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Conclusions and Policy Options

Saving is defined as the act of abstaining from current consumption. It is the excess of disposable income over expenditure on the final consumption of goods and services. It is also the first of the three sequential acts of capital formation, the subsequent two being *finance* and *investment.*

Savings are inevitable for a nation's growth. Savings play a crucial role in capital formation which is the engine of economic growth. An understanding of the behaviour of savings is important for the study of economic growth and development and also for the formulation of economic policies.

Saving is essential for keeping pace with the growing world. Saving is needed to maintain the existing capital stock and to make sure that the capital stock grows in proportion to the growing population. Also, increased saving may be needed to reduce a country's dependency on foreign capital and foreign ownership of domestic assets.

Lewisian theory suggests that *"the central problem in the theory of economic development is to understand the process by which a community which was previously saving and investing 4 or 5 percent of its national income converts itself into an economy where voluntary saving is running about 12 to 15 percent of the national income or more".* Lewis viewed saving transitions as the key to economic development. Countries with the most successful growth records in the post-war period have indeed gone through saving transitions.

Saving is an important macro-level policy variable. It is an interactive variable, sharing dynamic relationship with other equally important macro variables in the economic system. There is a two-way dynamic relationship between savings and macro economic variables. Saving influences a variety of macro variables and in turn gets influenced by them.

The present study makes a sincere attempt to explore the answers to various saving issues raised in the vast literature on savings. The specific objectives of the present study are:

1. To carry out a systematic analysis of the behaviour of Indian savings and its changing composition in the planned economy.

2. To explore the causes responsible for the uneven growth in savings in India.

3. To identify the determinants of household sector savings and test the empirical relationship between the household sector saving and its determinants using econometric techniques and analysis.

4. To test for Growth-Saving Causality and explore the answers on the unsettled issues therein.

5. To examine the Life-Cycle Hypothesis in the case of India.

6. To find out the nature and degree of inter-relationship of saving with important macro economic variables:

    i. Monetary Sector Variables
    ii. Fiscal Sector Variables
    iii. External Sector Variables
    iv. Real Sector Variables

7. To derive relevant policy inferences and options.

6.1 Study Approach

There are four major issues dealt with in this research endeavour. These issues are empirical in nature. First is the growth and behaviour of savings in the country. Second is the causal relationship between saving and growth. The third issue is the nature of interaction between saving and macro economic variables and the last being the determinants of household savings.

At the outset, this study begins with an examination of the trend and composition of savings in India for a period of over five decades. This was necessary to understand the nature, magnitude and composition of gross domestic saving and its components in the country.

The next step was to analyse the relationship between economic growth and gross domestic saving in the country. The growth and saving relationship has been empirically tested from the point of view of the long-run causal relationship between the two. The aim was to arrive at the direction of causality between saving and growth. It also throws light on the impact of real sector of the economy on savings.

Following which, the impact of the other sectors of the economy on savings was analysed in the third step. The relationship between saving and macro economic variables such as monetary sector variables, fiscal sector variables, external sector variables, real sector variable and demographic variable have been tested for the existence of a stable long-run relationship. The degree of sensitivity of savings to important macro economic variables has also been assessed. This serves as a base for establishing multivariate regressions between savings and macro variables. They help to understand not only the dynamics of inter-relationship between savings and macro economic variables but also to arrive at the right combination of policy prescription for enhancing savings in India.

As the household sector is the predominant source of savings in India, there is a need to undertake an in-depth analysis of each one of the components of household saving. The study identifies the determinants of household saving instruments and examines the long-run relationship between them. Also, the degree of relationship between household saving components and the determinants have been assessed to understand the nature of relationship and to draw policy inferences.

The study uses time series annual data for all the variables used. The analysis on trend and composition of Indian savings as well as the growth-saving relationship covers a time period from 1950-51 to 2003-04.

Since major changes in the economy and the financial sector started taking place in the early seventies only, for the study on dynamics of inter-relationship between savings and macro economic variables and for the study of determinants of household savings and its components, the present study takes a time period of over thirty years from 1970-71 to 2003-04. The time period of savings data has been matched with other participating variables in the study. In some cases, however, the

length of the data fluctuates by one or two years depending upon the availability of data.

