

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY <i>Bat 2 39</i>
---	--

1. SUBJECT CLASSIFICATION	A. PRIMARY	TEMPORARY
	B. SECONDARY	

2. TITLE AND SUBTITLE
 The prospects for regional economic cooperation and the rate of household savings in the LDC's

3. AUTHOR(S)
 Kelley, A.C.; Williamson, J.G

4. DOCUMENT DATE 1967	5. NUMBER OF PAGES 32p.	6. ARC NUMBER ARC 338.903.K29
--------------------------	----------------------------	----------------------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS
 WIS.

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publisher, Availability)
 (In Economic Interdependence in Southeast Asia research paper no.15)

9. ABSTRACT

(Economics R & D)

10. CONTROL NUMBER PN-AAC-435	11. PRICE OF DOCUMENT
12. DESCRIPTORS	13. PROJECT NUMBER
	14. CONTRACT NUMBER CSD-355 Res.
	15. TYPE OF DOCUMENT

CSO-355 Rev
PN-AAC-435

THE PROSPECTS FOR REGIONAL ECONOMIC COOPERATION AND
THE RATE OF HOUSEHOLD SAVINGS IN THE LDC'S

by

ALLEN C. KELLEY
and
JEFFREY G. WILLIAMSON

AID-University of Wisconsin
Research Project on
"Economic Interdependence
in Southeast Asia"
Research Paper #15
March 1967

The Prospects for Regional Economic Cooperation and
the Rate of Household Savings in the LDC's

One of the principal obstacles to international economic integration, whether it takes the form of trade expansion, factor market integration, or a combination of the two, is the danger that some members of the union will enjoy, as a result of the integration process, more rapid growth than others. Although disproportionate growth in some cases may be unrelated to integration, countries experiencing relatively low rates of growth will tend to describe their relationship with the more dynamic countries in terms of exploitation. If, as will be argued to be more likely, the process of integration does have certain growth-retarding effects on the relatively backward members of a union, the forces working for dissolution will be provided with even stronger arguments. This section describes very briefly some connections between the origin of forces working against successful integration and the key finding of the present paper regarding household savings.

The theme is a simple one. Differential growth rates arising out of the integration process are based in part on the behavior of factor prices in the face of trade expansion, as well as on the possibility of adverse capital flows resulting from a liberalization of factor movements. Even partial factor price equalization will result in a lower rate of return to capital in those countries which are the relatively capital-poor members of a union. It is reasonable to expect that a lower rate of return in these countries will exert a downward force on the rate of change in the capital stock. If, in addition, trade expansion is coupled with the development of integrated factor markets, and if this latter aspect of

integration gives rise to adverse capital flows, the supply of capital in capital-poor members will be seriously curtailed.

The supply of savings and the demand for investable resources thus become crucial factors in the degree of success experienced by any integration scheme. An inquiry into the determinants of the supply of savings constitutes the subject of the present study, "Household Savings Behavior in the Developing Economies: The Indonesian Case". The results of this paper can be viewed as an intermediate, yet crucial, research input into an examination of the process of economic integration as a whole. A fuller discussion of the theoretical relationship between domestic savings and integration, in addition to relevant policy implications, is provided in a forthcoming study, "Economic Integration: The Role of Inter and Intra National Capital Market Development", by Allen C. Kelley and James C. Knowles. What immediately follows is a brief summary of the main points contained therein.

The possibility that disproportionate growth may be intensified by economic integration arises in part from the relationship between trade expansion and the process of internal capital formation. If, as Paul Samuelson suggests,^{*} a relaxation of trade barriers between countries tends to equalize relative factor prices, there will be a fall in the price of capital in those countries where capital is scarce relative to labor.

Trade expansion in these countries will bring about specialization in the production of labor-intensive goods. This development may, under certain assumptions, have a retarding effect on the growth experienced

* Paul A. Samuelson, "International Trade and the Equalization of Factor Prices", Economic Journal (June, 1948).

by these nations relative to that enjoyed by other members, and may also be at variance with other national objectives such as industrialization. Resistance to economic union on the part of nations placed in this situation would, of course, be understandable.

If economic integration also implies a stimulus to factor mobility, as is the case with the European Economic Community, the tendency towards equalization of factor prices may be even stronger. There is, however, reason to believe that factor movements in Southeast Asia would be contrary to the behavior dictated by traditional integration theory. Due to a variety of causes, including extreme nationalism, low levels of education, and high costs of movement relative to wage differentials, labor migration may be an insignificant component of any cooperation scheme for Southeast Asia. Capital movements, on the other hand, may well be in the theoretically adverse direction of the relatively capital-rich members. Capital may flow to those countries which already enjoy a concentration of capital and technology in order to take advantage of what Hans Schmitt has called, "economies of agglomeration".* Or alternatively, as Kelley and Knowles argue, differences between real rates of return as derived from production functions, and those actually received by owners of capital when appropriately discounted for such factors as risk of confiscation, taxes, and exchange rate fluctuations, may also result in adverse capital movements. A possible conflict thus arises for the capital-poor countries between the gains from engaging in regional groupings (in the form of more efficient production through specialization and economies of scale) and the national constraints of

* Hans O. Schmitt, "The Integration of Capital Markets in Europe: A Step Towards Political Unification," Research Paper #6, International Bank for Reconstruction and Development (University of Wisconsin, 1966).

industrialization, movement toward capital-intensive techniques, and the maintenance of a national growth rate approximately equal to that of the region as a whole.

A key element in confronting this conflict is the ability on the part of capital-poor countries to generate enough capital internally through the mobilization of business, government, and household savings. The manner in which this task can be accomplished is not immediately apparent. With respect to the household sector, the answer lies clearly in identifying the determinants of saving and operating accordingly on these determinants within the context of national policy. If, for example, household savings are determined solely by the differential response of income by source, as between that originating from capital (profits) and that originating from labor (wages) (see [15], [24], [24], [41]), government policy to encourage internal capital formation would influence the distribution of income between capital and labor. On the other hand, if profit making entrepreneurs are the significant savers in society, and landlords, wage-earners, peasants, and salaried middle-classes contribute relatively little, a different mix of policies may be prescribed (see [20], pp. 225-244).

In the study below it is argued on theoretical grounds, and buttressed with empirical results, that the relevant distinction in explaining differential savings behavior may lie in that between the entrepreneur (self-employed) and all other household heads. This distinction is based on the grounds that the entrepreneur (1) manages a depreciating stock of capital, (2) possesses greater knowledge of capital market procedures and can thus take advantage of savings opportunities which are less available to others, (3) may exhibit a preference for internal finance in order to

maintain control over assets, and (4) may face a greater internal rate of return on assets, given capital market imperfections.

