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A MODEL OF THE DIFFERENTIAL GROWTH EFFECTS OF NATIONAL SECTORAL SAVING AND FOREIGN BORROWING OF THAILAND

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1. Introduction

Thailand is a middle-income developing country whose prime economic objective is to attain rapid and sustained economic growth and thus bring about improvement in the living standard of its people. However, like other developing countries in recent years, it has experienced a sustained rise in foreign borrowing, which has brought about a heavy burden of debt service payments. The need for domestic resource mobilization on a larger scale and for improvement in the efficiency of both domestic and foreign resource allocation has never been more urgent. In this regard, research on the possible, different quantitative growth effects of the various components of national sectoral saving and foreign borrowing will be both relevant and useful in the formulation of the national economic development policy of Thailand.

Two related issues addressed by the study therefore are : 1) whether savings from the three economic sectors (household, business and government) of Thailand have different effects on the growth of real national income; and 2) whether the foreign borrowing of Thailand contributed positively to the growth rate of its real GNP, and if so, to what extent this has been the case.

The objective of this paper is therefore to specify and estimate a model which allows for testing two hypotheses : (1) individual components of national sectoral saving in Thailand have different growth effects; and (2) foreign borrowing in Thailand has a positive income growth effect.

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2. Economic Growth, National Sectoral Saving, Investment and Foreign Borrowing in Thailand

Throughout the period of 1961–1982, the Thai economy had expanded at a rapid and steady rate. The annual average growth rate of real GNP in Thailand during the past two decades amounted to 7 percent (see Table 1). During the period of the first oil shock, the real GNP annual growth rate averaged around 7.4 percent in 1973–75, which subsequently declined to 6.8 percent in 1975. However, during the period of 1979–1982 in which the Thai economy suffered from the recessionary impact of the second oil shocks, the annual average growth rate of real GNP declined to 4.7 percent.

The average ratio of gross national saving to GNP was around 22 percent for the 1961–1982 period. During the same period, the average ratios to GNP of gross national saving, household saving, private business net saving and public saving were 22.1, 11.5, 1.0 and 3.2 percent, respectively (see Table 2). It was noted that during the commodity boom which overlapped with the first oil shock in 1973–1974, the gross national saving ratio reached a high level of 27.6 percent as a result of increases in the household saving and public saving ratios of 15.6 and 4.3 percent, respectively, while the private corporate net saving ratio declined slightly to 0.9 percent. During the 1961–1982 period, the average shares of household saving, private business net saving, public saving and depreciation allowance in gross national saving were 52, 6, 9 and 33 percent, respectively. Household saving has apparently played a major role in financing economic development by providing the major source of domestic resources.

National saving is channeled to finance investment via three routes, namely, financial intermediaries, government apropriation and self-finance. The bulk of national saving is mobilized to investment by financial intermediaries. According to Table 3, the main portion of household saving, which by itself comprises half of gross national saving, is in the form of financial assets. Specifically, during the period 1967–1980, the average ratio of household financial assets to household saving amounted to 71 percent whereas the average ratio of the sum of household demand and time deposits to household saving was around 34 percent.

In general, private business net profit after tax may be either retained by the corporation or paid out to shareholders as dividends. It was noted that during the 1961–1982 period, the average ratio of private corporate net saving to the GNP was around 1 percent, while that of the corporate dividends was only 0.4 percent. These figures suggest that private corporations in Thailand tend to save a significant portion of their net income, which is mainly channeled to finance investment through self-financing.

Public saving is defined as the excess of public sector revenues over public consumption. This is the sum of general government saving and saving of government enterprises. This sum increased steadily from 1961 to 1967. Thereafter, growth of public saving fluctuated widely. It was noted that in 1974, the year of the commodity boom, public saving rose tremendously because of increases in export tax revenues, despite the oil price hike during the same year. The recessionary impact of the second oil price hike in 1979-1982, however, was felt substantially, as public saving declined significantly over the period, except in 1981. In 1982, public consumption exceeded revenues by 2,976 million baht in nominal terms (see Table 4). The main portion of government revenues is derived from household and private corporate taxes. Therefore, public saving used to finance public investment represents appropriation of domestic resources by the government. It is of interest to compare the investment efficiency of public saving to that of household and business saving, as they use different investment channels.

Economic growth requires a rapid rate of capital formation. Over the period 1961-1982, gross domestic investment in nominal terms in Thailand had increased quite rapidly at an average of 15.8 percent per year. During the 1961-1982 period, the average gross national saving ratio was 22.1 percent, while the gross domestic investment ratio was slightly higher at 23.6 percent. Therfore, on the average, the investment-saving gap or the resource gap was 1.5 percent of GNP. The size of the gap relative to GNP rose sharply in 1975 and declined in 1976. Thereafter, it rose even more sharply than in 1975, especially in 1979 when the gap was 5.9 percent of GNP, It is noted that the Thai economy had experienced an investment boom during the same period, especially during the petro-dollar recycling years 1977-1979. The investment ratio went up to 29 percent in 1979, while the national saving ratio declined slightly to 23 percent. However, in 1982, the prolonged recessionary impact of the second oil shock was felt and the size of the gap fell to 2.2 percent of GNP (see Table 5).