6.2 Conclusions and Policy Options

Including the present concluding chapter, this research study has been divided into six chapters. The major findings, conclusions and policy inferences drawn from this extensive research endeavour are given below:

Chapter 1: Introduction

This is the introductory chapter. It explains the meaning and definition of savings, discusses the importance and role of savings in the economy, analyses the domestic as well as the global saving scenario, and finally raises certain pertinent issues related to Indian savings based on the literature review and the theoretical background. On the basis of this, the chapter outlines the objectives of the study and methodology of the study. It also covers a brief summary on each chapter of the thesis.

Chapter 2: Definitional Aspects, Behaviour and Composition of Savings

A study of savings requires an understanding of the past and present behaviour of saving and its components. In the first step, this chapter highlights the structure of savings in the economy. This chapter deals with the definitional and conceptual aspects, behaviour and composition of savings. Under the definitional aspects of savings, we have classified savings into its components and discussed the definitions of savings and each one of its components.

As savings data are mostly calculated as residuals of other macro economic variables, they are inherent with estimation errors. As such, the data issues and complications involved in the calculation and estimation of saving data have been discussed in the chapter.

The trend behaviour and composition of Gross Domestic Saving [GDS] and its components have been analysed for the planned economic era from 1950-51 to

2003-04. The trend behaviour of GDS has been analysed using three indicators: Trend Growth of Saving, Trend Growth of Saving Rate and Average Saving Rate. In addition, this chapter carries out an extensive analysis of the changing composition and profile of savings in India using appropriate statistical techniques.

After studying the trend behaviour and composition of savings, the following conclusions can be drawn:

i. The gross domestic saving rate has exhibited an upward trend throughout the post-planning period despite considerable fluctuations from year to year.

ii. The Indian saving, in the planned era, has witnessed six distinct phases -

1. Low Saving Phase [1950-51 to 1968-69]
2. Increasing Saving Phase [1969-70 to 1975-76]
3. High Saving Phase [1976-77 to 1978-79]
4. Stagnation Phase [1979-80 to 1984-85]
5. Recovery Phase [1985-86 to 1992-93]
6. New High Saving Phase [1993-94 to 2003-04]

iii. The Indian savings experience has been marked with varied oscillations in the saving rate throughout the planning period. For almost twenty years of the five decades or more, the saving rate in India was quite low averaging at 11.9 percent. There were two main reasons for this behaviour of gross domestic saving. One, the private corporate saving rate had stagnated and second, the agricultural sector occupied a larger share of the country's GDP. As the agricultural sector is characterised by low propensity to save, it depressed the overall saving rate in the economy.

iv. After lying low for almost two decades, the saving rate increased to an average of 16.7 percent by the mid-seventies. The sudden spurt in savings was mainly because this period coincided with the financial deepening taking place in the economy and the Green Revolution effects. Other factors which contributed to the rise in savings were the rise in public sector savings in response to the oil shock, the foreign inward remittances by Indians working abroad, large scale food procurement by the government, declining share of

agriculture in GDP, changing pattern of production in favour of durable goods and services and income redistribution in favour of the high-income groups.

v. The saving rate rose even higher during the late seventies averaging at 23.2 percent. For nearly four years during this period, India continuously witnessed high saving rates chiefly as a fall out of all the factors that characterised the Indian economy in the earlier phase. Besides, the gap between the propensities of agricultural and non-agricultural sectors widened during this period.

vi. After withstanding high savings for few years, for almost half a decade till the mid-eighties, the economy experienced stagnancy in the saving rates with an average of 19.8 percent. The factors responsible for the lull in saving rates during this period were the decline in household physical savings and public sector savings accompanied by a stagnant private corporate saving rate.

vii. From the second half of eighties, for almost a decade, the economy witnessed a revival in the saving rates to an average of 21.5 percent. This period marked the introduction of the first phase of reforms in the Indian economy which imparted buoyancy to the capital market, led to favourable response in the new issues market and widened the mutual funds sector. In addition to these, there were other factors that triggered the recovery in saving rates during this phase, such as attractive real interest rates, low average inflation rate, real GNP growth, faster growth of non-farm income, reduction in marginal tax rates and also growth in corporate savings which had remained stagnant for long in the earlier periods.

viii. In the post-reform period, coinciding with the implementation of economic and financial reforms, the saving rate escalated reaching an ever high average saving rate of 24.1 percent. The saving rate during this period was unparallel in the history of Indian saving rates reaching 28.1 percent in the year 2003. The reasons contributing to the ever rising saving rates in this period were a substantial increase in household financial savings combined with a rise in

household physical savings, increasing private corporate sector savings and high real GDP growth rates.

