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# RESEARCH MEMORANDUM SERIES



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# DO THE MORE WEALTHY SAVE LESS?

by

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June 1991

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## Abstract

Empirical estimates suggest that in developing countries people with higher wealth (permanent income) have higher savings rates. However these results do not mean that individuals with greater wealth have higher propensities to save out of current income. To the contrary, a simple permanent income model implies that, conditional on the same level of current income, the more wealthy save less. Empirical estimates for the developing country of Thailand are consistent with this model in that the propensity to save out of current income is inversely associated with measures of physical and human resource wealth. Such estimates suggest that care must be taken in interpreting the large number of studies that explore the association between savings and current income without controlling for the impact of wealth.

The determinants of savings in developing countries are of interest in part because such savings long have been thought to be an important factor in the growth prospects of such countries. In the 1950's and early 1960's, in fact, increasing the savings rate was seen as the essential act to initiate and to accelerate the economic development process. Rostow (1960), in his influential Stages of Economic Growth: A Noncommunist Manifesto, claimed in his analogy with an airplane that "takeoff" occurred when the savings and investment rates reached 10 percent of national income. The then widely-used Harrod-Domar model stated in its simplest form that the growth rate in income equals the savings rate divided by the incremental capital output ratio, and pointed to increasing the savings rate as a major means for increasing growth.

Savings is not now seen by many to be so central to the development process as it was a few decades ago, and it is realized that the empirical correlation between savings rates and growth, while positive, is much less than one.<sup>1</sup> Nevertheless, increasing savings to enable more capital accumulation out of domestic resources still is widely viewed as important in the development process. Moreover, as Deaton (1990) recently has emphasized, household savings are seen as important means for smoothing consumption given considerable variations in income in many developing countries. Improved knowledge of what determines household savings, therefore, is useful to predict better this important flow in order to design better longer-run development and shorter-term stabilization policies and to understand better how different households cope with income variations.

Most micro estimates of savings determinants in developing countries use cross-sectional data because very few relevant longitudinal data sets are available. These studies typically either estimate the relation between savings and current income or they use an instrumented value of income to represent permanent income (in either case with other controls included in an additive fashion). Deaton (1990: 70), in his recent review of saving in developing countries, summarizes the results of the latter studies regarding the relation between saving propensities and wealth (or permanent income):

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<sup>1</sup>In a steady state neoclassical growth model (e.g., Solow 1956) the proportion of income saved determines the income level, but not the rate of growth. In the movement towards a steady state, however, temporarily increased savings temporarily increase income growth.

"Perhaps the most important feature ... [of simulations with his model that he claims represents well some of the special features<sup>2</sup> of savings determination in developing countries] is the prediction that savings will increase with 'permanent income' as conventionally defined, so that the elasticity of consumption with respect to permanent income will be less than unity. The literature on household saving in LDC's has almost uniformly found this result (see in particular Bhalla 1979, 1980 for India; Musgrove 1979 for Latin America; Muellbauer 1982 for Sri Lanka; Betancourt 1971 for Chile, and Paxson 1989 for Thailand). The exception is Wolpin (1982) who, as Gersovitz (1988) points out, has a rather odd measure of permanent income -- he assumes, in the Indian context, that permanent income is positively spatially correlated with permanent differences in rainfall, which may not be true in the presence of migration."

Rather than focus on savings out of permanent income as in studies of the type that Deaton summarizes, in this paper we ask a related, but different question: What are the implications of permanent income considerations for the savings propensities out of current income? The particular form of this question on which we focus is: If two households in a cross section have the same current income and are identical in every other respect except for their wealth, would one expect the wealthier household to save more of their current income? Studies such as those summarized by Deaton<sup>3</sup> do not directly address this question. That the savings propensity out of permanent income tends to increase with wealth as found in these studies certainly does not imply that the propensity to save out of current income is positively related to wealth. The answer to this question about the relation between the propensity to save out of current income and wealth may have important implications for

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<sup>2</sup>Deaton's model is within the framework of the standard life-cycle permanent income model, but he emphasizes the uncertainty of income and borrowing difficulties for low-income households to focus on the role of "high-frequency" savings as a buffer between consumption and unpredictable and uncertain income rather than on "low-frequency" life-cycle considerations.