The question arises whether there exists a logical sequence or relationship between the rate of internal capital market development and the external capital market integration envisioned by many regional cooperation schemes. Whereas the European countries engaged in an integration experiment after they had each established a visible industrial base and a well-developed internal capital market, neither of these "preconditions" is typically present in the countries of Southeast Asia. If the forces which would tend to operate against successful integration arise largely out of the relationship between free trade and capital flows on the one hand and various national aspirations related to industrialization on the other hand, then a key factor entering into any analysis of a workable Southeast Asian integration scheme is an appreciation of, and a possible influence on, those factors which explain the internal rate of savings in each prospective member country. The study which follows examines this issue in detail.

SUMMARY

This study attempts to identify the determinants of household savings behavior in the Daerah Istimewa Jogjakarta Region of Indonesia. The data consist of a 1959 household survey of 490 families. While several non-linear models are explored, the analysis and findings relate to linear per capita functions. (At one point, experimentation with adult equivalents was undertaken.) The variables considered include income, occupation (farmer, trader and craftsman, owner of business, government employee, other wage earner), degree of asset ownership (farmers who derived varying proportions of their income from owned land), education (grades 1,2,3,4,5,6, 7-9, 10-12, more than 12), location (urban, rural), and age (20-29, ..., 60-69).

Two models of savings behavior are explored. The first examines the influence of source of income and occupation. We conclude that the development hypotheses which stress source of income (e.g., Lewis model) might better be formulated by stressing the ownership of earning assets. This approach was found very useful in interpreting differential savings behavior by income source. Access to an efficient capital market may emerge as a significant element in determining average household savings levels, given household income.

The second model is a straight forward representation of the life-cycle hypothesis. The empirical results, constrained by the relatively small sample size, are somewhat neutral regarding the applicability of life-cycle formulations in Indonesia.

**"Household Savings Behavior in the Developing Economies:
The Indonesian Case"***

Allen C. Kelley

and

Jeffrey G. Williamson

1. Introduction

Econometric research on household expenditure and savings behavior based on micro observations drawn from the less developed countries has lagged far behind the pace set by economists analyzing such behavior in the advanced nations. There has been but limited hypothesis testing in the LDC's beyond macro formulations of the consumption function. Furthermore very little of the development literature attempts to isolate the impact of structural change on aggregate saving, since few studies provide meaningful disaggregation. This state of affairs seems paradoxical given the currency of W.A. Lewis' remark that the central problem of development theory is to explain an increase in saving from 4 to 5 percent of national income to 12 to 15 percent.¹ The profound lack of empirical evidence appears even more peculiar given the prominent role played currently by marginal savings rates in a flourishing crop of growth models. The recent Chenery-Strout (1966) article is just one example [5]; most growth models make saving a function of per capita income, either current or lagged [16] [18] [23] [42] [43] [44] [45]. This approach may yield simple, well-behaved models and reasonably useful short-run forecasts; it offers limited insight, however, into the development process.

*The authors are an assistant professor and an associate professor, respectively, at the University of Wisconsin. During the year 1967-68, Professor Williamson is additionally associated with the University of the Philippines-University of Wisconsin Joint Research Training Project in Quezon City, The Philippines. The present study was both enabled and stimulated by Professor E.D. Hawkins, who originally formulated and collected the Indonesian sample survey and who made it available for research. Professor Hawkins is most gratefully acknowledged. Mr. J. Knowles and Mr. R. Keehn provided both computational assistance and useful substantive comments.

¹W.A. Lewis [28], reprinted in [1], p. 416.

One exception to this generalization² is a contribution by Bruton [18, pp. 239-298] in which the impact of changes in age distribution, family size, education, urbanization, income distribution, and other selected elements in economic structure are treated explicitly. Bruton's valuable theoretical exercise both exposes our ignorance regarding household savings behavior in the LDC and simultaneously suggests the direction in which research should proceed to remedy the situation.

Our lack of knowledge concerning family expenditure and saving behavior can be explained primarily by data constraints prevailing in the developing nations. As a result, the estimation of planning parameters and the pursuit of hypothesis testing has been restricted in large measure to inadequate macro data [8] [12] [45], to international cross-section studies [19] [20] [21], or in extreme cases to borrowed parameters estimated from contemporary North American and European experience. The LDC rarely possesses time series of sufficient length to permit successful and detailed analysis of expenditure and savings. Furthermore, sample survey data which exist are typically presented in grouped form such that successful analysis of all but a few determinants of savings is severely constrained while the original micro observations are usually unavailable. Equally important, statistical agencies in the LDC's normally do not possess the manpower, time, or expertise to submit the wealth of data at their disposal to intensive economic analysis, and for this reason much information is essentially lost.³

The present paper provides an exploratory analysis of savings behavior as described by a sample of households in the Jogjakarta region of Indonesia (1958-1959). We propose to revive and to extend the theory as it relates to the impact of occupation and source of earnings on savings

²There have been a few major empirical studies on household saving in the LDC's. One outstanding set of examples is the Indian research completed by the National Council of Applied Economic Research based on Indian Sample Surveys taken in the 1960's. See [34] [35] [36] [37] and [38]. Consult also the work of Nurul Islam [22].

³This appears to have been the case, for example, with the seventeen separate Philippine Statistical Surveys of Households (PSSH) taken since 1956, [39].

behavior. Selected elements of the model along with life-cycle formulations of saving will be tested on the Indonesian sample. Although we attempt to appraise the usefulness of these hypotheses in the LDC environment, our efforts appear to raise more issues than provide answers. In so doing, however, we hope to demonstrate the usefulness of micro-economic analysis, based on cross-section data, in providing significant insights regarding the relationship of savings behavior to structural change and economic development.⁴

2. Data and Method

The data is a sample survey of 490 families⁵ from the Daerah Istimewa Jogjakarta Region of Indonesia taken in 1959 by the Bureau of Economic Research-Faculty of Economics at Gadjah Mada University. The observations refer to the year from August 1958 to August 1959 and include urban households in the City of Jogjakarta as well as rural families in the Region of Jogjakarta. The Indonesian survey, using the 1954 Ceylon Consumer Finance Study [4] as its model, includes data on income, consumption, savings, source of income and the age, sex, place of birth, education, employment status of the household head, in addition to other selected economic and demographic information [2] [17].

The income variable (Y_i) used in the present paper represents the reported income figure from the survey. Capital gains are excluded. The survey also reported total family consumption (C_i); one can derive, residually, a measure for savings (S_i). The weaknesses in sample survey estimates of savings are well-known and have been discussed extensively in the literature [33]. In the Jogjakarta survey an attempt was made to measure savings directly (S_i^d) from family asset and liability data, but these estimates seemed to us too fragile to be utilized in the present analysis.

An extensive investigation of functional form is not our primary

⁴Cross-section data has recognized inherent limitations, relating primarily to the conflict of time series and cross-section results. The literature on these issues is abundant. Consult, for example, [26] [33].