ix. India's saving rates are quite impressive from the global perspective and compares favourably to that of other developing countries. It is however lower than the saving rates of the East Asian 'miracle' nations.

x. Among the developing nations, China, India and Thailand are the three countries with the household sector contributing more than half of their gross domestic savings.

xi. India's household saving rate [24.3 percent] is competitive to that of China's [25.5 percent] but still India falls short of China in terms of its gross domestic saving rate. It is largely the high level of consumerism in the Indian household sector which curbs the level of gross domestic savings in the economy.

xii. The household sector is the most important source of GDS, followed by the private corporate sector and lastly the public sector. The household sector contribution to GDS has always been predominant with a share of over 70.0 percent.

xiii. Private corporate savings have experienced lots of fluctuations. It has ranged from 6.6 percent to 16.7 percent during the five decades. It declined for the initial three decades [1950-1979] and then started rising, reaching a peak of 16.7 percent during the post-reform period [1993 to 2003].

xiv. The public sector contributed substantially for a long time period from 1950 to 1978. However, 1979 onwards it started falling and eventually became a major dissaver in the economy with increasing contributions towards public sector dissavings.

xv. A striking feature is that the rise in private corporate savings is concurrent with decline in public savings. Savings of one sector offsets savings in the other sector. This implies a substitution of domestic saving across sectors.

xvi. There is a portfolio shift from physical to financial saving assets. In due course of time, financial assets have absorbed a larger share of household saving, as against physical assets. This explains the financial deepening taking place in the economy.

xvii. Within financial saving, in comparison to contractual saving assets, there has been a higher and increasing preference of households to save in non-contractual saving instruments. The most important household financial saving assets are deposits, currency, provident and pension funds, and life funds.

The share of both, contractual and non-contractual savings in GDS increased substantially from 1950 to 1985 and then after remained stagnant till 2003. Among the two financial saving components, non-contractual saving contributes maximum to the GDS.

xviii. Among the contractual saving components, the moderate decline in the share of life funds and provident and pension funds seem to have paved way for saving in terms of UTI units. However, the composition of GDS by financial instruments reveals a different picture. The household savings in shares and debentures has fallen drastically and the proportion of provident and pension funds has increased substantially whereas the savings in units of UTI has fallen with negative contribution in GDS.

xix. Non-contractual savings experienced a major shift from currency holdings to deposits with growth and spread of the financial system in the economy. With the diversification of saving assets, the choice of saving instruments has been changing over time.

xx. Within deposits, bank deposits have been substituted by non-banking deposits but only to a small extent. Almost 90.0 percent of the total deposits are held as bank deposits. Deposit turns out to be the most important saving instrument in India contributing 20.7 percent in the GDS in 2003.

xxi. 1979 onwards, there was a switch over from currency and deposits to shares and debentures. The sudden rise in household investment in shares and

debentures during 1985-1992 indicates people's preference for profitability over liquidity, which also led to financial disintermediation in the banking sector.

xxii. Post-liberalisation, one of the most prominent and uprising non-contractual saving asset has been the claims on government securities and other small saving assets. It contributes one-tenth share in GDS in 2003. This was the initial phase of liberalisation and small saving assets had become an attractive avenue for households to save in.

xxiii. In the public sector, the dismal performance of the government administration and departmental enterprises gets reflected in their increasing dissavings over time. However, the non-departmental enterprises have done exceptionally well with rise in savings that are huge enough to cover up any losses by the former.

xxiv. The periods of low to stagnant saving rates witnessed by the Indian economy has been characterised by the following features:

1. High inflation rates.
2. Balance of Payment crisis.
3. Larger share of agricultural income in GDP.
4. Stagnant private corporate sector savings.

xxv. During the phases of high saving, the economy experienced the following features:

1. Financial spread and deepening in the economy.
2. Spurt in foreign inward remittances from abroad.
3. Large scale food procurement by the government.
4. Shifts in the private consumption pattern from non-durable to durable goods and services.
5. Income distribution in favour of the high income groups.
6. Faster growth of non-farm incomes.
7. Higher real economic growth.
8. Lesser share of agriculture in GDP.

9. Increase in private corporate sector profitability.
10. Emergence of a large number of financial institutions.
11. High effective yield rates and attractive real interest rates.

Overall, the Indian saving has been growing at an impressive rate even from the international perspective. It is very important to find out whether this impressive growth in saving has been able to fuel economic growth? Or to put it the other way, *whether high growth in savings in the country is reflected in its growth rate? Does saving influence economic growth? What is the Growth-Saving dynamics in the country?* These are some of the important as well as relevant questions which are being answered in the next chapter on Growth-Saving Causality in India.

