CHAPTER THREE: THEORETICAL OUTLINE

3.0 INTRODUCTION

National saving does not increase as a result of individuals acquiring pieces of paper likes bills or stock and bond certificates. That merely swaps individual savings from one type of financial asset to another without affecting the total. National saving occurs when the nation acquires real domestic assets, such as new housing, new machinery, new factories and offices, additions to a firm's inventory of goods, or new claims on assets overseas **(Dornbusch and Fisher, 1994)**. And that is precisely what is meant by investment. Investment provides for growth in national wealth. However we cannot increase investment without increasing national saving. Measures taken to increase individual saving will not increase national saving unless they increase investment. Instead they may bring down the income of others, and thereby reduce both national saving and investment.

The importance of national savings to Malaysia's economic future has provided the stimulus for empirical research concerning the determinants of that aggregate. The attempt to encourage saving by raising real interest rates is at the heart of adjustment programs in a number of low- and middle-income developing countries. Higher saving, it is argued, can finance higher investment and lead to faster growth, which in turn increase saving rate. For instance, the remarkable record of sustained high growth in Malaysia over the past twenty years is partly due to high saving performance **(Faruqee & Husain,**

1995). Hence, it is important to investigate the patterns of exogenous variables, which determine the aggregate saving in Malaysia.

3.1 UNDERLYING THEORETICAL MODELS

The variables used in our theoretical and econometric models are adopted from **Baharumshah (2003)**. The theoretical framework is outlined here, exploring the relationship between saving and determinants. Firstly, we use the Keynesian saving theory and the Harrold-Domar growth model to explore the basic relationship between saving-consumption and saving-economic growth relations. Latter on, then we try to explain the influence of exogenous changes to saving rate, using theoretical and empirical arguments.

3.1.1 KEYNESIAN SAVING THEORY

First at all, we used the Keynesian approach to explore the basic relationship between saving and consumption. A central notion in the Keynesian model is that for a level of output to be at an equilibrium level, output has to be equal to aggregate demand. The condition for this equilibrium can be discussed as:

$$Y = AD = C + I + G \qquad (1)$$

Where Y is equal to total output GDP and AD equals aggregate demand consisting of three components: consumption (C), business investment demand (I) and the government sector's demand (G). Keynes assumed that GDP and national income are equivalent and all variables are real variables meaning that all changes are changes in the real terms. With Y as national income, we can write:

$$Y = C + S + T \tag{2}$$

An identity definition stating that national income, all of which is to be paid to households in return for the factor services that consists of three components: consumption (C), paid-out taxes (T) and saving (S). We can rewrite equation (2) as:

$$Y_D \equiv Y - T = C + S \tag{3}$$

Equation (3) states that disposable income (Y_D) is equal to consumption plus saving. This means that, two relations exist which carries out that consumption-income and saving-income relationship. However, the consumption-income relation explained that the level of consumer expenditure was a stable function of disposable income and income was the dominant influence determining consumption. The specific consumption function as proposed by Keynes is as follows:

$$C = a + bY_D \tag{4}$$

The intercept term a is autonomous consumption that assumed to be positive $(a > 0)$, is the level of consumption that would take place even if income were zero. If an individual's income fell to zero some of his existing spending could be sustained by using savings. This is known as dis-saving. The parameter b, the slope of the function that assumed to be $0 < b < 1$, gives the increase in consumer expenditure per unit increase in disposable income, which can express as follows:

$$b = \frac{\Delta C}{\Delta Y_D} \tag{5}$$

This is the change in consumption divided by the change in income. The value of the increment to consumer expenditure per unit increment to income is termed the marginal propensity to consume (MPC). Consumer spending rises with an increase in disposable income $(b > 0)$. However, the rise in consumer spending is less quickly than increase in disposable income $(b < 1)$. Figure 2 graphs this relationship.

Figure 2 implies a positive relationship between disposable income and consumer spending. The gradient of the consumption curve gives the marginal propensity to consume. As income rises, so does total consumer demand. A change in the marginal propensity to consume causes a pivotal change in the consumption function.