<sup>3</sup>Or other studies in the literature. For example, we have not been able to find reference to this question in surveys of savings in developing or developed economies such as Deaton (1990), Gersovitz (1988), King (1985), Leff (1969, 1979), Mason (1988), Mikesell and Zinser (1973), Modigliani (1986), Sandmo (1985), Snyder (1974) and Ram (1982).



interpreting the large number of estimates for developing countries<sup>4</sup> that relate savings to current income. In Section 1 we show that a simple permanent income model suggests that the propensity to save out of current income is inversely associated with wealth. In Section 2 we present some empirical evidence that is consistent with the implication that the propensity to save out of current income is inversely associated with indicators of physical and human resource wealth in cross-sectional data for the developing country of Thailand.

### Section 1. Simple Theoretical Considerations

We begin with a very simple model of savings, following Gersovitz (1988). Assume that the  $j$ th individual lives for  $T_j$  periods; receives income (from labor earnings or sources other than interest payments) in the  $i$ th period of  $y_{ij}$ ; consumes  $c_{ij}$  in the  $i$ th period; neither receives nor leaves bequests; faces no liquidity constraints so that s/he can borrow or lend at the interest rate  $r_i$ ; and knows with certainty all relevant information. The only constraint on this individual's choices is that the present discounted value of lifetime consumption ( $C_j$ ) must be less than or equal to the present discounted value of lifetime income ( $Y_j$ ):

$$(1) \quad C_j = \sum_i [c_{ij}/(1 + r_i)^i] \leq \sum_i [y_{ij}/(1 + r_i)^i] = Y_j.$$

Assume that the individual maximizes the sum ( $V_j$ ) of the discounted utility of consumption in each period,  $a^i U(c_{ij})$ :

$$(2) \quad V_j = \sum_i a^i U(c_{ij}), \text{ with } 0 < a < 1.$$

Under the assumption that there is an interior maximum, the first-order conditions if death occurs at the start of the third period are that (1) holds with an equality and that:

$$(3) \quad U'(c_{1j}) = (1 + r_1) a U'(c_{2j}).$$

First-period savings ( $s_{1j}$ ) are:

$$(4) \quad s_{1j} = y_{1j} - c_{1j}.$$

Now suppose that there is a second individual ( $k$ ) who is identical to individual  $j$  in every respect

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<sup>4</sup>And for developed economies as well, although interest in savings for growth and smoothing purposes probably is greater for the developing countries.

including first-period income except that k has higher second-period income and therefore higher present discounted value of lifetime income or wealth ( $y_{1j} = y_{1k}$  and  $y_{2j} < y_{2k}$  so that  $Y_j < Y_k$ ). Relations (1) - (4) can be written for k, as well. First-period savings for k are:

$$(4') \quad s_{1k} = y_{1k} - c_{1k} = y_{1j} - c_{1k}.$$

Since k has higher lifetime income, s/he consumes more in the first period than does j ( $c_{1k} > c_{1j}$ ) in order to satisfy the counterpart for k of relation (3). Therefore it follows that first-period savings (and the average savings propensity out of current income) are less for k, the individual with higher wealth. That is, in a cross section, the average savings propensity is inversely associated with wealth since the wealthier individual saves less given the same current income.<sup>5</sup>

In the second period in this example, the kth individual saves more in absolute terms since over the total life time savings are assumed to sum to zero.<sup>6</sup> But this does not mean that in the second period the wealthier individual (k) has a higher savings propensity out of current income than does j. To the contrary, the implications of this framework are that the wealthier individual has a lower second-period average savings propensity than does the poorer individual (j). For the second period, one could compare k's behavior with some other individual with identical preferences, identical second-period income and different first-period income (and therefore different permanent lifetime income or wealth). A little reflection along lines parallel to the argument above indicates that k has higher (lower) savings in the second period than does this third person (with identical second-period income as has k) iff k has lower (higher) first-period income and therefore lower (higher) wealth than the third person.

Thus this simple example illustrates that if two individuals have the same current income in a

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<sup>5</sup>If the wealthier individual has greater income than the poorer person, the former's savings may or may not be greater than the latter's, depending on how large is the income difference, what is the savings difference if the two individuals have the same first-period income, and what is the marginal propensity to save for the wealthier individual.

<sup>6</sup>If, as Deaton (1990) summarizes the evidence (see the introduction), the marginal propensity to save out of permanent income increases with permanent income (e.g., because of an increasing propensity to leave bequests with more permanent income), the wealthier individual will save even more in the second period (see the second point below).

particular period, the one with the greater wealth saves less. Though the example is simple, to our knowledge, it has not been emphasized in the previous literature.

What happens if this simple model is complicated to reflect better some of the pertinent features of reality? The answer is that, at least with some complications, the result on which we are focusing is robust. With others it is not guaranteed to hold, but probably holds under realistic assumptions about the real world.