Modern theories of the current account balance suggest that the size of the investment-saving gap determines the external financial dependence of the country. During the 1961-1982 period, the investment-saving gap of the Thai economy was covered by foreign borrowing and other external financial resources, namely, reduction in international reserves and foreign direct investment.

Over the same period, foreign borrowing (by both private and public sectors, and commercial banks) averaged 2.6 percent of GNP (see Table 5). The movement of the foreign borrowing ratio seemed to follow a pattern similar to that of the investment-saving gap ratio. It rose sharply in 1975 and declined in 1976. Thereafter, it rose sharply from 4.5 percent in 1977 to 6.4 percent in 1979, and then declined to 3.3 percent in 1982. It should be noted that during the same

period, i.e., in 1977–1979, petro-dollar recycling gave rise to massive liquidity in the international financial market, which led to a worldwide investment boom and subsequent sharp rise in foreign borrowing by many developing countries, including Thailand.

3. The Model

The present model is a macroeconomic model of the investment–saving type developed for a small open economy facing a current account deficit under a fixed exchange rate system. Equilibrium in the goods and services market is maintained via adjustments in the current account balance, i. e., with demand for foreign borrowing reflecting the *ex ante* excess demand gap in the market for goods and services. Domestic prices and interest rates are functions of world prices and interest rates. Domestic output is supply-determined, specifically by the stock of capital, and the economy normally operates at a level close to full capacity, given the infrastructure and the current availability of labor resources.

The above small open developing economy may be viewed as being composed of four sectors : the household sector, the private business sector, the public sector and the foreign sector. It is hypothesized that each sector can be differentiated by its saving behavior and by the main channel through which its saving flows into investment, thereby exerting a distinctive effect on real income growth. A growth equation is formulated to account for the differential effects of national sectoral saving ratios, and the effect of foreign borrowing ratio on the growth rate of real income, based on the hypothesis that components of investment finance are a constraint on growth.

An investment function is defined to represent independent investment decision making in the economy. Separate functions are specified for each sectoral saving variable to account for differences in their behavior.

The model is completed by an equation for the planned change-in-international-reserves ratio and five identity equations.

Differential Growth Effects of National Sectoral Saving

$$GRGNP = GRGNP\ (SHG,\ SBG,\ SGGG,\ FBG,\ FOFSG) \qquad (1)$$

The above equation explains the growth rate of income (GRGNP) in accord with the modern capital-oriented growth model, which treats the formation of capital as a prime determinant of economic growth (see Papanek, 1973; Gupta, 1975). The sectoral composition of saving, is considered to be, in turn, a constraint on the efficiency of the composition of investment and, therefore, on growth. Specifically, the growth rate of income is determined not only by the total amount of saving and investment, but also by the efficiency of investment as influenced by the compositions of investment finance.

In order to focus on the question of the relative efficiency of investment finance from the various sectoral saving sources, the overall level of saving is constrained to be equal to the level of investment, which, in turn, is determined by an independent investment demand function.

Gross Domestic Investment Ratio (IDG)

It is assumed that the investment ratio (IDG) depends on lagged variables representing financial, economic and technological conditions and constraints existing at the time an investment decision is formulated (Evans, 1969). More specifically, IDG is assumed to depend on the previous period's real lending rate (AR2L1) and the previous period's growth rate of real income (GRGNPL 1). The AR2L1 variable implies that investment funds are borrowed and lent at the real rate of interest anticipated at the time an investment decision is made. The GRGNPL 1 variable reflects the accelerator mechanism, i. e., an increase in the previous period's growth rate of real income tends to create an expectation of greater future profit, and to encourage a higher planned investment expenditure for the following period. Furthermore, the previous period's investment ratio (IDGL 1) is included to reflect the lagged adjustment process of IDG. The equation below represents the investment demand function :

$$IDG = IDG\ (AR2L1,\ GRGNPL1,\ IDGL1) \qquad (2)$$

Household Saving

Most of household saving is in form of financial assets, channeled into investment through financial intermediaries. These investible funds are hypothesized to be more efficiently allocated among competing investment opportunities via the market mechanism, as compared to other investible funds, i. e., private business net retained earnings and public saving, which are primarily channeled to investment via self-financing and government appropriation, respectively.[4] Thus the effect of household saving on growth is hypothesized to be greater than those of the other sectors' saving.

The household saving decision is expressed in equation (2) below :

$$SHG = SHG\ (HYNTTG,\ AR5,\ GRGNP,\ DR1) \qquad (3)$$

The household saving ratio (SHG) depends on the ratio of its current disposable income ratio to GNP (HYNTTG), in accord with the Keynesian saving function.

The effect of interest rate (AR5) change on saving can be separated into substitution effect and income effect. An increase in the interest rate (AR5) increases the opportunity cost of present consumption. Individuals substitute future consumption for present consumption, and hence present saving. At the same time,

an increase in interest rate (AR5) implies an increase in interest income. Individuals have an opportunity to maintain the same level of consumption in the future with less saving today. The total effect of interest rate (AR5) change on saving can be positive or negative depends on whether substitution effect or income effect is stronger.