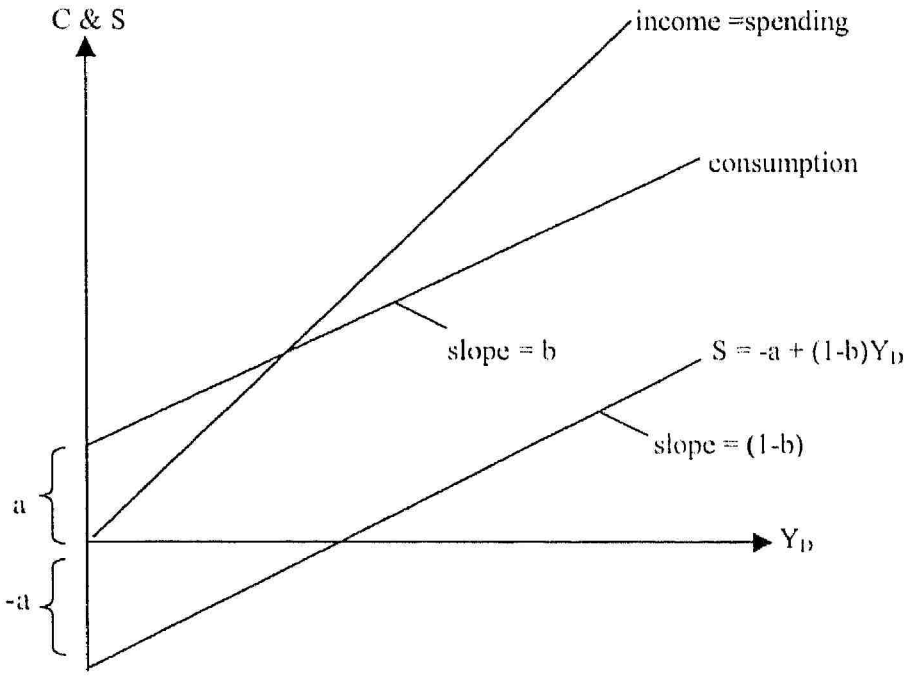

Figure 2: Keynesian Consumption and Saving Function

Furthermore, the theory of consumption-income relation implicitly determines the saving-income relationship. The saving function, proposed by Keynes was as follows:

$$S = -a + (1 - b)Y_D \tag{6}$$

If consumption is a units with Y_D equal to 0, then at that point:

$$S \equiv Y_D - C = 0 - a = -a \tag{7}$$

If one-unit raise in disposable income leads to an increase of b units in consumption, the remainder of the one-unit increase $(1-b)$ is the increase in saving:

$$\frac{\Delta S}{\Delta Y_D} = 1 - b \qquad (8)$$

This increment to saving per unit in disposable income $(1-b)$ is named the marginal propensity to save (MPS). The saving function also illustrated in Figure 2.

3.1.2 HARROD-DOMAR GROWTH MODEL

The Harrod-Domar growth model gives some insights into the dynamics of growth **(Todaro, M. P, 2000)**. This model suggests that savings provide the funds that are borrowed for investment purposes. The model suggests that the economy's rate of growth depends on the level of saving and the productivity of investment i.e. the capital output ratio. Lets σ, represent the capital output ratio, Y representing GNP, national savings ratio, s, is a fixed proportion of national output and total new investment is determined by the level of total savings. The level of savings is a function of the level of GNP, hence, we have the following equation:

$$S = sY \tag{9}$$

Investment (I) is a very important variable for the economy because investment has a dual role. Investment represents an important component of the demand for the output of an economy as well as the increase in capital stock. Investment is defined as the change in the capital stock, K, and can be represented by ΔK such that:

$$I = \Delta K \tag{10}$$

Then, the level of capital K that is needed to produce an output Y is given by the equation as follows:

$$K = \sigma Y \tag{11}$$

or

$$\Delta K = \sigma \Delta Y \tag{12}$$

For equilibrium there must be a balance between supply and demand for a nation's output. In simple case this equilibrium condition reduces to:

$$I = S \tag{13}$$

Thus, we have:

$$I = \Delta K = \sigma \Delta Y \tag{14}$$

Therefore, follows that, the identity of saving equaling investment can be expressed as follows:

$$S = sY = \sigma \Delta Y = \Delta K = I \tag{15}$$

or

$$sY = \sigma \Delta Y \tag{16}$$

Dividing both sides of equation (16) first by Y and then by σ we obtain the following expression:

$$\frac{\Delta Y}{Y} = \frac{s}{\sigma} \tag{17}$$

Therefore, the equilibrium rate of growth of GNP (g) can be expressed as follows:

$$g = \frac{\Delta Y}{Y} = \frac{s}{\sigma} \tag{18}$$

In words, the equilibrium growth rate of output is equal to the ratio of the marginal propensity to save and the capital-output ratio. More specifically, in the absence of government, the growth rate of national income will be directly or positively related to the savings ratio and inversely or negatively related to the economy's capital-output. This implying that, the more an economy is able to save and invest out of given GNP, the greater the rate of growth of GNP. On the other hand, the higher σ is, the lower the rate of GNP growth will be.