⁵While the original sample numbered 503, some of the observations were discarded due to problems of data coding.

interest. The typical savings formulation used below is $(S/N)_i = \alpha + \beta (Y/N)_i$ where N = family size. These "per capita" functions belong to the larger family of more general forms where N is introduced explicitly, but the intercorrelation between Y and N clouded the results and the approach was abandoned. Initially, an experiment was performed with five competing hypotheses regarding the consumption-income relationship. The results are given below for the total Jogjakarta sample:

(1)	$(C/N) =$	$107.84 +$ (26.63)	$+ .901(Y/N),$ (.013)	$R^2 = .9133,$ mpc = .901,
(2)	$\log(C/N) =$	$581 +$ (.093)	$+.9162\log(Y/N),$ (.0135)	$R^2 = .9036,$ mpc = .900,
(3)	$(C/N) =$	$-9320.7 +$ (472.0)	$1547.31\log(Y/N),$ (68.6)	$R^2 = .5107,$ mpc = 1.197,
(4)	$(C/Y) =$	$1.070 -$ (.024)	$.000024(Y/N),$ (.000011)	$R^2 = .0095,$ mpc = 1.008,
(5)	$(C/N) =$	$145.17 +$ (33.64)	$.8648(Y/N) + .0000021(Y/N)^2$ (.0236) (.0000018)	$R^2 = .9139,$ mpc = .870.

The linear and double-log forms yield almost identical marginal propensities at the mean income level; neither differs greatly from the quadratic (5). Nevertheless, the second term in the quadratic does not possess a coefficient significantly different from zero at the 90 percent level. Equations (3) and (4) present non-sensical results. In the disaggregated models explored below several non-linear formulations were also pursued. The results, as with the total sample, are generally negative. On the basis of this evidence we have used the relatively simple linear "per capita" form throughout.

3. Source of Income, Occupation, and Savings

The explanation of household savings behavior from models stressing source of income and occupation takes several forms. The simplest of these appears in growth theories associated with the writings of Kaldor, Hahn, Kalecki and Robinson.⁶ Postulating homogeneity of capital and a two factor growth framework, savings is determined solely by the

⁶[15] [24] [25] [41]. For an excellent survey, see [16].

differential response of income by source as between that originating from capital (profits) and that originating from labor (wages). Assuming the propensity to save out of wage earnings is less than that from profits, and in the extreme zero, aggregate savings rates are uniquely determined by the distribution of income. The two factor framework and the homogeneity assumption make these formulations compatible with the Harrod-Domar dynamics, a model which the "classical" savings theories are designed to confront. These models, however, lend limited insight into either the theoretical basis for the proposed savings functions or the process of economic growth and development more broadly conceived.

W.A. Lewis' writings, couched in a somewhat more speculative theoretical vein, and the works of Houthakker, Friend and Kravis, and others, formulated with hypothesis testing as the main focus, provide a more useful approach [11] [20] [21] [26] [28]. Lewis argues that the profit making entrepreneurs are the significant savers in society and that landlords, wage-earners, peasants, and the salaried middle-classes contribute relatively little to savings [20, pp. 225-244]. The latter groups are less thrifty since they have weaker savings motivations (conspicuous consumption for the salaried middle class, unstable income for the peasants, and generally a "spending rather than saving mentality" for the whole group). To make matters worse, the savings of these classes is typically channeled into relatively unproductive investment [29, pp. 226-230]. Lewis offers little empirical support to his hypotheses. Indeed, he notes that in fact "there is very little evidence on savings out of wages, salaries, and peasant incomes" for the underdeveloped economies [29, p. 228]. Lewis does suggest in passing that an important determinant of savings out of these income sources is the availability of savings institutions and an organized capital market, as was apparently the case for Japan.

Houthakker's work has been empirical. Expanding on the classical tradition, he finds the explanation of aggregate personal saving lies in a decomposition of national income. Income recipients behave differently according to the source of that income, quite apart from its size:⁷

⁷[20] [21]. See also the comments by T. Watanabe, [46]. The approach can be found in recent country studies by Gulati [14] and Sturmthal [43].

$$S = \alpha + \beta_1 L + \beta_2 V + \beta_3 D + \beta_4 R + \beta_5 T,$$

where L = compensation of employees,
V = income from unincorporated enterprises,
D = dividends,
R = other property income,
and T = direct taxes on households.

We would normally predict $\beta_i \neq \beta_j$, but we might argue that such differences would disappear if the model explicitly introduced income changes, wealth stocks, age and family size. Houthakker proposes that capital market imperfections may in part justify the formulation.

A somewhat different approach, and the one which is employed here, is to distinguish, at least conceptually, the entrepreneur (self-employed) from all other household heads. The theoretical justification lies in the recognition that for the entrepreneurial group, the firm and the household are no longer separable. For the wage-earning household which offers only its labor services to the factor market, the determination of savings involves, in addition to an allocation between present and future consumption, a decision regarding the maintenance of the existing stock of human capital and the increments in that stock. The self-employed entrepreneur, on the other hand, receives income for labor services, for the use of his non-human earning assets, and for managerial abilities. To the extent that household saving decisions are determined simultaneously with those based on entrepreneurial earning assets, then different consumption behavior compared to other occupational households is to be expected. This distinction becomes all the more important in the LDC where the entrepreneur assumes a far greater role due to the relative size of the agricultural sector and also due to the relative backwardness of the corporate movement in the non-agricultural sector.⁸

⁸Some well-known observations might usefully be reviewed here. To the extent that the entrepreneur is a high income recipient, a test which does not control for occupation will bias upwards the positive association between income size and the saving-income ratio. Furthermore, within the entrepreneurial group the mps may be larger given the greater variability of entrepreneurial income. Thus, samples from rural areas tend to produce steeper savings functions than urban; presumably the same is true for farm as opposed to non-farm and urban entrepreneurs as opposed to wage earners.

The distinctiveness of entrepreneurial saving requires more than an appeal to sociological characteristics and the Puritan ethic.⁹ Klein has reminded us that the entrepreneur may possess a clear preference for his own funds for reinvestment since he may desire to retain control over the firm. Under these conditions not only will the entrepreneur be a high gross saver, maintaining his stock of capital, but also the availability of internally generated income determines his net savings position just as with the corporation [26, pp. 297-335].

Equally important, in the LDC all occupational groups must operate in a world of extremely imperfect capital markets. In this situation, the internal rate of return on investment in the family enterprise can exceed the market rate and thus the high marginal savings rates among entrepreneurs may reflect imperfections in the capital market rather than inherent differences in time preference. Similarly, wage and salary earners may find that outlets for saving (in the form of earning assets) are severely restricted, thus producing low marginal and average savings rates for this class (but possibly a high rate of accumulation of children as future earning assets).