First, the result holds with extension to more periods, as can be readily seen by simple extension of the above argument.

Second, the result holds with incorporation of the possibility of bequests, whether the bequest motivation is altruism, parental control, or precaution against uncertain timing of death or of expenses associated with illnesses at a later point in the life cycle. The intuition is simple. Suppose that two individuals are identical in all respects, including their income streams, the bequests that they receive and the bequests that they intend to leave. Their consumption and savings patterns, of course, also are the same. Now perform the comparative static experiment of increasing the income of the second individual by  $x$  in the second period. As long as there is positive marginal utility to that individual's first-period consumption, s/he will increase first-period consumption<sup>7</sup> and reduce first-period savings. If the increase in the second person's lifetime income is from an increase in initial bequests received by that person from his/her parents instead of an increase in second-period income, in fact, the result will be reduced savings in every period in response to this greater wealth. This is not to say that with bequests the wealthier may not save more than the poorer. Blinder (1976) gives a simple example in which the richer do save more than the poorer if the utility of bequests left can be added to expression (2), if the utility from bequests and from consumption are constant elasticity functions, and if the elasticity with respect to bequests exceeds that with respect to consumption. But still in this case the wealthier save less than the poorer in any period in which the current incomes of the wealthier and of

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<sup>7</sup>As well as other period consumption and bequests if there is positive marginal utility to such consumption and to bequests.

the poorer are the same even though the savings of the wealthier may be greater in any period in which their incomes are greater than are those of the poorer.

Third, the result may not hold with borrowing constraints, depending on the nature of those constraints, but it seems likely to hold under probable real-world conditions. As Gersovitz (1988) discusses, borrowing constraints tend to increase savings above the optimal unconstrained level by eliminating or lessening negative savings or by forcing saving prior to big expenditures such as for a house. But as he also discusses, borrowing constraints may affect more either the poor or the rich (with regard to lifetime income). Often there is emphasis on borrowing constraints affecting the poorer more (e.g., Deaton 1990) because they experience larger income shocks in proportional terms, because for the poor there is a greater premium on stable consumption in order to meet subsistence requirements, because the poor have relatively less assets to buffer income shocks, and because the poor have less collateral to use with potential lenders. But Gersovitz notes that borrowing constraints affect more those with low initial income but a steep income profile than those with equally low initial income and a flat income profile -- that is, the relatively richer in a lifetime sense. He provides an eloquent comment from Blinder (1976: 88) in this regard: "The poor man with a flat age-income profile and no financial inheritance is constrained by many things but not by the inability to borrow against future receipts."<sup>8</sup> If only the poor are relatively credit constrained and save more as a result, our above result probably still holds. If the wealthier are completely constrained from borrowing, however, then the result does not necessarily hold since the wealthier may not be able to dissave as much as they would like to were there no constraints in the period in which their income is the same as that of the poorer. But this requires that the wealthier have no more assets (either themselves or through families or other connections) from which to dissave during such a period than do the poorer, which seems unlikely. Therefore, though it is possible that the result does not hold if there are borrowing constraints, most likely it still does.

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<sup>8</sup>Blinder and Gersovitz also seem to assume implicitly a relatively flat age-consumption profile since, if consumption were relatively high at an early age, the individual whom Blinder describes could be constrained by the inability to borrow against future receipts.



Fourth, the effects of uncertainty also are not certain, though they are not obviously likely to offset the above result. Uncertainty may reflect randomness in future income ( $y$ ), the rate of return on savings ( $r$ ), the duration of life ( $T$ ), and the quality of life (e.g., through health status). In Gersovitz's (1988: 390) words: "The theoretical effects on saving of all these types of uncertainty are quite indeterminate, depending in complicated ways on the parameters of the utility function." The simple model above can be modified to allow for the first two types of uncertainty by replacing  $a^i U(c_{ij})$  by its expectation in expressions (2) and (3) for  $i > 1$ . Gersovitz provides the explicit conditions under which savings increase with riskiness in terms of the first and second derivatives of  $U$  and the first- and second-period incomes and consumption. In the special case in which relative risk aversion is constant, savings increase iff relative risk aversion is greater than one. Although examples probably can be constructed in which the wealthier save more than the poor due to uncertainty (e.g., if relative risk aversion is constant, but that for the rich is sufficiently larger than that for the poor to offset the effect discussed above), it is not obvious that such cases are very likely empirically. For example, in careful experiments undertaken in rural south India Binswanger (1980) finds that relative risk aversion is in the range of 0.5 for small fluctuations in income (with a standard deviation of about one month's wage) to about 1.2 for large fluctuations (with a standard deviation of about a half year's income) and that physical and human resource wealth tend to reduce relative risk aversion. Thus neither the magnitude of relative risk aversion nor the association with wealth in this case is likely to satisfy conditions so that the richer save more with the same first-period income as the poorer due to risk aversion.