Consequently, whether a rise in the interest rate would lead to a positive or negative response in the household propensity to save (SHG) is, therefore, an empirical issue.

The life-cycle saving model can also be used to justify the inclusion of the growth rate of real income (GRGNP) as a determinant of the household saving ratio. Specifically, in a society with a growing population and a growing per capita income. Aggregate net personal saving is positive because the working population tends to be larger relative to the retired population. Also, the higher the level of current per capita income of the working group, the larger will be the amount of saving necessary to maintain an individual's consumption level in retirement.

The number of children supported by a typical family might also affect the household saving ratio (SHG), i. e., a higher dependency ratio (DR1) is likely to reduce the household average propensity to save, since present consumption needs of younger, child-raising households are bound to be relatively higher (Leff, 1969).

Private Business Net Retained Earnings

Given that capital markets in developing countries are not well developed, there is often a wide margin between what the capital market can earn from relending funds for investment projects with high rates of return, and what it has to pay for the cost of funds, as reflected by the market interest rate. Households, in general, do not have any immediate investment opportunities other than to lend funds to the capital market and earn the low interest rates. The private business corporation, on the other hand, would not lend out its internal funds if the market interest rate is lower than the rate of return it can earn on its own investment project. It would rather use the funds to finance its investment project, which may, however, not yield as high a rate of return as those investment projects financed by investible funds allocated by the financial intermediaries.[4] The above argument implies that investible funds from private business net retained earnings, which are channeled to investment through self-financing, may be less efficiently allocated and may thus have a lesser impact on income growth than funds that are channeled through financial intermediation, such as household saving. Since the internal funds may be expected to finance capital-intensive and lower-yielding, long term investment projects, this is likely to lead to an increase in the overall incremental capital-output ratio.[5]

Moreover, an increase in business net saving is at the expense of household saving, i.e., the increase in retained profit might have otherwise been paid out as dividends to shareholders, thereby, increasing household income, and consequently boosting household saving and economic growth. Investment financed from business savings, therefore, represents a diversion of funds from more to less efficient outlets of utilization. An increase in the business net saving ratio (SBG) is therefore expected to lead to a relatively smaller increase in the growth rate of real income (GRGNP) than that for the household saving ratio (SHG).

In the present model, the firm's saving decision is represented by the following function :

$$SBG = SBG\ (CYNTG,\ GRGNPL1) \qquad (4)$$

The firm, unlike the household, may allocate its net corporate income after tax and depreciation allowances between dividend payments and net retained earnings. Therefore, it is hypothesized that the firm's net saving ratio (SBG) depends on its current net corporate profit after tax (CYNTG) (Turnovsky, 1964).

Changes in the planned level of investment also influence the level of the firm's retained earnings. If the amount required for investment is anticipated to increase, the firm would then decide to increase its retained earnings in order to avoid resorting to external financing. Planned investment expenditure is likely to increase if the firm perceives a higher rate of return on investment. The growth rate of income in the previous period (GRGNPL1) serves as an indicator of the expected rate of return on investment. As national income rises, people tend to consume more, thereby brighttening business prospects.

Public Saving

Investible funds from public saving are often used to finance social overhead capital projects which often have low rates of return and long gestation periods. The growth effect of the pubilc saving ratio (SGGG) is therefore expected to be relatively less than that of the household saving ratio (SHG), given that public saving is channeled via government appropriation, rather than through financial intermediaries.

Assuming that the government is pursuing a target growth path, the fiscal behavior of the public sector is hypothesized to be influenced by the nation's income growth target, current economic conditions, and the availability of foreign borrowing. Specifically, it is hypothesized that the current planned saving ratio of the public sector (SGGG) depends on the growth gap (TARQDLN), i.e., the previous year's target growth rate minus the previous year's actual growth rate of real income, and on the current planned foreign borrowing ratio (FBG). This is expressed in the following function :

$$SGGG = SGGG\ (TARQDLN,\ FBG) \tag{5}$$

During the period in which the growth rate falls short of the target (TARQDLN), e.g. during a recession, government revenue from taxation is less than anticipated, while at the same time, government expenditure is likely to be increased to stimulate economic recovery; the planned saving ratio will therefore decrease.

It is assumed that the government has an almost inexhaustible of consumption programmes to be undertaken should funds become available. These consumption expenditures are, however, foregone in favor of the public investment required to fulfill the growth target. Given access to borrowing from foreign sources (FBG), a government may be somewhat relieved of the restrictions imposed by its investment commitment, and thus be able to spend a larger share of its total revenues on consumption, than would be the case were such external resources not potentially available (Papanek, 1972; Dacy, 1975; Heller, 1975).

Changes in Official International Reserves

External finance can be in the form of unilateral transfers, foreign direct investment, foreign borrowing, and reduction in foreign exchange reserves. In the present model, unilateral transfers are implicitly treated as additions to gross national product. Foreign direct investment is treated as an exogenous variable.