The role of the capital market imperfections in explaining divergent savings behavior by occupation or functional income type is not ignored in modern consumption theories--although ironically, they may be under-emphasized in the development literature.¹⁰ In Friedman's model [10], permanent income represents a discounted stream of expected returns from family assets. Since the discount rate is subjective, Friedman anticipates a sharp divergence between internal rates of return and market rates.¹¹

⁹The argument is sometimes made that the entrepreneurial class is a selective population regarding its attitudes toward uncertainty and risk. For an appraisal and exposition of this thesis, consult the writings of Weber, Troeltsch, and Marx.

¹⁰See, however, Cairncross [3, pp. 125-130].

¹¹Eisner makes much of this in developing an argument for greater equality of income distribution:

"We are hence able to advance a proposition that, because of risk attached to expectations of return to investment in individual human beings, imperfections in capital markets which these in part engender, and externalities of return, ...capitalistic economies are biased in the direction of levels of investment in education which are too low and suboptimum from the point of view of economic growth [7, p.410]".

The Modigliani-Brumberg-Ando life-cycle model lends itself to a similar interpretation [32]. A low rate of return on investment in land, for example, may encourage consumption, conspicuous or otherwise. The landlord, faced with capital market imperfections, may have low savings propensities totally unrelated to social class. Rather than the villain he becomes a victim of imperfect capital markets.

In summary, if the problem is formulated as a comparison of savings propensities of entrepreneurial and all other households, the following predictions can be made. The average, and possibly the marginal, savings rates will be higher for the entrepreneurial group since the entrepreneur (1) manages a depreciating stock of capital, (2) possesses greater knowledge of capital market procedures and thus can take advantage of savings opportunities which are less available to others, (3) may exhibit a preference for internal finance in order to maintain control over assets, and (4) may face a greater internal rate of return on assets, given capital market imperfections. Additionally, the marginal savings rate will be higher for the entrepreneurial group due to greater short-run instability of current income, and thus a divergence between measured and permanent income.

4. Empirical Results

The total sample, numbering 490 households, is initially divided into six relatively homogeneous occupational groups. The occupational classifications, based on the structure of the household's income sources, are the following: (1) farmer, including farm laborers ($N = 296$); (2) traders and craftsmen ($N = 35$); (3) owners of business ($N = 33$); (4) government employees, including policemen and soldiers ($N = 43$); (5) other wage earners ($N = 47$); and (6) unclassified occupations ($N = 56$). The miscellaneous category is excluded from the regression analysis except as it appears in the total sample. The most heterogeneous group are the "farmers", which include farm laborers, those who rent their land and those who own their land. This group is examined in detail below.

The results given in Table 1 relate to a simple postulated linear savings function $(S/N)_{ij} = \alpha_j + \beta_j(Y/N)_{ij}$ where S = household savings, Y = household income excluding capital gains, $Y = S + C$, N = family size, and each variable is reported for an i^{th} household whose head is employed

Table 1
Estimated Parameters of the Savings Function $S/N = \alpha + \beta Y/N$

	α	β	N	R ²	(Y/N)	APS at group mean of (Y/N)	APS at grand mean of (Y/N)	Educ. Index (average years)	Age (average years)
(1) Farmer	- 93.6 (22.5)	.1071 (.0218)	276	.0809	862.3	-.0014	.0346	.729	50.2
(2) Trader and Craftsman	-416.2 (79.5)	.4257 (.0582)	35	.6187	1186.5	.0749	.1035	1.571	47.9
(3) Owner of Business	-321.7 (110.2)	.3077 (.0621)	33	.4423	1289.3	.0582	.0586	.515	46.5
(4) Government Employee	-160.6 (69.8)	.0475 (.0132)	43	.2388	3121.9	-.0039	-.0768	6.512	43.1
(5) Other Wage earner	-173.2 (61.9)	.1111 (.0366)	47	.1699	1433.0	-.0098	-.0230	1.851	45.0
TOTAL	-107.8 (26.6)	.0990 (.0126)	490	.1129	1291.6	.0155	.0155	1.553	49.4

Note: All the estimated coefficients are significant at the 99% level. The group observations will not sum to 490 since the unclassified occupations (N = 56) are excluded.

in the j^{th} occupational class.

The results are consistent with our expectations regarding household saving behavior. The range in the β_j coefficient over these occupational groups is very large. For the total Jogjakarta sample, $\beta = .0990$, so that the marginal propensity to save is approximately 10 percent. This compares favorably with marginal savings ratios computed for households in advanced nations. This result may be due primarily to the heavy weight accorded to the entrepreneurial household in the LDC and the instability of income associated with households in agrarian economies. (See also [10, p. 235].) The wage and salary earners possess mps's equal to or far less than the Jogjakarta average. The government employee, with the highest income in the group, has very low average and marginal savings rates; part of this behavior may be explained by the group's high educational level. It would also appear that the farmer has a marginal savings rate roughly equal to that of the group sample--hardly surprising given the farm group's preponderance in the Jogjakarta survey. The very high marginal savers are the non-farm entrepreneurs--the trader, craftsman and owner of business with β coefficients of .4257 and .3077, respectively.

Although our interest is primarily in the slope of the saving function, dictated in part by the known weaknesses of savings data as estimated from household surveys, an attempt was made to examine the relative importance of income levels in influencing average savings rates by occupation. Income per family member ranges widely between the farm group, which has an average income at 67 percent of the Jogjakarta average, and the highly educated government employee, whose income is approximately two and a half times the average.

Not surprisingly, the average savings ratio for the entire Jogjakarta sample is only 1.6 percent, but again the range between occupational groups is large. The farmer, government employee and urban wage earner are all negative savers while the trader-craftsmen and owner of business have average savings ratios of 7.5 and 5.8 percent, respectively. These results obtain at the mean income of each group. If we use the total sample mean income of 1,291.6 throughout, then we shall have effectively standardized for the divergence between group mean income levels. The standardization procedure produces only two significant changes: the

farmer becomes a net saver (+.0346), and the government employee becomes an even higher negative saver (-.0768).¹²

As noted above, the farm class is especially heterogeneous (perhaps explaining why the postulated saving function in fact leaves 92 percent of the variation in S/N unexplained). There is considerable variation within this group regarding the amount of income derived from owned land. Since our interest is in isolating source of income effects (as an index of control over productive assets), rather than occupational effects, as a second experiment we have stratified the farm group by share of income derived from owned land. The household, then, is to varying degrees a producer of real goods and services beyond that of merely offering its labor services--it is in varying degrees an owner and/or manager of capital assets.