In summary, the simple model with which we start this section indicates that the poorer individual saves more at a given current income level than does the wealthier individual. This result clearly is robust under some extensions of the model, and likely to be robust (although theoretical counter examples can be constructed) for other extensions given conditions that are likely to be encountered empirically.

## Section 2. Empirical Exploration

We now turn to some simple empirical estimates. We consider the case of a developing country, Thailand. The determinants of household savings in developing countries are of interest, as

noted in the introduction, both because of long emphasis on the role of such savings in providing resources for growth and because of the role of such savings in smoothing consumption given considerable income variations in developing countries. Beyond these general considerations about household savings in developing countries, there is particular interest in Thai household savings because of an increasing gap between domestic savings and investment and because of substantial declines in average household savings rates in most of the 1980's (e.g. Mason, Woramontri, and Kleinbaum 1987, Sussangkarn and Cripps 1986, James, Naya and Meier 1987).<sup>9</sup>

### Subsection 2.1. Data

Our data are from the 1980-1 Thai Socioeconomic Survey, a data set that is similar in general terms to those that have been used to estimate savings behavior for many developing countries. We use data on households in which both a household head and the spouse are present in order to avoid problems of how to treat missing observations on the schooling of the man or of the woman and limit our data set to households in which the woman is in the 15 to 44 age range in order to be able to link with other data to create our measure of the schooling quality experienced by the head and the spouse.<sup>10</sup> Average household savings in this data set are 302 Baht per month.<sup>11</sup> This level of savings

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<sup>9</sup>There are a number of existing macro and micro studies of Thai household savings behavior. Sussangkarn (1989) provides a recent survey. None of the existing studies, however, focuses on the possible inverse association between wealth and the marginal propensity to save out of current disposable income that is our interest in this paper. In fact generally the existing studies assume a priori that the propensity to save out of current income is independent of wealth.

<sup>10</sup>The tradeoffs regarding such limitations on the sample are obvious. Households without both a head and a spouse present may be different with respect to some important unobserved characteristics; however in Thailand most households in the age range that we consider do have the head and the spouse present (a much larger proportion than in, say, the United States because children generally stay in their parental households until they marry instead of setting up separate households and separation and divorce are much less common). Also households with older heads and spouses may behave differently, but for such individuals the available time series on local teacher/student ratios do not exist far enough back in time to permit linkage with such ratios when they were of school age. Moreover, the probabilities of women being members of intact households with their husbands present decline after the women are in their mid forties (e.g., Hutaserani 1989). Given the current age structure of the Thai population and that adult children of the head, the parents of the head and parents-in-law of the head not infrequently live in the household of the head, most Thais are in households that are represented in our sample.

implies an average savings rate as conventionally defined of about 9.2 percent.<sup>12</sup> There is large variance across households, with the standard deviation in household savings equal to 3853 Baht per month, about 85 percent of the standard deviation in household disposable income. This simple comparison of the standard deviation for savings versus that for income indicates that the former is big enough to allow for (but by no means to guarantee) the possibility that the marginal propensity to save might be quite high, perhaps because of high transitory components in current income.

The last two columns in Table 1 give the sample means and standard deviations for the right-side variables in our estimates. Disposable income, of course, is the standard primary household savings determinant. The mean household disposable income in the sample is 3296 Baht per month (or almost US\$1600 per year), with a standard deviation about 140 percent of the mean.

The other variables are all posited to affect the average propensity to save out of current household disposable income, and thus enter interactively with disposable income in the relation that determines household savings. These fall into three groups: the wealth variables of primary interest, controls for life-cycle effects, and controls for liquidity constraints.

1. Indicators of household wealth: The impact on the savings propensity of these variables is of primary interest in this study, given the conjecture in Section 1 that such impact should be inverse. Since the available data do not permit one summary measure of total physical, financial, human capital and entitlement wealth and since it is not clear a priori that all forms of wealth should have the same impact on savings, we use a set of different wealth indicators in our estimates. These in turn can be

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<sup>11</sup>The exchange rate was about 25 Baht to one United States' dollar.

