HOMES

No. 3a

Domestic Resource Mobilization: Analysis of Thai Survey Data

Andrew Mason
Varai Woramontri
Robert M. Kleinbaum

November 1987

EAST-WEST POPULATION INSTITUTE
EAST-WEST CENTER HONOLULU, HAWAII

HOMES Research Reports are circulated to inform planners and researchers about research findings and training materials from the Household Model for Economic and Social Studies developed at the East-West Population Institute. The primary purpose of the HOMES project is to expand the scope and improve the quality of demographic information available for development planning and the formulation of economic and social policy by providing projections of the number and demographic characteristics of households. In addition, modules have been developed to forecast economic changes in the household sector, for example in the composition of consumer expenditures, labor supply, and aggregate household saving. The HOMES project has been supported by the U.S. Agency for International Development, the Asian Development Bank, and the General Motors Research Laboratories. Their support is gratefully acknowledged. A list of other HOMES publications is included with this report. For further information about HOMES please contact: Andrew Mason, East-West Population Institute, East-West Center, Honolulu, Hawaii 96848.

HOMES Research Report

No. 3a

Domestic Resource Mobilization: Analysis of Thai Survey Data

Andrew Mason
Varai Woramontri
Robert M. Kleinbaum

November 1987

East-West Population Institute
East-West Center
1777 East-West Road
Honolulu, Hawaii 96848

This report was prepared in cooperation with the National Economic and Social Development Board and the National Statistical Office of Thailand as part of the Asian Development Bank technical assistance project Economic and Demographic Forecasting for the Kingdom of Thailand.

EXECUTIVE SUMMARY

A recent study by the Asian Development Bank (Abbot, 1984) concludes that "Asian developing countries . . . will have to raise their national saving rates . . . to provide the basis for self-sustained growth and development." Yet, the saving ratio in Thailand has fallen rapidly during the last decade. By 1985 national saving as a percent of net national product was nearly as low as at any point during the last thirty-five years, clearly endangering the successful pace of economic growth achieved over the last two decades.

This report addresses long-run prospects for household saving, which accounted for about ninety percent of total saving during the last five years. Based on analysis of the 1981 Socio-Economic Survey of Thailand, the principal issue addressed is whether or not the recent decline in saving reflects basic shifts in the underlying determinants of the long-run rate of saving.

Analysis of saving patterns shows that the major shifts in Thailand's demographic character, particularly a decline in the number of children per household, are consistent with moderately rising household saving forecast to continue until the end of this century. Household saving as a percent of disposable household income is forecast to rise from 13 percent in 1980 to 14 percent in 2000.

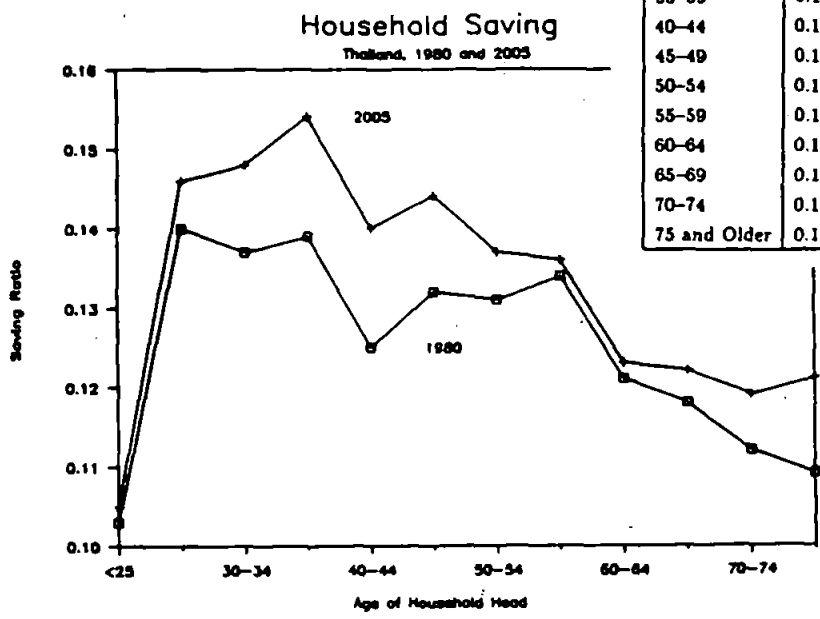
Year	Saving Ratio
1980	0.130
1985	0.132
1990	0.135
1995	0.137
2000	0.139
2005	0.140
2010	0.140
2015	0.140

These results suggest that the recent decline in household saving is a short-run phenomenon related to temporary economic conditions and that some recovery to levels above those forecast in this report might be anticipated.

A second issue addressed by this report is the extent to which households are providing for their financial security by saving. Forecasts of saving rates show that households at every stage of their life cycle should be saving more in the future than they do today. Most importantly, saving rates at the prime earning ages are forecast to increase the most. Thus, even though Thailand's elderly of the future will have fewer children upon whom they can

rely, they should have more financial resources to see them through their retirement years.

Age of Head	1980	2005
Less than 25	0.103	0.105
25–29	0.140	0.146
30–34	0.137	0.148
35–39	0.139	0.154
40–44	0.125	0.140
45–49	0.132	0.144
50–54	0.131	0.137
55–59	0.134	0.136
60–64	0.121	0.123
65–69	0.118	0.122
70–74	0.112	0.119
75 and Older	0.109	0.121



Detailed analyses of subgroups of the population show that the forecast increase in saving is probably on the conservative side. Saving in the "modern" sectors of the economy is more sensitive to underlying demographic change than is saving in more traditional sectors of the economy. Thus, as Thailand's economy becomes more industrialized and educational attainment increases, household saving should reach higher levels.

The procedures used in this report have not been employed in previous studies of Thailand or any other country. Because of their innovative nature, the conclusions must remain tentative. Further research, particularly analysis of the 1986 Socio-Economic Survey of Thailand, is required to confirm the results of this study.

INTRODUCTION

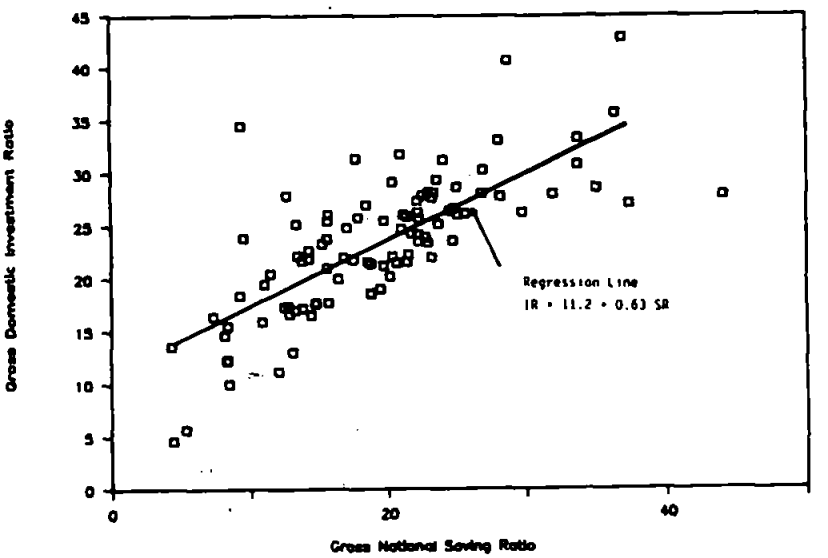
Investment in new plants and equipment, the development of improved infrastructure, and many other key components of developing country efforts to achieve higher standards of living require large amounts of investable funds. These funds can, in principle, come from a variety of sources. Households, businesses, and the government share responsibility for mobilizing domestic resources and multi-national corporations, foreign financial institutions, and multilateral and bilateral lending and development institutions inject foreign resources.

In a few countries foreign funds have played an important role, but domestic saving is far and away the most important source of investable funds. Among the non-industrialized countries, gross national saving averaged 79 percent of gross domestic investment between 1970 and 1981 according to recent data from the World Bank. Of 97 countries with a current population exceeding one million, only two, Sierra Leone and Yemen, relied on foreign sources for more than half of their investable funds.

The close association between domestic saving and investment for most countries is evident in Figure 1. The simple correlation between the saving and investment rate is 0.74 and each percentage point increase in saving is estimated to increase the investment ratio by six–tenths of a percentage point. And if very high saving ratio (above 30 percent) countries are excluded from the analysis, the estimated increase in the investment ratio is three-quarters of a percentage point for each percentage point increase in the saving ratio.

Figure 1. Investment Vs. Saving

Ninety-Seven Countries, 1970-1981



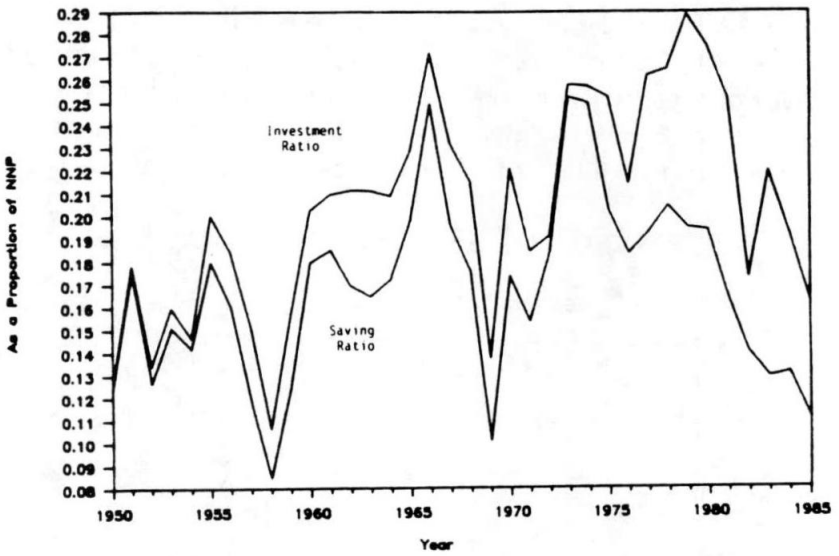
More sophisticated analyses by Feldstein (1983) and Feldstein and Horioka (1980) support the recent conclusion of an Asian Development Bank study of domestic resource mobilization in Asia (Abbot, 1984):

> Asian developing countries . . . will have to raise their national saving rates if they want to keep their investment rates at about the level they have averaged in recent years. But apart from this immediate consideration, higher national saving rates are needed to provide the basis for self-sustained growth and development.

That this generalization is applicable to Thailand is clearly demonstrated by comparing investment to national saving (Figure 2). In only a few years since 1950 (the earliest year for which data are available) has foreign saving reached one-quarter of net investment. More typically, domestic saving has been sufficient to replace depreciated capital and to provide for two-thirds or more of all new investment. Particularly apparent in Figure 2 is the close connection between national saving and investment. Year to year changes in investment are clearly governed by changes in domestic saving.

Figure 2. National Saving and Investment

Thailand, 1950-1985



Although government and business share responsibility for mobilizing domestic resources with the household sector, this study is confined to an analysis of saving by households. Among most Asian developing countries, household saving is the most important component of domestic saving and Thailand is no exception to this generalization. Over the last 35 years household saving has averaged between 65 and 90 percent of national saving.

The decline in the national saving ratio from its 1970's peak may represent a major setback to Thailand's development effort and is a surprising departure from the upward trend in saving observed over the preceding two decades. Furthermore, Thailand's rapid fertility decline has not yielded higher saving rates as has apparently been the case in other countries, such as Japan and Korea.

Table 1. Investment and Saving in Thailand

Period	Investment Ratio	National Saving Ratio	
		Household	Total
1950–54	0.149	0.122	0.144
1955–59	0.160	0.086	0.134
1960–64	0.209	0.120	0.174
1965–69	0.217	0.117	0.184
1970–74	0.222	0.147	0.202
1975–79	0.256	0.148	0.196
1980–85	0.213	0.127	0.145

Note: All values are net of depreciation

Analysis of survey data and forecasts presented here indicate a modest reversal of the recent downward trend in saving. The household saving rate is forecast to rise gradually to reach about 14 percent of disposable income in the year 2000. However, without changes in the underlying determinants of saving or changes in economic and financial policies that influence saving, there is no evidence that saving will return to the levels observed in the 1970's.

PART I. SURVEY ANALYSIS

Determinants of Household Saving

Studies of domestic resource mobilization typically focus on government policy and institutional constraints that impede or encourage financial saving. The purpose of the analysis undertaken here is quite different. Our purpose is to identify factors that affect the propensity to save by households given the existing institutional and legal environment. The results of the analysis can be used in three ways. First, forecasts of household saving will be presented that reflect expected changes in household characteristics. These forecasts can be used to identify possible shortfalls in saving that must be made up by mobilizing saving from alternative sources or by motivating households to increase their rate of saving. Second, forecasts will identify the kinds of households that are contributing the greatest amount to household saving and those that are contributing the least to household saving. This information is useful in identifying groups at which domestic resource mobilization policies should be aimed. Third, the analysis may be useful for identifying households that may not be accumulating sufficient financial resources to provide for their old age.

Four sets of variables are used to describe household characteristics that impinge on the propensity to save. First, the age of the household head measures systematic variation in household saving associated with the household life cycle. In many countries, the accumulation of pensions is an important motivation for household saving. During years when the household head and other adult members are working, households accumulate wealth to provide for the old age security of members in later years. If the pension motive is important, saving should be higher for "working" households, particularly when members are at their peak earning years, whereas saving should be lower for "retired" households.

Second, household saving will vary with the demographic composition of the household. The simplest way to visualize this effect is to imagine that each member of a household contributes to household income and, at the same time, consumes some part of household income. Some members, depending on their consumption "needs" and their earning capability, will contribute more to income than to consumption. Their presence will lead to higher household saving. Other members will contribute less to income than to consumption and their presence will lead to lower household saving. One would expect that additional children or elderly household members would depress saving, whereas additional prime age adults would encourage saving. Depending on attitudes toward women and sex differentials in wages, one might expect females to have a different impact on saving than males.

Of course, the actual effect of demographic composition on household saving is considerably more complex. The behavior of one household member is affected by the presence of another. For example, employment and earning by women will be affected by the presence of a young child. Also, the addition of a new member to the household may lead all other members to reduce their consumption. Analysis of the impact of demographic composition provides an estimate of the "net" effect of an additional member on household saving.

Third, household saving may vary by the type of household. We are particularly interested in female-headed households and one-person households that may find it difficult

to accumulate financial wealth.

Fourth, we analyze a range of socio-economic characteristics that capture occupational status and income level of the household. In particular, we estimate variation in saving rates for farm households, distinguishing land owners from renters and size of land holdings. For urban households, we distinguish households primarily on the basis of occupation.

The specific form of the equation to be estimated is:

$$\ln c = \beta_0 + \beta_1 AGE2 + \beta_2 AGE3 + \beta_3 AGE4 + \beta_4 AGE5$$

$$+ \beta_5 FEM + \beta_6 ONEM + \beta_7 ONEF + \beta_8 N_1 + \beta_9 N_2 + \beta_{10} N_3$$

$$+ \beta_{11} NM_4 + \beta_{12} NF_4 + \beta_{13} NM_5 + \beta_{14} NF_5$$

$$+ \beta_{15} X_1 + \cdots + \beta_{14+j} X_j + e \qquad (1)$$

where $\ln c$ is the natural log of the ratio of consumption to disposable income, $AGE2$ to $AGE5$ are dummy variables representing the age of the head, FEM is a dummy variable that takes the value of one for households headed by a woman, $ONEM$ and $ONEF$ are dummy variables for men and women living by themselves, N_k is the number of household members in selected age and sex categories, and the X_j's are socio-economic variables. More detailed definitions are provided in Table 2.

Description of Survey

Analysis is based on the 1981 Socio-Economic Survey, conducted throughout the Kingdom by the National Statistical Office during the 12-month period February, 1981 through January, 1982. The primary objective of the survey was to assess patterns and levels of household expenditures and income and to relate variations in expenditure patterns to differences in household characteristics.

The survey covered all private, non-institutional households. Individuals living in transient hotels and rooming houses, boarding schools, military barracks, wats (temples), hospitals, prisons, and other such establishments, as well as foreign diplomats and other temporary residents, were not interviewed.

Sampling Procedure

Information was obtained from a sample of households selected by a statistical sampling procedure to represent all private, non-institutional households in each region (the Northern, Northeastern, Central, and Southern) and the Greater Bangkok Metropolitan Area. This procedure was based on a self-weighting, stratified, three-stage sample design.

In the first stage, sample amphoe were selected as primary sampling units with probability of selection proportional to their population. The total sample was 135 amphoes, scattered in 63 changwats. In the second stage, geographic areas within sample amphoes were stratified into three community types representing different levels of urbanization:

municipal areas (MA), sanitary districts (SD), and villages (V). Sample blocks were selected systematically from the MA stratum, and sample villages were selected from the SD and V strata, with probability of selection proportional to their populations. In the third stage, all households and vacant units in sample blocks and villages were listed and classified by size and occupation of the household head or as vacant. Within sample blocks, 12 addresses in municipal areas, 8 in sanitary districts and 6 in villages were selected from these listings. A similar procedure was followed for the Greater Bangkok Metropolitan Area, which includes the Bangkok metropolis, Nonthaburi, Pathumthani and Samutprakarn. At the second stage, however, communities were stratified into city core, suburbs and fringe areas.

The number of blocks and villages selected in the second stage was determined in order to give a uniform sampling rate within each community type stratum. This second-stage sample size was calculated by the following formula:

$$N_i = \frac{1}{C} \times \frac{1}{N} \times \frac{1}{P_i} \times \frac{M}{N_{ij}},$$

where:

N_i = sample size (number of blocks and villages in the i^{th} amphoe)

$\frac{1}{C}$ = overall sampling fraction

N = number of sample amphones in sub-region

P_i = probability of selecting the first-stage i^{th} amphoe in a sub-region

M_i = total number of households in the i^{th} sample amphoe

N_{ij} = number of sample households in the j^{th} block of village in the i^{th} amphoe.

The overall sampling fraction $\frac{1}{C}$ varies according to area as follows:

Area	Sampling Fraction
Greater Bangkok Metropolitan Area	1/300
Municipal areas in other changwats	1/250
Villages in sanitary districts	1/500
Villages	1/1000

A total of 12,250 sample addresses were selected for the survey. They were distributed by region and community type as follows:

Area	Total	Municipal Areas	Sanitary Districts	Villages
Northern	2,302	600	472	1,230
Northeastern	3,180	612	576	1,992
Central	2,146	468	496	1,182
Southern	1,448	624	176	648
Bangkok*	3,174	2,112	240	822
Total	12,250	4,416	1,960	5,874

*community types are city core, suburbs, and fringe areas

The total household sample was divided into twelve regionally representative sub-samples, and one sub-sample of households was interviewed during each month of the year.

Every effort was made to interview all households living in the sample dwelling units. If an interview proved to be impossible, a substitute household from the same size and occupation group was selected and interviewed. Substitutions were made if 1) after several visits, no responsible member of the household could be found at home, 2) the household was temporarily away and not expected to return during the survey period, 3) the sample address could not be found because of improper listing, 4) the dwelling could not be reached due to impassable roads or for security reasons, and 5) the household absolutely refused to be interviewed. However, no substitutions were made for vacant dwelling units.

Data Collection

One or two weeks prior to the scheduled interview period, interviewers who were permanent members of the Field Operation division working out of NSO provincial branch offices were sent out to list all households residing in sample blocks and villages. From the listing, sample households were selected. In order to obtain complete information, several visits were made. The first visit was to collect information on household composition, housing facilities, income and work experience of each household member, and expenditure on non-food consumption. Various reference periods were used for collecting data. For all goods and services, data were obtained for the preceding month. However, for items usually purchased infrequently and for income, data were obtained for the preceding 12 months. During the second half of the month, interviewers visited households every other day over a 7-day period to obtain detailed information about expenditures and consumption of food, beverages, and tobacco.

Quality Control

To provide the highest possible quality of collected data, supervisors were expected to reinterview about 10 percent of the sample households each month, and to assist interviewers as problems occurred. In addition, each completed interview was subject to a thorough field edit, followed by a follow-up interview if the information was found to be incomplete or internally inconsistent. In this connection, a household account balance sheet was prepared for each completed interview. This balance compared total money

"disbursements" with total money "receipts" for the preceding month. If the account was more than 15 percent out of balance, the interviewer was expected to revisit the household in order to reconcile the difference.

Data Editing

All questionnaires were examined for completeness and consistency. Descriptive information was coded numerically for computer processing. All expenditure and income values were converted to a monthly basis by dividing annual values by 12 and multiplying weekly values by 4.3.

Farm income was calculated as the total annual value of production less operating expenses plus rent received from renting out agricultural equipment or animals (if any). Non-farm, business income was calculated as sales less operating expenses.

Concepts and Definitions

Household was defined as:

1) a group of two or more related individuals who make common provision for food and other living essentials; or,

2) an individual living with a group of unrelated persons, not exceeding five persons. Even if the individuals shared meals, each was treated as a one-person household; or,

3) an individual who makes provision for his/her own food and other living essentials without having common housekeeping or financial arrangements with other persons.

Members of a household may pool their income and have a common budget. They may be related or not. Unrelated boarders or lodgers not paying for living quarters or meals, and servants receiving food, clothing, and housing free or as part of wages were counted as household members. Married children and their spouses were treated as separate households.

Unrelated boarders or lodgers and their family members, if any, paying for living quarters or meals were treated as separate households.

Household Members – The criteria used to identify household members were:

1) common housekeeping arrangements

2) sharing of principal meals

3) common financial arrangements for supplying basic living essentials, and

4) recognition of one member as head.

If usual members of the household were absent at the time of the interview but not expected to be away for more than three months, they were counted as members provided their income and expenditures could be recorded.

Head of Household – The head of household was the person recognized as such by other members whether the head was responsible for financial support or welfare of the household members or not.

Household Income – The total household income includes:

1) wages and salaries, tips, bonuses, etc.