Following the argument presented above, for a given level of income we expect both the marginal and average savings ratio to increase with the degree of land or asset ownership. Other attributes which affect saving and which may be correlated with degree of landownership, for example, age and education, are for the present excluded from the regressions.¹³ The first regression results were disappointing and are not reported in Table 2. The farm sector was divided into ten subsamples (0-10, 11-19, ..., 91-100 percent of income from owned land). Due to the resulting small sample sizes, the coefficients were insignificant in six out of ten cases. Nevertheless, the marginal savings rates vary between .106 and .377 while that of the whole sample is .107. Table 2 presents the regression results which overcome our problem with degrees of freedom. Cumulative subsamples are utilized, beginning with the total farm category (with zero percent or greater of the income from owned land) and concluding with those who derived 91 percent or more of their income from owned land.

¹²We fully appreciate the problems associated with savings estimates derived from sample surveys and the biases associated with income levels and sources. Having said as much in Section 2, we make no further apologies.

¹³Preliminary tests indicated that lack of variation in education (79% of farmers are illiterate) and small sample size both precluded a satisfactory identification of this variable's influence on savings. Age is treated separately in the next Section.

Table 2
Parameters of the Savings Function: $S/N = \alpha + \beta Y/N$

Farmers (% of Y from owned land)	α	β	N	R^2	Y/N	APS at group mean Y/N	APS at grand mean Y/N	Educ. Index	Age
(1) Total Farm Sample	- 93.6 (22.5)	.1071 (.0218)	276	.0809	862.3	-.0014	-.0014	.729	50.2
(2) Greater than 11%	- 96.3 (24.0)	.1122 (.0232)	253	.0856	864.7	.0008	.0005	.729	49.0
(3) Greater than 21%	- 96.4 (24.7)	.1124 (.0237)	244	.0851	866.5	.0011	.0006	.733	49.0
(4) Greater than 31%	-102.0 (26.3)	.1202 (.0249)	223	.0956	875.4	.0037	.0037	.740	51.1
(5) Greater than 41%	-118.2 (28.5)	.1416 (.0272)	203	.1189	870.0	.0054	.0045	.749	51.5
(6) Greater than 51%	-120.0 (30.2)	.1450 (.0285)	189	.1224	876.1	.0088	.0066	.730	52.0
(7) Greater than 61%	-116.3 (32.5)	.1433 (.0303)	168	.1185	882.2	.0115	.0084	.738	52.1
(8) Greater than 71%	- 84.6 (28.1)	.1152 (.0202)	134	.1383	926.0	.0238	.0171	.800	51.7
(9) Greater than 81%	- 88.8* (33.7)	.1223 (.0285)	108	.1486	973.0	.0310	.0193	.870	51.3
(10) Greater than 91%	-106.8* (51.4)	.1057 (.0405)	66	.0957	1045.1	.0035	-.0182	1.167	52.3

Note: All the estimated coefficients are significant at the 99% level with the exception of those marked with (*).
The latter are significant at the 95% level.

Several general observations relating to the results of Table 2 might be instructive. First, disaggregating the farm sample increases the proportion of variance in (S/N) explained. Second, income per family member exhibits considerable variation--from 862.3 to 1,045.1--and, as expected, the correlation is positive as between income and degree of landownership. Third, there is a direct association between educational attainment of household head and degree of landownership: this seems especially true as among the four highest land-ownership groups.

The detailed regression results generally confirm our expectations since both the marginal and average savings rates increase with increasing degrees of landownership.¹⁴ An exception appears in the highest three classes where the β coefficients trail off sharply. Part of the problem may lie with the variation in education, since average educational attainment increases in this range. A higher education should increase expected future incomes, stimulate present consumption, and depress actual savings. It should be noted, however, that the ability to engage in a life-cycle consumption plan may be constrained in part by the capital market imperfections. The applicability of either the permanent income hypothesis or the life-cycle formulations, and thus the actual significance of asset variables (including education), may be systematically related to financial and economic development.

5. The Life-Cycle Hypothesis and Savings

The literature on the so-called life-cycle hypothesis examines many forms of age-specific relationships affecting human behavior [9] [13, pp. 49-174] [27, pp. 388-436] [30] [31] [32]. Our present interest focuses on the life-cycle as it pertains to household savings and consumption in the LDC. There has been little attempt to apply the life-cycle savings

¹⁴This may, of course, be due to nonlinearities in the "true" savings function, but the income range between the ten classes does not appear large enough to support that view. With respect both to the occupational results above, and to the stratification of the farm sector, three non-linear formulations were examined:

$$S/N = \alpha + (Y/N)^2, \quad S/N = \alpha + \beta (Y/N) + \gamma(Y/N)^2, \quad \text{and} \quad C/N = \alpha + \beta \log(Y/N).$$

Typically, the first two yielded insignificant results and the third an occasional negative marginal savings rate.

(continued on next page)

formulation in a situation of uncertainty regarding earning life and life span, and in an environment of extended family systems where children become the means to accumulate future productive earning assets which satisfy the income requirements at retirement. We begin with the most well-known contributions to the life-cycle theory of consumption and savings, the Modigliani-Brumberg-Ando formulation, and attempt to confront it with Indonesian data.

The basic economic problem in the M-B-A framework is the maximization of utility over time. The household's decision is to establish the total value of consumption in each period. Under the usual simplifying assumptions,¹⁶ the individual's consumption at age t becomes $C_t = V_t/L_t$, where $L_t = L - t + 1$ is the remaining lifetime, and V_t is the sum of current income (Y_t), average expected incomes (Y_t^e), and assets held at the beginning of the current year (a_t). In this model assets are set aside as part of the life plan to finance retirement. (Under the extended family system, this motivation may be greatly reduced, perhaps limiting the model's applicability.)

To test adequately the life-cycle formulation on the Indonesian data, it would have been desirable to control for selected determinants of consumption, particularly those which are correlates of age, for example, location, asset stock, and education, but sample size constrained such a

(14, continued)

It does seem likely that the range in group β 's can be explained by an appeal to unequal degrees of instability in family income within each group. That aspect of the problem in comparing marginal saving rates across occupational groups is not present here although it was present in our previous "occupational" tests.

¹⁵The assumptions include 1) constant prices and interest rates, 2) no inheritances or bequests, and 3) the postulate that the share of the individual's total resources devoted to consumption in any period is a function of tastes, and is invariant to the size of his resources. The first condition is satisfied when the hypothesis is tested with cross-section data. More restrictive assumptions include 1) zero interest rates, and 2) a plan whereby the individual consumes a fixed proportion of his anticipated lifetime resources. See, for example, Fisher [9, pp. 218-220].

procedure.¹⁷ We have divided the sample into its rural and urban components since, among other things, the prevalence of the extended family system should exhibit its greatest variation as between these classifications. Tables 3, 4, and 5 present selected mean statistics relating to the age classes: number of households, income (\bar{Y}), savings (\bar{S}), family size (\bar{N}), income per family member (\bar{Y}/\bar{N}), the savings ratio (\bar{S}/\bar{Y}), and years of education of the household head (\bar{E}). Unfortunately the data is in a form allowing only for five age classes: 20-29, 30-39, 40-49, 50-59, and 60-69. Thus considerable variation in the age variable will be attenuated through implicit smoothing.