<sup>12</sup>The original data indicate average savings close to zero. But as Paxson (1989) points out, in part the low reported savings in the original data probably is due to the fact that consumption is reported for the past month but income is reported for the past year. Therefore consumption is measured in the last month's prices and income is measured on the average in terms of prices of about half a year earlier. To correct for this possibility, we have adjusted income for the average inflation during the previous year. This adjustment does not affect substantially, however, our regression estimates other than the constant. Also the basic results are not affected substantially by efforts to adjust the savings data for purchases of durables.

**Table 1**  
 Regression for the Determination of the Propensity  
 to Save out of Household Disposable Income from the Thai  
 1980-1 Socioeconomic Survey and Sample Means and Standard Deviations<sup>a</sup>

	<u>Extended</u>		<u>Sample Characteristics</u>	
	<u>Regression</u>		<u>Means</u>	<u>Standard</u> <u>Deviations</u>
	(1)		(2)	(3)
<u>Disposable Income Times</u>				
1. Wealth				
a. Physical Capital				
Housing stock rental value	-.000054	(3.2)	404	1021
Land access (rai)	-.0025	(2.2)	9.4	15.4
Own enterprise	-.0962	(2.2)	0.49	0.50
b. Human capital				
Man's schooling (years)	-.017	(0.1)	4.6	2.8
(quality)	-.052	(2.6)	2.3	1.0
Woman's schooling (years)	-.0096	(0.9)	4.0	2.4
(quality)	.037	(1.6)	2.4	1.0
c. Entitlements				
Governmental employment	-.166	(4.5)	0.11	0.31
2. Lifecycle factors				
Man's age	-.016	(1.0)	36.4	8.7
(Man's age) <sup>2</sup>	.00012	(0.5)		
3. Liquidity constraints				
Bank deposits per household	-.0019	(4.4)	29	47
Agricultural income primarily	.0528	(0.6)	0.63	0.48
<u>Disposable Income</u>	1.57	(4.8)	3296	4612
Constant	-2350	(15.2)		
R <sup>2</sup>	.824			
Breusch-Pagan Chi Squared (d.f.)	39065	(13)		

<sup>a</sup>The dependent variable in the regression is household savings. Absolute t values are presented in parentheses to the right of the point estimates. Standard errors are corrected for heteroskedasticity using the Breusch-Pagan (1979) procedure.



subdivided into three subgroups.

The first subgroup of indicators of household wealth includes indicators of physical and financial wealth. The first one is the household's imputed rental value of owner-occupied housing. Such housing is a major durable for most households. This variable has a mean value of 404 Baht per month,<sup>13</sup> or about 12 percent of disposable income, with relatively great variation (i.e., a standard deviation equal to over 250 percent of the mean). The second variable in this group is the extent of access to land, which averages 9.4 rai, with a standard deviation that is almost twice as large at 17.9 rai.<sup>14</sup> The third is whether the major source of household income is own enterprise, as is the case for 49 percent of all sample households. Such enterprises have wealth in the form of physical and financial assets and perhaps in the form of good will.<sup>15</sup>

The second subgroup of indicators of household wealth includes human capital variables. These are represented by the schooling quantity and quality of the man who is household head and of his wife. Schooling quantity is measured by grades of school. For men (women) the mean is 4.6 grades (4.0), with a standard deviation of 2.8 (2.4). Schooling quality is included in addition to the standard schooling quantity because of increasing recent evidence that schooling quality affects subsequent socioeconomic outcomes.<sup>16</sup> Schooling quality is represented in this study by the weighted teacher to

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<sup>13</sup>The implied value of the housing wealth, of course, depends on the interest rate. For example with an interest of 10 percent per year, the implied mean value of the housing stock is about 48,500 Baht.

<sup>14</sup>There are about 6.25 rai to a hectare. We use land access rather than land ownership since a large proportion of the Thai population (estimates suggest roughly a fifth of the total) live on and farm land that de jure is owned by the Kingdom even though such farm families have de facto control over such land.

<sup>15</sup>Many of these households are in agriculture, and agricultural households are conjectured to face greater credit constraints. Therefore in the third group of variables there is control for whether agriculture is the primary source of income.