The demand for international reserves arises from the need for insurance against future temporary balance-of-payments disturbances (Brown, 1964; Heller, 1966; Olivera, 1969). A country may plan to draw down its reserves temporarily if the year's current account deficit is unexpectedly and substantially greater than that of the previous year, i. e., there is an unplanned increase in the current account deficit ratio ($CCAG > 0$). The reverse is true in the case of an unplanned decrease in the current account deficit or an unexpected increased surplus in the current account balance ($CCAG < 0$). The country may then plan to accumulate international reserves. Specific benefits to be derived from a reduction in reserves to finance a payment deficit include avoidance of additional foreign borrowing and costly and protracted adjustments by the economy.

Equation (6) below states that the determinants of the planned change-in-international-reserves ratio (CRPG) are the increase in the current account deficit ratio (CCAG), and the previous period's change-in-international-reserves ratio (CRPGL1), which is included to reflect the lagged adjustment process of CRPG.

$$CRPG = CRPG\ (CCAG,\ CRPGL1) \tag{6}$$

Identity Equations

In order to close the model, five identity equations are required :

1) The demand for foreign borrowing is derived from the difference between investment demand and national saving adjusted for foreign direct investment (FDIG) and change in official international reserves (CRPG) :

$$FBG = IDG - SHG - SBG - SGGG - PCFCG - FDIG + CRPG \quad (7)$$

(2) The current account deficit ratio (CAG) is defined as the ratio of the difference or gap between domestic investment and national saving :

$$CAG = IDG - SHG - SBG - SGGG - PCFCG \quad (8)$$

where PCFCG is the depreciation allowances ratio

3) The increase in the current account deficit ratio (CCAG) is defined as the current account deficit of the current period (CAG) minus the previous period's current account deficit (CAGL1) :

$$CCAG = CAG - CAGL\,1 \quad (9)$$

4) The ratio of other foreign saving inflows (FOFSG) is equal to the sum of the foreign direct investment ratio (FDIG), which is exogenous, and the absolute value of the decline in the international reserves ratio (CRPG) :

$$FOFSG = FDIG - CRPG \quad (10)$$

5) The private corporate net profit ratio (CYNTG) is defined as the sum of private business net retained earnings ratio (SBG) and the dividend ratio (DVDG), which is an exogenous variable :

$$CYNTG = SBG + DVDG \quad (11)$$

Implications of the Model

In any time period, due to the aforementioned lagged response of planned investment expenditures to investment decisions, the gross domestic investment ratio (IDG) is determined by lagged explanatory variables as expressed in equation (2), and is thus given as a datum. National sectoral saving ratios are then determined according to equations (3), (4) and (5). The resulting resource gap ratio is the current account deficit ratio (CAG), given by identity (8). This deficit requires foreign resource inflows to fill the gap, assuming domestic prices and interest rates to be functions of world prices and interest rates, respectively. An increase in national saving will be at the expense of foreign resource inflows, the latter being the sum of foreign borrowing, foreign direct investment and reductions is international reserves.

The overall amount of investment is determined by equation (2), which in turn determines the overall amount of saving according to equation (7) of FBG. The latter equation is an equilibrium condition which states that total planned investment is equal to total planned saving. Equation (1) of the growth rate of real GNP (GRGNP), implies that GRGNP will depend not only on the total amount of investment which determines the total amount of saving required, but also on the investment efficiency of the sectoral composition of aggregate saving, namely, household saving, private corporate net saving, public saving, foreign borrowing and other foreign saving. The sectoral composition of aggregate determines the efficiency of the composition of investment and has differential effects on GNP growth.

Since household saving is channeled to investment mainly via financial intermediaries which supposedly allocate investible funds via the market mechanism and hence provide for a relatively more efficient allocation than other investment channels (namely, self-finance from private corporate retained earnings, and government appropriation of public saving), it is hypothesized that the household saving ratio has the strongest impact on income growth (GRGNP).

In the present model, the total causal effects of foreign borrowing on national sectoral saving can be disaggregated into direct and indirect effects. The direct effect of foreign borrowing on national saving is taken into account in equation (5) for the public saving ratio (SGGG). The indirect causal effects of FBG on SHG, SBG and SGGG are captured via the GRGNP and GRGNPL1 variables, which enter the national sectoral saving ratio equations as explanatory variables, while GRGNP is partly determined by FBG as expressed in equation (1). The impact of the foreign borrowing ratio on growth: in turn, depends on its total effects on the national sectoral saving ratios, which, in turn partly determine the growth rate of income (GRGNP) according to the Harrod-Domar growth model.

Identity equation (7) of FBG implies that foreign resource inflows, specifically foreign borrowing, and national resources are additive, i.e., foreign resources supplement national saving. Foreign borrowing allows the release of more resources for productive investment, and hence permits a higher growth rate of income (GRGNP) to be attained than would be possible with national resources alone. A higher growth rate of income (GRGNP) in turn generates a higher propensity to save in the domestic economy, which further fuels income growth.

Consequently, the effect of foreign resource inflows, specifically the foreign borrowing ratio (FBG), on income growth (GRGNP) is hypothesized to be positive as they enhance the availability of domestic resources for investment both directly and indirectly.