Most cross-section data from the developed European and North American nations show average family income following a roughly parabolic path over the earning span, rising sharply to a peak in the 35-54 age range and declining moderately thereafter. Family size follows the same pattern but with a more pronounced peak at age 35-44 and a sharp decline thereafter as children establish independent households [6, p. 28]. The resultant average income per member reaches a low at age 35-44, rising markedly thereafter. Tables 3 - 5 suggest similar patterns in the Jogjakarta region but not without some unique variation. The rural sector exhibits less variation in \bar{Y} over the life cycle as compared to the urban sector. This may in part be explained by the greater scope for skill acquisition over time in the urban sector, while in rural activities, declining productivity of the head in late ages may be offset by increasing

¹⁷ In an attempt to control for the influence of education, yet conserve on degrees of freedom, the following model is representative of over fifty formulations which were examined.

$$S/N = \alpha_1 + \beta_1(Y/N) + \alpha_2 A_2 + \beta_2(Y/N)A_2 + \alpha_3 A_3 + \beta_3(Y/N)A_3 + \alpha_4 A_4 + \beta_4(Y/N)A_4 + \alpha_5 A_5 + \beta_5(Y/N)A_5 + \gamma_1 E_1 + \delta_1(Y/N)E_1 + \gamma_2 E_2 + \delta_2(Y/N)E_2 + \gamma_3 E_3 + \delta_3(Y/N)E_3.$$

S/N = per capita savings; Y/N = per capita income; A_1, \dots, A_4 = binary dummies for the age cohorts 30-39, ..., 60-69, respectively; and E_1, \dots, E_3 = binary dummies for educational categories 1-3 years, 4-6 years, and seven or more years, respectively. The illiterate category and the 20-29 age cohort are represented by the estimated parameters for α_1 and β_1 . For the urban sample, fourteen out of the sixteen estimated parameters were insignificant at the 90% confidence level. While the rural estimates were somewhat better (nine out of the sixteen were significant), the marginal savings rates were negative in several instances.

Table 3

Urban	No. obs.	\bar{Y}	\bar{S}	\bar{N}	\bar{Y}/\bar{N}	\bar{S}/\bar{Y}	\bar{E}
20-29	15	8201	-290	2.33	3520	-.035	9.60
30-39	25	9586	- 55	5.00	1917	-.006	5.52
40-49	15	11366	- 34	5.33	2132	-.003	4.60
50-59	11	4853	- 73	2.64	1838	-.015	1.27
60-69	15	4558	+ 19	2.60	1753	+.004	.87
TOTAL	81	8085	- 83	3.80	2128	-.010	4.67

Table 4

Rural	No. Obs.	\bar{Y}	\bar{S}	\bar{N}	\bar{Y}/\bar{N}	\bar{S}/\bar{Y}	\bar{E}
20-29	17	3655	- 16	3.41	1072	-.004	2.29
30-39	75	4301	+123	4.77	902	+.029	1.73
40-49	127	4278	- 61	5.01	854	-.014	.91
50-59	81	4727	+267	5.01	944	+.056	.36
60-69	55	3854	+ 80	4.33	890	+.021	.35
TOTAL	355	4290	+ 77	4.78	897	+.018	.94

Table 5

Total	No. Obs.	\bar{Y}	\bar{S}	\bar{N}	\bar{Y}/\bar{N}	\bar{S}/\bar{Y}	\bar{E}
20-29	32	5786	-144	2.91	1988	-.025	5.72
30-39	100	5622	+ 78	4.83	1163	+.014	2.68
40-49	142	5026	- 12	5.04	997	-.002	1.30
50-59	92	4742	+ 23	4.73	1003	+.005	.47
60-69	70	4005	+ 67	3.96	1011	+.017	.46
TOTAL	436	4995	+ 19	4.60	1086	+.004	1.63

labor participation rates of children. Additionally education, which is age specific, may have contributed to the difference of urban and rural family income patterns. In any case, the peculiar behavior of the total sample, with \bar{Y} declining throughout all age classes, indicates the relative youth of the urban population (the urban sample has a declining weight over age groups in the total sample) and the necessity of breaking up the sample in pursuit of life-cycle tests.

It would appear that \bar{N} peaks later in the Jogjakarta region than is typically the case for developed nations; in the urban sample \bar{N} peaks in the 40-49 age range while in the rural sample the peak occurs in the 40-59 range, all of which is consistent with our knowledge of the extended family system. Thus, the farm producing unit offers children greater employment opportunities than does the urban wage earner's household.

Income per family member in the total and rural sample generally follows the predicted inverse pattern with a low reached at age 40-49. The urban sample exhibits a somewhat different behavior.

On the basis of the life-cycle patterns in family size and income in the typical developed nation, the "naive" life cycle model would predict high average savings rates in the age groups 45-64 and low savings in the age groups 25-44 and at retirement. An application of this model to the Indonesian experience reveals somewhat different predictions of savings behavior. We follow Modigliani and Ando [31, pp. 105-108] by assuming constant per capita consumption over the life cycle. This is taken as an average over households of all age groups: for the total sample, average per capita consumption is 1,082; for the urban sample, 2,106; and for the rural sample 881. The test of the model rests not in total savings levels, nor average savings ratios, but in the variation of S/Y over age groups. Multiplying the per capita consumption figures by each age classes' average family size, we can predict consumption, \hat{C}_1 , savings, \hat{S}_1 , and the average propensity to save, \hat{S}_1/\bar{Y} . These figures are given in Table 6. The estimates for \hat{S}_2 and \hat{S}_3 attempt to control, however crudely, for the "equivalent adults" problem [9, p. 224] [31, pp. 106-108]. The "cost" to a household of a given family size is assumed to be proportional to $[1 + \alpha(N - 1)]$, where all members beyond the first have a constant marginal cost. The estimates \hat{S}_1 assume $\alpha = 1$, while those

Table 6

Actual Savings per Household (\bar{S}), Households Savings Predicted by the Naive Life-Cycle Model ($\hat{S}_1, \hat{S}_2, \hat{S}_3$), and Household Savings Predicted from $S/N = \alpha + \beta Y/N$, (\hat{S}_4).