<sup>16</sup>For examples regarding labor market outcomes in other developing countries, see Behrman and Birdsall (1983, 1985), Behrman, Birdsall, and Kaplan (1990), Heyneman and Loxley (1983), Moll (1991), and Tropp (1991). For an example regarding nonlabor market outcomes in Thailand, see

student ratio in the local primary school at the time that the individual of concern was 12, with the weights reflecting the relative wages of teachers with different types of certification.<sup>17</sup> For men (women) the mean of schooling quality is 2.3 (2.4) and the standard deviation is 1.0 (1.0). Human capital, of course, is a form of wealth just as are physical and financial wealth, so if our conjecture is correct these schooling variables also affect the propensity to save out of a given current income level negatively. While there has been considerable emphasis in the development literature in general and regarding Thailand in particular on how schooling increases both market and nonmarket productivity,<sup>18</sup> there does not seem to have been much, if any, recognition that increased schooling might have some negative effects on physical capital accumulation *ceteris paribus* by reducing the propensity to save out of current income. Note that this form of wealth is more evenly distributed than are the other forms that we consider, with standard deviations less than 65 percent of the means.

Our third subgroup of wealth indicators refers to entitlements. On a general level, various forms of private and governmental entitlements are wealth in the sense of affecting future income prospects just as are physical, financial and human capital. Our data do not permit a very wide representation of such entitlements. But they do permit the inclusion of one major indicator of entitlements -- whether governmental employment is a major source of income. Governmental employment is an entitlement in that it provides a relatively secure source of future income, pension benefits in an economy in which such benefits are rare, and health insurance for the entire family (including parents of employees) in a society in which health insurance is limited.

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Behrman and Sussangkarn (1990).

<sup>17</sup>So that the order of magnitude of the schooling quality variable is the same as that of the schooling quantity variable, we multiply the quality variable constructed as is described in the text by 100. For an extensive discussion of the advantages and the limitations of such representations of schooling quality, see Behrman and Birdsall (1983).

<sup>18</sup>For example see Cochrane, Leslie and O'Hara (1980, 1982), Colclough (1982), Eisemon (1988), Haddad, Carnoy, Rinaldi and Regel (1990), King and Hill (1991), Mensch, Lentzner, and Preston (1985), Psacharopoulos (1985, 1988), Schultz (1988a, 1989), and World Bank (1980, 1981, 1990, 1991). On Thailand in particular see Kiranandana (1988) and Sussangkarn (1988).

2. Indicators of life-cycle factors: Such factors are represented in our estimates by a polynomial in the age of the man who is the household head. The mean age in the sample is 36.4, with a standard deviation of 8.7. Life-cycle stories lead us to anticipate that savings initially increase with age, reach a maximum during the prime earnings years, and then decline (perhaps to negative values). But such stories do not indicate how the propensity to save out of a given income changes over the life cycle, which is what is of interest for this study. Our prior is ambiguous regarding the impact of age on the propensity to save. Therefore we include age in a quadratic form to allow some flexibility in the estimated effect of age on the propensity to save.<sup>19</sup>

3. Indicators of liquidity constraints: As is discussed in Section 1, liquidity constraints may alter the savings propensities from what they otherwise would have been, although it is not clear a priori that they interact with income or with wealth in their effects. We include two crude indicators of possible constraints on liquidity in our estimates. The first is the local bank deposits per capita as a representation of the development of the local banking system. Our priors on the impact of this variable are ambiguous. If the formal financial market is more developed, then forms in which households can hold their savings are more extensive and the expected returns probably higher, which ceteris paribus would seem to increase the savings propensity through the price effect. However the more developed banking system also implies probable greater access to credit if needed now or in the future, which is like an asset with a negative income or wealth effect if our conjecture is correct. The mean household bank deposit is 29 Baht, or only 0.9 percent of the mean household monthly disposable income, which indicates that on the average the banking system is not very well developed. The standard deviation is 47 Baht, suggesting that there is substantial variation across provinces. The second indicator of liquidity constraints is whether the household receives its income primarily from agriculture since agricultural households are thought to have less access to credit, ceteris paribus, if for no other reason than their relative isolation from provincial centers. However the interpretation of this variable is not that clean because it easily might be representing other effects. For instance, agricultural households have relatively large transitory income components (see Paxson 1989). If saving is

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<sup>19</sup>Collinearity is sufficiently high among the various terms involving age that we are not able to include a cubic in age in the estimates presented below.

relatively high out of transitory income as is usually posited (and is suggested by the simple analysis in Section 1) the agricultural variable might have a positive impact on the savings propensity. In the sample 63 percent of all households receive their income primarily from agriculture.

### Subsection 2.2. Estimates

Our primary interest is in the determinants of savings and whether the average savings propensity is inversely associated with various forms of wealth. Therefore we estimate what we refer to as an extended savings regression, in which the average savings propensity depends on each of the three groups of variables that are discussed in the previous section. The first column of Table 1 gives this regression. By standard statistical tests the extended regression is preferred to a simple one (not presented) in which the marginal propensity to save out of disposable income is constant ( $F = 213.5$ ).