In conclusion, in order for an economy to grow, it must save and invest a certain proportion of their GNP. The more they can save and invest, the faster the economy grows. This is significant because it tells us how the economy can grow such that the growth in the capacity of the economy to produce is matched by the demand for the economy's output.

3.2 DETERMINANTS OF SAVINGS

In the following segments, exogenous variables that influence savings are examined.

3.2.1 ECONOMIC GROWTH

Modern saving theories indicate that the rate of growth in aggregate real income is a fundamental determinant of the national savings rate. Higher saving, it is argued, can finance higher investment and lead to faster growth. Rapid growth thus will raise the saving rate. Consequently, higher national saving then releases resources for the investment needed to sustain high growth. Higher savings promote higher growth, after that higher growth promotes higher savings, which creates a virtuous cycle. This implies that growth will enhance saving, which in turn further enhances growth. However, if investment is discouraged, the fall of the growth rate will result, as will the saving rate. As a result, the link between saving and investment is the growth rate, which determines saving and is partly determined by investment.

The important question regarding economic growth and saving rate is the way in which the direction of association runs. Theory has shown that the direction of association can run both ways: firstly, theoretical underpinnings for the direction of association running from saving to growth. Capital accumulation or physical investment is the proximate source of economic growth. Secondly, the lifecycle theory of saving and consumption supports the direction of association running from growth to saving. The theory says that

changes in an economy's rate of economic growth would affect its aggregate saving rate. The explanation is that young people save for retirement and old people consume their previously accumulated assets, an increase in the rate of economic growth will increase the aggregate saving rate, because it increases the lifetime saving of younger-age groups relative to older-age groups. But, if we take into account the possibility of the young borrowing against future income in order to finance current consumption, the degree to which growth affects the saving rate increases with the severity of liquidity constraints. When liquidity constraints are not binding at all, an increase in the growth rate actually decreases the saving rate **(Deaton, 1991)**.

Besides that, the effect of factors such as human capital and technological innovation, which are necessary for economic growth is twofold: not only do they have a direct effect on growth, but also, by promoting growth they promote a higher saving rate and thus investment rate, which further promotes growth. Thus, we have theoretical backing for a potential two-way direction of association between saving and growth. The empirical evidence to date has shown that there is a relationship between saving rates and growth. During 1984-94, 31 countries had an average annual per capita GDP growth rate of 2.5 percent or higher. In these successful countries the median saving rate was 24 percent. This implies that gross national savings appears to be largely determined by exogenous factors: it expands prior to the overall increase in GDP. By contrast, the median saving rate stood at 16 percent in the 59 countries in which per capita income grew at less than one percent a year **(Edward, 1995)**.

According to a previous study, it was found that a one-percentage point increase in the growth rate raises the national saving rate by, on average just over 1 percentage point in the 14 Asian sample countries **(Fry, 1984)**. Furthermore, gross national savings has also taken on added importance with the development of endogenous growth models. In contrast, the neoclassical Solow growth model attribute the rate of long run growth to exogenous factors such as growth rate of labor and exogenous technical change, and say that other factors such as saving rate and accumulation of human capital have no role in explaining the rate of growth **(Romer, D, 2001)**. Solow model explained that, a policy change has no growth effect but have only level effect. Policy changes increase growth rate but only temporarily along the transition to the balanced growth path, hence there is no growth effect. However, policy changes can have level effects, that is, a permanent policy change can permanently raise (or lower) the level of output per worker.