4. The Results

The model is estimated by the method of two stage least squares using annual time-series data on Thailand for the period 1961 to 1982. The data used in estimating the model are obtained from the National Economic and Social Development Board (NESDB), the Bank of Thailand (BOT), and the International Monetary Fund (IMF).

In order to take into account the economic impacts of the two oil shocks in 1973-74 and 1979-80, and other exogenous shocks in the 1970s, dummy variables are used. Specifically, two dummy variables (D75 and D792) account for the staggered impacts of the 1973-74 and 1979-80 oil shocks.[6] The impact of petro-dollar recycling on investment during 1977-1979 is taken into account by another dummy variable (D779). The effect of the world-wide commodity boom in 1974 is also taken into account by a fourth dummy variable (D74).

The results of two-stage least squares estimation of the structural equations of the model are presented below for each equation. The number in parenthesis below each coefficient estimate is the t-value. An asterisk is used to denote the t-value of a coefficient that is significant at the 10 percent level. $\bar{R}_S^2$ are the usual R^2 adjusted for the inclusion of additional variables. All Durbin-Watson and Durbin h statistics indicate no serial correlation of error terms at the 5 percent level of significance.

$$\begin{array}{l} \text{GRGNP} = \underset{(-0.27)}{-0.00638} + \underset{(3.53)^*}{0.73561}\ \text{SHG} - \underset{(-1.80)^*}{1.8908}\ \text{SBG} + \underset{(0.60)}{0.18926}\ \text{SGGG} \\ \qquad \underset{(2.01)^*}{0.59542}\ \text{FBG} + \underset{(0.87)}{0.36312}\ \text{FOFSG} - \underset{(-1.81)^*}{0.02011}\ \text{D792} \\ \qquad\qquad \bar{R}^2 = 0.4943 \qquad \text{D.W.} = 1.6973 \end{array} \tag{12}$$

$$\begin{array}{l} \text{SHG} = \underset{(-0.29)}{-0.02601} + \underset{(1.72)}{0.18939}\ \text{HYNTTG} - \underset{(-9.36)^*}{0.29901}\ \text{AR5} + \underset{(2.38)^*}{0.317}\ \text{GRGNP} \\ \qquad \underset{(1.34)}{-0.04581}\ \text{DR1} + \underset{(2.91)^*}{0.02643}\ \text{D75} \\ \qquad\qquad \bar{R}^2 = 0.7814 \quad \text{D.W.} = 1.6424 \end{array} \tag{13}$$

$$\begin{array}{l} \text{SBG} = \underset{(-2.46)^*}{-0.00161} + \underset{(39.05)^*}{0.78327}\ \text{CYNTG} + \underset{(1.81)^*}{0.01256}\ \text{GRGNPL1} \\ \qquad\qquad \bar{R}^2 = 0.9865 \quad \text{D.W.} = 1.8133 \end{array} \tag{14}$$

$$\begin{array}{l} \text{SGGG} = \underset{(13.22)^*}{0.03261} + \underset{(0.86)}{0.09514}\ \text{FBG} - \underset{(-4.24)^*}{0.30118}\ \text{TARQDLN} + \underset{(2.30)^*}{0.01926}\text{D74} \\ \qquad \underset{(-5.44)^*}{-0.02508}\ \text{D792} \end{array} \tag{15}$$

$$\bar{R}^2 = 0.7294 \qquad D.W. = 1.2216$$

$$\begin{aligned} IDG = {} & 0.07876 + 0.64774 \underset{(6.75)^*}{IDGL1} + \underset{(0.47)}{0.08501\ GRGNPL1} \\ & \underset{(-1.63)}{-0.10235}\ AR2L1 + \underset{(2.73)^*}{0.02761}\ D779 \end{aligned} \tag{16}$$

$$\bar{R}^2 = 0.7220 \qquad D.W. = 1.8582$$
$$\text{Durbin h statistic} = -0.4955$$

$$\begin{aligned} CRPG = {} & \underset{(0.01)}{0.00002} + \underset{(8.74)^*}{0.94417}\ CRPGL1 - \underset{(-4.48)^*}{0.032954}\ CCAG \\ & + \underset{(3.21)^*}{0.02202}\ D74 - \underset{(-2.74)^*}{0.02087}\ D75 \end{aligned} \tag{17}$$

$$\bar{R}^2 = 0.7782 \qquad D.W. = 2.2973$$
$$\text{Durbin h statistic} = -0.96417$$

Empirical Evidence of the Differential Growth

Effects of National Sectoral Saving

The econometric equation (12) indicates that the Thai household saving ratio (SHG) coefficient is statistically significant and shows the greatest positive effect on the growth rate of real income (GRGNP) among the national sectoral saving ratios. The value of its structural coefficient is 0.73561, which indicates that the direct growth effect of SHG is quite substantial, that is, a 10 percentage point increase in SHG will be accompanied by a 7 percentage point rise in the rate of growth of real GNP in Thailand.

The growth effect of the public saving ratio (SGGG), although positive, is not statistically significant at the 10 percent level, i.e., SGGG has no statistically significant effect on the growth rate of real GNP (GRGNP) for Thailand during the period.

It is interesting to note that the estimated coefficient of the private corporate net saving ratio (SBG) (–1.8908) has a significant negative sign, which is a surprising result.

