investors. Hirschman further argues that even in the poorest countries, the savings potential is not realized for two possible reasons: either there is a lack of investment opportunities, or the channels for transforming savings into productive investment are inadequate. A consequence of these conditions in developing countries is, to quote Hirschman, that "frustrated savings exist whenever the total supply of savings is highly responsive to the appearance of new investment opportunities."

1/ Hirschman (1958) p. 38.
More recently, Goldsmith (1969) McKinnon (1973) and Shaw (1976) have extended and refined these arguments. McKinnon's arguments are of particular interest; he contends that the relative shortage of financial intermediaries, and the "financial repression" of large segments of the population have resulted in a severe misallocation of funds in developing countries. McKinnon was particularly concerned with the lack of penetration by commercial banks into the rural sector which, he claimed, frustrated rural savings. "This dearth of organized banking, on both the deposit and the lending sides" has resulted in the mass of small farmers and indigenous urban industry remaining financially "repressed", forced to invest in their own enterprise for a low rate of return whilst investors of high return projects face a shortage of funds. He strongly favours unifying the capital market which would widen the exploitable investment opportunities, and in this way would stimulate domestic saving through sharply increasing the rate of return offered to domestic savers.

While there does not appear to be any empirical study specifically examining the relationship between savings behavior and the financial structure, there is, indirectly, evidence to support such a relationship. It will be recalled that earlier in this paper it was shown that the empirical evidence available does support the hypothesis that the source of income exerts a significant impact on saving behavior. Specifically, there was evidence to show that the propensity

1/ McKinnon (1973) p. 71.
2/ Adams (1973) endorses this view.
to save out of property or entrepreneurial income is higher than that out of wage or salary income. It was also found that upper income groups in general quite apart from their occupation appear to have a higher propensity to save. One eminently reasonable explanation of these two phenomena is that those who are entrepreneurs or own property, as well as those in the upper income brackets, have a wider choice of investment opportunities available to them than other segments of the population. Not only can such people be assumed to have a greater knowledge of investment possibilities, but they may also be less risk averse.

This is to some extent, borne out by the results of the NEAER rural income survey of India. From a comparative analysis of saving behavior of households affected by the Green Revolution (HYV households) and those whose technological horizon did not widen (non-HYV households) reveals that the former have higher levels of income, investment and saving. HYV households had a larger share of investment in irrigation than non-HYV households (19.6 percent compared to 15.5 percent), reflecting the need for irrigation in the new technology, and in financial assets, (19.0 percent compared to 12 percent). This difference could be attributed to both the relatively higher incomes as well as to better knowledge and access to financial opportunities of HYV households.

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1/ i.e. in addition to the influence of transitory income on savings behavior.
2/ Reported in Bhalla (1976).
It may not first be a matter of widening people's knowledge to existing saving instruments; the introduction of a low-risk easily accessible saving instrument to all segments of the population may well attract these "frustrated savings." Witness, for example, the success of the Post Office Savings Scheme in mobilising savings in Sri Lanka and in Japan. The negative real rate of return offered on such savings could not have been the attraction, but such non-price attributes as low-risk and accessibility could be assumed to have drawn savers.

To conclude, therefore, empirical scrutiny has lagged behind the growing interest in the relationship between financial structure and savings behavior. This does seem to be one area where such empirical work could be valuable.

IV. Conclusions

The studies reviewed here on the determinants of household saving behaviour fail to provide conclusive evidence on the principal hypotheses, although they do indicate potentially fruitful areas of further research. The literature reviewed does substantiate the existence of a relationship between saving and income, although the precise formulation of this relationship is less clear. There is evidence that, in poorer countries at least, the MPS is an increasing function of household income. Investigations of the absolute income hypothesis for long- and short-run behaviour do indicate that the short-run MPS is considerably higher than the long-run, although the evidence is far from conclusive.

Studies of developing countries tend to support the relevance of the permanent income hypothesis to household saving behaviour, finding a considerably higher MPS out transitory income than out of permanent income. No evidence was found, however, to support Friedman's assumption of unitary MPS out of transition income. The life cycle hypothesis found little corroboration in developing countries, where its relevance to household saving behaviour has been seriously questioned. While there does appear to be a positive interaction between wealth and saving, the evidence available on the target wealth hypothesis is contradictory, and also suffers from poor data on wealth holdings.

The available evidence is contradictory on the relationship between interest rates and household saving behaviour. Despite recent evidence indicating an interest sensitivity of savings in developed countries, the few studies undertaken for developing countries have yielded.
contradictory results. The whole issue of interest-sensitivity of saving is clouded by the very complexity of this relationship and by difficulties in interpreting results, since, as one authority puts it, "the explanation of the responsiveness of saving to increases in the real rate of interest may lie in the effects of monetary reform on the level of investment and national income which in turn have a positive effect on saving." Data deficiencies also hamper empirical investigation, so that few studies have addressed the question of whether interest rate charges affect the composition of saving rather than its aggregate level.

Several potentially significant determinants of household saving behaviour remain practically unexamined in the literature. The impact of direct taxation, of prices, and of such demographic factors as the size of households or the age of the household head have been the subject of relatively few studies. A recent Kuznets paper implies that the "long-term" income received by a household, and hence the saving/expenditure pattern of that household, is critically affected by demographic factors. Inadequate data on these demographic characteristics, however, limit empirical examination. An alternative "approach" would be to examine the saving behaviour of socio-economic groups, such as salary earner, wage earner, rural household, non-corporate household enterprise and professional groups. Theoretically, there is considerable support for the hypothesis that the source of income influences savings behavior, and the available empirical evidence is also supportive. In view of the promising results so far available, together with the implications which

1/ Mikesell and Zinser (1973) p. 19.
can be drawn from such studies, this does seem to be one area suitable for further research. Another potential determinant, the financial structure, has been neglected in the literature, yet, as described earlier, these are several indications that it may well exert a significant impact on saving behaviour.

One final conclusion which emerges from this survey is the need for more empirical work on a disaggregative level. Since it is apparent that not one, but several interdependent variables determine aggregate saving behaviour, more precise formulation of the saving function may be possible if the savings behaviour of different types of transactors (such as households, companies, rural/urban households) are examined. This brings us back to the initial point made in this survey, the underlying constraint imposed on any savings investigation by the extremely weak data base. Particularly for developing countries, a precondition for any such analysis is the generation of reliable data on the savings and income of the different types of transactors described earlier, on the composition of their saving, and on the potential determinants (e.g. interest rate structure, wealth holdings, etc.).

1/ This Division is currently involved in such a study. Using Indian data, the savings behavior of certain socio-economic groups in the rural area is being analysed.


Zohar, Uri, Consumption and Saving in Developing Countries: An International Comparison, unpublished dissertation: Claremont Graduate School, 1967.