2) net profits from farming and non-farming

3) property income, such as land rent, royalties, interest, and dividends

4) transfer payments received, such as assistance payments, pensions, scholarships and grants

5) income-in-kind – the value of goods and services received as part of pay, home-produced and consumed (including rental value of owner-occupied dwelling), or received free from other sources, and

6) other money receipts such as insurance proceeds, lottery winnings and other windfall receipts.

Household Disposable Income – total household income less taxes paid.

Household Expenditures – total household expenditures include:

1) the amount spent to purchase goods and services used for living purposes;

2) the value of goods and services received as part of pay, home-produced and consumed (including rental value of owner-occupied dwelling), or received free from other sources; and,

3) the amount spent for contributions, insurance premiums, lottery tickets, interest on debts, and other non-consumption items.

Occupation – the type of work performed by a person at their principal job. If, during the previous 52 weeks, the respondent had more than one job, the job with the greatest number of weeks worked was recorded. If the number of weeks worked for each job was the same, the job with the highest income was recorded.

Socio-economic class – The classification of households into socio-economic groups was based on the main source of livelihood, economic activity and occupation. Ten categories are employed:

1) farm operators mainly owning land

2) farm operators mainly renting land

3) own-account trade and industrial workers

4) own-account professional, technical, and administrative workers

5) professional, technical, and administrative workers who worked for pay

6) farm workers

7) general workers

8) clerical, sales, and service workers

9) production workers, and

10) economically inactive households.

In general, socio-economic class is based on the principal source of livelihood and the employment status of the chief income earner, usually the household head. However, if the combined earnings of several members of the household represented the main source of livelihood, the classification is based on the employment status of these members. For example, if a household operated a small farm but the earnings of the household members working off the farm as common laborers exceeded farm profits (including the value of home-produced and consumed products), the household was then classified in the general worker group.

Data and Estimation Procedure

For the analysis of saving, a broad definition of expenditure is used rather than a definition designed to mimic the national income account concept of household consumption. Expenditure includes all household payments, including gifts, insurance premiums, lottery ticket purchases, and interest payments, but the payment of direct taxes is excluded. Expenditure also includes the value of food produced and consumed at home and the rental value of owner-occupied housing. Household income is measured by disposable income and is the sum of all receipts, including earnings, property income, transfers, insurance proceeds, lottery winnings, and non-money income, e.g., foods produced for home consumption and the rental value of owner-occupied housing. From this value, direct taxes are subtracted to obtain disposable income. The ratio of expenditure to disposable income, the household consumption ratio, is the dependent variable analyzed most extensively below.

The household consumption ratio and the household saving ratio (equal to 1 less the consumption ratio) differ from their national income accounting counterparts in several ways. First, several transfer items, gifts, lottery tickets and winnings, and interest payments and receipts are included as expenditure and as income. These are included because for individual households such items represent income or expenditures even though for the economy as a whole, they do not. Second, the household consumption ratio or household saving ratio often referred to uses total income including taxes in the denominator, whereas this analysis is concerned with the disposition of resources over which the household has control, namely disposable income. Third, national income accounts typically include employer contributions to life insurance and pension plans as household income and as household saving (with operating costs of the insurance or pension plan netted out). Likewise, employer-provided health care is typically included in household income and expenditure. The analysis reported below does not include these items.

Demographic characteristics of households are distinguished in a number of ways. First, the age of the household head is included using a series of dummy variables for age of head: less than 25, 25–39, 40–49, 50–59, and 60 and older. Second, the demographic composition of household membership is captured using a series of variables assigned a value equal to the number of members who are males or females at selected ages. The following age categories are used for both males and females: 0–2, 3–12, 13–19, 20–59, and 60 and older. The number of members variable includes heads as well as other household

members.[1] Third, households are distinguished using a dummy variable that takes the value of one if the head is a female and zero if the head of the household is male. In addition, one-person male households and one-person female households are also distinguished using dummy variables.

Finally, a series of dummy variables is employed to measure socio-economic status of the household. These variables are used in lieu of variables that measure occupation of the head and household assets. Occupation of the head is available but adequately captured by the socio-economic status variables. Household assets are not available from the survey. Farm owners are distinguished from farm renters and further distinguished by the size of their landholdings. Self-employed households are distinguished by whether they have employees or not. A complete description of the socio-economic variables is provided in Table 2.

Table 3 reports summary statistics for each of the variables used in the statistical analysis. Items are weighted so as to obtain a representative estimate for Thailand as a whole.[2]

Statistical Analysis

The most serious statistical problem that may influence empirical results is reporting error, because data on consumption and income are notoriously difficult to collect. Despite the care with which the socio-economic survey data were collected, reporting errors are a serious problem. The calculated consumption ratio varies over an unreasonably wide range and, in addition, income is systematically under-reported as compared with consumption. Thus, the average consumption ratio for the sample exceeds one. National income account statistics, although not strictly comparable, would be consistent with a value in the 0.85 to 0.90 range.

The implications of errors in the dependent variable depends on the nature of the errors. If the error is multiplicative and uncorrelated with independent variables, the log specification employed here yields unbiased regression coefficients. As a further safeguard, the model was estimated using the full sample and using a sub-sample of households with reported consumption ratios ranging from 0.5 to 1.5. In addition, an alternative and independent measure of consumption was constructed using changes in assets and liabilities collected by the survey. The alternative measure is also crude and probably subject to even greater reporting error, but does provide for a partial cross-check of results. For the most part, the alternative approaches provide a generally consistent picture about the determinants of household saving. The results reported below are based on the sample with a consumption ratio varying between 0.5 and 1.5.

---

[1] Preliminary analysis yielded no gender differences among children. Results reported below only distinguish adult males and females.

[2] The weighting procedure is described below.

Table 2. Description of Variables

Name	Definition
C	Household consumption ratio
Age_i	Age of household head
	1. Less than 25
	2. 25 – 39
	3. 40 – 49
	4. 50 – 59
	5. 60 and older
F	Female head; 0 if male head, 1 if female head
OPM	One person, male (equal to 1, zero otherwise)
OPF	One person, female (equal to 1, zero otherwise)
Ni	Number of members in age category i
	1. Age 0 – 2
	2. Age 3 – 12
	3. Age 13 – 19
NMi	Number of male household members in age category i
NFi	Number of female household members in age category i
	1. Age 20–59
	2. Age 60 and older
V16	Farm operator, small landowner (equal to 1, zero otherwise)
V17	Farm operator, medium landowner (equal to 1, zero otherwise)
V18	Farm operator, large landowner (equal to 1, zero otherwise)
V19	Farm operator, small land renter (equal to 1, zero otherwise)
V20	Farm operator, large land renter (equal to 1, zero otherwise)
V21	Farm operator, fishing, forestry, etc. (equal to 1, zero otherwise)
V22	Entrepeneur, paid employees (equal to 1, zero otherwise)
V23	Entrepeneur, no paid employees (equal to 1, zero otherwise)
V24	Professional, technical, and managerial (equal to 1, zero otherwise)
V25	Laborers, farm (equal to 1, zero otherwise)
V26	Laborers, non-farm (equal to 1, zero otherwise)
V27	Clerical, sales and service workers (equal to 1, zero otherwise)
V28	Production workers (equal to 1, zero otherwise)
V29	Economically inactive (equal to 1, zero otherwise)

Table 3. Descriptive Statistics
1981 Socioeconomic Survey of Thailand

Variable Name	Mean	Standard Deviation	Minimum Value	Maximum Value
Consumption Ratio	0.9872	0.2519	0.5001	1.5000
Age Dummies				
AGE1	0.0653	0.2537	0	1
AGE2	0.3352	0.4848	0	1
AGE3	0.2308	0.4327	0	1
AGE4	0.1859	0.3995	0	1
AGE5	0.1828	0.3969	0	1
Household Type				
F	0.2059	0.4153	0	1
OPM	0.0413	0.2045	0	1
OPF	0.0448	0.2125	0	1
Number of Members				
N1	0.2533	0.5069	0	3
N2	1.0960	1.2548	0	7
N3	1.4003	2.0211	0	14
NM4	1.1886	1.1505	0	12
NM5	0.1460	0.3759	0	3
NF4	1.3281	1.1933	0	12
NF5	0.1873	0.4332	0	4
Socioeconomic Status				
V16	0.0890	0.2923	0	1
V17	0.1069	0.3172	0	1
V18	0.1378	0.3539	0	1
V19	0.0292	0.1729	0	1
V20	0.0253	0.1612	0	1
V21	0.0149	0.1245	0	1
V22	0.0268	0.1658	0	1
V23	0.1426	0.3590	0	1
V24	0.0868	0.2891	0	1
V25	0.0542	0.2325	0	1
V26	0.0203	0.1449	0	1
V27	0.1040	0.3134	0	1
V28	0.0913	0.2958	0	1
V29	0.0712	0.2641	0	1

Number of Observations = 9,097

The consumption ratio was regressed on the independent variables described above using weighted least-squares regression. The weights used are those calculated by the World Bank for the 1981 Socio-Economic Survey, obtained by comparing 1980 census tabulations of the number of households to sample sizes in each sampling unit (World Bank, 1985). Because a different weighting scheme is employed than the one used by the National Statistical Office of Thailand, the results are not directly comparable to those in NSO publications.

A complete compilation of regression estimates, standard errors, and other relevant statistics are presented in Appendix A. The statistical analysis can only shed a limited amount of light on the factors that account for differences in the household consumption ratio. All of the independent variables taken together explain less than 4 percent of the variation in the consumption ratio. Demographic characteristics of the household, including the age of head, have a statistically significant impact on the consumption ratio, as does socio-economic status. None of the variables that measure household type is statistically significant, however.

Household Composition and the Age of the Household Head

The statistical results provide convincing evidence that the consumption ratio increases and the saving ratio declines as the number of children in the household increases. Children under 3 years of age have no consistent or reliably estimated effect on saving, but the presence of a child aged 3–12 increases the consumption ratio by a full percentage point or more, whereas children 13–19 years old have somewhat less effect.

The model has been estimated for several subsamples as a further gauge to the reliability of the results and in an attempt to determine whether the results are generalizable to the entire population. The sample was subdivided based on occupational status of the household. Farm households who own their land were distinguished from those who are land renters, and non-farm households were divided into two groups: entrepeneurial and professional households and households mainly with employees or unemployed members. Results were also estimated separately for households with a head who had primary education or less, a head with secondary education, and a head with some tertiary education.

The estimated impact of the number of children aged 3–12 is remarkably constant across all households (Table 4). The partial effect of an additional child ranges from 0.010 to 0.020, and is statistically significant for all but two subgroups. The partial effect of an additional child aged 13–19 varies quite considerably from group to group. In the case of land-renting farm households, the contribution of teenagers to income exceeds their impact on consumption. But among employee households and households headed by more educated adults, teens have a far smaller impact on income than on consumption. This finding is entirely consistent with the widely held view that the economic value of children is greater in agrarian societies because children can be more usefully employed in agriculture. Likewise, households with their own businesses are more likely to be able to employ teenage children.

It is interesting to speculate as well about the difference between land renters and land owners. The economic value of a teenager may vary depending upon whether com-

plementary inputs are relatively abundant or not. It may be that land owners are working with a relatively fixed supply of land whereas land renters can, with lower transaction cost, vary the amount of cultivable land. If this is the case, the marginal product of additional workers, their children, will be higher, i.e., they will contribute more to farm income.

Teenage employment represents a tradeoff between current earning and human capital investment through additional schooling. Teenagers from different backgrounds face different opportunities that will offer differing rewards to investment in education. Thus, teenagers of parents with more education may have a greater incentive to stay in school and postpone employment. In addition, the financial advantage to parents themselves will depend on the likelihood that teenagers will remain economically tied when they become adults. Children may be more likely to stay at home in households that own land (to be passed on to a son or daughter.) It could be to the advantage of such households to invest more in the human resources of their children.

Table 4. Household Composition and the Consumption Ratio
Number of Children

Sample Characteristics	Number of Children			Number of Observations
	0–2	3–12	13–19	
Full sample	0.001	0.012*	0.004*	9096
Land owners	0.015	0.012*	0.005	2446
Land renters	–0.035	0.013	–0.013*	572
Business and professional	–0.012	0.016*	0.001	2353
Employees and unemployed	–0.002	0.010*	0.011*	3722
Primary education	0.002	0.011*	0.003	7390
Secondary education	–0.006	0.013	0.012*	915
College education	0.017	0.020*	0.016*	765

* significant at 0.05 level

Some analyses of aggregate saving data have shown that an increase in the relative number of elderly household members depresses saving. This is an important phenomenon because it implies that, over the demographic transition, age structure changes will have, to some extent, offsetting effects. As the number of children declines saving rises, but at later stages of the demographic transition, saving may decline as the number of elderly increases.

The analysis of household data distinguishes two ways in which the number of elderly affects saving. The first, effect of age of head, is discussed below. The second, the addition of elderly household members, is summarized in Table 5. These results provide no evidence that an additional elderly member depresses saving. Older women have no significant effect on saving one way or another. An additional elderly man actually depresses the consumption ratio and increases the saving ratio. Furthermore, the magnitude of the

effect is quite substantial for the entire sample and for many of the subgroups. It is interesting to note, however, that for heads with secondary and college education, the presence of an additional elderly male member depresses saving. The estimated coefficient is not statistically significant, however.

Table 5. Household Composition and the Consumption Ratio
Number of Adults

Sample Characteristics	Adults 20–59		Adults 60 and Older	
	Female	Male	Female	Male
Full sample	–0.008*	–0.010*	–0.0001	–0.022*
Land owners	–0.010	–0.000	–0.023	–0.028
Land renters	0.014	–0.015	0.033	–0.034
Business and professional	–0.016*	–0.014*	0.009	0.009
Employees and unemployed	–0.003	–0.017*	0.008	–0.047*
Primary education	–0.006*	–0.011*	–0.002	–0.024*
Secondary education	–0.017*	–0.013	0.017	0.053
College education	–0.020	0.017	–0.020	0.004

* significant at 0.05 level

The number of elderly also influences aggregate saving because an increase in their numbers will raise the number of households with elderly heads. These results, summarized in more detail below, show that the saving ratio declines systematically with the age of the head. Households headed by elderly save about one percent less of their income than those headed by someone 55 to 64 but nearly four percent less than households with a head in the 25 to 39 age range. The net effect of aging, then, is difficult to judge. The impact on saving will depend on the extent to which elderly establish separate households and the exact nature of changes in the age structure. However, the forecasts to which we turn below provide a convenient way of summarizing the impact of the number of elderly. These show that at least between now and 2015, an increase in the number of elderly will not depress aggregate saving.

Household Size and Scale Effects

The impact of household size, *per se*, on the consumption ratio is assessed by calculating the change in the consumption ratio were the average number of members in each age and sex category to decrease by a given percentage holding all other variables constant. The impact of such a change is of interest in judging the impact of extended families. One might think of siblings with identical childbearing histories who choose to live in separate households rather than together. To judge the impact of a decline in extended families, then, the change in the consumption ratio accompanying a fifty-percent decline in the number of members in each age category was calculated. The calculated impact of such a

change is to reduce the consumption ratio by about one-quarter of one percentage point. In sum, there is no evidence of scale effects.

Household Type

The consumption function is specified so as to distinguish four types of households: family households with a male head, family households with a female head, men living alone and women living alone.[3] The effect associated with household type is shown in Table 6, which gives adjusted mean values for the consumption and saving ratio. The adjusted means give the calculated values if all variables, except those governing household type, are set to the mean value for the entire sample. This allows us to compare, for example, saving by female-headed and male-headed family households were their no difference in household size or composition, per capita expenditures, or socio-economic status. It is important to understand that this is a theoretical construct intended to identify the effect of household type, *per se*. Thus, one-person household adjusted means are calculated setting the number of member variables to their sample means even though one-person households cannot have more than one member. But by controlling for household size and other variables in this manner, we can quantify the unique effect associated with one-person households beyond the effect associated with variation in household size observed across all types of households.

Table 6. Adjusted Mean Consumption Ratio

Household Type	Consumption Ratio	Saving Ratio
Intact	0.867	0.133
Single Female Head	0.862	0.138
One Person, Male	0.875	0.124
One Person, Female	0.867	0.133

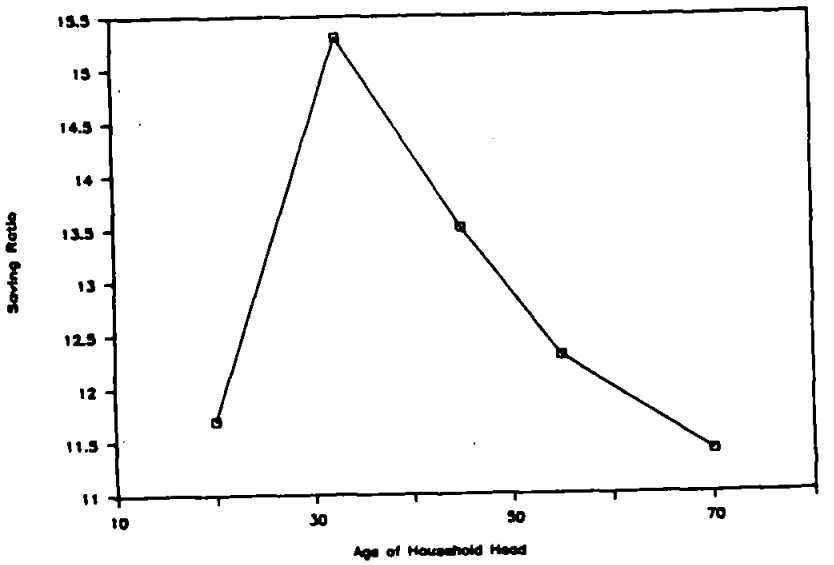
The statistical results suggest that household type may not be a particularly important determinant of saving. Men living alone have somewhat lower saving rates than calculated for other types of households, and households with single female heads have somewhat higher saving ratios. However, the differences shown are not statistically significant for the full sample or for any of the sub-samples.

[3] Primary individual households, groups of unrelated individuals, are treated as several one-person households by the socio-economic survey. In the great majority of family households headed by a woman, the husband of the head is not present in the household.

Age of Head

The effect of age of the household head is estimated by including variables that distinguish five age categories, under 25, 25–39, 40–49, 50–59, and 60 or older. The detailed results are reported in Appendix A and these show that the relationship between household consumption and age of head is statistically significant. The estimated age profile of saving, calculated by holding all other variables at their sample means, is shown in Figure 3. The age profile is hump-shaped, reaching its peak at fifteen percent of disposable income among households aged 25 to 39. Households with a head under 25 or over 60 have the lowest saving ratios – in the 11 to 12 percent range.

Figure 3. Age of Head and the Adjusted Saving Ratio



The impact of age of head is quite substantial and, by itself, would lead to a decline in the household saving ratio as population aging sets in. However, other demographic factors, namely compositional effects described above, will offset the age of head effect. The net impact on consumption and saving is assessed below using forecasts of aggregate saving.

The Effect of Control Variables

The regression equation also includes a number of control variables that measure different dimensions of socio-economic status, including residence (farm vs. non-farm), occupation, and wealth (size of farm). Detailed results are presented in Appendix A for the interested reader. The finding that seems to stand out is a positive association between saving and socio-economic status or wealth. Farm households with large land holdings have higher saving than those with small land holdings; farm renters with large land areas have higher saving than those with small land areas; and entrepeneurial and professional, technical, and managerial households have higher saving than employee households.

PART II. FORECASTS

Description of Methodology

The saving ratio is forecast using aggregate level demographic data generated by HOMES and using exogenously supplied assumptions about growth in per capita income. The saving ratio is calculated separately for intact family households, family households with female heads, male one-person households, and female one-person households. For each household type, forecasts are further broken down by the age of the household head. Of course, the average saving ratio for all households of each type, all households with heads of specified age, and all households combined are also calculated. Documentation of the module for forecasting saving is contained in Appendix D.

Forecast saving ratios are calculated using the estimated consumption equation and three types of independent variables: per capita disposable income, demographic characteristics of the household, and control variables.

Forecasts of the age of head, type of households, and number of male and female members in five-year age groups is a direct output of HOMES. For forecast purposes, however, we require the number of members in age groupings that do not correspond to the five-year schema. Standard demographic procedures for interpolating single-year age data from five-year age groupings are used to obtain the number of members aged 0–2, 3–12, and 13–19.[4]

The socio-economic status variables included in the regression equations are treated as control variables for purposes of forecasting. In other words, the proportion of households in each socio-economic category is held constant at the 1981 level observed for each age of head and household type group. The proportions are obtained directly from the 1981 Socio-Economic Survey.

Per capita disposable expenditure is not an independent variable in the regression analysis of the consumption ratio. However, forecasts of per capita income are used to obtain weights required to calculate average saving ratios and to calculate the absolute amount of saving.

Disposable income is expected to rise as a consequence of general improvements in the standard of living in Thailand and forecasts presented below are based on an assumed rate of growth in per capita income of four percent per annum. In addition, household income will be affected directly by changes in household composition, e.g., the forecast decline in the number of young adults per household. These demographic factors have been incorporated into the forecasts using regression estimates obtained by regressing the log of per capita income on the same set of independent variables used to analyze the consumption ratio. The statistical results are presented in Appendix A.

[4] Sprague multipliers are employed for this purpose. For complete details see Appendix C.

Description of Independent Variables

Detailed forecasts are presented in Appendix B. The text provides a summary of these results.

Number of Members

The average number of members per household in 1980 is compared with the average number in 2005 in Table 7. Overall, average household size is projected to decline from 5.3 to 3.7 members over the twenty-five year interval.[5] The greatest declines are among households with heads aged 35–49. In 1980, for example, households with heads 40–44 averaged 6.4 members as compared with only 4.2 members in 2005. Because the greatest decline is expected among households at the peak of their family size, variation across the life cycle was considerably greater in 1980 than is expected for 2005.