The Solow model believes that a sustained increase in capital investment increases the growth rate only temporarily: because the ratio of capital to labor goes up but the marginal product of additional units of capital is assumed to decline and the economy eventually moves back to a long-term growth path, with real GDP growing at the same rate as the workforce plus a factor to reflect improving productivity. A steady-state growth path is reached when output, capital and labor are all growing at the same rate, so output per worker and capital per worker are constant. The theory believes that to raise an economy's long-term trend rate of growth requires an increase in the labor supply and an improvement in the productivity of labor and capital. Differences in the rate of technological change are said to explain much of the variation in economic growth

between developed countries. As a result, in the Solow model, in the long run only changes in the rate of technological progress have growth effects.

However, the "new" growth theory attempts to explain such differential growth among nations by focusing on the saving rate, human capital investment, research and development (R&D) and so on. Associated with these developments are empirical efforts to explain the rate of growth by various structural factors. Correlation of the growth rate with various factors finds a positive relationship of per capita growth rate with school enrolment variables and a negative relationship with initial income **(Barro, 1991)**.

Besides that, a study using a modified Solow model to explain the level and growth rate of per capita income found that the growth rate is positively related to physical and human capital investment and negatively related to initial income level with the assumption of conditional convergence **(Mankiw, 1992)**. Then, using a slightly different model, it was found that growth in developing countries increased with increased domestic savings ratios, budgetary allocations to improve human capital, and export performance **(Otani and Villanueva, 1990)**. In addition, according to the view of **Buiter (1993)** on the endogenous growth theory, if one assumes the aggregate production function has the property that output is proportional or constant return to scale to capital input then the rate of growth of the economy, both capital and output, is proportional to the rate of national savings.

3.2.2 INTEREST RATE

An understanding of interest rates is important for understanding theory of saving and investment. First at all, we try to explore the relationship between interest-saving and interest-investment relations using the classical theory. Basically, interest is either the reward you get for saving or the premium you pay for having funds now rather than later. The higher the interest rate, the more people will save, since the return to saving is higher. The evidence seems to indicate that saving increases with the rate of interest, but whether by a little or a lot remains a matter of debate. As a result, saving is an upward sloping function of the interest rate.

Then, we try to explore the concept of investment. Why do people invest? The motive for investment is to make money. People can earn a higher return on their investment than it costs them to borrow the funds. If they are investing their own funds, then they invest because believe can earn more than on any alternative means of holding their savings. Besides that, investment takes place when we purchase plants or equipment, which make workers and businesses more productive in the future. Thus, we can say that investment demand is a downward sloping function of the interest rate. The less it costs to borrow, the more attractive an investment opportunity becomes.

How do saving and investment come into balance? The answer, of course, is the interest rate. Classical theory treated saving as a direct function of the rate of interest, and

investment as an inverse function. Graphically, the intersection of the saving and investment curves determines the interest rate, as illustrated in Figure 3

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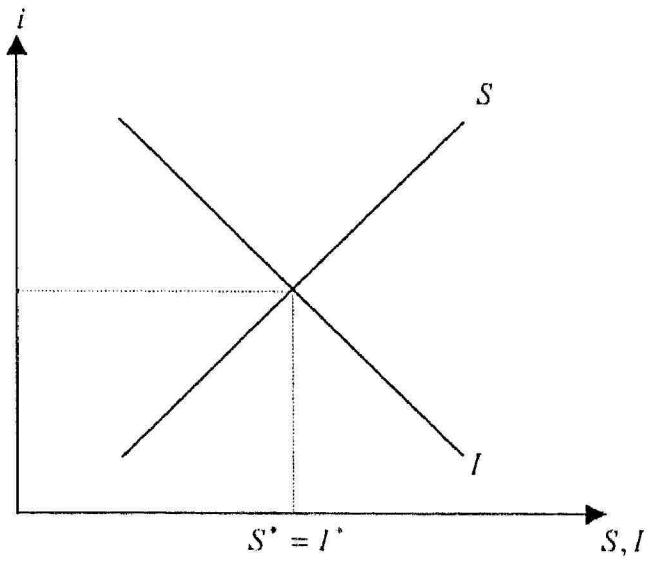

Figure 3: The Equilibrium Of Saving and Investment

Then, the next question to arise is whether the rate of interest will fluctuate freely over the wider range necessary to equate saving and investment. To simplify the exposition of the classical system, let us assume here that the curve is indeed elastic, so that investment is relatively responsive to changes in the rate of interest. Small changes will then keep saving and investment in balance.