Empirical Evidence on the Income Growth

Effect of Foreign Borrowing

The hypothesis that foreign borrowing, expressed as a ratio to GNP, positively contributes to growth has found support from the empirical evidence in the regression equations (12) and (15). According to the estimated equation (12), the

foreign borrowing ratio exerts a significant positive effect on the growth rate of real GNP of Thailand, albeit rather small, as the values of its structural coefficient and elasticity at the mean are 0.59542 and 0.14296 respectively. On the average, a 10 percent increase in FBG will lead to only a 1.4 percent increase in Thai GRGNP.

The estimated equation (15) for the public saving ratio indicated that the estimated coefficient of the foreign borrowing ratio (FBG), while it has the positive sign, is statistically insignificant. This empirical finding has profound implications regarding the role of foreign borrowing in the process of economic growth in Thailand. The above econometric results suggest that foreign borrowing does not substitute for public saving in Thailand.

As discussed in section 3, the impact of FBG on GRGNP would work not only directly as expressed in equation (12), but also through its effect on national saving, specifically, on SGGG, which in turn determines GRGNP in the usual manner of the Harrod-Domar model, In other words, the impact of the foreign borrowing (FBG) on income growth (GRGNP) could be diluted because it affects a substitution for public saving. However, the above empirical evidence indicates a statistically insignficant relationship between FBG and SGGG for the Thai data. An increase in Thai foreign borrowing can thus be expected no supplement, rather than supplant, national saving and to promote the economic growth process in Thailand.

The above empirical finding of the positive growth effect of foreign borrowing is in sharp contrast with the conclusions of radical critics (see Rahman, 1967; Griffin, 1970; Weisskopf, 1972) who have argued that foreign resource inflows, via a negative causal relationship with domestic saving, have a negative impact on the economic development process in recipient countries.

5. Conclusion

The major findings of this study are as follows :

1) The components of national sectoral saving, each expressed as a ratio, have different growth effects in Thailand, In particular, the household saving ratio has the largest growth effect Thai private corporate net saving has a negative growth effect, and Thai public saving has virtually no growth effect.

2) The foreign borrowing ratio has a positive relationship with the growth rate of real GNP.

3) Foreign borrowing does not substitute for public saving, in contrary to what has been argued by radical critics.

Policy Implications

The empirical finding that Thai household saving has the greatest effect on the growth rate of real GNP, among sectoral saving, suggests that in order to achieve a more rapid and sustained economic growth sucessfully, the Thai government ought to consider measures to encourage household saving. This would not only increase the level of national saving, but it would also at the same time improve the efficiency of domestic resource allocation.

In addition, the Thai government should consider an improvement in the allocative efficiency of the private business net saving and the public saving. With regard to private business net saving, the Thai government should encourage more participation in the capital market by the private business sector so that a larger proportion of retained earnings will be channeled through financial intermediaries.

In improving the allocative efficiency of public saving, government should consider public investment projects which are more labor-intensive. The number of public investment projects which are highly capital-intensive and have low rates of return and long gestation periods, should be reduced.

The second and third major empirical findings are that : (1) Thai foreign borrowing has a positive relationship on the growth rate of real GNP, and (2) foreign borrowing does not substitute for public saving. What this suggests is that an increase in Thailand's foreign borrowing may not lead to a decrease in the growth rate of real national income, contrary to what is often argued by the redical critics. Therefore foreign borrowing for investment projects could continue. However, an explicit and precise evaluation of the debt service capacity of the country requires a more detailed study of the benefits and costs of external debt.

In sum, Thailand has the capacity to attain a higher rate of economic growth, what needs to be done consists mainly of providing incentives for a higher rate of household saving and utilizing the investment funds more productively.

NOTES

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2. Hence forth, a reference to a variable's ratio, unless otherwise specified, means the ratio of the variable to GNP, for the sake of brevity.

3. Both business and government also have access to financial intermediaries, and may therefore also channel their investible funds through these. However, it can be assumed that their holdings of financial securities represent only a small portion of their total investible funds.

4. Part of the internal funds may still go to investment in lower-yielding projects, but for non-profit motives, e.g., goodwill, empire-building, etc.

5. The incremental capital-output ratio (ICOR) is a crude measure of capital productivity or average investment efficiency referred to in macroeconomic literature. This ratio shows the link between the size of investment and the generated incremental output. High returns on investment implies low ICORs while high ICORs are associated with low returns on investment.

6. The impact of the first oil price shock on the Thai economy in 1973-1974 was delayed to 1975. The high prices of some of Thailand's major exports in 1974 were able to stave off the recessionary impact until 1975. The variable D75 takes on a value of one if the year is 1975 and zero if not. Thailand was already in a weakened balance of payments and debt position when the successive oil price increases of 1979-1980 hit the world economy. Coupled with the prolonged world recession that followed, the Thai economy experienced a deep and prolonged recession in 1979-1982. D792 takes on a value of one during the 1979-1982 period, and zero for any other year.