Table 7. Average Number of Household Members
Thailand, 1980 and 2005

Age of Head	1980	2005
Less than 25	3.72	3.17
25–29	4.60	3.48
30–34	5.32	3.69
35–39	6.09	4.11
40–44	6.35	4.22
45–49	6.33	4.05
50–54	5.92	3.76
55–59	5.25	3.41
60–64	4.85	3.27
65–69	4.54	3.10
70–74	4.48	3.18
75 and Older	4.54	3.28
Total	5.31	3.72

The greatest part of the decline in average household size can be traced to reduced numbers of children per household. Table 8 illustrates this phenomenon for intact households. Between 1980 and 2005, the number of children under 3 declines by 50 percent or more depending upon the age of the head's spouse. Similar percentage declines are registered for older children and teenagers, as well. The decline in the average number of adults per household is quite dependent on the age of the (male) head or his wife. Among

[5] These averages do not include primary individual households and so differ somewhat from projected values presented in Mason et al. (1987a).

older heads, the number of adults aged 20 to 59 declines by roughly one-quarter. But in the case of households with younger heads, no decline is anticipated. The number of elderly per household is not anticipated to change at all during the period in question.

Table 8. Age of Members, Intact Households
Thailand, 1980 and 2005

Age of Member	Age of Spouse of Head			
	25–29	40–44	55–59	70–74
		1980		
0– 2	0.74	0.36	0.30	0.28
3–12	1.61	1.92	0.81	0.96
13–19	0.18	1.65	0.93	0.41
20–59	2.16	2.62	3.17	1.35
60+	0.08	0.12	0.56	1.98
TOTAL	4.77	6.67	5.77	4.98
		2005		
0– 2	0.35	0.13	0.10	0.09
3–12	0.95	0.66	0.30	0.35
13–19	0.10	0.85	0.33	0.21
20–59	2.12	2.64	2.51	1.07
60+	0.08	0.14	0.55	1.98
TOTAL	3.60	4.42	3.79	3.70

Forecasting Household Saving

Detailed forecasts for the saving ratio in 1980 and 2005 are presented in Tables 9 and 10. (Appendix B provides detail for all years from 1980 to 2015. Also, see Appendix E for adjustment procedures.) The average saving ratios for one-person households in each of the five-year age categories do not change over the forecast interval because they experience no change in their demographic composition. But because of changes in the age distribution of heads, the average for all one-person male households combined rises moderately whereas the average for all one-person female households declines moderately.

The saving ratio for family households is forecast to rise from 13.1 percent in 1980 to 14.2 percent in 2005 for intact households, from 13.3 to 14.0 percent for households headed by single males, and from 12.0 to 12.7 percent for households headed by single females.

Table 9. Calculated Saving Ratio
Thailand, 1980

Age of Head	Intact	Single Male Head	Single Female Head	One Person Male	One Person Female	All Combined
Less than 25	0.103	0.109	0.102	0.097	0.105	0.103
25–29	0.139	0.156	0.138	0.145	0.160	0.140
30–34	0.136	0.154	0.130	0.154	0.149	0.137
35–39	0.139	0.147	0.133	0.146	0.146	0.139
40–44	0.126	0.123	0.116	0.123	0.136	0.125
45–49	0.133	0.131	0.128	0.110	0.121	0.132
50–54	0.134	0.110	0.121	0.100	0.111	0.131
55–59	0.138	0.123	0.128	0.104	0.099	0.134
60–64	0.124	0.132	0.114	0.097	0.073	0.121
65–69	0.119	0.149	0.110	0.110	0.076	0.118
70–74	0.117	0.127	0.106	0.096	0.088	0.112
75 and Older	0.116	0.165	0.094	0.105	0.084	0.109
Total	0.131	0.133	0.120	0.123	0.112	0.130

Table 10. Projected Saving Ratio
Thailand, 2005

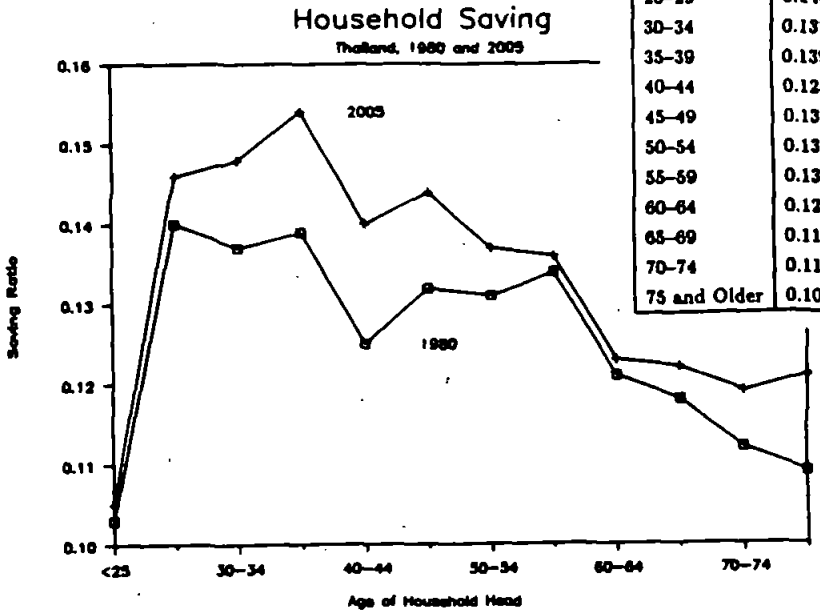
Age of Head	Intact	Single Male Head	Single Female Head	One Person Male	One Person Female	All Combined
Less than 25	0.105	0.111	0.106	0.097	0.105	0.105
25–29	0.146	0.154	0.142	0.145	0.160	0.146
30–34	0.148	0.154	0.138	0.154	0.149	0.148
35–39	0.155	0.152	0.145	0.146	0.146	0.154
40–44	0.142	0.132	0.128	0.123	0.136	0.140
45–49	0.145	0.140	0.136	0.110	0.121	0.144
50–54	0.141	0.115	0.126	0.100	0.111	0.137
55–59	0.140	0.126	0.130	0.104	0.098	0.136
60–64	0.125	0.135	0.117	0.097	0.073	0.123
65–69	0.122	0.152	0.114	0.110	0.076	0.122
70–74	0.123	0.140	0.112	0.096	0.088	0.119
75 and Older	0.122	0.187	0.100	0.105	0.084	0.121
Total	0.142	0.140	0.127	0.124	0.111	0.140

Changes in the relationship between age of head and saving is portrayed graphically in Figure 4. Saving for every age of head increases between 1980 and 2005, but the greatest increases are observed among households with children, i.e., households with heads aged 25–49. Saving also increases moderately for households with heads 65 years of age and older. This is also a consequence of declines in the number of children in their household.

Figure 4. Age Profile of Household Saving

Thailand, 1980 and 2005

Age of Head	1980	2005
Less than 25	0.103	0.105
25–29	0.140	0.146
30–34	0.137	0.148
35–39	0.139	0.154
40–44	0.125	0.140
45–49	0.132	0.144
50–54	0.131	0.137
55–59	0.134	0.136
60–64	0.121	0.123
65–69	0.118	0.122
70–74	0.112	0.119
75 and Older	0.109	0.121



Forecasts at five-year intervals from 1980 to 2015 are presented in Table 11. A steady increase in the household saving ratio is anticipated starting in 1980 and ending in 2000. Thereafter, the saving ratio is relatively constant at about 14 percent of disposable income. The beneficial effects of fertility decline apparently will be captured during the next 15 years.

The gradual increase in the saving ratio together with rising income combine to push the absolute amount of domestic resources supplied by households for investment purposes by substantial amounts. Monthly aggregate household saving is calculated to rise from 5.9 billion baht in 1980 to 32.6 billion baht by 2005 and to 55.5 million baht by 2015. Thus, household saving increases ten-fold over the 35-year projection period, representing a rate of growth of 6.4 percent per annum.

Table 11. Projected Saving

Year	Saving Ratio	Aggregate Monthly Saving*
1980	0.130	5,853
1985	0.132	8,571
1990	0.135	12,393
1995	0.137	17,531
2000	0.139	24,199
2005	0.140	32,628
2010	0.140	42,967
2015	0.140	55,498

* millions of baht

Conclusions

Previous research on aggregate saving trends has concluded that a number of Asian countries, Japan and Korea being notable examples, have achieved higher national saving rates as a consequence of declining fertility and shifts in age structure. Although Thailand has experienced rapid fertility decline in recent years, there is no evidence that saving has risen as a result. In fact, the national saving rate has declined markedly over the last ten years.

Analysis of household saving patterns in 1980–81 indicates, however, that declines in child dependency should lead to higher saving in the future. Over the next fifteen years, given projected declines in fertility, the household saving ratio is forecast to rise by 1.0 percentage point or by about 8 percent.

Detailed analysis of subgroups of the population shows that the increase could be even greater. Saving in the "modern" sectors of the economy, in other words, saving by households with educated heads, is more strongly influenced by changes in child dependency. As these households make up a larger proportion of the Thai population in the future, overall household saving rates could rise even more in response to declining fertility.

SAS 9:05 WEDNESDAY, JUNE 10, 1987 1

VARIABLE	LABEL	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
AGE1	AGE, <25	9097	0.06528	0.25368	0	1.00000	0.00266	626.22000	0.06435	388.591
AGE2	AGE, 25-39	9097	0.33516	0.48476	0	1.00000	0.00508	3215.09000	0.23500	144.637
AGE3	AGE, 40-49	9097	0.23084	0.43272	0	1.00000	0.00454	2214.37000	0.18725	187.455
AGE4	AGE, 50-59	9097	0.18593	0.39953	0	1.00000	0.00419	1783.38000	0.15963	214.882
AGE5	AGE, 60+	9097	0.18279	0.39691	0	1.00000	0.00416	1753.45000	0.15753	217.138

Appendix A
Estimation Results

LN(E/Y) IS A FUNCTION OF AGE DUMMIES 9:05 WEDNESDAY, JUNE 10, 1

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	27	20.53683075	0.76062336	10.944	0.0001
ERROR	9069	630.30541	0.06950109		
C TOTAL	9096	650.84224			

ROOT MSE	0.2636306	R-SQUARE	0.0316
DEP MEAN	-0.0455219	ADJ R-SQ	0.0287
C.V.	-579.129		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.04440214	0.01484943	2.990	0.0028	INTERCEPT
NO_2	1	0.000930110	0.005776573	0.161	0.8721	
N3_12	1	0.01156229	0.002471725	4.678	0.0001	
N13_19	1	0.004151486	0.001556144	2.668	0.0076	
NF20_59	1	-0.008095504	0.002635413	-3.072	0.0021	
NM20_59	1	-0.009624586	0.002692926	-3.574	0.0004	
NF60U	1	-0.000136186	0.007787050	-0.017	0.9860	
NM60U	1	-0.02212771	0.01137181	-1.946	0.0517	
F	1	-0.005245717	0.008351172	-0.628	0.5299	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.04089668	0.01216421	-3.362	0.0008	AGE, 25-39
AGE3	1	-0.02056437	0.01300480	-1.581	0.1138	AGE, 40-49
AGE4	1	-0.006145077	0.01329684	-0.462	0.6440	AGE, 50-59
AGE5	1	0.004480798	0.01589992	0.282	0.7781	AGE, 60+
V17	1	-0.05908487	0.01229998	-4.804	0.0001	FARM OPERATOR, MEDIUM LAND OWNER
V18	1	-0.12059358	0.01181460	-10.207	0.0001	FARM OPERATOR, LARGE LAND OWNER
V19	1	-0.01395947	0.01820473	-0.767	0.4432	FARM OPERATOR, SMALL LAND RENTER
V20	1	-0.06319450	0.01931851	-3.271	0.0011	FARM OPERATOR, LARGE LAND RENTER
V21	1	-0.12954848	0.02384610	-5.433	0.0001	FARM OPERATOR, FISHING, FORESTRY, ETC
V22	1	-0.12828803	0.01888385	-6.794	0.0001	ENTREPRENEUR - WITH PAID WORKERS
V23	1	-0.07500458	0.01158754	-6.473	0.0001	ENTREPRENEUR - WITHOUT PAID WORKERS
V24	1	-0.10149567	0.01304200	-7.782	0.0001	PROFESSIONAL, TECHNICAL AND MANAGERIAL
V25	1	-0.01972664	0.01471376	-1.341	0.1801	LABORERS, FARM
V26	1	-0.007959719	0.02098059	-0.379	0.7044	LABORERS, NON-FARM
V27	1	-0.05005415	0.01241198	-4.033	0.0001	CLERICAL, SALES AND SERVICE WORKERS
V28	1	-0.05455752	0.01278993	-4.266	0.0001	PRODUCTION WORKERS
V29	1	-0.03925780	0.01405048	-2.794	0.0052	ECONOMICALLY INACTIVE, SOCIO-ECON CLASS
OPMALE	1	0.01039655	0.01486719	0.699	0.4844	ONE PERSON, MALE
OPFEMALE	1	0.005268854	0.01539071	0.342	0.7321	ONE PERSON, FEMALE

REGRESSION ON LAND OWNERS SAMPLE 9:05 WEDNESDAY, JUNE 10, 1

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	16	11.56042173	0.72252636	7.799	0.0001
ERROR	2430	225.12371	0.09264350		
C TOTAL	2446	236.68413			

ROOT MSE	0.3043739	R-SQUARE	0.0488
DEP MEAN	-0.0481293	ADJ R-SQ	0.0426
C.V.	-632.409		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.04627554	0.03047402	1.519	0.1290	INTERCEPT
NO_2	1	0.01503319	0.01115580	1.348	0.1779	
N3_12	1	0.01234055	0.004663740	2.646	0.0082	
N13_19	1	0.004646222	0.003027317	1.535	0.1250	
NF20_59	1	-0.009876242	0.005622021	-1.757	0.0791	
NM20_59	1	-0.000028344	0.005494922	-0.005	0.9959	
NF60U	1	-0.02341555	0.01488454	-1.573	0.1158	
NM60U	1	-0.02770576	0.02445985	-1.133	0.2575	
F	1	0.005967195	0.01782515	0.335	0.7378	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.07580924	0.03085205	-2.457	0.0141	AGE, 25-39
AGE3	1	-0.01010687	0.03183502	-0.317	0.7509	AGE, 40-49
AGE4	1	-0.006680444	0.03247056	-0.206	0.8370	AGE, 50-59
AGE5	1	0.009981339	0.03787929	0.264	0.7922	AGE, 60+
V17	1	-0.06677374	0.01443277	-4.627	0.0001	FARM OPERATOR, MEDIUM LAND OWNER
V18	1	-0.13070279	0.01430236	-9.139	0.0001	FARM OPERATOR, LARGE LAND OWNER
OPMALE	1	0.01923045	0.06344470	0.303	0.7618	ONE PERSON, MALE
OPFEMALE	1	-0.01202432	0.04589509	-0.262	0.7933	ONE PERSON, FEMALE

REGRESSION ON LAND RENTERS SAMPLE 9:05 WEDNESDAY, JUNE 10, 1

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	16	3.70236783	0.23139799	2.922	0.0001
ERROR	556	44.03640398	0.07920217		
C TOTAL	572	47.73877181			

ROOT MSE	0.2814288	R-SQUARE	0.0776
DEP MEAN	-0.0369834	ADJ R-SQ	0.0510
C.V.	-760.959		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.09640784	0.05307056	1.817	0.0698	INTERCEPT
NO_2	1	-0.03482821	0.02493051	-1.397	0.1630	
N3_12	1	0.01305324	0.01002796	1.302	0.1936	
N13_19	1	-0.01294880	0.006364619	-2.034	0.0424	
NF20_59	1	0.01370678	0.01162638	1.179	0.2389	
NM20_59	1	-0.01521079	0.01152650	-1.320	0.1875	
NF60U	1	0.03295079	0.03487360	0.945	0.3451	
NM60U	1	-0.03411159	0.04947085	-0.690	0.4908	
F	1	-0.02079370	0.04671642	-0.445	0.6564	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.05029062	0.05138731	-0.979	0.3282	AGE, 25-39
AGE3	1	-0.11460121	0.05612853	-2.042	0.0416	AGE, 40-49
AGE4	1	-0.12821610	0.05748762	-2.230	0.0261	AGE, 50-59
AGE5	1	-0.03731077	0.07335135	-0.509	0.6112	AGE, 60+
V20	1	-0.04583900	0.02602291	-1.761	0.0787	FARM OPERATOR, LARGE LAND RENTER
V21	1	-0.11420999	0.02943551	-3.880	0.0001	FARM OPERATOR, FISHING, FORESTRY, ETC
OPMALE	1	0.07733048	0.08142653	0.950	0.3427	ONE PERSON, MALE
OPFEMALE	1	-0.07142839	0.09602159	-0.744	0.4573	ONE PERSON, FEMALE

REGRESSION ON ENTREPRENEUR/PROFESSIONAL SAMPLE 9:05 WEDNESDAY, JUNE 10, 19

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	16	4.29034056	0.26814629	3.787	0.0001
ERROR	2337	165.48173	0.07080947		
C TOTAL	2353	169.77207			

ROOT MSE	0.2661005	R-SQUARE	0.0253
DEP MEAN	-0.0758825	ADJ R-SQ	0.0186
C.V.	-350.674		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	-0.04636352	0.03543991	-1.308	0.1909	INTERCEPT
NO_2	1	-0.01179450	0.01239689	-0.951	0.3415	
N3_12	1	0.01604696	0.005004074	3.207	0.0014	
N13_19	1	0.001076325	0.002869643	0.375	0.7076	
NF20_59	1	-0.01558083	0.004365635	-3.569	0.0004	
NM20_59	1	-0.01390543	0.004828323	-2.880	0.0040	
NF60U	1	0.009427149	0.01394689	0.676	0.4992	
NM60U	1	0.008998430	0.01951668	0.461	0.6448	
F	1	0.009628520	0.01529826	0.629	0.5292	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.05639342	0.02999294	-1.880	0.0602	AGE, 25-39
AGE3	1	-0.04062667	0.03142013	-1.293	0.1961	AGE, 40-49
AGE4	1	-0.006042198	0.03182067	-0.190	0.8494	AGE, 50-59
AGE5	1	-0.06509737	0.03534653	-1.842	0.0656	AGE, 60+
V23	1	0.05010843	0.01821708	2.751	0.0060	ENTREPRENEUR - WITHOUT PAID WORKERS
V24	1	0.02405563	0.01930817	1.246	0.2129	PROFESSIONAL, TECHNICAL AND MANAGERIAL
OPMALE	1	-0.03457746	0.02652377	-1.304	0.1925	ONE PERSON, MALE
OPFEMALE	1	-0.02478250	0.03081892	-0.804	0.4214	ONE PERSON, FEMALE

REGRESSION ON LABORERS SAMPLE 9:05 WEDNESDAY, JUNE 10, 1

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	18	4.22926932	0.23495941	4.623	0.0001
ERROR	3704	188.25945	0.05082599		
C TOTAL	3722	192.48872			

ROOT MSE	0.2254462	R-SQUARE	0.0220
DEP MEAN	-0.021907	ADJ R-SQ	0.0172
C.V.	-1029.11		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.01372896	0.01756903	0.781	0.4346	INTERCEPT
NO_2	1	-0.002208297	0.008354466	-0.264	0.7915	
N3_12	1	0.009586057	0.003928904	2.440	0.0147	
N13_19	1	0.01137332	0.002567560	4.430	0.0001	
NF20_59	1	-0.003277181	0.004384716	-0.747	0.4549	
NM20_59	1	-0.01652340	0.004273751	-3.866	0.0001	
NF60U	1	0.008162819	0.01340053	0.609	0.5425	
NM60U	1	-0.04650663	0.01850863	-2.513	0.0120	
F	1	-0.03496223	0.01214853	-2.878	0.0040	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.01504397	0.01442287	-1.043	0.2970	AGE, 25-39
AGE3	1	-0.02438273	0.01634492	-1.492	0.1358	AGE, 40-49
AGE4	1	-0.005842204	0.01685509	-0.347	0.7289	AGE, 50-59
AGE5	1	0.04227658	0.02214913	1.909	0.0564	AGE, 60+
V26	1	0.01096656	0.01902208	0.577	0.5643	LABORERS, NON-FARM
V27	1	-0.03344516	0.01241990	-2.693	0.0071	CLERICAL, SALES AND SERVICE WORKERS
V28	1	-0.03663041	0.01266201	-2.893	0.0038	PRODUCTION WORKERS
V29	1	-0.02460521	0.01437634	-1.712	0.0871	ECONOMICALLY INACTIVE, SOCIO-ECON CLAS
OPMALE	1	0.03045039	0.01785238	1.706	0.0882	ONE PERSON, MALE
OPFEMALE	1	0.03199981	0.01844434	1.735	0.0828	ONE PERSON, FEMALE

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	27	16.69846829	0.61846179	8.636	0.0001
ERROR	7363	527.27560	0.07161152		
C TOTAL	7390	543.97406			