However in Keynesian theory, saving is a direct function of the level of income. The rate of interest may have an influence on saving, but it is of minor importance in the Keynesian framework. However, in classical theory, the rate of interest is very important, and the level of income is of minor importance. Since the classical model argues that full

employment is the normal state of affairs in the economy, the level of income is in effect ruled out as a variable in the short run, and so it is ruled out as an influence on the amount of saving. The problem in classical economics is to explain how saving will vary at the full-employment level of income. The solution is simply provided by the rate of interest: the higher the rate of interest, the greater the amount of the full-employment income that is withheld from consumption or devoted to saving.

Furthermore, Keynesian argued that classical theory was wrong in two fundamental ways. Firstly, the argument points to the view that savings and investment were not made equal by the interest rate. While he agreed with classical theory in believing that investment was mainly determined by the interest rate, however, income determines saving. Secondly, wages and prices were not as flexible as classical economists claimed. Both could rise as easily as classical economists claimed, but wages and prices were sticky downward. This meant that, the economy did not automatically return to full employment. Instead, firms would reduce output and lay off workers.

Then, the modern interest-saving relation theories are related to financial liberalization. The financial reform has been equated to a shift towards higher interest rates, as it implies reducing the constraints on the level of interest rates that go along with financial repression. From a macroeconomic point of view, the level of interest rates might not only be associated with the extent of liberalization and financial opportunities, but also reflect the existence of political uncertainty or macroeconomic instability. The rate of

return at which financial resources are transferred in time is an obvious reference point in the analysis of the impact of changes in the financial environment on saving decisions.

While financial liberalization is expected to enhance the efficiency with which saving is channeled to investment, its effect on the quantity of saving is theoretically ambiguous. A competitive and liberalized financial system can be characterized by improved saving opportunities. For examples, including higher deposit interest rates, a wider range of savings media with improved risk-return characteristics, and a greater number of banks and other financial intermediaries. These all characteristics of financial liberalization will have positive effects on the quantity of savings.

However, as noted in Chapter 2, the sign of the interest rate elasticity of saving is ambiguous, both theoretically and empirically **(Rossi, 1988)**. Although economic theory suggests that saving could be sensitive to interest rates, the existence of opposing effects does not lead to a clear conclusion regarding the sign of such an elasticity. On one hand, higher interest rates increase saving through the substitution effect. On the other hand, the high interest rates could also reduce the saving rate if the associated income and wealth effects are sufficiently strong. Thus, higher interest rates do not necessarily increase saving, because of the contradiction between the substitution effect and the income effect. This is another one of those things that can, in theory, go either way. The theoretical ambiguity has not been solved, and the direction of the response of saving to an exogenous change in the interest rate still remains vastly controversial and can be determined only empirically.

Empirically, the literature by **Fry (1995)** reveals that the number of positive elasticities found in the studies exceeds the number of negative ones. This implies that financial liberalization may promote savings through higher deposit interest rates. At the same time, however, financial liberalization typically reduces borrowing constraints and, particularly in developing countries, increases foreign capital inflows. These changes may result to reduce savings. When borrowing constraints are reduced, previously constrained consumers are expected to increase their consumption. Even for unconstrained consumers, the possibility of binding constraints in the future is lowered, thereby reducing the need for precautionary savings. Besides that, a cross-country analysis shows that liquidity constraints and the amount of savings are indeed negatively correlated **(Jappelli and Pagano, 1994)**.

3.2.3 DEPENDENCY RATIO

Dependency ratio is used to explain how the population age structure gives effect to the savings rate. We used life-cycle hypothesis to explore such a relationship between savings rate and the population age. The life-cycle hypothesis presents a well-defined linkage between the consumption plans of an individual and his income expectations as he passes from childhood, through the work participating years, into retirement and eventual decease **(Modigliani, 1980)**. An individual's level of consumption depends on current income and long-term expected earnings. This implies that individuals will plan consumer expenditure based on expected incomes over their lifetime.