On a priori grounds it seems possible that such a savings function has considerable heteroskedasticity since the variance in savings would seem to be larger in absolute terms for higher income than for lower income households. As is well known, heteroskedasticity does not bias the point estimates, but may bias the estimated standard errors and therefore tests of significance. To explore such a possibility we used the Breusch-Pagan (1979) Chi squared test for heteroskedasticity. The test statistics (given in Table 1) indicate such heteroskedasticity at the 1 percent level in ordinary least squares estimates. Therefore we have followed the Breusch-Pagan procedure to correct the estimated standard errors for heteroskedasticity, which in this case increases the estimated standard errors for the point estimates substantially. Table 1 presents  $t$  statistics based on the corrected estimates.

We summarize these estimates first with respect to the estimated impact of the nonwealth variables on the average propensity to save, and then turn to the estimated effects of the wealth variables.

The savings propensity for the most part is not significantly affected by the last two groups of nonwealth variables discussed in Section 2. Neither the quadratic in the man's age nor that a household's income source primarily is agricultural is significant. The one exception is the bank deposits per household, which have a significantly negative coefficient estimate. The discussion of the



previous section suggests that this may reflect that the added flexibility in times of dissavings presented by a more developed financial system outweighs the greater ease of and possibly higher returns to some forms of saving due to a more developed banking system. The magnitude of the point estimate suggests that an increase in such deposits equal to one standard deviation in the sample implies a drop of -0.089 in the average savings propensity.

The question of primary interest is whether the various forms of wealth lower the average propensity to save. Our results support our conjecture that *ceteris paribus* the average propensity to save out of given disposable income is inversely associated with wealth. Following are the statistically-significant changes in the average propensity to save that are associated with a one standard deviation increase in the variables indicated: housing wealth (-0.055), land (-0.039), own-enterprise primary source of income (-0.096), quality of the man's schooling (-0.120),<sup>20</sup> and governmental employment (-0.051). All five of these significant coefficient estimates, thus, imply that increased wealth reduces the saving propensity out of a given current income level, and in some cases the impact is fairly substantial.<sup>21</sup>

An important part of the reason that we find a strong inverse association between the average propensity to save and a range of indicators of financial, physical, human and entitlement wealth may be the large role of transitory income. For this reason it might seem of additional interest to explore what is the relation between the propensity to save out of permanent income and various indicators of

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<sup>20</sup>The conventional wisdom (though not without exceptions, such as in Behrman and Sussangkarn 1990 in the Thai case) is that the rates of return to schooling for men and women tend to be about the same in terms of labor market productivity, but that the impact of women's schooling is greater than that of men's within the household (e.g., Birdsall 1988; Birdsall and Sabot 1991; Cochrane 1979; Cochrane, Leslie, and O'Hara 1980, 1982; Colclough 1982; Haddad, Carnoy, Rinaldi, and Regel 1990; Haveman and Wolfe 1984; King and Hill 1991; Mensch, Lentzner, and Preston 1985; Michael 1982; Schultz 1988b, 1989; World Bank 1980, 1981, 1990). Our results for the Thai average propensity to save, however, indicate that in this household decision, men's schooling has a significant impact but women's schooling does not.

<sup>21</sup>In addition the significantly negative estimated coefficient of banking deposits per household in the community discussed above is consistent with a more speculative household or community wealth interpretation.

wealth as in the studies that are surveyed in Deaton (1990). But it is not clear how one could undertake such an investigation with cross-sectional data. The most satisfactory way to represent permanent income in such a case would be to use an instrumental variable representation of permanent income as in the studies that are surveyed by Deaton (1990). But the appropriate instruments for such estimates would seem to be precisely all of the indicators of wealth, which -- if used -- means that the conjecture of the impact of such wealth indicators on the average propensity to save could be identified only by not very satisfactory nonlinear functional forms. Therefore we do not undertake such estimates.

Thus our estimates suggest that the answer to the question posed in the title is positive. Yes, more wealth tends to reduce the average propensity to save out of current income on a priori grounds and in the empirical case that we have examined. As Thailand continues to develop and households acquire greater wealth in the form of physical, fiscal, and human capital and greater entitlements to pension and health-care systems, therefore, these estimates suggest that the relatively high marginal propensity to save out of a given level of current household disposable income is likely to decline.<sup>22</sup> Such a decline does not necessarily mean that savings decline with more wealth. The effect of an increase in wealth on savings depends on the impact on income as well as on the impact on the average propensity to save from that income. The latter effect probably tends to be smaller than the former. But the inverse impact of wealth on the average propensity to save offsets part of the effect of wealth on income, and, if ignored, could lead to significant overestimates of the impact of increased current wealth broadly-defined on current savings and thus on future growth, as well as misunderstanding of the role of savings in smoothing consumption.