ROOT MSE	0.2676033	R-SQUARE	0.0307
DEP MEAN	-0.0394122	ADJ R-SQ	0.0271
C.V.	-678.986		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.02810239	0.01668683	1.684	0.0922	INTERCEPT
N0_2	1	0.002045825	0.006443215	0.318	0.7509	
N3_12	1	0.01060808	0.002703855	3.923	0.0001	
N13_19	1	0.002655497	0.001713959	1.549	0.1213	
NF20_59	1	-0.006301857	0.002927864	-2.152	0.0314	
NM20_59	1	-0.01100673	0.002926970	-3.760	0.0002	
NF60U	1	-0.001742851	0.008552442	-0.204	0.8385	
NM60U	1	-0.02449177	0.01225636	-1.998	0.0457	
F	1	-0.006148963	0.009172196	-0.670	0.5026	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.02079537	0.01466081	-1.418	0.1561	AGE, 25-39
AGE3	1	-0.000592360	0.01538160	-0.039	0.9693	AGE, 40-49
AGE4	1	0.01805637	0.01368446	1.151	0.2497	AGE, 50-59
AGE5	1	0.02744686	0.01829499	1.500	0.1336	AGE, 60+
V17	1	-0.06058819	0.01259536	-4.810	0.0001	FARM OPERATOR, MEDIUM LAND OWNER
V18	1	-0.12151709	0.01215181	-10.000	0.0001	FARM OPERATOR, LARGE LAND OWNER
V19	1	-0.01370955	0.01856097	-0.739	0.4602	FARM OPERATOR, SMALL LAND RENTER
V20	1	-0.06446724	0.01966690	-3.278	0.0011	FARM OPERATOR, LARGE LAND RENTER
V21	1	-0.12870202	0.02474820	-5.200	0.0001	FARM OPERATOR, FISHING, FORESTRY, ETC
V22	1	-0.13636450	0.02115740	-6.445	0.0001	ENTREPRENEUR - WITH PAID WORKERS
V23	1	-0.06865281	0.01213050	-5.660	0.0001	ENTREPRENEUR - WITHOUT PAID WORKERS
V24	1	-0.08652288	0.02301916	-3.759	0.0002	PROFESSIONAL, TECHNICAL AND MANAGERIAL
V25	1	-0.02064383	0.01504612	-1.372	0.1701	LABORERS, FARM
V26	1	-0.009723842	0.02154489	-0.451	0.6518	LABORERS, NON-FARM
V27	1	-0.04972494	0.01434415	-3.467	0.0005	CLERICAL, SALES AND SERVICE WORKERS
V28	1	-0.05049121	0.01356305	-3.723	0.0002	PRODUCTION WORKERS
V29	1	-0.03532851	0.01545667	-2.286	0.0223	ECONOMICALLY INACTIVE, SOCIO-ECON CLAS
OPMALE	1	0.01368574	0.01896040	0.722	0.4704	ONE PERSON, MALE
OPFEMALE	1	0.002087329	0.01758441	0.119	0.9055	ONE PERSON, FEMALE

REGRESSION ON EDUCATION=SECONDARY SAMPLE 9:05 WEDNESDAY, JUNE 10, 19

DEP VARIABLE: LNEY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	26	3.69260162	0.14202314	2.483	0.0001
ERROR	889	50.84785935	0.05719669		
C TOTAL	915	54.54046098			

ROOT MSE	0.2391583	R-SQUARE	0.0677
DEP MEAN	-0.0618437	ADJ R-SQ	0.0404
C.V.	-386.714		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	-0.002976323	0.08343331	-0.036	0.9716	INTERCEPT
NO_2	1	-0.005526281	0.01720651	-0.321	0.7482	
N3_12	1	0.01261778	0.008418083	1.499	0.1343	
N13_19	1	0.01232341	0.005101794	2.416	0.0159	
NF20_59	1	-0.01655038	0.008056982	-2.054	0.0403	
NM20_59	1	-0.01266241	0.009870826	-1.283	0.1999	
NF60U	1	0.01710704	0.02422693	0.706	0.4803	
NM60U	1	0.05278099	0.04302547	1.227	0.2202	
F	1	-0.05680033	0.03278653	-1.732	0.0835	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.09964798	0.03205962	-3.108	0.0019	AGE, 25-39
AGE3	1	-0.08135674	0.03584619	-2.270	0.0235	AGE, 40-49
AGE4	1	-0.07465403	0.03634617	-2.054	0.0403	AGE, 50-59
AGE5	1	-0.22502407	0.05782535	-3.891	0.0001	AGE, 60+
V17	1	0.10393113	0.11418413	0.910	0.3630	FARM OPERATOR, MEDIUM LAND OWNER
V18	1	-0.003729668	0.09159591	-0.041	0.9675	FARM OPERATOR, LARGE LAND OWNER
V19	1	-0.03699622	0.20035555	-0.185	0.8535	FARM OPERATOR, SMALL LAND RENTER
V21	1	-0.03979701	0.12220641	-0.326	0.7448	FARM OPERATOR, FISHING, FORESTRY, ETC
V22	1	-0.01867837	0.08993606	-0.208	0.8355	ENTREPRENEUR - WITH PAID WORKERS
V23	1	-0.01307987	0.08332264	-0.157	0.8753	ENTREPRENEUR - WITHOUT PAID WORKERS
V24	1	0.04071578	0.08232898	0.495	0.6210	PROFESSIONAL, TECHNICAL AND MANAGERIAL
V25	1	0.10171908	0.12091827	0.841	0.4004	LABORERS, FARM
V26	1	0.11898314	0.13879864	0.857	0.3915	LABORERS, NON-FARM
V27	1	0.07119315	0.08135883	0.875	0.3818	CLERICAL, SALES AND SERVICE WORKERS
V28	1	0.03682731	0.08362437	0.440	0.6598	PRODUCTION WORKERS
V29	1	0.06820155	0.08524195	0.800	0.4239	ECONOMICALLY INACTIVE, SOCIO-ECON CLASS
OPMALE	1	0.04587556	0.03720451	1.233	0.2179	ONE PERSON, MALE
OPFEMALE	1	0.03658720	0.05628132	0.650	0.5158	ONE PERSON, FEMALE

REGRESSION ON EDUCATION=COLLEGE SAMPLE 9:05 WEDNESDAY, JUNE 10, 19

DEP VARIABLE: LNY

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	20	3.38539736	0.16926987	2.806	0.0001
ERROR	745	44.94946169	0.06033485		
C TOTAL	765	48.33485905			

ROOT MSE	0.2456315	R-SQUARE	0.0700
DEP MEAN	-0.0927217	ADJ R-SQ	0.0451
C.V.	-264.913		

PARAMETER ESTIMATES

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0	PROB > |T|	VARIABLE LABEL
INTERCEP	1	0.01750923	0.04780585	0.366	0.7143	INTERCEPT
NO_2	1	0.01664116	0.02095965	0.794	0.4275	
N3_12	1	0.01953688	0.01002882	1.948	0.0518	
N13_19	1	0.01593803	0.005899651	2.702	0.0071	
NF20_59	1	-0.02025581	0.01071230	-1.891	0.0590	
NM20_59	1	0.01650239	0.01108924	1.488	0.1371	
NF60U	1	-0.02037658	0.03351840	-0.608	0.5434	
NM60U	1	0.003543916	0.07571644	0.047	0.9627	
F	1	0.000299099	0.03081855	0.010	0.9923	SEX OF HEAD, 0=MALE, 1=FEMALE
AGE2	1	-0.11397134	0.03232024	-3.526	0.0004	AGE, 25-39
AGE3	1	-0.11525097	0.04064112	-2.836	0.0047	AGE, 40-49
AGE4	1	-0.23575139	0.04828950	-4.882	0.0001	AGE, 50-59
AGE5	1	-0.07704653	0.08869599	-0.869	0.3853	AGE, 60+
V17	1	-0.21509655	0.18797954	-1.144	0.2529	FARM OPERATOR, MEDIUM LAND OWNER
V22	1	0.03282444	0.07500968	0.438	0.6618	ENTREPRENEUR - WITH PAID WORKERS
V23	1	-0.09142797	0.06148874	-1.487	0.1375	ENTREPRENEUR - WITHOUT PAID WORKERS
V24	1	-0.02670786	0.04117408	-0.649	0.5168	PROFESSIONAL, TECHNICAL AND MANAGERIAL
V27	1	-0.004781321	0.04533206	-0.105	0.9160	CLERICAL, SALES AND SERVICE WORKERS
V28	1	-0.02608307	0.05843049	-0.446	0.6554	PRODUCTION WORKERS
OPMALE	1	-0.03897663	0.03496358	-1.115	0.2653	ONE PERSON, MALE
OPFEMALE	1	0.004637994	0.04369033	0.106	0.9155	ONE PERSON, FEMALE

Appendix B

Forecasts

CONSUMPTION RATIO, 1980

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8975	0.8914	0.8977	0.9034	0.8953	0.8973
25-29	0.8609	0.8439	0.8617	0.8554	0.8403	0.8599
30-34	0.8639	0.8461	0.8701	0.8456	0.8510	0.8633
35-39	0.8610	0.8532	0.8666	0.8543	0.8541	0.8611
40-44	0.8741	0.8771	0.8838	0.8766	0.8644	0.8751
45-49	0.8671	0.8690	0.8725	0.8904	0.8786	0.8680
50-54	0.8656	0.8903	0.8789	0.9001	0.8894	0.8694
55-59	0.8623	0.8774	0.8723	0.8957	0.9015	0.8661
60-64	0.8760	0.8681	0.8857	0.9030	0.9272	0.8790
65-69	0.8807	0.8509	0.8903	0.8896	0.9241	0.8817
70-74	0.8827	0.8734	0.8943	0.9036	0.9125	0.8880
75+	0.8837	0.8347	0.9056	0.8949	0.9155	0.8910
TOTAL	0.8691	0.8668	0.8800	0.8773	0.8881	0.8705

SAVING RATIO, 1980

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1025	0.1086	0.1023	0.0966	0.1047	0.1027
25-29	0.1391	0.1561	0.1383	0.1446	0.1597	0.1401
30-34	0.1361	0.1539	0.1299	0.1544	0.1490	0.1367
35-39	0.1390	0.1468	0.1334	0.1457	0.1459	0.1389
40-44	0.1259	0.1229	0.1162	0.1234	0.1356	0.1249
45-49	0.1329	0.1310	0.1275	0.1096	0.1214	0.1320
50-54	0.1344	0.1097	0.1211	0.0999	0.1106	0.1306
55-59	0.1377	0.1226	0.1277	0.1043	0.0985	0.1339
60-64	0.1240	0.1319	0.1143	0.0970	0.0728	0.1210
65-69	0.1193	0.1491	0.1097	0.1104	0.0759	0.1183
70-74	0.1173	0.1266	0.1057	0.0964	0.0875	0.1120
75+	0.1163	0.1653	0.0944	0.1051	0.0845	0.1090
TOTAL	0.1309	0.1332	0.1200	0.1227	0.1119	0.1295

SAS

SAVING PER HOUSEHOLD (BAHT), 1980

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	404	625	418	344	311	410
25-29	689	1264	618	633	672	702
30-34	716	1043	608	776	474	717
35-39	818	886	630	634	470	799
40-44	760	773	563	410	359	732
45-49	830	885	631	336	324	792
50-54	884	606	614	299	239	797
55-59	867	653	602	309	202	759
60-64	622	519	471	262	118	539
65-69	565	643	427	293	145	489
70-74	602	418	436	264	186	463
75+	581	340	340	314	183	376
TOTAL	714	714	543	444	276	679

MONTHLY AGGREGATE SAVING, 1980
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	371.64	23.50	16.88	10.34	5.11	427.47
25-29	740.26	42.68	28.47	14.53	7.12	833.05
30-34	715.96	28.64	37.05	12.67	4.64	799.17
35-39	734.64	21.79	53.30	8.00	3.83	821.57
40-44	654.37	22.42	62.38	4.88	2.95	746.99
45-49	585.58	32.56	83.93	3.54	2.96	708.57
50-54	469.31	24.98	90.85	2.90	2.86	590.90
55-59	303.57	28.87	81.27	2.97	2.74	419.42
60-64	135.16	22.11	58.00	2.69	1.68	219.64
65-69	69.30	21.75	43.32	2.56	2.75	139.69
70-74	39.84	11.21	32.33	1.31	3.33	88.02
75+	20.37	9.67	22.94	2.01	3.23	58.22
TOTAL	4840.00	290.38	610.72	68.40	43.20	5852.70

SAS

CONSUMPTION RATIO, 1985

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8971	0.8906	0.8970	0.9034	0.8953	0.8969
25-29	0.8590	0.8433	0.8604	0.8554	0.8403	0.8581
30-34	0.8607	0.8449	0.8677	0.8456	0.8510	0.8603
35-39	0.8571	0.8511	0.8636	0.8543	0.8541	0.8574
40-44	0.8704	0.8753	0.8810	0.8766	0.8644	0.8715
45-49	0.8635	0.8668	0.8700	0.8904	0.8786	0.8647
50-54	0.8631	0.8886	0.8767	0.9001	0.8894	0.8670
55-59	0.8610	0.8758	0.8709	0.8957	0.9015	0.8648
60-64	0.8748	0.8653	0.8840	0.9030	0.9272	0.8776
65-69	0.8791	0.8493	0.8884	0.8896	0.9241	0.8801
70-74	0.8810	0.8633	0.8921	0.9036	0.9125	0.8850
75+	0.8820	0.8297	0.9037	0.8949	0.9155	0.8885
TOTAL	0.8662	0.8643	0.8776	0.8767	0.8875	0.8677

SAVING RATIO, 1985

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1029	0.1094	0.1030	0.0966	0.1047	0.1031
25-29	0.1410	0.1567	0.1396	0.1446	0.1597	0.1419
30-34	0.1393	0.1551	0.1323	0.1544	0.1490	0.1397
35-39	0.1429	0.1489	0.1364	0.1457	0.1459	0.1426
40-44	0.1296	0.1247	0.1190	0.1234	0.1356	0.1285
45-49	0.1365	0.1332	0.1300	0.1096	0.1214	0.1353
50-54	0.1369	0.1114	0.1233	0.0999	0.1106	0.1330
55-59	0.1390	0.1242	0.1291	0.1043	0.0985	0.1352
60-64	0.1252	0.1347	0.1160	0.0970	0.0729	0.1224
65-69	0.1209	0.1507	0.1116	0.1104	0.0759	0.1199
70-74	0.1190	0.1367	0.1079	0.0964	0.0875	0.1150
75+	0.1180	0.1703	0.0963	0.1051	0.0845	0.1115
TOTAL	0.1338	0.1357	0.1224	0.1233	0.1125	0.1323

SAS

SAVING PER HOUSEHOLD (BAHT), 1986

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	493	729	491	421	380	497
25-29	846	1509	738	774	621	859
30-34	895	1249	742	948	579	893
35-39	1045	1073	789	774	574	1017
40-44	975	937	709	501	438	936
45-49	1035	1059	768	410	396	982
50-54	1092	736	752	365	292	983
55-59	1054	785	727	377	246	919
60-64	767	643	585	320	144	666
65-69	702	832	533	358	177	612
70-74	760	519	551	322	227	583
75+	714	500	419	383	223	476
TOTAL	891	875	670	548	340	846

MONTHLY AGGREGATE SAVING, 1986
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	524.92	31.63	22.47	14.57	7.08	600.67
25-29	1100.46	61.36	40.90	21.36	10.46	1234.53
30-34	1122.20	43.74	58.52	19.62	7.34	1251.42
35-39	1103.68	31.75	79.80	11.75	5.59	1232.57
40-44	908.71	29.34	81.76	6.44	3.75	1029.99
45-49	845.02	45.13	118.30	5.01	4.19	1017.64
50-54	683.00	34.93	131.45	4.06	4.12	857.56
55-59	452.24	42.58	123.54	4.45	4.22	627.03
60-64	193.48	32.25	83.77	3.87	2.38	315.76
65-69	98.15	30.59	61.15	3.40	3.80	197.10
70-74	54.84	17.18	42.73	1.97	4.26	120.98
75+	29.08	15.48	33.65	2.68	4.70	85.59
TOTAL	7115.77	415.97	878.02	99.19	61.89	8570.85

SAS

CONSUMPTION RATIO, 1990

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8962	0.8896	0.8958	0.9031	0.8950	0.8961
25-29	0.8579	0.8433	0.8597	0.8554	0.8403	0.8572
30-34	0.8581	0.8446	0.8658	0.8456	0.8510	0.8578
35-39	0.8530	0.8490	0.8604	0.8543	0.8541	0.8535
40-44	0.8655	0.8724	0.8770	0.8766	0.8644	0.8667
45-49	0.8592	0.8639	0.8668	0.8904	0.8786	0.8605
50-54	0.8617	0.8876	0.8755	0.9001	0.8894	0.8656
55-59	0.8599	0.8749	0.8700	0.8957	0.9015	0.8638
60-64	0.8741	0.8638	0.8831	0.9030	0.9272	0.8768
65-69	0.8781	0.8460	0.8870	0.8896	0.9241	0.8787
70-74	0.8794	0.8613	0.8902	0.9036	0.9125	0.8832
75+	0.8805	0.8215	0.9020	0.8949	0.9155	0.8854
TOTAL	0.8634	0.8622	0.8756	0.8761	0.8873	0.8650

SAVING RATIO, 1990

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1038	0.1102	0.1042	0.0969	0.1050	0.1039
25-29	0.1421	0.1567	0.1403	0.1446	0.1597	0.1428
30-34	0.1419	0.1554	0.1342	0.1544	0.1490	0.1422
35-39	0.1470	0.1510	0.1396	0.1457	0.1459	0.1465
40-44	0.1345	0.1276	0.1230	0.1234	0.1356	0.1333
45-49	0.1408	0.1361	0.1332	0.1096	0.1214	0.1395
50-54	0.1383	0.1124	0.1245	0.0999	0.1106	0.1344
55-59	0.1401	0.1251	0.1300	0.1043	0.0985	0.1362
60-64	0.1259	0.1362	0.1169	0.0970	0.0728	0.1232
65-69	0.1219	0.1540	0.1130	0.1104	0.0759	0.1213
70-74	0.1206	0.1387	0.1098	0.0964	0.0875	0.1168
75+	0.1195	0.1785	0.0980	0.1051	0.0845	0.1146
TOTAL	0.1366	0.1378	0.1244	0.1239	0.1127	0.1350

SAS

SAVING PER HOUSEHOLD (BAHT), 1990

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	597	828	565	516	466	600
25-29	1030	1746	869	945	1003	1043
30-34	1102	1462	886	1157	707	1096
35-39	1305	1290	965	946	701	1266
40-44	1236	1116	882	612	535	1182
45-49	1305	1282	952	501	483	1235
50-54	1310	858	890	446	356	1175
55-59	1263	942	858	461	301	1099
60-64	915	776	693	391	176	793
65-69	856	1025	649	437	216	747
70-74	938	683	680	393	278	726
75+	880	664	516	468	272	596
TOTAL	1101	1048	808	675	415	1041

MONTHLY AGGREGATE SAVING, 1990
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	725.52	40.28	28.88	19.99	9.60	824.28
25-29	1554.21	82.13	54.63	30.18	14.48	1735.63
30-34	1674.53	61.31	84.22	28.92	10.80	1860.27
35-39	1733.53	48.49	126.36	18.23	8.84	1935.46
40-44	1359.92	42.14	121.58	9.48	5.47	1538.59
45-49	1157.44	59.14	152.96	6.62	5.34	1381.50
50-54	950.63	47.19	180.31	5.76	5.84	1189.72
55-59	641.11	58.81	172.77	6.26	6.10	885.05
60-64	284.72	47.99	125.57	5.83	3.69	467.79
65-69	139.70	44.89	87.08	4.95	5.44	282.05
70-74	77.35	24.78	59.82	2.64	5.91	170.50
75+	40.96	24.50	46.03	3.90	6.39	121.78
TOTAL	10339.61	582.14	1240.21	142.76	87.90	12392.62

SAS

CONSUMPTION RATIO, 1995

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8952	0.8900	0.8951	0.9031	0.8950	0.8952
25-29	0.8562	0.8444	0.8592	0.8554	0.8403	0.8557
30-34	0.8557	0.8450	0.8644	0.8456	0.8510	0.8556
35-39	0.8499	0.8482	0.8582	0.8543	0.8541	0.8505
40-44	0.8625	0.8703	0.8747	0.8766	0.8644	0.8639
45-49	0.8564	0.8618	0.8645	0.8904	0.8786	0.8579
50-54	0.8592	0.8859	0.8736	0.9001	0.8894	0.8631
55-59	0.8601	0.8752	0.8702	0.8957	0.9015	0.8640
60-64	0.8739	0.8642	0.8826	0.9030	0.9272	0.8767
65-69	0.8776	0.8455	0.8862	0.8896	0.9241	0.8782
70-74	0.8781	0.8576	0.8888	0.9036	0.9125	0.8815
75+	0.8793	0.8147	0.9004	0.8949	0.9155	0.8827
TOTAL	0.8609	0.8606	0.8743	0.8754	0.8874	0.8628

SAVING RATIO, 1995

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1048	0.1100	0.1049	0.0969	0.1050	0.1048
25-29	0.1438	0.1556	0.1408	0.1446	0.1597	0.1443
30-34	0.1443	0.1550	0.1356	0.1544	0.1490	0.1444
35-39	0.1501	0.1518	0.1418	0.1457	0.1459	0.1495
40-44	0.1375	0.1297	0.1253	0.1234	0.1356	0.1361
45-49	0.1436	0.1382	0.1355	0.1096	0.1214	0.1421
50-54	0.1408	0.1141	0.1264	0.0999	0.1106	0.1369
55-59	0.1399	0.1248	0.1298	0.1043	0.0985	0.1360
60-64	0.1261	0.1358	0.1174	0.0970	0.0728	0.1233
65-69	0.1224	0.1545	0.1138	0.1104	0.0759	0.1218
70-74	0.1219	0.1424	0.1112	0.0964	0.0875	0.1185
75+	0.1207	0.1853	0.0996	0.1051	0.0845	0.1173
TOTAL	0.1391	0.1394	0.1257	0.1246	0.1126	0.1372

SAS

SAVING PER HOUSEHOLD (BAHT), 1995

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	722	927	646	630	569	721
25-29	1249	1946	992	1154	1225	1257
30-34	1347	1669	1042	1414	864	1335
35-39	1601	1511	1149	1155	857	1549
40-44	1506	1317	1050	747	653	1435
45-49	1582	1494	1139	612	590	1492
50-54	1587	999	1064	544	435	1422
55-59	1475	1085	983	563	368	1278
60-64	1076	916	807	477	215	931
65-69	1006	1223	756	533	264	877
70-74	1134	868	818	480	339	884
75+	1071	896	630	572	333	743
TOTAL	1344	1230	953	829	504	1264