Chapter 3: Growth - Saving Causality in India

'Causality implies predictability'. This chapter deals with the saving-growth causal relationship. A major debate has been going on the nature and direction of causal relationship between saving and economic growth around the world. The motive of the present chapter has been to investigate whether there exists a long-run causal relationship between saving and economic growth in India, and if yes, then what is the nature of the causal relationship? Is it uni-directional or bi-directional? This chapter further investigates the sensitivity of alternative variable definitions used, on the results of growth-saving causality.

In the first phase, this chapter examined the saving rate and the growth rate relationship in the post-planned period in India and came to the conclusion that India's economic growth rate has not kept pace with the saving rates. In response to it, this chapter explored various reasons for this kind of saving and income behaviour which is widely termed as the high saving-low growth puzzle. The high saving-low growth riddle has been explained by the following factors:

i. Low investment multiplier
ii. Low overall productivity
iii. Estimation problems
iii. Low investment demand
iv. Low capacity utilisation
v. Structural factors

In the second phase, the study examined the growth-saving causality to arrive at the answers to several important questions:

- Is it growth that causes saving?
- Does saving cause growth?
- Is the causal relationship between saving and growth bi-directional?
- Whether there exists a causal relationship between saving and growth at all?

The study examined the causal relationship between Gross Domestic Saving [S] and Income [defined alternatively as nominal national income (Y), nominal national income at factor cost (Y_{fc}) and non-agricultural income at factor cost (YNA_{fc})], using the cointegration approach to Granger causality test.

This empirical analysis involved the following steps:

1. *Augmented Dickey-Fuller [ADF] test* - Unit Root Test is performed for examining the level at which saving and income variables are stationary.

2. *Cointegrating Regression* - Ordinary Least Squares method is used for estimating these regressions between the saving and income variables for deriving the residual series.

3. *Augmented Engle-Granger [AEG] test* - Cointegration test is employed for finding out the level of stationarity of residuals for confirming the existence or absence of long-run stable relationship between saving and income variables.

4. *Error Correction Mechanism [ECM]* - for studying the short-run dynamics between saving and income.

5. *Granger Causality Test* -

    a. *Vector Error Correction Model [VECM]* - for examining causality between saving and income variables that are not stationary at level zero [I(0)] and are cointegrated.

    b. *Wald's F-test* - for testing the causality between saving and growth variables that are stationary at zero level [I(0)].

Based on the empirical results, the study concludes the following:

i. The Gross domestic saving and income share a uni-directional causal relationship from income to saving in the long-run, meaning thereby that income causes gross domestic saving for all the income variables.

ii. Three alternative measures of National Income [Y, Y_{fc}, YNA_{fc}] were used in the study with Gross Domestic Saving [S], but the causal relationship shared between these variables did not change. The marginal propensity to save [MPS] was found to be nearly the same for all the income measures around 0.3.

iii. On the other hand, saving defined as growth rate of gross domestic saving [$\Delta S/S$] and income defined as growth rate of income [$\Delta Y/Y$, $\Delta Y_{fc}/Y_{fc}$, $\Delta YNA_{fc}/\Delta YNA_{fc}$] share a uni-directional causal relationship from growth rate of saving to growth rate of income. This implies that growth rate of saving causes growth rate of income [or economic growth] for all the income variables but the reverse is not true.

iv. In the short-run, Gross Domestic Saving [S] and National Income [Y, Y_{fc}, YNA_{fc}] share a bi-directional causal relationship, meaning thereby that saving causes income and income causes saving.

v. From the above results on the causality between saving and growth, the conclusion is made that in India growth rate of saving is not economic growth led.

How well these results compare with other empirical studies?

To answer this, the study carried out a vast survey of literature on the empirical work on causality between growth rates of saving and economic growth and concluded that:

i. Income class of a country plays an important role in determining the direction of causality. The empirical results for high income countries confirmed causality from economic growth to growth rate of savings. In

case of upper-middle income countries, causality was found to be bi-directional between economic growth and growth rate of savings. Most of the low-middle income countries experienced causality from economic growth to growth rate of savings. For the low-income countries, the results were mixed on the causal relationship between economic growth and growth rate of savings.

ii. In the country specific studies, *growth to saving causality* was found for the following countries - Pakistan, Mexico and Philippines, whereas *saving to growth causality* was observed in the case of Sri Lanka, Congo and Singapore.

iii. India's results seem to be more towards the capital fundamentalist view which identifies and interprets the strong connection between saving and growth variables as a causal chain running from saving to growth. Also, the results are in consistency with Lewis [1955], who stressed upon the role of savings in initiating economic growth in poor countries.

iv. Saving is not economic growth led in the Indian case. Therefore, to enhance the savings in India, it is not economic growth which is more important. To enhace the savings further, there is a need to focus on framing of saving incentive policies by the government.