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<sup>22</sup>This decline due to increased wealth is likely to be reinforced by a decline in the importance of agriculture, though the changing effect of life cycle factors given an increasing proportion of the population in the prime working years may work in the opposite direction during the next several decades. See Mason, Woramontri and Kleinbaum (1987) for support for the latter proposition with regard to total savings, though not explicitly for the propensity to save.

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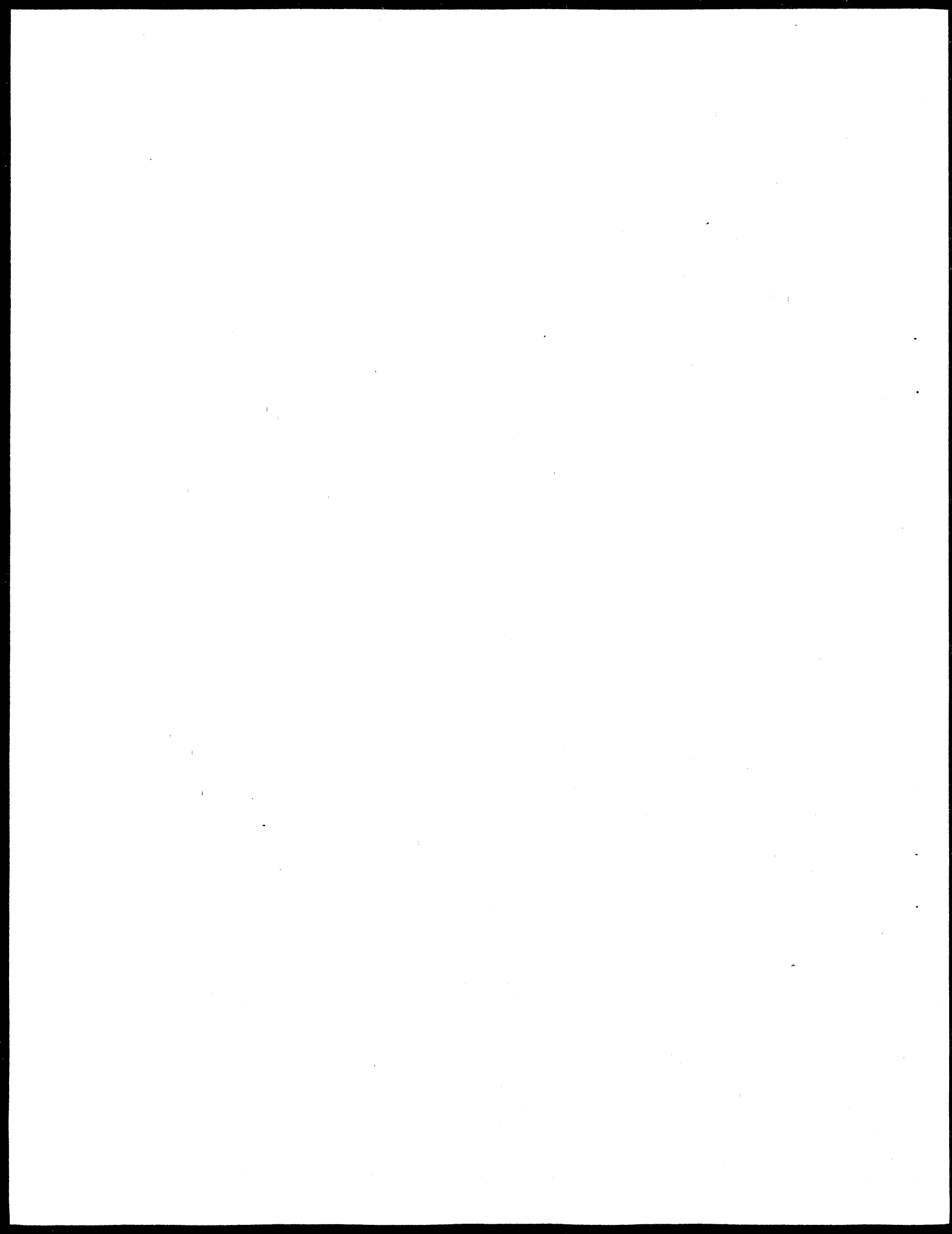
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