	\bar{S}	\hat{S}_1 ($\alpha=1$)	\hat{S}_2 ($\alpha=.75$)	\hat{S}_3 ($\alpha=.50$)	\hat{S}_4
<u>Total</u>					
20-29	-144	-2637	+2518	+2303	+259.0
30-39	+ 78	- 396	+ 417	+ 433	+ 35.3
40-49	- 12	- 427	- 394	- 341	- 45.9
50-59	+ 23	- 376	- 369	- 358	- 40.2
60-69	+ 67	+ 283	- 326	- 402	- 30.5
<u>Rural</u>					
20-29	- 16	+ 651	+ 989	+ 797	
30-39	+123	+ 99	- 56	+ 44	
40-49	- 61	- 136	- 143	- 125	
50-59	+267	+ 313	+ 558	+ 543	
60-69	+ 80	- 39	+ 322	+ 238	
<u>Urban</u>					
20-29	-290	+3294	+3039	+2633	
30-39	- 55	- 944	- 738	- 416	
40-49	- 34	+ 141	+ 369	+ 797	
50-59	- 73	- 707	- 903	-1215	
60-69	+ 19	- 918	-1120	-1443	

for \hat{S}_2 and \hat{S}_3 assume $\alpha = .75$ and $\alpha = .50$, respectively.¹⁹

The savings estimates generated by the naive life-cycle formulation suggest a number of tentative observations regarding the applicability of the model to the LDC environment. (1) The variation in average age-specific household savings predicted by the naive model is far greater than in the actual mean savings levels. This places in doubt the assumption regarding constant consumption per family member over the life cycle. Indeed, it tends to contradict the emphasis placed on the retirement motive at least for the LDC environment. (2) Varying assumptions regarding the "adult equivalence" measure have little impact upon life-cycle savings behavior. (3) The predictions of savings for the 20-29 age group are especially poor. (4) Excluding the 20-29 age group, however, the model would appear to identify age-specific variations (not levels) in savings fairly well for rural households and very badly for the urban households, just the reverse of our expectations. But clearly at this point we are plagued by the confines of a small sample size, and by our inability to control for education and its important impact on expected future income and thus on present consumption by age. (5) The overall savings function predicts saving levels by age group about as well as the life-cycle formulation. \hat{S}_4 in Table 4 is derived from:

$$S/N = -107.8 + .0090Y/N(26.6)(.0126)$$

which was estimated from the full sample.

An initial interpretation might be that the evidence appears to cast some doubt on the applicability of the life-cycle hypothesis of savings to the LDC household. On the one hand, even given its highly restrictive assumptions, the "naive" model has survived very well the tests of micro data drawn from the developed nations, and very often the data has not been further stratified by occupation, education and other attributes which might be systematically related to age.

On the other hand, a more detailed examination of the attributes of these age groups in the Jogjakarta sample suggests that the test of the life-cycle model is far more difficult to perform for the LDC. Literacy

¹⁸A very interesting attempt to identify quantitatively the nature of adult equivalents is that of Prais [40].

rates and levels of investment in human beings have increased dramatically in the post World War II period. The LDC's and the Jogjakarta region of Indonesia are no exception. Tables 3, 4 and 5 present data on the educational attainment by age class, both in urban and rural areas. The range within the rural sample is quite small although the positive correlation between age and education is clear. The urban sample exhibits the most dramatic effects of age on education, perhaps suggesting why our tests of the life-cycle model were least satisfactory for that group. In the youngest class, aged 20-29, the average period of formal schooling is in excess of 9 years. The level drops sharply to 5.5 years in cohort 30-39, declining to 4.6 in the subsequent age group. A dramatic fall to 1.3 years for those aged 50-59 follows, and a level close to illiteracy is found in the oldest age group.

The evidence on investment in human capital is at odds without implicit assumption that actual current income and expected income are closely related. In terms of the urban sample, the discounted expected future income stream would far exceed that based upon current income experience for the 20-29 age group. An adequate control on education would presumably revise upwards our predicted family consumption figures for this young age group thus bringing predicted savings levels into line with actual savings behavior of that cohort. For those aged 30-39 and 40-49, much less divergence is to be expected since the educational levels are close to the urban mean, and the number of years of expected return on the investment in education is less. In summary, this added evidence on investment in human capital offers one powerful explanation for the life-cycle model's gross overprediction of savings in young age groups. It also suggests the great necessity for analysis of large samples drawn from the LDC in order to explore adequately the impact of age and education on family savings decisions.

Our final step was to estimate savings functions using the cross-section data within age groups. Because of the small size of the urban sample within age groups, we only attempted to estimate age-specific savings functions for the total and rural sample. Modigliani and Ando have pointed out that predictions relating to age-specific marginal propensities are very difficult given the complexity of the life-cycle

hypothesis [31, pp. 111-119]. Nevertheless, the model predicts a rise in the mps as the household grows older since current and prospective income from employment declines as a share of total resources. This prediction is consistent with the Indonesian sample since income per family member declines up to the age group 40-49 and stabilizes or rises only slightly thereafter.

Table 7 presents the estimated coefficients from the savings function $(S/N)_{ij} = \alpha_j + \beta_j(Y/N)_{ij}$ where $(S/N)_{ij}$ is savings per family member for the i^{th} family in the j^{th} age class and $(Y/N)_{ij}$ is the income per family member. The results indicate not only a great variation in the marginal propensity to save over age groups, but also a confirmation of this aspect of the life cycle hypothesis. With the exception of the insignificant results in the 40-49 cohort, the marginal propensity to save does indeed increase as households age. Furthermore, the rate of increase is quite sharp. In the rural sample β rises from .133 for the youngest group to .759 at or near retirement (age 60-69). Presumably, the complications of intercorrelation which education presents in comparing average group savings behavior are far less prevalent within each group.

Table 7

Age	Total				Rural			
	N	α	β	R ²	N	α	β	R ²
20-29	32	-197.9 (99.0)	.046 (.018)	.178	17	-146.0 (43.6)	.133 (.032)	.528
30-39	100	-59.1 (38.0)	.065 (.019)	.101	75	-247.5 (47.0)	.302 (.043)	.399
40-49	142	-6.6* (18.5)	-.005* (.014)	.001	127	-3.0* (19.1)	-.008* (.016)	.002
50-59	92	-249.9 (54.3)	.277 (.040)	.350	81	-318.8 (50.8)	.389 (.041)	.536
60-69	70	-676.8 (115.9)	.599 (.061)	.583	55	-752.4 (111.5)	.759 (.063)	.734

Note: An asterisk (*) indicates parameters which are insignificantly different from zero at the 90% level.

6. Conclusion

The implications of our findings relating to the relationship of household savings, source of income, and age are numerous. First, since both the age structure and the composition of income by source are changing systematically as development proceeds, the availability of internal financing will exhibit a response in size and direction according, in part, to the household savings patterns identified above. Secondly, if our hypotheses explaining the divergent savings behavior by income source are correct, especially those relating to the nature and significance of the capital market, then continued government attention to the development of a more sophisticated financial structure (together with the favored industrial activities) would seem warranted. Third, while the impact of education on consumption and savings is complicated, our results suggest that a precise identification of both the causation and its magnitude can be important in appraising the social rate of return on human capital formation. Fourth, and possibly most important, the empirical findings suggest that much could be learned from a similar investigation of larger micro samples where modern models of household savings could more adequately be put to test in the LDC environment. The returns in the form of increasing understanding of both consumer behavior and the process of economic growth and development would appear very large indeed.