If not economic growth then what are the factors which influence the Indian saving growth? This is a very pertinent question has been explored in the next chapter.

Chapter 4: The Dynamics of Inter-relationship between Saving and Macro Economic Variables

This chapter is basically divided between the theoretical framework weaving the saving-macro variable relationships and the empirical analysis on the dynamics of inter-relationship between saving and macro economic variables. Based on the empirical analysis and findings, suitable policy options have been suggested for enhancing savings in India.

The present chapter deals with the dynamics of inter-relationship between savings and macro economic variables. The chapter undertakes theoretical discussion as well as empirical testing of the relationship between savings and the following macro economic variables:

1. Monetary Sector Variables
    a. Rate of Inflation [WPI]
    b. Rate of Interest [INT]
2. Fiscal Sector Variables
    a. Budget Deficit [FD]
    b. Taxation [TR]
3. External Sector Variables
    a. Export Orientation [EXP]
    b. Terms of Trade [TOT]
    c. Foreign Capital Inflows [FCI]
4. Real Sector Variable
    a. National Income [Y]
5. Demographic Variable
    a. Dependency Ratio [DEP]

The literature on the nature of relationship between savings and macro economic variables reveals mixed views. There is no consensus on the impact of macro variables on savings. The vast literature on the inter-relationship between savings and macro variables is either in contradiction to each other or inconclusive.

The study empirically tests the relationship between macro economic variables and savings for the time period 1970-71 to 2003-04. For the empirical tests, the first step involved was to formulate a set of hypotheses on the nature of relationship between saving and macro economic variables.

In the next step, cointegration approach was used for examining the dynamics of inter-relationship between savings and macro economic variables using the following function:

$$S = f\,[WPI, INT, FD, TR, EXP, TOT, FCI, Y, DEP]$$

The estimation technique for cointegration approach involved the following steps:

1. Time series analysis requires that the variables under consideration be stationary. In case of non-stationary time series data, there would be spurious results rendering the analysis meaningless. Therefore, stationary test or unit root test has been carried out for all variables, dependent as well as independent variables for finding out whether the variables are stationary and if not then at what level; which also determines the number of unit roots contained in the variable series. To examine the unit roots in the variables the Augmented Dickey-Fuller [ADF] test has been used.

2. Various specifications of all the variables [change, as a percentage to national income, growth rate and in log] have been tested for unit roots for identifying the variables with the same level of stationarity or order of integration. The pre-condition for cointegration test is that the dependent and independent variables should be integrated of the same order.

3. The variables that are stationary at the same level or that have the same order of integration were selected for each macro economic variable. The Ordinary Least Squares method was used to estimate the cointegrating regression between the identified specifications of dependent and independent variables.

4. The residual series derived from the cointegrating regression was tested for unit roots using the Augmented Engle-Granger [AEG] test for finding out whether there exists a long-run relationship between the dependent and independent variables so as to identify the macro economic variables that share a stable long-run relationship with saving.

5. All the macro variables that share a long-run relationship with saving were taken together to obtain several multivariate regressions.

6. The best fit equation was selected from the estimated multivariate regressions, based on the basic statistics such as R^2, Adjusted R^2, D-W statistic and F-statistic.

The following final model was selected in the study:

Log S/Y = 0.17 - 0.71 Log [WPI] + 0.13 Log [FD/Y] + 0.29 Log [TR] + 0.44 Log [EXP/Y]
[0.55] [3.82] [2.71] [3.49] [4.89]

- 0.21 Log [TOT] - 1.18 FCI/Y + 0.125 Log [ΔY] + 0.52 ΔDEP
[3.23] [1.82] [2.71] [0.135]

R-square: 0.925956 *D-W statistic:* 1.658818
Adjusted R-square: 0.897749 *F-statistic:* 32.82692

Indian saving rate [S/Y] was found to be most sensitive to wholesale price index [WPI] with an elasticity of -0.71 followed by export rate [EXP/Y] with an elasticity of 0.44. The saving rate was found to be relatively inelastic to tax revenue [TR] and terms-of-trade [TOT]; whereas it was inelastic to the fiscal deficit rate [FD/Y], foreign capital inflow rate [FCI/Y] and change in national income [ΔY].