MONTHLY AGGREGATE SAVING, 1995
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	927.24	45.58	33.51	24.71	11.89	1042.93
25-29	2172.35	105.73	71.44	42.58	20.27	2412.37
30-34	2375.21	81.79	112.44	40.95	14.98	2625.37
35-39	2580.51	68.71	181.66	26.95	13.04	2870.86
40-44	2087.59	63.32	187.90	14.75	8.68	2362.25
45-49	1659.98	83.41	219.05	9.79	7.81	1980.04
50-54	1253.40	59.70	225.36	7.64	7.46	1553.58
55-59	871.86	79.04	230.23	8.92	8.67	1198.72
60-64	397.40	65.60	173.85	8.25	5.35	650.45
65-69	204.05	66.52	128.90	7.50	8.44	415.42
70-74	110.71	37.76	84.94	3.86	8.51	245.79
75+	57.48	37.88	63.99	5.46	8.89	173.70
TOTAL	14697.77	795.06	1713.29	201.36	123.97	17531.44

SAS

CONSUMPTION RATIO, 2000

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8948	0.8898	0.8946	0.9031	0.8950	0.8948
25-29	0.8546	0.8454	0.8586	0.8554	0.8403	0.8542
30-34	0.8535	0.8457	0.8632	0.8456	0.8510	0.8535
35-39	0.8472	0.8475	0.8564	0.8543	0.8541	0.8479
40-44	0.8604	0.8687	0.8731	0.8766	0.8644	0.8618
45-49	0.8554	0.8608	0.8638	0.8904	0.8786	0.8569
50-54	0.8584	0.8850	0.8731	0.9001	0.8894	0.8624
55-59	0.8595	0.8743	0.8696	0.8957	0.9015	0.8633
60-64	0.8744	0.8646	0.8829	0.9030	0.9272	0.8771
65-69	0.8775	0.8467	0.8858	0.8896	0.9241	0.8782
70-74	0.8773	0.8578	0.8882	0.9036	0.9125	0.8810
75+	0.8782	0.8109	0.6994	0.8949	0.9155	0.8802
TOTAL	0.8591	0.8599	0.8736	0.8754	0.8882	0.8611

SAVING RATIO, 2000

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1052	0.1102	0.1054	0.0969	0.1050	0.1052
25-29	0.1454	0.1546	0.1414	0.1446	0.1597	0.1458
30-34	0.1465	0.1543	0.1368	0.1544	0.1490	0.1465
35-39	0.1528	0.1525	0.1436	0.1457	0.1459	0.1521
40-44	0.1396	0.1313	0.1269	0.1234	0.1356	0.1382
45-49	0.1446	0.1392	0.1362	0.1096	0.1214	0.1431
50-54	0.1416	0.1150	0.1269	0.0999	0.1106	0.1376
55-59	0.1405	0.1257	0.1304	0.1043	0.0985	0.1367
60-64	0.1256	0.1354	0.1171	0.0970	0.0728	0.1229
65-69	0.1225	0.1533	0.1142	0.1104	0.0759	0.1218
70-74	0.1227	0.1422	0.1118	0.0964	0.0875	0.1190
75+	0.1218	0.1891	0.1006	0.1051	0.0845	0.1198
TOTAL	0.1409	0.1401	0.1264	0.1246	0.1118	0.1389

SAS

SAVING PER HOUSEHOLD (BAHT), 2000

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	878	1061	755	770	694	875
25-29	1510	2207	1142	1410	1496	1514
30-34	1637	1865	1213	1726	1055	1616
35-39	1954	1767	1363	1411	1046	1886
40-44	1813	1563	1233	913	798	1724
45-49	1864	1723	1314	747	721	1751
50-54	1858	1120	1224	665	532	1657
55-59	1731	1246	1139	688	449	1500
60-64	1249	1061	915	583	262	1075
65-69	1172	1424	866	652	322	1017
70-74	1326	1066	935	587	414	1034
75+	1286	1197	752	699	406	915
TOTAL	1628	1425	1106	1006	606	1520

MONTHLY AGGREGATE SAVING, 2000
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1157.71	52.30	39.62	30.23	14.72	1294.59
25-29	2778.63	121.92	83.76	52.88	25.21	3062.40
30-34	3323.68	105.74	150.22	57.87	20.99	3658.49
35-39	3654.50	93.38	244.88	38.25	18.11	4049.12
40-44	3052.04	91.19	266.73	21.86	12.81	3444.63
45-49	2470.58	123.29	328.69	15.28	12.40	2950.26
50-54	1742.91	81.30	311.20	11.34	10.93	2157.69
55-59	1115.90	99.11	279.48	11.89	11.09	1517.48
60-64	538.96	89.21	229.89	11.83	7.62	877.51
65-69	282.81	90.28	176.10	10.68	12.29	572.17
70-74	161.40	58.03	123.82	5.91	13.26	362.42
75+	81.55	60.42	89.36	7.96	12.68	251.97
TOTAL	20360.68	1066.18	2323.76	275.99	172.12	24198.73

SAS

CONSUMPTION RATIO, 2005

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8946	0.8393	0.8938	0.9030	0.8949	0.8946
25-29	0.8542	0.8461	0.8581	0.8554	0.8403	0.8539
30-34	0.8517	0.8462	0.8620	0.8456	0.8510	0.8519
35-39	0.8451	0.8475	0.8551	0.8543	0.8541	0.8459
40-44	0.8584	0.8678	0.8716	0.8766	0.8644	0.8598
45-49	0.8547	0.8604	0.8635	0.8904	0.8786	0.8563
50-54	0.8586	0.8852	0.8735	0.9001	0.8894	0.8626
55-59	0.8600	0.8741	0.8700	0.8957	0.9015	0.8638
60-64	0.8748	0.8647	0.8831	0.9030	0.9272	0.8774
65-69	0.8778	0.8476	0.8859	0.8896	0.9241	0.8785
70-74	0.8772	0.8603	0.8883	0.9036	0.9125	0.8813
75+	0.8779	0.8126	0.8997	0.8949	0.9155	0.8791
TOTAL	0.8579	0.8600	0.8733	0.8762	0.8893	0.8601

SAVING RATIO, 2005

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1054	0.1107	0.1062	0.0970	0.1051	0.1054
25-29	0.1458	0.1539	0.1419	0.1446	0.1597	0.1461
30-34	0.1483	0.1538	0.1380	0.1544	0.1490	0.1481
35-39	0.1549	0.1525	0.1449	0.1457	0.1459	0.1541
40-44	0.1416	0.1322	0.1284	0.1234	0.1356	0.1402
45-49	0.1453	0.1396	0.1365	0.1096	0.1214	0.1437
50-54	0.1414	0.1148	0.1265	0.0999	0.1106	0.1374
55-59	0.1400	0.1259	0.1300	0.1043	0.0985	0.1362
60-64	0.1252	0.1353	0.1169	0.0970	0.0728	0.1226
65-69	0.1222	0.1524	0.1141	0.1104	0.0759	0.1215
70-74	0.1228	0.1397	0.1117	0.0964	0.0875	0.1187
75+	0.1221	0.1874	0.1003	0.1051	0.0845	0.1209
TOTAL	0.1421	0.1400	0.1267	0.1238	0.1107	0.1399

SAS

SAVING PER HOUSEHOLD (BAHT), 2005

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1074	1272	910	941	850	1068
25-29	1840	2569	1372	1722	1827	1840
30-34	1980	2183	1425	2109	1289	1952
35-39	2358	2047	1602	1724	1278	2270
40-44	2175	1826	1452	1115	975	2066
45-49	2187	1999	1510	912	881	2050
50-54	2146	1248	1376	812	649	1901
55-59	1985	1393	1279	840	548	1710
60-64	1444	1203	1042	712	320	1241
65-69	1358	1630	976	796	393	1169
70-74	1532	1257	1052	717	506	1191
75+	1493	1551	847	853	496	1084
TOTAL	1960	1642	1272	1206	725	1816

MONTHLY AGGREGATE SAVING, 2005
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1438.72	63.21	48.46	37.27	18.18	1605.84
25-29	3468.54	141.92	101.69	64.59	31.11	3807.84
30-34	4246.30	126.06	179.85	71.99	26.13	4650.32
35-39	5083.17	125.35	330.67	54.15	25.40	5618.73
40-44	4253.27	124.09	357.57	31.09	17.81	4783.83
45-49	3526.06	173.49	457.18	22.70	18.33	4197.77
50-54	2551.27	116.12	455.57	17.76	17.39	3158.12
55-59	1523.72	135.23	377.38	17.73	16.29	2070.35
60-64	682.11	111.19	275.37	15.88	9.79	1094.35
65-69	384.43	122.07	232.61	15.42	17.60	772.13
70-74	222.84	80.52	167.29	8.49	19.44	498.57
75+	116.21	97.78	125.23	12.14	19.28	370.64
TOTAL	27496.64	1417.03	3108.87	369.20	236.75	32628.49

SAS

CONSUMPTION RATIO, 2010

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8941	0.8886	0.8930	0.9030	0.8948	0.8941
25-29	0.8539	0.8457	0.8577	0.8554	0.8403	0.8537
30-34	0.8511	0.8463	0.8614	0.8456	0.8510	0.8513
35-39	0.8437	0.8479	0.8514	0.8543	0.8541	0.8446
40-44	0.8574	0.8675	0.8707	0.8766	0.8644	0.8585
45-49	0.8542	0.8604	0.8633	0.8904	0.8786	0.8559
50-54	0.8586	0.8854	0.8737	0.9001	0.8894	0.8627
55-59	0.8605	0.8745	0.8703	0.8957	0.9015	0.8642
60-64	0.8754	0.8643	0.8836	0.9030	0.9272	0.8779
65-69	0.8782	0.8479	0.8864	0.8896	0.9241	0.8789
70-74	0.8774	0.8612	0.8895	0.9036	0.9125	0.8815
75+	0.8780	0.8155	0.9003	0.8949	0.9155	0.8790
TOTAL	0.8573	0.8603	0.8734	0.8774	0.8906	0.8597

SAVING RATIO, 2010

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1059	0.1114	0.1070	0.0970	0.1052	0.1059
25-29	0.1461	0.1543	0.1423	0.1446	0.1597	0.1463
30-34	0.1489	0.1537	0.1386	0.1544	0.1490	0.1487
35-39	0.1563	0.1521	0.1456	0.1457	0.1459	0.1554
40-44	0.1426	0.1325	0.1293	0.1234	0.1356	0.1411
45-49	0.1458	0.1396	0.1367	0.1096	0.1214	0.1441
50-54	0.1414	0.1146	0.1263	0.0999	0.1106	0.1373
55-59	0.1395	0.1255	0.1297	0.1043	0.0985	0.1358
60-64	0.1246	0.1357	0.1164	0.0970	0.0728	0.1221
65-69	0.1218	0.1521	0.1136	0.1104	0.0759	0.1211
70-74	0.1226	0.1388	0.1115	0.0964	0.0875	0.1185
75+	0.1220	0.1845	0.0997	0.1051	0.0845	0.1210
TOTAL	0.1427	0.1397	0.1266	0.1226	0.1094	0.1403

SAS

SAVING PER HOUSEHOLD (BAHT), 2010

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1311	1553	1100	1151	1039	1304
25-29	2249	3116	1668	2103	2232	2248
30-34	2413	2629	1715	2576	1574	2377
35-39	2829	2391	1968	2105	1561	2722
40-44	2585	2134	1698	1362	1190	2452
45-49	2567	2309	1734	1114	1076	2402
50-54	2492	1415	1558	992	793	2199
55-59	2287	1560	1435	1026	670	1955
60-64	1658	1358	1171	869	391	1416
65-69	1570	1851	1096	972	481	1346
70-74	1774	1465	1189	875	618	1373
75+	1716	1910	945	1042	606	1261
TOTAL	2347	1889	1453	1436	862	2154

MONTHLY AGGREGATE SAVING, 2010
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1730.54	74.82	56.48	44.15	21.38	1927.37
25-29	4335.42	175.38	126.81	80.33	38.98	4756.93
30-34	5302.74	152.04	218.91	88.04	32.28	5794.01
35-39	6437.52	149.45	393.47	67.49	31.65	7079.57
40-44	5827.98	168.37	480.74	44.11	25.02	6546.21
45-49	4813.40	234.06	598.69	32.38	25.53	5704.07
50-54	3611.24	160.68	625.75	26.47	25.77	4449.91
55-59	2234.62	195.04	552.87	27.89	25.98	3036.40
60-64	939.32	153.77	373.28	23.77	14.43	1504.57
65-69	488.68	153.21	276.03	20.81	22.72	961.45
70-74	304.26	112.04	222.69	12.38	27.98	679.35
75+	161.67	146.64	171.82	18.05	28.97	527.16
TOTAL	36187.37	1875.52	4097.54	485.86	320.70	42966.99

SAS

CONSUMPTION RATIO, 2015

CSUMPTN	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.8939	0.8885	0.8926	0.9031	0.8949	0.8935
25-29	0.8531	0.8455	0.8572	0.8554	0.8403	0.8529
30-34	0.8507	0.8456	0.8611	0.8456	0.8510	0.8509
35-39	0.8429	0.8477	0.8538	0.8543	0.8541	0.8438
40-44	0.8565	0.8674	0.8702	0.8766	0.8644	0.8581
45-49	0.8539	0.8605	0.8634	0.8904	0.8786	0.8556
50-54	0.8587	0.8857	0.8739	0.9001	0.8894	0.8627
55-59	0.8607	0.8751	0.8707	0.8957	0.9015	0.8645
60-64	0.8759	0.8647	0.8841	0.9030	0.9272	0.8785
65-69	0.8788	0.8473	0.8865	0.8856	0.9241	0.8793
70-74	0.8776	0.8624	0.8888	0.9036	0.9125	0.8818
75+	0.8782	0.8184	0.9010	0.8949	0.9155	0.8793
TOTAL	0.8569	0.8604	0.8738	0.8787	0.8927	0.8596

SAVING RATIO, 2015

SAVING	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	0.1061	0.1115	0.1074	0.0969	0.1051	0.1061
25-29	0.1469	0.1545	0.1428	0.1446	0.1597	0.1471
30-34	0.1493	0.1544	0.1389	0.1544	0.1490	0.1491
35-39	0.1571	0.1523	0.1462	0.1457	0.1459	0.1562
40-44	0.1435	0.1326	0.1298	0.1234	0.1356	0.1419
45-49	0.1461	0.1395	0.1366	0.1096	0.1214	0.1444
50-54	0.1413	0.1143	0.1261	0.0999	0.1106	0.1373
55-59	0.1393	0.1249	0.1293	0.1043	0.0985	0.1355
60-64	0.1241	0.1353	0.1159	0.0970	0.0728	0.1215
65-69	0.1212	0.1527	0.1131	0.1104	0.0759	0.1207
70-74	0.1224	0.1376	0.1112	0.0964	0.0875	0.1182
75+	0.1218	0.1616	0.0990	0.1051	0.0845	0.1207
TOTAL	0.1431	0.1396	0.1262	0.1213	0.1073	0.1404

SAS

SAVING PER HOUSEHOLD (BAHT), 2015

SAV_HH	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	1597	1845	1334	1404	1267	1587
25-29	2747	3775	2009	2568	2720	2745
30-34	2957	3307	2095	3146	1923	2914
35-39	3453	2951	2260	2571	1907	3323
40-44	3086	2550	1996	1663	1454	2929
45-49	3025	2705	1995	1361	1314	2824
50-54	2912	1625	1782	1211	969	2565
55-59	2659	1788	1624	1253	818	2263
60-64	1914	1539	1310	1062	478	1617
65-69	1799	2105	1213	1187	587	1530
70-74	2050	1658	1340	1069	755	1581
75+	1982	2271	1053	1273	741	1458
TOTAL	2811	2187	1655	1706	1013	2553

MONTHLY AGGREGATE SAVING, 2015
(MILLIONS OF BAHT)

AGG_SAV	INTACT	S MALE	S FEMALE	OP MALE	OP FMALE	TOTAL
<25	2026.97	84.62	64.76	51.30	24.73	2252.38
25-29	5231.54	207.46	148.45	95.85	46.27	5729.57
30-34	6648.60	194.94	274.66	109.62	40.49	7268.31
35-39	8056.60	184.83	482.01	82.62	39.15	8845.20
40-44	7344.71	205.66	577.48	55.06	31.22	8214.12
45-49	6547.07	318.99	793.38	46.03	35.92	7741.39
50-54	4915.24	215.97	817.75	37.84	35.96	6022.75
55-59	3177.56	273.50	760.99	41.68	38.58	4292.31
60-64	1384.55	225.46	547.34	37.54	23.10	2217.98
65-69	675.12	214.79	370.62	31.33	33.66	1325.53
70-74	390.05	140.93	267.13	16.80	36.37	851.29
75+	223.70	211.91	232.01	26.80	42.89	737.31
TOTAL	46621.70	2479.04	5336.58	632.47	428.36	55498.14

Appendix C

Procedures for Forecasting Data

To forecast consumer expenditures requires the following demographic information about the number of households:

Number of intact households by age of head

Number of single-female headed households by age of head

Number of male one-person households by age of head

Number of female one-person households by age of head

And for households within each type and age category, the average numbers of members who are:

Males and females, 0–2

Males and females, 3–12

Males and females, 13–19

Males and females, 20–59

Males and females, 60 and older

The numbers of households in each type and age of head category are projected by HOMES and can be used directly by the consumer expenditure forecasting module. HOMES also projects the number of male and female members in five-year age categories, but not in the age categories required for consumer expenditure forecasts. A demographic module has been developed that takes as its input the number of members in five-year age groups and produces as its output the number of members in age categories specified above.

The conceptual problem that must be tackled to accomplish the task is a simple one: interpolating population in a single year of age groups from five-year age groups. In the particular case at hand, the population aged 0–5 is broken down into single ages to determine the population aged 0–2 and 3–4 and the population aged 10–14 is broken down to determine the population aged 10–12 and 13–14. The populations in these age groups are combined with the populations in five-year age groups to determine the age groupings required.

A variety of procedures have been developed for interpolating single year age groupings which involve fitting a curve, e.g., a polynomial, to the cumulative distribution of the population in the five- year group in question and adjacent age groups (see Shryock and Siegel, 1971). Once the parameters of the curve are identified, then the population in single-year age groups can be calculated. These procedures are not entirely reliable, particularly if the age distributions subject to interpolation are not smooth. Given unusual distributions, it is even possible to obtain negative calculated values for single years of age. Another problem with interpolation is that it inevitably involves smoothing of the age distribution,

so that any erratic features are lost. This should not prove to be of much concern given the nature of our problem – medium-run forecasting.

The particular method selected uses Sprague multipliers, which involves multiplying known coefficients by the five-year age group populations. The multipliers are applied separately to males and females for the national population and the percentages of those in the required single-year age groupings are calculated. These percentages are then applied to sub-groups of the population, e.g., male members of intact households with heads aged 45-49, to obtain the number of members for each of the required age groups for each of the household groups.

An alternative approach would be to apply the multipliers directly to the number of members for each of the household groups. The advantage of this approach is that it allows for differences among household groups in the age distributions of members within the five-year age categories. However, this approach proves to be unreliable because the age distribution of members tends to be insufficiently smooth.

The preparation of the required demographic data is carried out using two SAS computer programs written using PROC MATRIX routines. THAI80.NHH.CNTL and THAI80.MEM are programs used to create SAS data files that are specifically designed to simplify the use of HOMES output in applications such as forecasting consumer expenditures. The basic unit is the value for one year of a demographic variable for each of the different households distinguished by HOMES. For example, the variable M15Y1980 refers to the number of males aged 15–19 in the year 1980 living in each household type. The variables stored include the number of households, the average age of the household head, and the number of male members and the number of female members in five-year age groups (85+ is the upper age group.)

Each variable is arrayed as a nineteen-by-eight matrix. Each row contains data corresponding to the age of the head (wife of head for intact households), and the nineteenth row reports the total for all age groups. The first seven columns contain values for each of the seven household types: intact; single head male; single head female; primary individual, male; primary individual, female; one person, male; and one person, female. The eighth column reports the total for all household types. An annotated listing for the program is shown below.

The following SAS programs (GENACCM.CNTL and SELECT.CNTL) create additional demographic variables using standard HOMES output. First, Sprague multipliers are applied to calculate the number of members in the age categories required for the consumer expenditure forecasts. Second, the means of the number of members per household are calculated by dividing the number of members by the number of households. These data are then stored in SAS files to be used in the consumer expenditure forecasting file. The structure of the files is identical to that described above except that no row or column totals are generated. An annotated listing of the program and sample output are provided below.