APPENDIX

DEFINITION OF VARIABLES

Exogenous Variables :

AR2L1 : real lending rate for the previous period
AR5 : real interest rate on time deposit
CAGL1 : current account deficit ratio for the previous period
CRPGL1 : change in international reserve as a percentage of GNP for the previous period
DR1 : population dependency ratio
D74 : dummy variable for commodity boom in 1974
D75 : dummy variable for the delayed recessionary impact of the first oil shock in 1975
D779 : dummy variable for the impact of petrodollar recycling in 1977–1979
D792 : dummy variable for the deep and prolonged recessionary impact of the second oil shock in 1979–82
DVDG : private corporate dividends distributed, a percentage of GNP
FDIG : foreign direct investment as a percentage of GNP
GRGNPL1 : growth rate of real income in the previous period
HYNTTG : household disposable income as a percentage of GNP
IDGL1 : gross domestic investment ratio for the previous period
PCFCG : depreciation allowance as a percentage of GNP
TARQDLN : target growth rate of real GNP in the previous period (TRQDL) minus actual growth rate of real GNP in the previous period (GRGNPL1)

Endogenous Variables :

CAG : current account deficit as a percentage of GNP
CCAG : increase in the current account deficit as a percentage of GNP
CRPG : planned change in international reserves as a percentage of GNP
CYNTG : private net profit after tax and depreciation as a percentage of GNP
FBG : foreign borrowing as a percentage of GNP
FOFSG : other foreign saving as a percentage of GNP
GRGNP : annual growth rate of real GNP
IDG : gross domestic investment as a percentage of GNP
SBG : private net retained earnings as a percentage of GNP
SGGG : public saving as a percentage of GNP
SHG : household saving as a percentage of GNP

TABLE 1

GROSS NATIONAL PRODUCT, GROSS DOMESTIC PRODUCT, AND NET FACTOR INCOME FROM ABROAD THAILAND, 1961-1982

(Billions of 1975 baht)

Year	GNP	GDP	Net Factor Income from Abroad	Growth Rate of GNP (%)	Growth Rate of GDP (%)
1961	108.2	108.5	-.25	5.3	5.3
1962	116.9	117.2	-.33	8.0	8.1
1963	126.9	127.1	-.17	8.6	8.4
1964	135.1	135.5	-.37	6.5	6.6
1965	146.1	146.2	-.06	8.1	7.9
1966	163.8	164.0	-.20	12.1	12.2
1967	176.9	176.7	.13	8.0	7.8
1968	192.2	191.8	.44	8.6	8.5
1969	207.1	207.0	.15	7.8	7.9
1970	220.8	220.4	.42	6.6	6.5
1971	230.7	230.7	.04	4.5	4.7
1972	241.3	241.7	-.43	4.6	4.8
1973	263.9	264.5	-.62	9.4	9.4
1974	279.7	278.9	.79	6.0	5.4
1975	298.6	298.8	-.22	6.8	7.1
1976	323.7	324.8	-1.14	8.4	8.7
1977	346.3	348.1	-1.82	7.0	7.2
1978	378.9	383.3	-4.42	9.4	10.1
1979	399.5	406.6	-7.10	5.4	6.1
1980	422.1	430.0	-7.90	5.7	5.8
1981	444.4	457.1	-12.68	5.3	6.3
1982	454.7	469.3	-14.60	2.3	2.7
Average : 1961 - 1982	--	--	--	7.0	7.2

Source : International Monetary Fund, *International Financial Statistics.*

TABLE 2

RATIO OF NATIONAL SECTORAL SAVING AND INVESTMENT TO GNP
THAILAND, 1961 = 1982

Year	Household Savings Ratio	Net Retained Earnings Ratio	Public Savings Ratio	Gross National Savings Ratio	Gross Domestic Investment Ratio
1961	11.73	.16	3.99	19.20	15.15
1962	9.96	.22	4.29	18.17	18.43
1963	8.93	.39	4.61	18.18	21.49
1964	8.93	.39	5.05	19.14	20.09
1965	11.39	.37	4.78	21.57	20.18
1966	15.56	.57	4.81	26.04	23.59
1967	10.08	.73	5.41	22.04	23.70
1968	8.54	.92	4.79	20.66	25.03
1969	9.80	1.03	3.70	21.31	25.89
1970	10.18	.76	2.98	21.45	26.12
1971	9.33	1.17	2.07	20.60	24.24
1972	11.05	1.06	2.23	22.27	20.82
1973	17.09	.76	2.78	27.50	24.08
1974	14.18	1.20	5.84	27.74	24.89
1975	12.66	1.34	2.69	23.73	25.37
1976	12.51	1.27	1.40	22.32	23.32
1977	11.27	1.40	3.02	23.00	26.15
1978	12.35	1.66	2.64	24.07	27.33
1979	12.41	1.72	1.68	23.48	29.33
1980	13.08	1.72	1.04	23.38	27.70
1981	10.52	1.79	1.13	21.19	25.44
1982	10.48	1.34	-.36	19.46	21.69
Average : 1961 - 1982	11.46	1.00	3.21	22.12	23.64

Source : Calculated from Table 1 and Table 4

TABLE 3

SAVING, FINANCIAL ASSETS, DEMAND AND TIME DEPOSIT HOLDINGS OF HOUSEHOLDS IN THAILAND
1967 – 1980

(millions of current baht)