REFERENCES

- [1] A.N. Agarwala and S.P. Singh (eds.) The Economics of Underdevelopment (New York: Oxford University Press, 1963).
- [2] Bureau of Economic Research, Consumer Finance Survey in the D.I.J. (Gadjah Mada University, Faculty of Economics, mimeo, 1959).
- [3] A.K. Cairncross, Factors in Economic Development (New York: Praeger, 1962).
- [4] Central Bank of Ceylon, Department of Economic Research, Survey of Ceylon's Consumer Finances (Colombo, 1954).
- [5] H.P. Chenery and A.M. Strout, "Foreign Assistance and Economic Development," American Economic Review (September 1966, 56), pp. 679-733.
- [6] Lincoln H. Clark (ed.), Consumer Behavior, Vol. II (New York: New York University Press, 1955).
- [7] R. Eisner, "Income Distribution, Investment and Growth," Indian Economic Journal (April-June 1964, 11), pp. 400-412).
- [8] J.C.H. Fei and D.S. Paauw, "Foreign Assistance and Self-Help: A Reappraisal of Development Finance," Review of Economics and Statistics (August 1965, 47), pp. 251-267.
- [9] M.R. Fisher, "Exploration in Savings Behavior," Bulletin of the Oxford University Institute of Statistics (August 1956), pp. 201-277.
- [10] M. Friedman, A Theory of the Consumption Function (Princeton: National Bureau of Economic Research, 1957).
- [11] I. Friend and I.B. Kravis, "Entrepreneurial Income, Saving and Investment," American Economic Review (June 1957, 47), pp. 269-301.
- [12] I. Friend and P. Taubman, "The Aggregate Propensity to Save: Some Concepts and their Application to International Data," Review of Economics and Statistics (May 1966, 43), pp. 113-123.
- [13] I. Friend and R. Jones (eds.), Proceedings of the Conference on Consumption and Saving, Vol. 2 (Philadelphia, 1960).
- [14] I.S. Gulati, "Household Saving and Income Distribution: An Interpretation of the Indian Case," Indian Economic Journal (July-September 1963, 11), pp. 29-36.
- [15] H. Hahn, "The Share of Wages in the National Income," Oxford Economic Papers (June 1951, 31), pp. 147-157.
- [16] F.H. Hahn and R.C.O. Matthews, "The Theory of Economic Growth: A Survey," Economic Journal (December 1964, 71), pp. 779-902.

- [17] B.D. Hawkins, Consumer Finances in the Region of Jogjakarta: A Preliminary Report (Jogjakarta: mimeo, 1960).
- [18] B.F. Hoselitz (ed.), Theories of Economic Growth (New York: Macmillan, 1960).
- [19] H.S. Houthakker, "An International Comparison of Household Expenditure Patterns, Commemorating the Centenary of Engel's Law," Econometrica (October 1957, 25), pp. 532-551.
- [20] H.S. Houthakker, "An International Comparison of Personal Saving," Proceedings of the 32nd Session of the International Statistical Institute (1961), pp. 55-69.
- [21] H.S. Houthakker, "On Some Determinants of Saving in Developed and Underdeveloped Countries," Memorandum No. 20 (Stanford: Research Center in Economic Growth, mimeo, July, 1962).
- [22] Nurul Islam, Studies in Consumer Demand (Karachi: Oxford University Press, 1965), Volume I and II.
- [23] Institute of Asian Economic Affairs, Long-Term Economic Projections for the Developing Asian Countries 1961-1970 (Tokyo, 1964).
- [24] N. Kaldor, "Alternative Theories of Distribution," Review of Economic Studies (April 1956, 23), pp. 83-100.
- [25] M. Kalecki, Essays in the Theory of Economic Fluctuations (London: Allen and Unwin, 1939).
- [26] L. Klein, "Entrepreneurial Saving," Proceedings of the Conference on Consumption and Saving, Vol. II, pp. 297-335.
- [27] K. Kurihara (ed.), Post-Keynesian Economics (New Brunswick: 1954).
- [28] W.A. Lewis, "Economic Development With Unlimited Supplies of Labour," The Manchester School (May 1954), pp. 139-191.
- [29] H.F. Lydall, "The Life Cycle in Income, Saving and Asset Ownership," Econometrica (April 1955, 23), pp. 131-150.
- [30] F. Modigliani and A. Ando, "Tests of the Life-Cycle Hypothesis of Savings," Bulletin of the Oxford University Institute of Statistics (May 1957, 19), pp. 99-124.
- [31] F. Modigliani and A. Ando, "The Life-Cycle Hypothesis of Saving," American Economic Review (March 1963, 53), pp. 55-84.
- [32] Eva Mueller and I.R.K. Sarma, "Pattern of Income Distribution in an Underdeveloped Economy: A Case Study of India: Comment," American Economic Review (December 1965, 55), pp. 1173-1178.

- [33] National Council of Applied Economic Research, Contractural Saving in Urban India (New Delhi, July 1962).
- [34] National Council of Applied Economic Research, Delhi Saving Survey (New Delhi, 1960).
- [35] National Council of Applied Economic Research, Measurement and Analysis of Saving (New Delhi, 1962).
- [36] National Council of Applied Economic Research, Saving in India (New Delhi, 1965).
- [37] National Council of Applied Economic Research, Urban Income and Saving (New Delhi, 1962).
- [38] Philippine Bureau of the Census and Statistics, The Philippine Statistical Survey of Households (Manila, numbers 1-16, 1956-1965).
- [39] S.J. Prais, "The Estimation of Equivalent-Adult Scales from Family Budgets," Economic Journal (December 1953, 63), pp. 791-810.
- [40] J. Robinson, The Accumulation of Capital (London: Macmillan, 1956).
- [41] P.N. Rosenstein-Rodan, "International Aid for Underdeveloped Countries," Review of Economics and Statistics (May 1961, 43), pp. 107-138.
- [42] A. Sturmhthal, "Economic Development, Income Distribution and Capital Formation in Mexico," Journal of Political Economy (June 1955, 63), pp. 183-201.
- [43] United Nations, Problems of Long-term Economic Projections with Special Reference to Economic Planning in Asia and the Far East, Development Programming Techniques Series No. 3 (New York, 1963).
- [44] United Nations, ECAFE, Projections for Selected ECAFE Countries, 1961-1980 (New York, 1965).
- [45] United Nations, ECAFE, Review of Long-term Economic Projections for Selected Countries in the ECAFE Region, Development Programming Techniques Series, No. 5 (Bangkok, 1964).