Appendix C

1. THAI80.NHH.CNTL Program

```
//T206780X JOB (0678,1M,9KI,4KL),KRIST                                  00000010
/*ROUTE PRINT RMT8                                                      00000020
/*ROUTE PUNCH RMT8                                                      00000030
//  EXEC SAS,REGION=1800K,OPTIONS='MACRO'                               00000040
//IN  DD DSN=T106780.THAI80.NN1.DATA,DISP=OLD                           00000050
//NHH1 DD DSN=T206780.THAI80.NHH1.DATA,DISP=OLD                         00000060
//*     SPACE=(TRK,(50,20),RLSE),UNIT=TSSDA1                           00000070
//SYSIN DD *                                                            00000080
  OPTIONS NOSOURCE;                                                     00000090
  %LET I = 1;                                                           00000100
  %LET K = 26;                                                          00000110
  %LET IY = 1980;                                                       00000120
%MACRO INP (I,K,IY);                                                    00000130
  DATA DAT;                                                             00000140
    INFILE IN FIRSTOBS = &I OBS = &K;                                   00000150
    INPUT X1 - X19;                                                     00000160
  PROC MATRIX;                                                          00000170
    FETCH X DATA = DAT;                                                 00000180
    COL1 = X(22,4:18);                                                  00000190
           MI = J (15,15,0);  XMI = J (15,15,0) ;                       00000200
         CTMI = J (1,15,0);   RTMI = J (15,1,0);                        00000210
          SMI = J (15,15,0);                                            00000220
         TCOL2 = J (15,1.0);                                            00000230
                MI = X (7:21,4:18);                                     00000240
         DO II = 1 TO 15;                                               00000250
            DO JJ = 1 TO 15;                                            00000260
               XMI (II,JJ) = MI (II,JJ) #/ X (II + 6, 19);             00000270
               SMI (II,JJ) = XMI (II,JJ) # X (3, II + 3);              00000280
            END;                                                        00000290
         END;                                                           00000300
         PRINT XMI;                                                     00000301
              CTMI  = SMI (+,);                                         00000320
              RTMI  = SMI (,+);                                         00000330
    COL2 = CTMI;                                                        00000350
    COL3 = X(2,4:18);                                                   00000360
    COL4 = X(23,4:18);                                                  00000370
    COL5 = X(24,4:18);                                                  00000380
    COL6 = X(25,4:18);                                                  00000390
    COL7 = X(26,4:18);                                                  00000400
       Y = COL1 //COL2//COL3//COL4//COL5//COL6//COL7;                   00000410
       Y = %STR(Y%');                                                   00000420
    COLN='INTACT' 'S MALE' 'S FEMALE' 'PI M' 'PI F' 'OP M' 'OP F';      00000430
    ROWN='15-19' '20-24' '25-29' '30-34' '35-39' '40-44' '45-49'        00000440
         '50-54' '55-59' '60-64' '65-69' '70-74' '75-79' '80-84'        00000450
         '85+';  PRINT Y COLNAME=COLN ROWNAME=ROWN;                     00000460
        NOTE   NUMBER OF HOUSEHOLD YEAR &IY ;                           00000470
    OUTPUT Y OUT = NHH1.HY&IY;                                          00000480
    MID = 17.5 22.5 27.5 32.5 37.5 42.5 47.5 52.5 57.5 62.5             00000490
          67.5 72.5 77.5 82.5 87.5;                                     00000500
    TMID = %STR(MID%'); YY = J(15,1,0);                                 00000510
    SMAL = J(15,1,0);                                                   00000511
    DO IM = 1 TO 15;                                                    00000520
       IJ = IM + 3;                                                     00000530
      YY (IM,1) = (MID * X(7:21,IJ) #/ X(22,IJ));                       00000540
     SMAL(IM,1) = (MID * SMI(1:15,IM) #/ CTMI(1,IM));                   00000550
    END;                                                                00000560
    MIDY = YY||SMAL||TMID||TMID||TMID||TMID||TMID;                      00000570
    NOTE PAGE ;                                                         00000580
    NOTE AVERAGE AGE OF HEAD OF HOUSEHOLD YEAR &IY;                     00000590
    PRINT MIDY ROWNAME=ROWN  COLNAME=COLN  ;                            00000600
```

2. THAI80.MEM Program

```
//T106780K JOB (0678,1M,2KI,4KL),KRIST                                  00000010
/*ROUTE PRINT RMT8                                                      00000020
/*ROUTE PUNCH RMT8                                                      00000030
//  EXEC SAS,REGION=1800K,OPTIONS='MACRO'                               00000040
//IN  DD DSN=T106780.THAI80.NNT.DATA,DISP=OLD                           00000050
//NHH  DD DSN=T106780.THAI80.NHH.DATA,DISP=OLD                          00000060
//*     SPACE=(TRK,(50,20),RLSE),UNIT=TSSDA1                           00000070
//SYSIN DD *                                                            00000080
    OPTIONS NOSOURCE;                                                   00000090
  %LET I = 1;                                                           00000100
  %LET K = 192;                                                         00000110
  %LET IY = 1980;                                                       00000120
 %MACRO COLPRO(MM1,MM2,MM3,MM4,MM5);                                    00000130
    COLM1 = %STR (X (&MM1,4:18)%');                                     00000140
    COLM2 = %STR (X (&MM2,4:18)%');                                     00000150
    COLM3 = %STR (X (&MM3,4:18)%');                                     00000160
    COLM4 = %STR (X (&MM4,4:18)%');                                     00000170
    COLM5 = %STR (X (&MM5,4:18)%');                                     00000180
    YM = COLM1 ||COLM2||COLM3||COLM4||COLM5;                            00000190
    COLF1 = %STR (X (&MM1 + 19,4:18)%');                                00000200
    COLF2 = %STR (X (&MM2 + 19,4:18)%');                                00000210
    COLF3 = %STR (X (&MM3 + 19,4:18)%');                                00000220
    COLF4 = %STR (X (&MM4 + 19,4:18)%');                                00000230
    COLF5 = %STR (X (&MM5 + 19,4:18)%');                                00000240
    YF = COLF1 ||COLF2||COLF3||COLF4||COLF5;                            00000250
 %MEND COLPRO;                                                          00000260
 %MACRO INCRMM;                                                         00000270
    %LET MM1 = %EVAL (&MM1 + 1);                                        00000280
    %LET MM2 = %EVAL (&MM2 + 1);                                        00000290
    %LET MM3 = %EVAL (&MM3 + 1);                                        00000300
    %LET MM4 = %EVAL (&MM4 + 1);                                        00000310
    %LET MM5 = %EVAL (&MM5 + 1);                                        00000320
 %MEND INCRMM;                                                          00000330
%MACRO INPRO (I,K,IY);                                                  00000340
  DATA DAT;                                                             00000350
    INFILE IN FIRSTOBS = &I OBS = &K;                                   00000360
    INPUT X1 - X19;                                                     00000370
  PROC MATRIX;                                                          00000380
     %LET MM1 = 1;                                                      00000390
     %LET MM2 = 77;                                                     00000400
     %LET MM3 = 39;                                                     00000410
     %LET MM4 = 115;                                                    00000420
     %LET MM5 = 153;                                                    00000430
  FETCH X DATA = DAT;                                                   00000440
    COL1 = %STR (X (19,4:18)%') + %STR (X (38,4:18)%');                 00000450
    COL2 = %STR (X (95,4:18)%') + %STR (X (114,4:18)%');                00000460
    COL3 = %STR (X (57,4:18)%') + %STR (X (76,4:18)%');                 00000470
    COL4 = %STR (X (133,4:18)%') + %STR (X (152,4:18)%');               00000480
    COL5 = %STR (X (171,4:18)%') + %STR (X (190,4:18)%');               00000490
    COL6 = %STR (X (191,4:18)%');                                       00000500
    COL7 = %STR (X (192,4:18)%');                                       00000510
    YN = COL1 ||COL2||COL3||COL4||COL5||COL6||COL7;                     00000520
    COLN='INTACT' 'S MALE' 'S FEMALE' 'PI M' 'PI F' 'OP M' 'OP F';      00000530
    ROWN='15-19' '20-24' '25-29' '30-34' '35-39' '40-44' '45-49'        00000540
         '50-54' '55-59' '60-64' '65-69' '70-74' '75-79' '80-84'        00000550
         '85+';                                                         00000560
    NOTE   NUMBER OF TOTAL MEMBER YEAR &IY;                             00000570
    PRINT YN ROWNAME = ROWN COLNAME = COLN;                             00000580
    OUTPUT YN OUT = NHH.NY&IY;                                          00000590
      %COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                               00000600
```

```
YM0 = YM || J (15,2,0);                                          00000610
YF0 = YF || J (15,2,0);                                          00000620
OUTPUT YM0 OUT=NHH.M0Y&IY;                                       00000630
OUTPUT YF0 OUT=NHH.F0Y&IY;                                       00000640
%INCRMM ;                                                        00000650
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00000660
YM5 = YM || J (15,2,0);                                          00000670
YF5 = YF || J (15,2,0);                                          00000680
OUTPUT YM5 OUT=NHH.M5Y&IY;                                       00000690
OUTPUT YF5 OUT=NHH.F5Y&IY;                                       00000700
%INCRMM;                                                         00000710
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00000720
YM10 = YM || J (15,2,0);                                         00000730
YF10 = YF || J (15,2,0);                                         00000740
OUTPUT YM10 OUT=NHH.M10Y&IY;                                     00000750
OUTPUT YF10 OUT=NHH.F10Y&IY;                                     00000760
%INCRMM;                                                         00000770
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00000780
YM15 = YM || J (15,2,0);                                         00000790
YF15 = YF || J (15,2,0);                                         00000800
YM15 (1,6) = X (191,4);                                          00000810
YF15 (1,7) = X (192,4);                                          00000820
OUTPUT YM15 OUT=NHH.M15Y&IY;                                     00000830
OUTPUT YF15 OUT=NHH.F15Y&IY;                                     00000840
%INCRMM;                                                         00000850
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00000860
YM20 = YM || J (15,2,0);                                         00000870
YF20 = YF || J (15,2,0);                                         00000880
YM20 (2,6) = X (191,5);                                          00000890
YF20 (2,7) = X (192,5);                                          00000900
OUTPUT YM20 OUT=NHH.M20Y&IY;                                     00000910
OUTPUT YF20 OUT=NHH.F20Y&IY;                                     00000920
%INCRMM;                                                         00000930
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00000940
YM25 = YM || J (15,2,0);                                         00000950
YF25 = YF || J (15,2,0);                                         00000960
YM25 (3,6) = X (191,6);                                          00000970
YF25 (3,7) = X (192,6);                                          00000980
OUTPUT YM25 OUT=NHH.M25Y&IY;                                     00000990
OUTPUT YF25 OUT=NHH.F25Y&IY;                                     00001000
%INCRMM;                                                         00001010
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001020
YM30 = YM || J (15,2,0);                                         00001030
YF30 = YF || J (15,2,0);                                         00001040
YM30 (4,6) = X (191,7);                                          00001050
YF30 (4,7) = X (192,7);                                          00001060
OUTPUT YM30 OUT=NHH.M30Y&IY;                                     00001070
OUTPUT YF30 OUT=NHH.F30Y&IY;                                     00001080
%INCRMM;                                                         00001090
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001100
YM35 = YM || J (15,2,0);                                         00001110
YF35 = YF || J (15,2,0);                                         00001120
YM35 (5,6) = X (191,8);                                          00001130
YF35 (5,7) = X (192,8);                                          00001140
OUTPUT YM35 OUT=NHH.M35Y&IY;                                     00001150
OUTPUT YF35 OUT=NHH.F35Y&IY;                                     00001160
%INCRMM;                                                         00001170
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001180
YM40 = YM || J (15,2,0);                                         00001190
YF40 = YF || J (15,2,0);                                         00001200
```

```
YM40 (6,6) = X (191,9);                                          00001210
YF40 (6,7) = X (192,9);                                          00001220
OUTPUT YM40 OUT=NHH.M40Y&IY;                                     00001230
OUTPUT YF40 OUT=NHH.F40Y&IY;                                     00001240
%INCRMM;                                                         00001250
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001260
YM45 = YM || J (15,2,0);                                         00001270
YF45 = YF || J (15,2,0);                                         00001280
YM45 (7,6) = X (191,10);                                         00001290
YF45 (7,7) = X (192,10);                                         00001300
OUTPUT YM45 OUT=NHH.M45Y&IY;                                     00001310
OUTPUT YF45 OUT=NHH.F45Y&IY;                                     00001320
%INCRMM;                                                         00001330
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001340
YM50 = YM || J (15,2,0);                                         00001350
YF50 = YF || J (15,2,0);                                         00001360
YM50 (8,6) = X (191,11);                                         00001370
YF50 (8,7) = X (192,11);                                         00001380
OUTPUT YM50 OUT=NHH.M50Y&IY;                                     00001390
OUTPUT YF50 OUT=NHH.F50Y&IY;                                     00001400
%INCRMM;                                                         00001410
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001420
YM55 = YM || J (15,2,0);                                         00001430
YF55 = YF || J (15,2,0);                                         00001440
YM55 (9,6) = X (191,12);                                         00001450
YF55 (9,7) = X (192,12);                                         00001460
OUTPUT YM55 OUT=NHH.M55Y&IY;                                     00001470
OUTPUT YF55 OUT=NHH.F55Y&IY;                                     00001480
%INCRMM;                                                         00001490
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001500
YM60 = YM || J (15,2,0);                                         00001510
YF60 = YF || J (15,2,0);                                         00001520
YM60 (10,6) = X (191,13);                                        00001530
YF60 (10,7) = X (192,13);                                        00001540
OUTPUT YM60 OUT=NHH.M60Y&IY;                                     00001550
OUTPUT YF60 OUT=NHH.F60Y&IY;                                     00001560
%INCRMM;                                                         00001570
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001580
YM65 = YM || J (15,2,0);                                         00001590
YF65 = YF || J (15,2,0);                                         00001600
YM65 (11,6) = X (191,14);                                        00001610
YF65 (11,7) = X (192,14);                                        00001620
OUTPUT YM65 OUT=NHH.M65Y&IY;                                     00001630
OUTPUT YF65 OUT=NHH.F65Y&IY;                                     00001640
%INCRMM;                                                         00001650
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001660
YM70 = YM || J (15,2,0);                                         00001670
YF70 = YF || J (15,2,0);                                         00001680
YM70 (12,6) = X (191,15);                                        00001690
YF70 (12,7) = X (192,15);                                        00001700
OUTPUT YM70 OUT=NHH.M70Y&IY;                                     00001710
OUTPUT YF70 OUT=NHH.F70Y&IY;                                     00001720
%INCRMM;                                                         00001730
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                              00001740
YM75 = YM || J (15,2,0);                                         00001750
YF75 = YF || J (15,2,0);                                         00001760
YM75 (13,6) = X (191,16);                                        00001770
YF75 (13,7) = X (192,16);                                        00001780
OUTPUT YM75 OUT=NHH.M75Y&IY;                                     00001790
OUTPUT YF75 OUT=NHH.F75Y&IY;                                     00001800
```

```
%INCRMM;                                                          00001810
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                               00001820
YM80 = YM || J (15,2,0);                                          00001830
YF80 = YF || J (15,2,0);                                          00001840
YM80 (14,6) = X (191,17);                                         00001850
YF80 (14,7) = X (192,17);                                         00001860
OUTPUT YM80 OUT=NHH.M80Y&IY;                                      00001870
OUTPUT YF80 OUT=NHH.F80Y&IY;                                      00001880
%INCRMM;                                                          00001890
%COLPRO (&MM1,&MM2,&MM3,&MM4,&MM5);                               00001900
YM85 = YM || J (15,2,0);                                          00001910
YF85 = YF || J (15,2,0);                                          00001920
YM85 (15,6) = X (191,18);                                         00001930
YF85 (15,7) = X (192,18);                                         00001940
OUTPUT YM85 OUT=NHH.M85Y&IY;                                      00001950
OUTPUT YF85 OUT=NHH.F85Y&IY;                                      00001960
NOTE   NUMBER OF MEMBER   MALE  0-4   YEAR &IY;                  00001970
PRINT YM0  ROWNAME = ROWN COLNAME = COLN;                         00001980
NOTE   NUMBER OF MEMBER FEMALE  0-4   YEAR &IY;                   00001990
PRINT YF0  ROWNAME = ROWN COLNAME = COLN;                         00002000
NOTE   NUMBER OF MEMBER   MALE  5-9   YEAR &IY;                   00002010
PRINT YM5  ROWNAME = ROWN COLNAME = COLN;                         00002020
NOTE   NUMBER OF MEMBER FEMALE  5-9   YEAR &IY;                   00002030
PRINT YF5  ROWNAME = ROWN COLNAME = COLN;                         00002040
NOTE   NUMBER OF MEMBER   MALE 10-14  YEAR &IY;                   00002050
PRINT YM10 ROWNAME = ROWN COLNAME = COLN;                         00002060
NOTE   NUMBER OF MEMBER FEMALE 10-14  YEAR &IY;                   00002070
PRINT YF10 ROWNAME = ROWN COLNAME = COLN;                         00002080
NOTE   NUMBER OF MEMBER   MALE 15-19  YEAR &IY;                   00002090
PRINT YM15 ROWNAME = ROWN COLNAME = COLN;                         00002100
PRINT YF15 ROWNAME = ROWN COLNAME = COLN;                         00002110
NOTE   NUMBER OF MEMBER FEMALE 15-19  YEAR &IY;                   00002120
PRINT YM20 ROWNAME = ROWN COLNAME = COLN;                         00002130
NOTE   NUMBER OF MEMBER   MALE 20-24  YEAR &IY;                   00002140
PRINT YF20 ROWNAME = ROWN COLNAME = COLN;                         00002150
NOTE   NUMBER OF MEMBER FEMALE 20-24  YEAR &IY;                   00002160
PRINT YM25 ROWNAME = ROWN COLNAME = COLN;                         00002170
NOTE   NUMBER OF MEMBER   MALE 25-29  YEAR &IY;                   00002180
PRINT YF25 ROWNAME = ROWN COLNAME = COLN;                         00002190
NOTE   NUMBER OF MEMBER FEMALE 25-29  YEAR &IY;                   00002200
PRINT YM30 ROWNAME = ROWN COLNAME = COLN;                         00002210
NOTE   NUMBER OF MEMBER   MALE 30-34  YEAR &IY;                   00002220
PRINT YF30 ROWNAME = ROWN COLNAME = COLN;                         00002230
NOTE   NUMBER OF MEMBER FEMALE 30-34  YEAR &IY;                   00002240
PRINT YM35 ROWNAME = ROWN COLNAME = COLN;                         00002250
NOTE   NUMBER OF MEMBER   MALE 35-39  YEAR &IY;                   00002260
PRINT YF35 ROWNAME = ROWN COLNAME = COLN;                         00002270
NOTE   NUMBER OF MEMBER FEMALE 35-39  YEAR &IY;                   00002280
PRINT YM40 ROWNAME = ROWN COLNAME = COLN;                         00002290
NOTE   NUMBER OF MEMBER   MALE 40-44  YEAR &IY;                   00002300
PRINT YF40 ROWNAME = ROWN COLNAME = COLN;                         00002310
NOTE   NUMBER OF MEMBER FEMALE 40-44  YEAR &IY;                   00002320
PRINT YM45 ROWNAME = ROWN COLNAME = COLN;                         00002330
NOTE   NUMBER OF MEMBER   MALE 45-49  YEAR &IY;                   00002340
PRINT YF45 ROWNAME = ROWN COLNAME = COLN;                         00002350
NOTE   NUMBER OF MEMBER FEMALE 45-49  YEAR &IY;                   00002360
PRINT YM50 ROWNAME = ROWN COLNAME = COLN;                         00002370
NOTE   NUMBER OF MEMBER   MALE 50-54  YEAR &IY;                   00002380
PRINT YF50 ROWNAME = ROWN COLNAME = COLN;                         00002390
NOTE   NUMBER OF MEMBER FEMALE 50-54  YEAR &IY;                   00002400
```

```
      PRINT YM55 ROWNAME = ROWN COLNAME = COLN;                          00002410
      NOTE   NUMBER OF MEMBER   MALE 55-59  YEAR &IY;                    00002420
      PRINT YF55 ROWNAME = ROWN COLNAME = COLN;                          00002430
      NOTE   NUMBER OF MEMBER FEMALE 55-59  YEAR &IY;                    00002440
      PRINT YM60 ROWNAME = ROWN COLNAME = COLN;                          00002450
      NOTE   NUMBER OF MEMBER   MALE 60-64  YEAR &IY;                    00002460
      PRINT YF60 ROWNAME = ROWN COLNAME = COLN;                          00002470
      NOTE   NUMBER OF MEMBER FEMALE 60-64  YEAR &IY;                    00002480
      PRINT YM65 ROWNAME = ROWN COLNAME = COLN;                          00002490
      NOTE   NUMBER OF MEMBER   MALE 65-69  YEAR &IY;                    00002500
      PRINT YF65 ROWNAME = ROWN COLNAME = COLN;                          00002510
      NOTE   NUMBER OF MEMBER FEMALE 65-69  YEAR &IY;                    00002520
      PRINT YM70 ROWNAME = ROWN COLNAME = COLN;                          00002530
      NOTE   NUMBER OF MEMBER   MALE 70-74  YEAR &IY;                    00002540
      PRINT YF70 ROWNAME = ROWN COLNAME = COLN;                          00002550
      NOTE   NUMBER OF MEMBER FEMALE 70-74  YEAR &IY;                    00002560
      PRINT YM75 ROWNAME = ROWN COLNAME = COLN;                          00002570
      NOTE   NUMBER OF MEMBER   MALE 75-79  YEAR &IY;                    00002580
      PRINT YF75 ROWNAME = ROWN COLNAME = COLN;                          00002590
      NOTE   NUMBER OF MEMBER FEMALE 75-79  YEAR &IY;                    00002600
      PRINT YM80 ROWNAME = ROWN COLNAME = COLN;                          00002610
      NOTE   NUMBER OF MEMBER   MALE 80-84  YEAR &IY;                    00002620
      PRINT YF80 ROWNAME = ROWN COLNAME = COLN;                          00002630
      NOTE   NUMBER OF MEMBER FEMALE 80-84  YEAR &IY;                    00002640
      PRINT YM85 ROWNAME = ROWN COLNAME = COLN;                          00002650
      NOTE   NUMBER OF MEMBER   MALE 85 +   YEAR &IY;                    00002660
      PRINT YF85 ROWNAME = ROWN COLNAME = COLN;                          00002670
      NOTE   NUMBER OF MEMBER FEMALE 85 +   YEAR &IY;                    00002680
%MEND INPRO;                                                             00002690
%MACRO READT;                                                            00002700
  %DO II = 1 %TO 8;                                                      00002710
    %INPRO (&I,&K,&IY);                                                  00002720
    %LET IY = %EVAL (&IY + 5);                                           00002730
    %LET I = %EVAL (&I + 192);                                           00002740
    %LET K = %EVAL (&K + 192);                                           00002750
  %END;                                                                  00002760
%MEND READT;                                                             00002770
%READT;                                                                  00002780
/*                                                                       00002790
//                                                                       00002800
```