Year	Total Household Savings	Acquisition of Financial Assets	Demand and Time Deposits	Financial Assets as a % of Total Savings	Bank Deposits as a % of Total Savings
1967	10,992	6,159	2,670	.56	.24
1968	10,402	6,747	3,183	.65	.31
1969	13,992	7,780	3,110	.56	.22
1970	13,803	8,330	3,542	.60	.26
1971	13,082	10,381	5,397	.79	.41
1972	17,930	17,930	9,227	.95	.49
1973	37,008	25,251	9,592	.68	.26
1974	37,795	27,281	13,059	.72	.34
1975	38,086	20,274	12,907	.53	.34
1976	42,412	26,953	16,949	.64	.40
1977	44,395	36,159	21,262	.81	.48
1978	57,690	52,691	18,659	.91	.32
1979	68,090	45,234	18,873	.66	.28
1980	88,333	71,395	40,860	.81	.46
Average : 1967 – 1980	---	---	---	.71	.34

Notes : Financial assets are composed of currency, demand and time deposits, public authoity securities, government non-budgetary accounts, and credit and capital market instruments.

Source : National Accounts Division, Office of the National Economic Economic and Social Development Board (NESDB) and Research Department, Bank of Thailand (BOT), *Flow of Funds Accounts of Thailand*; 1981.

TABLE 4

NATIONAL SAVING AND DOMESTIC INVESTMENT
THAILAND, 1961 - 1982

(millions of current baht)

Year	Household Savings	Net Retained Earnings	Public Savings	Gross National Savings	Gross Domestic Investment
1961	6,907	97	2,350	11,305	8,919
1962	6,341	141	2,732	11,574	11,737
1963	6,077	265	3,133	12,369	14,620
1964	6,658	293	3,764	14,274	14,988
1965	9,600	310	4,026	18,182	17,012
1966	15,768	574	4,871	26,397	23,908
1967	10,923	791	5,867	23,886	25,685
1968	10,044	1,079	5,631	24,296	29,435
1969	12,820	1,343	4,844	27,887	33,877
1970	13,872	1,029	4,060	29,245	35,606
1971	13,429	1,682	2,979	29,648	34,887
1972	17,869	1,717	3,598	36,026	33,679
1973	36,712	1,630	5,963	59,050	51,711
1974	38,427	3,253	15,832	75,187	67,441
1975	37,815	4,000	8,038	70,867	75,747
1976	42,071	4,281	4,691	75,084	78,444
1977	44,062	5,455	11,816	89,942	102,240
1978	57,387	7,724	12,268	111,807	126,950
1979	67,830	9,405	9,186	128,308	160,287
1980	87,985	11,576	7,022	157,223	186,258
1981	80,386	13,707	8,633	161,985	194,479
1982	85,936	10,952	-2,976	159,561	177,772
Average : 1961 - 1982	32,224	3,696	5,833	61,550	68,440

Source : Office of The National Economic and Social Development Board, *National Income of Thailand.*

TABLE 5

RESOURCE GAP DOMESTIC AND FOREIGN INTEREST RATES
THAILAND, 1961–1982

Year	Investment – Saving Gap as a % of GNP	Foreign Borrowing as a % of GNP	Domestic Bank Rate (%)	Euro Dollar Rate at London (%)	U.S. Federal Fund Rate (%)
1961	-4.1	1.4	8.0	3.58	1.96
1962	0.2	2.3	8.0	3.77	2.68
1963	3.3	2.1	8.0	3.95	3.18
1964	1.0	2.1	8.0	4.32	3.50
1965	-1.4	0.5	7.0	4.81	4.07
1966	-2.5	1.5	7.0	6.12	5.12
1967	1.7	1.9	7.0	5.46	4.22
1968	4.4	0.9	7.0	6.36	5.67
1969	4.6	1.7	11.0	9.76	8.21
1970	4.7	1.9	9.0	8.52	7.18
1971	3.6	0.1	9.0	6.58	4.66
1972	-1.5	1.2	8.0	5.46	4.43
1973	-3.4	1.9	10.0	9.24	8.73
1974	-2.9	2.5	11.0	11.10	10.50
1975	1.6	2.8	10.0	6.99	5.82
1976	1.0	2.3	9.0	5.58	5.05
1977	3.1	4.5	9.0	6.00	5.54
1978	3.2	5.4	12.5	8.73	7.93
1979	5.9	6.4	13.75	11.96	11.20
1980	4.3	5.5	14.25	14.36	13.36
1981	4.3	5.4	15.25	16.51	16.38
1982	2.2	3.3	13.25	13.11	12.26

Note : 1) Saving in column (1) is gross national saving. The investment – saving gap as a percentage of GNP was calculated from Table A. 3

2) Figure for foreign borrowings in any year was calculated by adding up item 2, item 3, item 4, item 5 and items I.2 – I.3 in the balance of payments accounts.

Sources : Data on balance of payments were obtained from the Bank of Thailand *Quarterly Bulletin*.

Data on foreign interest rates were obtained from International Monetary Funds, *International Financial Statistics*.

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