The following assumptions are making about the individual's plans: firstly, individual desires a constant consumption flow over their lifetime. Secondly, these people plan to consume the total amount of lifetime earnings plus current assets with no bequest motive. Thirdly, no interest is paid on assets. All assumptions imply that consumption in a given period will be a constant proportion $\left(1/T\right)$ of expected lifetime resources. The individual plans to consume lifetime earnings in T equal installments. The consumption function implied by the life cycle hypothesis is as follows:

$$C_t = \frac{1}{T}\left[Y_t^1 + (N-1)\overline{Y}^{1e} + A_t\right] \qquad (9)$$

where C_t = consumption in period time t

Y_t^1 = the individual's labor income in the current time period (t)

$\overline{Y}^{1e}$ = the average annual labor income expected over the future $(N-1)$ year

A_t = the value of presently held assets

$[\cdot]$ = expected lifetime resources

The life cycle hypothesis states that consumption would be less responsive to changes in current income (Y_t^1) and more sensitive to average expected future income:

$$\frac{\Delta C_t}{\Delta Y_t^1} = \frac{1}{T} \tag{10}$$

An increase in income that was expected to persist throughout the work years would mean that $\overline{Y}^{1e}$ also rises. Thus, the effect on consumption would be much greater:

$$\frac{\Delta C_t}{\Delta Y_t^1} + \frac{\Delta C_t}{\Delta \overline{Y}^{1e}} = \frac{1}{T} + \frac{N-1}{T} = \frac{N}{T} \tag{11}$$

The life-cycle hypothesis is a theory of saving and consumption behavior on the part of the individual's position in the life cycle. Young workers entering the labor market have relatively low incomes and low saving rates. Income and saving rates will increase when individual step into middle-age years. Retirement brings a decrease in income and is expected to begin with a period of dis-saving. Figure 4 graphs shown this relation.

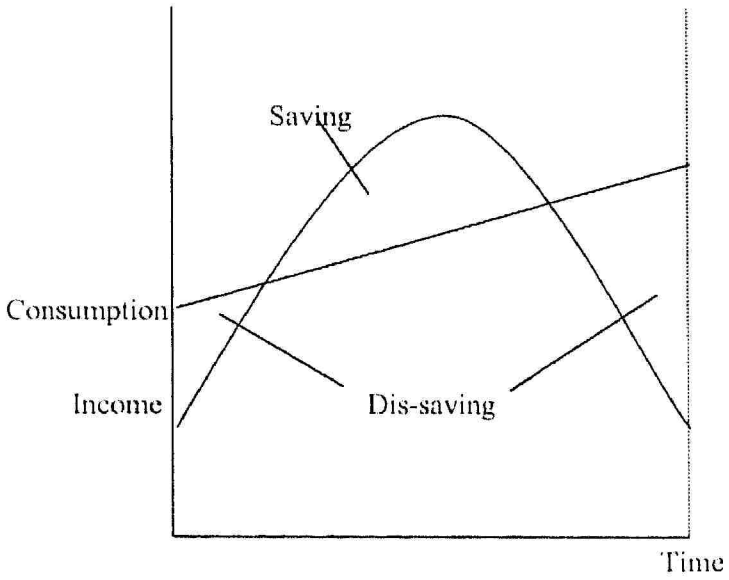

Figure 4: Income and Consumption over the Life Cycle

Figure 4 shows that consumption increases gradually over the life cycle. Income increases sharply over the early working years, peaks and then decline during the retirement period. The typical shape of the income profile over the life cycle starts with low income during the early years of the working life, then income increases until a peak is reached before retirement, while pension income during retirement is substantially lower. To make up for the lower income during retirement and to avoid a sharp drop in utility at the point of retirement, individuals will save some fraction of their income during their working life and dis-save during retirement. This results in a hump-shaped savings profile over the life cycle.

Conclusions of the life cycle theory regarding aggregate household saving are: firstly, that saving is not determined, as earlier theories have suggested, by households' income level, but rather by the rate of increase in that income level. Secondly, saving is affected

by population growth as well as by population age structure, and finally saving is affected by households' aggregate.

The relationship between population change and economic growth has taken on added salience in the last few decades because of demographic trends in the developing world. At varying rates, developing countries are undergoing a demographic transition to lower rates of mortality and fertility, producing a boom generation that is gradually working its way through nations' age structures. Thus, many developing countries face opportunities to translate their ongoing demographic transitions into economic gains. The East Asian "economic miracle" shows how reduced fertility can help to create conditions for robust economic growth.