3. GENACCM.CNTL Program

```
//T206780K JOB (0678,2M,20KI,4KL),KRIST,NOTIFY=T206780,                 00000010
//     MSGCLASS=H                                                       00000020
/*ROUTE PRINT RMT8                                                     00000030
/*ROUTE PUNCH RMT8                                                     00000040
//   EXEC SAS,REGION=1800K,OPTIONS='MACRO'                             00000050
//IN   DD DSN=T106780.THAI80.NNT.DATA,DISP=OLD                         00000060
//NHH1 DD DSN=T206780.THAI80.NHH1.DATA,DISP=OLD                        00000070
//GMEM DD DSN=POP.KRIST.THAILBFR.DATA,DISP=OLD                         00000080
//SYSIN DD *                                                           00000090
  %LET IY = 1980;  /* START YEAR        */                            00000100
  %LET I  = 1;      /* FIRST OBSERVATION */                           00000110
  %LET L  = 192;    /* LAST  OBSERVATION */                           00000120
%MACRO INPRO (I,L,IY);                                                 00000130
  /* ------------------------------------------------ */               00000140
  /* READ INPUT DATA FORM HOMES NNT(NUMBER OF MEMBER) */               00000150
  /* ------------------------------------------------ */               00000160
  /*                                                  */               00000170
  DATA DAT;                                                            00000180
    INFILE IN FIRSTOBS = &I  OBS = &L;                                 00000190
    INPUT  X1 - X19;                                                   00000200
  PROC MATRIX;                                                         00000210
  /* ------------------------------------------------ */               00000220
  /* SPRAGUE MATRIXS PANEL 1 TO PANEL 5               */               00000230
  /* ------------------------------------------------ */               00000240
    S1 =  .3616 -.2768  .1488 -.0336 0/                                00000250
          .2640 -.0960  .0400 -.0080 0/                                00000260
          .1840  .0400 -.0320  .0080 0/                                00000270
          .1200  .1360 -.0720  .0160 0/                                00000280
          .0704  .1968 -.0848  .0176 0;                                00000290
    S2 =  .0336  .2272 -.0752  .0144 0/                                00000300
          .0080  .2320 -.0480  .0080 0/                                00000310
         -.0080  .2160 -.0080  .0000 0/                                00000320
         -.0160  .1840  .0400 -.0080 0/                                00000330
         -.0176  .1408  .0912 -.0144 0;                                00000340
    S3 = -.0128  .0848  .1504 -.0240  .0016/                           00000350
         -.0016  .0144  .2224 -.0416  .0064/                           00000360
          .0064 -.0336  .2544 -.0336  .0064/                           00000370
          .0064 -.0416  .2224  .0144 -.0016/                           00000380
         -.0016 -.0240  .1504  .0848 -.0128;                           00000390
    S4 = 0 -.0144  .0912  .1408 -.0176/                                00000400
         0 -.0080  .0400  .1804 -.0160/                                00000410
         0  .0000 -.0080  .2160 -.0080/                                00000420
         0  .0080 -.0480  .2320  .0080/                                00000430
         0  .0144 -.0752  .2272  .0336;                                00000440
    S5 = 0  .0176 -.0848  .1968  .0704/                                00000450
         0  .0160 -.0720  .1360  .1200/                                00000460
         0  .0080 -.0320  .0400  .1840/                                00000470
         0 -.0080  .0400 -.0960  .2640/                                00000480
         0 -.0336  .1488 -.2768  .3616;                                00000490
  /* ------------------------------------------------ */               00000500
  /*   FETCH HOUSEHOLD & MEMBER MATRIXS               */               00000510
  /* ------------------------------------------------ */               00000520
  FETCH X   DATA = DAT;                                                00000530
  FETCH H   DATA = NHH1.HY&IY;                                         00000540
  FETCH M0  DATA = NHH1.M0Y&IY;                                        00000550
  FETCH F0  DATA = NHH1.F0Y&IY;                                        00000560
  FETCH M5  DATA = NHH1.M5Y&IY;                                        00000570
  FETCH F5  DATA = NHH1.F5Y&IY;                                        00000580
  FETCH M10 DATA = NHH1.M10Y&IY;                                       00000590
  FETCH F10 DATA = NHH1.F10Y&IY;                                       00000600
```

```
FETCH M15 DATA = NHH1.M15Y&IY;                                          00000610
FETCH F15 DATA = NHH1.F15Y&IY;                                          00000620
FETCH M20 DATA = NHH1.M20Y&IY;                                          00000630
FETCH F20 DATA = NHH1.F20Y&IY;                                          00000640
/* ------------------------------------------------ */                 00000650
/*  COMPUTE SPRAGUE MATRIX TO PRODUCE PROPOTION     */                 00000660
/* ------------------------------------------------ */                 00000670
XXM    = %STR( X(191,1:5)%' );                                          00000680
XXF    = %STR( X(192,1:5)%' );                                          00000690
TOTMAL = X (1:5,19) + X (39:43,19) + X (77:81,19)                       00000700
       + X (115:119,19) + X (153:157,19) + XXM;                         00000710
TOTFEM = X (20:24,19) + X (58:62,19) + X (96:100,19)                    00000720
       + X (134:138,19) + X (172:176,19) + XXF;                         00000730
NNM1 = S1 * TOTMAL;     NNF1 = S1 * TOTFEM;                             00000740
NNM2 = S2 * TOTMAL;     NNF2 = S2 * TOTFEM;                             00000750
NNM3 = S3 * TOTMAL;     NNF3 = S3 * TOTFEM;                             00000760
NNM4 = S4 * TOTMAL;     NNF4 = S4 * TOTFEM;                             00000770
NNM5 = S5 * TOTMAL;     NNF5 = S5 * TOTFEM;                             00000780
     NM0 = (NNM1(1,1) #/ TOTMAL(1,1)) * M0;                             00000790
     NM1 = (NNM1(2,1) #/ TOTMAL(1,1)) * M0;                             00000800
     NM2 = (NNM1(3,1) #/ TOTMAL(1,1)) * M0;                             00000810
     NM3 = (NNM1(4,1) #/ TOTMAL(1,1)) * M0;                             00000820
     NM4 = (NNM1(5,1) #/ TOTMAL(1,1)) * M0;                             00000830
     NM5 = (NNM2(1,1) #/ TOTMAL(2,1)) * M5;                             00000840
     NM6 = (NNM2(2,1) #/ TOTMAL(2,1)) * M5;                             00000850
     NM7 = (NNM2(3,1) #/ TOTMAL(2,1)) * M5;                             00000860
     NM8 = (NNM2(4,1) #/ TOTMAL(2,1)) * M5;                             00000870
     NM9 = (NNM2(5,1) #/ TOTMAL(2,1)) * M5;                             00000880
    NM10 = (NNM3(1,1) #/ TOTMAL(3,1)) * M10;                            00000890
    NM11 = (NNM3(2,1) #/ TOTMAL(3,1)) * M10;                            00000900
    NM12 = (NNM3(3,1) #/ TOTMAL(3,1)) * M10;                            00000910
    NM13 = (NNM3(4,1) #/ TOTMAL(3,1)) * M10;                            00000920
    NM14 = (NNM3(5,1) #/ TOTMAL(3,1)) * M10;                            00000930
    NM15 = (NNM4(1,1) #/ TOTMAL(4,1)) * M15;                            00000940
    NM16 = (NNM4(2,1) #/ TOTMAL(4,1)) * M15;                            00000950
    NM17 = (NNM4(3,1) #/ TOTMAL(4,1)) * M15;                            00000960
    NM18 = (NNM4(4,1) #/ TOTMAL(4,1)) * M15;                            00000970
    NM19 = (NNM4(5,1) #/ TOTMAL(4,1)) * M15;                            00000980
    NM20 = (NNM5(1,1) #/ TOTMAL(5,1)) * M20;                            00000990
    NM21 = (NNM5(2,1) #/ TOTMAL(5,1)) * M20;                            00001000
    NM22 = (NNM5(3,1) #/ TOTMAL(5,1)) * M20;                            00001010
    NM23 = (NNM5(4,1) #/ TOTMAL(5,1)) * M20;                            00001020
    NM24 = (NNM5(5,1) #/ TOTMAL(5,1)) * M20;                            00001030
     NF0 = (NNF1(1,1) #/ TOTFEM(1,1)) * F0;                             00001040
     NF1 = (NNF1(2,1) #/ TOTFEM(1,1)) * F0;                             00001050
     NF2 = (NNF1(3,1) #/ TOTFEM(1,1)) * F0;                             00001060
     NF3 = (NNF1(4,1) #/ TOTFEM(1,1)) * F0;                             00001070
     NF4 = (NNF1(5,1) #/ TOTFEM(1,1)) * F0;                             00001080
     NF5 = (NNF2(1,1) #/ TOTFEM(2,1)) * F5;                             00001090
     NF6 = (NNF2(2,1) #/ TOTFEM(2,1)) * F5;                             00001100
     NF7 = (NNF2(3,1) #/ TOTFEM(2,1)) * F5;                             00001110
     NF8 = (NNF2(4,1) #/ TOTFEM(2,1)) * F5;                             00001120
     NF9 = (NNF2(5,1) #/ TOTFEM(2,1)) * F5;                             00001130
    NF10 = (NNF3(1,1) #/ TOTFEM(3,1)) * F10;                            00001140
    NF11 = (NNF3(2,1) #/ TOTFEM(3,1)) * F10;                            00001150
    NF12 = (NNF3(3,1) #/ TOTFEM(3,1)) * F10;                            00001160
    NF13 = (NNF3(4,1) #/ TOTFEM(3,1)) * F10;                            00001170
    NF14 = (NNF3(5,1) #/ TOTFEM(3,1)) * F10;                            00001180
    NF15 = (NNF4(1,1) #/ TOTFEM(4,1)) * F15;                            00001190
    NF16 = (NNF4(2,1) #/ TOTFEM(4,1)) * F15;                            00001200
```

```
    NF17 = (NNF4(3,1) #/ TOTFEM(4,1)) * F15;                          00001210
    NF18 = (NNF4(4,1) #/ TOTFEM(4,1)) * F15;                          00001220
    NF19 = (NNF4(5,1) #/ TOTFEM(4,1)) * F15;                          00001230
    NF20 = (NNF5(1,1) #/ TOTFEM(5,1)) * F20;                          00001240
    NF21 = (NNF5(2,1) #/ TOTFEM(5,1)) * F20;                          00001250
    NF22 = (NNF5(3,1) #/ TOTFEM(5,1)) * F20;                          00001260
    NF23 = (NNF5(4,1) #/ TOTFEM(5,1)) * F20;                          00001270
    NF24 = (NNF5(5,1) #/ TOTFEM(5,1)) * F20;                          00001280
/* FREE SOME MATRIX                                                  */ 00001290
   FREE M5 M10 M15 M20 F5  F10 F15 F20;                               00001300
   FREE NNM1 NNM2 NNM3 NNM4 NNM5;                                     00001310
   FREE NNF1 NNF2 NNF3 NNF4 NNF5;                                     00001320
   FREE TOTMAL TOTFEM;                                                00001330
/* ------------------------------------------------- */               00001340
/*   DEFINES UPPER TRIANGULAR MATRIX                 */               00001350
/* ------------------------------------------------- */               00001360
    UD = J(38,38,0);                                                  00001370
    DO II = 1 TO 38;                                                  00001380
       UD (II,II:38) = 1;                                             00001390
    END;                                                              00001400
/* ------------------------------------------------- */               00001410
/*   DEFINES ACCUMULATE MATRIX AGE 0-24,25,..,85     */               00001420
/* ------------------------------------------------- */               00001430
FETCH M25 DATA = NHH1.M25Y&IY;                                        00001440
FETCH F25 DATA = NHH1.F25Y&IY;                                        00001450
FETCH M30 DATA = NHH1.M30Y&IY;                                        00001460
FETCH F30 DATA = NHH1.F30Y&IY;                                        00001470
FETCH M35 DATA = NHH1.M35Y&IY;                                        00001480
FETCH F35 DATA = NHH1.F35Y&IY;                                        00001490
FETCH M40 DATA = NHH1.M40Y&IY;                                        00001500
FETCH F40 DATA = NHH1.F40Y&IY;                                        00001510
FETCH M45 DATA = NHH1.M45Y&IY;                                        00001520
FETCH F45 DATA = NHH1.F45Y&IY;                                        00001530
FETCH M50 DATA = NHH1.M50Y&IY;                                        00001540
FETCH F50 DATA = NHH1.F50Y&IY;                                        00001550
FETCH M55 DATA = NHH1.M55Y&IY;                                        00001560
FETCH F55 DATA = NHH1.F55Y&IY;                                        00001570
FETCH M60 DATA = NHH1.M60Y&IY;                                        00001580
FETCH F60 DATA = NHH1.F60Y&IY;                                        00001590
FETCH M65 DATA = NHH1.M65Y&IY;                                        00001600
FETCH F65 DATA = NHH1.F65Y&IY;                                        00001610
FETCH M70 DATA = NHH1.M70Y&IY;                                        00001620
FETCH F70 DATA = NHH1.F70Y&IY;                                        00001630
FETCH M75 DATA = NHH1.M75Y&IY;                                        00001640
FETCH F75 DATA = NHH1.F75Y&IY;                                        00001650
FETCH M80 DATA = NHH1.M80Y&IY;                                        00001660
FETCH F80 DATA = NHH1.F80Y&IY;                                        00001670
FETCH M85 DATA = NHH1.M85Y&IY;                                        00001680
FETCH F85 DATA = NHH1.F85Y&IY;                                        00001690
%DO IT = 1 %TO 7;                                                     00001700
  QM&IT = NM0(,&IT) || NM1(,&IT) || NM2(,&IT) || NM3(,&IT)            00001710
     || NM4(,&IT) || NM5(,&IT) || NM6(,&IT) || NM7(,&IT)              00001720
     || NM8(,&IT) || NM9(,&IT) || NM10(,&IT) || NM11(,&IT)            00001730
     || NM12(,&IT) || NM13(,&IT) || NM14(,&IT) || NM15(,&IT)          00001740
     || NM16(,&IT) || NM17(,&IT) || NM18(,&IT) || NM19(,&IT)          00001750
     || NM20(,&IT) || NM21(,&IT) || NM22(,&IT) || NM23(,&IT)          00001760
     || NM24(,&IT) ||  M25(,&IT) ||  M30(,&IT) ||  M35(,&IT)          00001770
     ||  M40(,&IT) ||  M45(,&IT) ||  M50(,&IT) ||  M55(,&IT)          00001780
     ||  M60(,&IT) ||  M65(,&IT) ||  M70(,&IT) ||  M75(,&IT)          00001790
     ||  M80(,&IT) ||  M85(,&IT);                                     00001800
```

```
    QF&IT = NF0(,&IT) || NF1(,&IT) || NF2(,&IT) || NF3(,&IT)          00001810
       || NF4(,&IT) || NF5(,&IT) || NF6(,&IT) || NF7(,&IT)            00001820
       || NF8(,&IT) || NF9(,&IT) || NF10(,&IT) || NF11(,&IT)          00001830
       || NF12(,&IT) || NF13(,&IT) || NF14(,&IT) || NF15(,&IT)        00001840
       || NF16(,&IT) || NF17(,&IT) || NF18(,&IT) || NF19(,&IT)        00001850
       || NF20(,&IT) || NF21(,&IT) || NF22(,&IT) || NF23(,&IT)        00001860
       || NF24(,&IT) ||  F25(,&IT) ||  F30(,&IT) ||  F35(,&IT)        00001870
       ||  F40(,&IT) ||  F45(,&IT) ||  F50(,&IT) ||  F55(,&IT)        00001880
       ||  F60(,&IT) ||  F65(,&IT) ||  F70(,&IT) ||  F75(,&IT)        00001890
       ||  F80(,&IT) ||  F85(,&IT);                                   00001900
   UM&IT = QM&IT * UD;                                                00001910
   UF&IT = QF&IT * UD;                                                00001920
   OUTPUT UM&IT OUT=GMEM.UM&IT&IY;                                    00001930
   OUTPUT UF&IT OUT=GMEM.UF&IT&IY;                                    00001940
 %END;                                                                00001950
  /* FREE SOME MATRIX                                        */       00001960
     FREE M25 M30 M35 M40 M45 M50 M55 M60 M65 M70 M75 M80 M85         00001970
          F25 F30 F35 F40 F45 F50 F55 F60 F65 F70 F75 F80 F85         00001980
          NM0 NM1 NM2 NM3 NM4 NM5 NM6 NM7 NM8 NM9 NM10 NM11 NM12     00001990
          NM13 NM14 NM15 NM16 NM17 NM18 NM19 NM20 NM21 NM22 NM23     00002000
          NF0 NF1 NF2 NF3 NF4 NF5 NF6 NF7 NF8 NF9 NF10 NF11 NF12     00002010
          NF13 NF14 NF15 NF16 NF17 NF18 NF19 NF20 NF21 NF22 NF23     00002020
          NM24 NF24 UD                                               00002030
          QM1 QM2 QM3 QM4 QM5 QM6 QM7                                00002040
          QF1 QF2 QF3 QF4 QF5 QF6 QF7;                               00002050
%MEND INPRO;                                                         00002060
  /* ******************************************************* */      00002070
  /*     DEFINE  1980 TO 2015          */                           00002080
  /* ******************************************************* */      00002090
%MACRO PRODUCES;                                                     00002100
  %DO M = 1 %TO 4;                                                   00002110
    %INPRO (&I,&L,&IY);                                              00002120
    %LET I  = %EVAL(&I + 192);                                       00002130
    %LET L  = %EVAL(&L + 192);                                       00002140
    %LET IY = %EVAL(&IY + 5);                                        00002150
  %END;                                                              00002160
%MEND PRODUCES;                                                      00002170
%PRODUCES;                                                           00002180
/*                                                                   00002190
//                                                                   00002200
```

4. SELECT.CNTL

```
//T206780K JOB (0678,1M,10KI,4KL),KRIST,NOTIFY=T206780,                 00000010
//     MSGCLASS=H                                                       00000020
/*ROUTE PRINT RMT8                                                      00000030
/*ROUTE PUNCH RMT8                                                     00000040
//  EXEC SAS,REGION=1800K,OPTIONS='MACRO'                               00000050
//NHH1 DD DSN=T206780.THAI80.NHH1.DATA,DISP=OLD                         00000060
//GMEM DD DSN=POP.KRIST.THAILBFR.DATA,DISP=OLD                          00000070
//SYSIN DD *                                                           00000080
      OPTIONS MPRINT SYMBOLGEN;                                        00000090
  /* ************************************************* */              00000100
  /*   AGE       YBN        YEN                        */              00000110
  /*     0         0          1                        */              00000120
  /*     1         1          2                        */              00000130
  /*     2         2          3                        */              00000140
  /*     3         3          4                        */              00000150
  /*     .         .          .                        */              00000160
  /*     .         .          .                        */              00000170
  /*    24        24         25                        */              00000180
  /*    25        25         26                        */              00000190
  /*    30        26         27                        */              00000200
  /*    35        27         28                        */              00000210
  /*    40        28         29                        */              00000220
  /*    45        29         30                        */              00000230
  /*    50        30         31                        */              00000240
  /*    55        31         32                        */              00000250
  /*    60        32         33                        */              00000260
  /*    65        33         34                        */              00000270
  /*    70        34         35                        */              00000280
  /*    75        35         36                        */              00000290
  /*    80        36         37                        */              00000300
  /*    85        37         38                        */              00000310
  /* ************************************************* */              00000320
  %LET IY = 1980;    /* START YEAR          */                         00000330
  %LET N  = 5;       /* NO. OF AGE GROUP    */                         00000340
  /* BEGIN1    = 0          END1   = 6     */                         00000350
  %LET YB1     = 1;   %LET  YE1   = 7;                                 00000360
  /* BEGIN2    = 7          END2   = 12    */                         00000370
  %LET YB2     = 7;   %LET  YE2   = 13;                                00000380
  /* BEGIN3    = 13         END3   = 13    */                         00000390
  %LET YB3     = 13; %LET  YE3   = 20;                                 00000400
  /* BEGIN4    = 20         END4   = 59    */                         00000410
  %LET YB4     = 20; %LET  YE4   = 32;                                 00000420
  /* BEGIN5    = 60         END5   = 85    */                         00000430
  %LET YB5     = 32; %LET  YE5   = 38;                                 00000440
%MACRO INPRO (IY,N);                                                   00000450
  PROC MATRIX;                                                         00000460
  /* ------------------------------------------------ */               00000470
  /*   FETCH HOUSEHOLD & MEMBER MATRIXS               */               00000480
  /* ------------------------------------------------ */               00000490
  FETCH H    DATA = NHH1.HY&IY;                                        00000500
  H = H(1,) + H(2,) // H(3:12,) // H(13,) + H(14,) + H(15,);           00000510
  %DO I = 1 %TO 7;                                                     00000520
  FETCH UM&I DATA = GMEM.UM&I&IY;                                      00000530
  FETCH UF&I DATA = GMEM.UF&I&IY;                                      00000540
  %END;                                                                00000550
  %DO NN = 1 %TO &N;                                                   00000560
       AM&NN = J(15,7,0);                                              00000570
       AF&NN = J(15,7,0);                                              00000580
       %IF (&NN = 1 AND &&&YB&NN = 1)  %THEN                           00000590
         %DO;                                                          00000600
```

```
            %LET YYE = &&&YE&NN;                                          00000610
            %DO II = 1 %TO 7;                                             00000620
                AM&NN(,&II) = UM&II(,&YYE);                               00000630
                AF&NN(,&II) = UF&II(,&YYE);                               00000640
            %END;                                                         00000650
            AM&NN  = AM&NN (1,) + AM&NN (2,) // AM&NN(3:12,) //           00000660
                     AM&NN (13,) + AM&NN (14,) + AM&NN(15,);              00000670
            AF&NN  = AF&NN (1,) + AF&NN (2,) // AF&NN(3:12,) //           00000680
                     AF&NN (13,) + AF&NN (14,) + AF&NN(15,);              00000690
            AM&NN  = AM&NN #/ H;                                          00000700
            AF&NN  = AF&NN #/ H;                                          00000710
          %END;                                                           00000720
        %ELSE                                                             00000730
          %DO;                                                            00000740
            %LET YYB = &&&YB&NN;                                          00000750
            %LET YYE = &&&YE&NN;                                          00000760
            %DO II = 1 %TO 7;                                             00000770
                AM&NN(,&II) = UM&II(,&YYE) - UM&II(,&YYB);                00000780
                AF&NN(,&II) = UF&II(,&YYE) - UF&II(,&YYB);                00000790
            %END;                                                         00000800
            AM&NN  = AM&NN (1,) + AM&NN (2,) // AM&NN(3:12,) //           00000810
                     AM&NN (13,) + AM&NN (14,) + AM&NN(15,);              00000820
            AF&NN  = AF&NN (1,) + AF&NN (2,) // AF&NN(3:12,) //           00000830
                     AF&NN (13,) + AF&NN (14,) + AF&NN(15,);              00000840
            AM&NN  = AM&NN #/ H;                                          00000850
            AF&NN  = AF&NN #/ H;                                          00000860
          %END;                                                           00000870
    ROWN = '< 25'  '25-29' '30-34' '35-39' '40-44'                        00000880
           '45-49' '50-54' '55-59' '60-64' '65-69' '70-74'                00000890
           '75-79' '85 +';                                                00000900
    COLN = 'INTACT' 'S MALE' 'S FEMALE' 'PI MALE' 'PI FEMALE'             00000910
           'OP MALE' 'OP FEMALE';                                         00000920
    NOTE PAGE;                                                            00000930
    NOTE  AVERAGE NUMBER OF MALE MEMBER YEAR &IY;                         00000940
    PRINT AM&NN ROWNAME=ROWN COLNAME=COLN;                                00000950
    NOTE PAGE;                                                            00000960
    NOTE  AVERAGE NUMBER OF FEMALE MEMBER YEAR &IY;                       00000970
    PRINT AF&NN ROWNAME=ROWN COLNAME=COLN;                                00000980
    OUTPUT AM&NN OUT=GMEM.AM&NN&IY;                                       00000990
    OUTPUT AF&NN OUT=GMEM.AF&NN&IY;                                       00001000
    %END;                                                                 00001010
  /* FREE SOME MATRIX                                          */         00001020
     FREE UM1 UM2 UM3 UM4 UM5 UM6 UM7                                     00001030
          UF1 UF2 UF3 UF4 UF5 UF6 UF7                                     00001040
          AM1 AM2 AM3 AM4 AM5 AF1 AF2 AF3 AF4 AF5;                        00001050
%MEND INPRO;                                                             00001060
%MACRO PRODUCES;                                                         00001070
   %DO I = 1 %TO 8;                                                      00001080
      %INPRO (&IY,&N);                                                   00001090
      %LET IY = %EVAL(&IY + 5);                                          00001100
   %END;                                                                 00001110
%MEND  PRODUCES;                                                         00001120
%PRODUCES;                                                               00001130
/*                                                                       00001140
//                                                                       00001150
```

Appendix D

Saving Module

```
//T106780Y JOB (0678,4KL,9KI,3M,367F),YUN,MSGLEVEL=(0,0)                00000010
//*ROUTE PRINT RMT8                                                     00000020
//*ROUTE PUNCH RMT8                                                     00000030
//   EXEC SAS,REGION=2000K                                              00000040
//IN   DD DSN=T106780.THAI.CONEXP.DATA,DISP=OLD                         00000050
//IN2  DD DSN=T206780.THAI80.NHH1.DATA,DISP=OLD                         00000060
//IN3  DD DSN=POP.KRIST.THAIOALL.DATA,DISP=OLD                          00000070
//SYSIN DD *                                                            00000080
    OPTIONS NOSOURCE NODATE;                                            00000090
  /****  SPECIFY THE BASE YEAR OF PROJECTION  ****/                     00000100
   %LET BASEYR= 1980;                                                   00000110
                                                                        00000120
                                                                        00000130
  /****  SPECIFY THE LAST YEAR OF PROJECTION ****/                      00000140
   %LET FINALYR=2015;                                                   00000150
                                                                        00000160
  /****  SPECIFY ANNUAL ECONOMIC GROWTH RATE  ****/;                    00000170
   %LET GAMMA=0.04;                                                     00000180
                                                                        00000190
                                                                        00000200
   /*****************************************************/             00000210
   /*  SELECT TYPE OF HOUSEHOLDS TO BE PROCESSED.  */                   00000220
   /*      1 = INTACT                              */                   00000230
   /*      2 = SINGLE MALE                         */                   00000240
   /*      3 = SINGLE FEMALE                       */                   00000250
   /*      4 = PRIMARY INDIVIDUAL, MALE HEADS      */                   00000260
   /*      5 = PRIMARY INDIVIDUAL, FEMALE HEADS    */                   00000270
   /*      6 = ONE PERSON, MALE                    */                   00000280
   /*      7 = ONE PERSON, FEMALE                  */                   00000290
   /*****************************************************/             00000300
                                                                        00000310
  %LET HHTYPE=1 3 6 7;    *SELECT THE TYPE OF HOUSEHOLDS ;              00000320
                                                                        00000330
                                                                        00000340
   /*-----------------------------------------------------*/            00000350
   /* PARAMETER ESTIMATES FOR THE LOG(EXPENDITURE/INCOME)*/             00000360
   /*-----------------------------------------------------*/            00000370
   DATA EST; SET IN.ESTNEW1;                                            00000380
   COL1 =INTERCEP; COL2 =N0_2; COL3 =N3_12;                             00000390
   COL4 =N13_19;   COL5 =NF20_59; COL6 =NM20_59;                        00000400
   COL7 =NF60U;    COL8 =NM60U;   COL9 =F;                              00000410
   COL10=AGE2;     COL11=AGE3;    COL12=AGE4;   COL13=AGE5;             00000420
   COL14=V17;      COL15=V18;     COL16=V19;                            00000430
   COL17=V20;      COL18=V21;     COL19=V22;                            00000440
   COL20=V23;      COL21=V24;     COL22=V25;                            00000450
   COL23=V26;      COL24=V27;     COL25=V28;                            00000460
   COL26=V29;      COL27=OPMALE;  COL28=OPFEMALE;                       00000470
   KEEP COL1-COL28;                                                     00000480
                                                                        00000490
                                                                        00000500
   /*-----------------------------------------------------*/            00000510
   /* PARAMETER ESTIMATES FOR THE LOG(PER CAPITA INCOME).*/             00000520
   /*-----------------------------------------------------*/            00000530
   DATA EST2;    SET IN.ESTNEW2;                                        00000540
   COL1 =INTERCEP; COL2 =N0_2;    COL3 =N3_12;                          00000550
   COL4 =N13_19;   COL5 =NF20_59; COL6 =NM20_59;                        00000560
   COL7 =NF60U;    COL8 =NM60U;   COL9 =F;                              00000570
   COL10=AGE2;     COL11=AGE3;    COL12=AGE4;   COL13=AGE5;             00000580
```

```
 COL14=V17;      COL15=V18;      COL16=V19;                                  00000590
 COL17=V20;      COL18=V21;      COL19=V22;                                  00000600
 COL20=V23;      COL21=V24;      COL22=V25;                                  00000610
 COL23=V26;      COL24=V27;      COL25=V28;                                  00000620
 COL26=V29;      COL27=OPMALE;   COL28=OPFEMALE;                             00000630
 KEEP COL1-COL28;                                                            00000640
                                                                             00000650
/*-------   START OF MACRO REG  --------*/                                   00000660
                                                                             00000670
 %MACRO REG;                                                                 00000680
LNEY  = EST(,1)         + EST(,2)*N0_2   + EST(,3)*N3_12 +                  00000690
        EST(,4)*N13_19 + EST(,5)*NF20_59 + EST(,6)*NM20_59 +                 00000700
        EST(,7)*NF60U + EST(,8)*NM60U  + EST(,9)*F      +                    00000710
        EST(,10)*AGE2 + EST(,11)*AGE3  + EST(,12)*AGE4 +                     00000720
        EST(,13)*AGE5 +                                                      00000730
        EST(,14)*V17  + EST(,15)*V18   + EST(,16)*V19  +                     00000740
        EST(,17)*V20  + EST(,18)*V21   + EST(,19)*V22  +                     00000750
        EST(,20)*V23  + EST(,21)*V24   + EST(,22)*V25  +                     00000760
        EST(,23)*V26  + EST(,24)*V27   + EST(,25)*V28  +                     00000770
        EST(,26)*V29  + EST(,27)*OPMALE + EST(,28)*OPFEMALE;                 00000780
                                                                             00000790
                                                                             00000840
 LNY  =  EST2(,1)         + EST2(,2)*N0_2    + EST2(,3)*N3_12   +            00000850
        EST2(,4)*N13_19 + EST2(,5)*NF20_59 + EST2(,6)*NM20_59 +              00000860
        EST2(,7)*NF60U + EST2(,8)*NM60U  + EST2(,9)*F      +                 00000870
        EST2(,10)*AGE2 + EST2(,11)*AGE3  + EST2(,12)*AGE4 +                  00000880
        EST2(,13)*AGE5 +                                                     00000890
        EST2(,14)*V17  + EST2(,15)*V18   + EST2(,16)*V19  +                  00000900
        EST2(,17)*V20  + EST2(,18)*V21   + EST2(,19)*V22  +                  00000910
        EST2(,20)*V23  + EST2(,21)*V24   + EST2(,22)*V25  +                  00000920
        EST2(,23)*V26  + EST2(,24)*V27   + EST2(,25)*V28  +                  00000930
        EST2(,26)*V29  + EST2(,27)*OPMALE + EST2(,28)*OPFEMALE +             00000940
        &GAMMA#&T;                                                           00000950
                                                                             00001000
    LNY = LNY(,&HHTYPE);                                                     00001010
                                                                             00001020
                                                                             00001030
%MEND;                                                                       00001040
                                                                             00001050
 /*-----   END OF MACRO REG  ------*/                                        00001060
                                                                             00001070
 /*-----  START OF MACRO MAIN  ------*/                                      00001080
                                                                             00001090
 %MACRO MAIN(IY,T,KK);                                                       00001100
 /*-------------------------------------------------*/                       00001110
 /* READING IN THE DEMOGRAPHIC VARIABLES FROM HOMES*/                       00001120
 /*-------------------------------------------------*/                       00001130
 FETCH N    DATA=IN2.NY&IY; FETCH H    DATA=IN2.HY&IY;                       00001140
 FETCH NM1  DATA=IN3.AM02&IY;FETCH NM2  DATA=IN3.AM12&IY;                    00001150
 FETCH NM3  DATA=IN3.AM19&IY;FETCH NM4  DATA=IN3.AM59&IY;                    00001160
 FETCH NM5  DATA=IN3.AM6U&IY;FETCH NF1  DATA=IN3.AF02&IY;                    00001170
 FETCH NF2  DATA=IN3.AF12&IY;FETCH NF3  DATA=IN3.AF19&IY;                    00001180
 FETCH NF4  DATA=IN3.AF59&IY;FETCH NF5  DATA=IN3.AF6U&IY;                    00001190
 N0_2   = NM1 + NF1;                                                         00001200
 N3_12  = NM2 + NF2;                                                         00001210
 N13_19 = NM3 + NF3;                                                         00001220
 NM20_59 = NM4;                                                              00001230
 NM60U   = NM5;                                                              00001240
 NF20_59 = NF4;                                                              00001250
 NF60U   = NF5;                                                              00001260
```

```
/*-------------------------------------------------*/                    00001270
/* AGE MATRICES                                    */                    00001280
/*-------------------------------------------------*/                    00001290
AGE2  = J.(12,7,0);                                                      00001300
AGE3  = J.(12,7,0);                                                      00001310
AGE4  = J.(12,7,0);                                                      00001320
AGE5  = J.(12,7,0);                                                      00001330
AGE2(2:4,)  = 1;        *25-39;                                          00001340
AGE3(5:6,)  = 1;        *40-49;                                          00001350
AGE4(7:8,)  = 1; *50-59;        AGE5(9:12,) = 1; *60+;                   00001360
                                                                         00001370
F=F(1:12,);  H=(H(1,)+H(2,))//H(3:12,)//(H(13,)+H(14,)+H(15,));          00001380
N=(N(1,)+N(2,))//N(3:12,)//(N(13,)+N(14,)+N(15,));                       00001390
OPMALE=OPMALE(1:12,);     OPFEMALE=OPFEMALE(1:12,);                      00001400
                                                                         00001410
H=H(,&HHTYPE);      N=N(,&HHTYPE);                                       00001420
                                                                         00001430
%REG;                                                                    00001440
                                                                         00001450
H=H||H(,+);          H=H//H(+,);                                         00001460
N=N||N(,+);          N=N//N(+,);                                         00001470
AVG=N#/H;                                                                00001480
                                                                         00001490
 TOT_INC = EXP(LNY)#N(1:12,1:5);                                         00001500
                                                                         00001510
                                                                         00001520
/*-------------------------------------------------*/                    00001530
/* TO CALCULATE WEIGHTED ROW & COLUMN TOTALS.  */                        00001540
/*-------------------------------------------------*/                    00001550
                                                                         00001551
    LNEY = LNEY(,&HHTYPE);  ELNEY=EXP(LNEY);                             00001552
    RWGT=J.(12,1,0);  CWGT=J.(1,5,0);                                    00001553
    DO I = 1 TO 12;                                                      00001554
    RSUM=0;                                                              00001560
     DO J= 1 TO 5;                                                       00001570
        RSUM = RSUM + (TOT_INC(I,J)#ELNEY(I,J));                         00001580
     END;                                                                00001590
     RWGT(I,1)=RSUM#/TOT_INC(I,+);                                       00001600
    END;                                                                 00001610
    DO J = 1 TO 4;                                                       00001620
    CSUM=0;                                                              00001630
     DO I = 1 TO 12;                                                     00001640
        CSUM = CSUM + (TOT_INC(I,J)#ELNEY(I,J));                         00001650
     END;                                                                00001660
     CWGT(1,J)=CSUM#/TOT_INC(+,J);                                       00001670
    END;                                                                 00001680
          ELNEY=ELNEY||RWGT;                                             00001690
          RWGT =%STR(RWGT%'); GSUM=(RWGT*TOT_INC(,+))#/SUM(TOT_INC);     00001700
          CWGT = CWGT||GSUM;                                             00001710
          ELNEY=ELNEY//CWGT;                                             00001720
                                                                         00001730
 TOT_INC = TOT_INC||TOT_INC(,+);                                         00001740
 TOT_INC = TOT_INC//TOT_INC(+,);                                         00001750
                                                                         00001760
CSUMPTN= ELNEY * ADJ1;              *CONSUMPTION RATIO;                  00001770
 * SAVING RATIO ;                                                       00001780
 SAVING=1-CSUMPTN;                                                       00001790
                                                                         00001800
*PER CAPITA INCOME;                                                      00001810
 YNCAP=TOT_INC#/N;                                                       00001820
```

```
                                                                        00001830
  *SAVING PER HOUSEHOLD;                                                00001840
   SAV_HH=YNCAP#AVG#SAVING#ADJ2;                                        00001850
                                                                        00001860
  *MONTHLY AGGREGATE SAVING;                                            00001870
   AGG_SAV=(SAV_HH#H)#/1000000;                                         00001880
                                                                        00001890
                                                                        00001900
                                                                        00001910
  COLN='INTACT'  'S FEMALE' 'OP MALE' 'OP FMALE' 'TOTAL';               00001920
  COL1='INTACT' 'S MALE' 'S FEMALE' 'OP MALE' 'OP FMALE' 'TOTAL';       00001930
  ROWN=' <25' '25-29' '30-34' '35-39' '40-44' '45-49'                   00001940
       '50-54' '55-59' '60-64' '65-69' '70-74' ' 75+'                   00001950
       'TOTAL';                                                         00001960
                                                                        00001970
  NOTE PAGE;                                                            00001980
  NOTE CONSUMPTION RATIO, &IY;                                          00001990
  PRINT CSUMPTN COLNAME=COLN ROWNAME=ROWN FORMAT=10.4;                  00002000
  NOTE SKIP=4;                                                          00002010
  NOTE SAVING RATIO, &IY;                                               00002020
  PRINT SAVING COLNAME=COLN ROWNAME=ROWN FORMAT=10.4;                   00002030
                                                                        00002040
  NOTE PAGE;                                                            00002050
  NOTE SAVING PER HOUSEHOLD (BAHT), &IY;                                00002060
  PRINT SAV_HH COLNAME=COLN ROWNAME=ROWN FORMAT=10.0;                   00002070
  NOTE SKIP=4;                                                          00002080
  NOTE MONTHLY AGGREGATE SAVING, &IY;  NOTE '(MILLIONS OF BAHT)';       00002090
  PRINT AGG_SAV COLNAME=COLN ROWNAME=ROWN FORMAT=10.2;                  00002100
                                                                        00002110
%MEND MAIN;                                                             00002120
  /*----     END OF MACRO MAIN     ----*/                              00002130
                                                                        00002140
                                                                        00002150
   %MACRO LOOP;                                                         00002160
     %DO IY=&BASEYR %TO &FINALYR %BY 5;                                 00002170
       %LET T=%EVAL(&IY-&BASEYR);                                       00002180
       %LET KK=%EVAL((&T+5)/5);                                         00002190
       %MAIN(IY=&IY,T=&T,KK=&KK);                                       00002200
     %END;                                                              00002210
   %MEND;                                                               00002220
                                                                        00002230
                                                                        00002240
  /*---------------------------------*/                                 00002250
  /*  START OF THE MAIN PROGRAM      */                                 00002260
  /*---------------------------------*/                                 00002270
                                                                        00002280
  PROC MATRIX;                                                          00002290
  FETCH EST   DATA=EST;        FETCH EST2 DATA=EST2;                    00002300
  FETCH V17   DATA=IN.V17;                                              00002310
  FETCH V18   DATA=IN.V18;     FETCH V19  DATA=IN.V19;                  00002320
  FETCH V20   DATA=IN.V20;     FETCH V21  DATA=IN.V21;                  00002330
  FETCH V22   DATA=IN.V22;     FETCH V23  DATA=IN.V23;                  00002340
  FETCH V24   DATA=IN.V24;     FETCH V25  DATA=IN.V25;                  00002350
  FETCH V26   DATA=IN.V26;     FETCH V27  DATA=IN.V27;                  00002360
  FETCH V28   DATA=IN.V28;     FETCH V29  DATA=IN.V29;                  00002370
  FETCH F     DATA=IN3.FEMALE;                                          00002380
  FETCH OPMALE DATA=IN3.OPMALE;                                         00002390
  FETCH OPFEMALE DATA=IN3.OPFEMALE;                                     00002400
                                                                        00002410
    ADJ1=0.9110;      * ADJUSTS CON RATIO;                              00002420
    ADJ2=1.85          * ADJUST DISPOSABLE INCOME                       00002430
                                                                        00002440
      %LOOP                                                             00002450
                                                                        00002460
                                                                        00002470
                                                                        00002480
/*                                                                      00002490
//                                                                      00002500
```

Appendix E

Macro Forecast Adjustments

Two adjustments of calculated aggregates are necessary to generate forecasts that are reasonably consistent with national income account aggregates for Thailand. First, the unadjusted calculated household saving ratio will generally underestimate its national income counterpart because households under-report income to a greater extent than they do consumption. The forecast saving ratio is adjusted upward to compensate for this differential under-reporting. Second, unadjusted forecasts of total household saving (obtained as the product of the adjusted saving ratio and household disposable income) is an underestimate of actual saving, again, because income is under-reported. Thus, disposable income is adjusted upward to yield a calculated value of aggregate saving consistent with national income aggregates.

There are several difficulties that hinder making the necessary adjustments. As discussed in the text, national income aggregates are not entirely consistent with household survey data even in principle. A national income measure that roughly corresponds to that calculated using survey data was obtained by using household saving as the numerator. The denominator, disposable income, was calculated as the sum of compensation of employees, income from unincorporated enterprises, and income from property less direct taxes on households. The household saving ratio thus defined has been calculated using national income statistics prepared by NESDB from 1980 to 1985 (NESDB, 1985 and 1986) and is presented in Table E.

Table E

Household Saving Ratio

Year	Saving Ratio
1980	17.5
1981	14.5
1982	14.1
1983	10.6
1984	11.1
1985	10.4

Ideally, the adjusted forecast household saving ratio would lie on Thailand's long-run trend so that the long-run forecasts would not be unduly influenced by the rather substantial year-to-year variation in the saving ratio, which is not a product of the slow processes associated with demographic change. (Between 1980 and 1985 the calculated saving ratio changes by only 0.2.) The average household saving ratio over the 1980–1985

period is 13.0 percent and this figure was employed to scale calculated saving ratios. (The unadjusted saving ratio for 1980 is only 4.5 percent.)

Disposable income was adjusted upward to yield a value as consistent as possible with the 1980 and 1985 reported disposable incomes. The ratio of the observed to the unadjusted disposable income in 1980 is 1.837 and in 1985 is 1.854. Adjusted disposable incomes for forecast years are calculated by multiplying the unadjusted forecast by 1.85.

THE EAST–WEST CENTER is a public, nonprofit educational institution with an international board of governors. Some 2,000 research fellows, graduate students, and professionals in business and government each year work with the Center's international staff in cooperative study, training, and research. They examine major issues related to population, resources and development, the environment, culture, and communication in Asia, the Pacific, and the United States. The Center was established in 1960 by the United States Congress, which provides principal funding. Support also comes from more than 20 Asian and Pacific governments, as well as private agencies and corporations.

Situated on 21 acres adjacent to the University of Hawaii's Manoa Campus, the Center's facilities include a 300-room office building housing research and administrative offices for an international staff of 250, three residence halls for participants, and a conference center with meeting rooms equipped to provide simultaneous translation and a complete range of audiovisual services.

THE EAST–WEST POPULATION INSTITUTE, established as a unit of the East–West Center in 1969, carries out multidisciplinary research, training, and related activities in the field of population, placing emphasis on economic, social, psychological, and environmental aspects of population problems in Asia, the Pacific, and the United States.