Declining mortality, followed by declines in fertility, resulted in a rapid demographic transition in the region between 1965 and 1990. As a result, the working-age population grew four times faster than the dependent population. A strong educational system and trade liberalization policies enabled national economies to absorb this "boom" generation into the workforce. The demographic dividend fueled the region's spectacular economic boom: real per capita income growth averaged 6 percent per year between 1965 and 1990. The demographic dividend accounted for approximately one-fourth to two-fifths of this growth and that further improve saving rates.

3.2.4 FOREIGN SAVINGS

In the context of an open economy, foreign savings assume a critical role either as complement to or substitute for domestic savings. Generally, national savings in most developing countries is not sufficient to finance the huge needs for investment required by economic growth and development. Hence, the resort to foreign capitals or foreign savings is inevitable to fill this insufficiency and causes an ex-post increase in domestic savings through its effects on investment and production **(Chenery-Strout, 1966)**. This theoretical analysis is based on twofold: firstly, the complementarily in the short run between foreign capitals and national savings. Secondly, the substitutability in the long run of national savings for foreign capitals, i.e., savings becomes progressively a substitute for foreign capitals to finance development **(Chenery, 1979)**. The equilibrium condition can be expressed as follows:

$$Y = C + I + G + (X - M) + TR \qquad (12)$$

Where G = government expenditure

$X - M$ = trade balance

TR = net factor income from abroad

Equation (12) can be rewritten as follows:

$$Y - C - G = I + (X - M) + TR \qquad (13)$$

or

$$I = S_n + (M - X) - TR \tag{14}$$

or

$$S_n = Y - C - G \tag{15}$$

Where S_n here is represents national savings. According to equation (14), it is possible to increase both investment and foreign capitals simultaneously, without changing the level of savings. This shows the weakness of national savings in developing countries. National savings cannot be an obstacle to investment since it can be compensated by capital inflows. Suppose equilibrium in the balance of payments with exchange reserves equal to zero, we can write:

$$(X - M) + TR + F = 0 \tag{16}$$

Where F expresses the balance of capital account equal $(X - M - TR)$. Then, equation (14) can be rewritten as follows:

$$I = S_n + F \tag{17}$$

Equation (17) shows that foreign capitals (F) are used in addition to national savings to finance investment. Through their effects on investment and production, capital inflows can make national savings replace them in financing investment progressively. Therefore,

national savings and foreign capitals are complementary and also substitutable each other.

There is now some literature on the role of foreign capital in determining the host country's economic growth and savings. Earlier studies that attempted to establish the relation between national and foreign savings failed to reach a consensus. Authors such **Griffin and Enos (1970)** showed that an extra dollar of foreign capital is associated with a rise in consumption of about seventy-five cents and a rise in investment by twenty-five cents. The author reported a positive correlation between foreign capital and national savings. Besides that, he notes that an increase in foreign capital provided an equal boost to the savings rate and was a stimulus to economic growth.

In addition, **Edwards (1996)** highlighted the importance of foreign savings as one of the explanatory variables in savings equation. Specifically, he concluded that high foreign savings is associated with lower domestic savings. Hence, in most of the empirical literature, however, the relationship between foreign and domestic savings has been found to be negative. In the 1980s, **Feldstein-Horioka (1980)** has again brought back the issue to the fore. These studies overwhelmingly rejected the hypothesis of perfect capital mobility. Further, their cross-country evidence clearly pointed that the strong link between domestic savings and investment resulted only in a weak association between foreign investment and domestic savings.

Consequently, recent studies on financial crises often find that crises are typically preceded by financial liberalization. A surge in capital inflows will follow by a fall in the saving rate. This strict to the point that domestic saving rate may fall in response to the increase in foreign savings. Because of this theoretical ambiguity, the impact of financial liberalization through foreign savings on the level of national savings can be determined only empirically.

3.3 CONCLUSION

Saving rates display great variation across countries and over time. They are also closely related to growth performance. This section provides an account of key variables, models and policies associated with saving. Drawing from a systematic exploration of the existing literature, the collection summarizes current knowledge about cross-country saving trends, the relation between saving and growth, the impact of financial liberalization on saving, the effect of foreign resource inflows on saving, and the links between age structure and aggregate saving. To sum up, the review of the relevant theoretical literature reveals an important argument that stand out in empirical studies: the effect of exogenous changes on national saving is at best mixed, and hence, has to be determined empirically.