Inferences and Policy Options

Based on the empirical results, we have carried out a discussion on the consistency of our results with other studies and also to explore policy options in the context of the past behaviour of the saving and macro variables.

1. Rate of Inflation

There are a large number of studies on the nature of relationship between saving and the rate of inflation, which suggest both a positive and negative relationship between inflation rate and saving. There is a controversy as to whether inflation promotes savings or discourages savings.

In our results, we have found a negative relationship between saving rate and inflation with a high elasticity of 0.71. The past behaviour of wholesale price index shows that it has been increasing over the years with a trend growth rate of 7.9 percent. A negative and high elasticity on one hand and a high trend growth of wholesale price index on the other has been resulting in depressing the saving rate in India substantially.

This negative impact of wholesale price index on saving is in consistency with the empirical results at large. The negative impact of the rate of inflation on savings has been supported by Yang [1964], Branson and Klevorick [1969] Mckinnon [1973], Howrey and Hymans [1978], Gylfason [1981] and Lahiri [1989].

The theoretical explanation to the negative saving-inflation relationship is explained by a negative *income effect* of inflation on savings. During inflation, if consumers resist cuts in their consumption, given the real income, the savings would be sacrificed.

2. Rate of Interest

Rate of interest is an important monetary policy variable influencing savings. Researchers are varied in their opinion on the saving-interest rate relationship. There are some who suggest a positive impact of rate of interest on savings while some who confirm a negative influence of interest rate on savings. Also, there are some who support the case for little or no interest rate elasticity of savings.

There is a vast review of literature on the relationship of saving and interest rate which are largely inconclusive. Theoretically, the rate of interest and saving relationship is examined through the direct and indirect effects of interest rate on saving. The direct impact of a change in the real rate of return on saving is felt through the *income and substitution effects.* A higher interest rate discourages savings for a net lender by increasing his interest earnings. The income effect of a change in interest rate on saving is thus negative. In contrast, the substitution effect is positive. An increase in the real rate of interest induces people to postpone their consumption in favour of present savings.

The indirect impact of interest rate on savings is the *wealth effect.* A rise in interest rate reduces the real value of existing wealth. To maintain the real value of assets, people tend to reduce their current consumption and start saving more. The total effect of a change in the real interest rate on savings is however ambiguous as it depends on each of the three effects [income effect, substitution effect and wealth effect] on savings.

Among the available literature, there is evidence of only a negligible effect of interest rate on savings. Particularly, in low income countries, the response of savings to changes in interest rate was found to be very poor.

In the present study, the interest rate does not share a long-run relationship with saving rate; hence we have excluded it from the final model in the study.

3. Fiscal Deficit

There are different views regarding the impact of budget deficit on private savings. The relationship is often viewed as one between government savings and private savings. According to the *conventional view*, a decline in government savings leads to a decline in private savings which cumulatively have a downward impact on national savings. On the contrary, the *Keynesian view* suggests that higher temporary government dissavings encourage private sector consumption. In the presence of underutilized production capital in the economy, an increase in aggregate demand stokes higher income through the operation of the multiplier effect. Hence, private sector income and savings will increase. However, the extent to which the rise in private savings will offset the decline in government savings is ambiguous.

In our results, fiscal deficit rate [FD/Y] has been found to share a positive relationship with the saving rate. The saving rate is inelastic to the fiscal deficit rate with an elasticity value of 0.13.

The indication of a positive relationship between fiscal deficit and saving in our analysis implies that a rise in government dissavings [fiscal deficit] has a positive impact on domestic savings which in the Indian case constitutes the savings of the private sector. This finding indicates the existence of Ricardian Equivalence in India

with dissavings in the public sector being offset by savings in the private sector. The household sector currently contributes almost 85.0 percent of gross domestic savings, the remaining being supplied by the private corporate sector as the public sector is a net negative saver.

Our finding of a positive impact of government deficit on saving gets support from the following studies such as Kochin [1974], Barro [1978], Tanner [1979], Kormendi [1983] and Seater and Mariano [1985].

4. Tax Revenue

Studies on tax-savings relationship have arrived at diverse results with some supporting the negative impact of taxation on savings, others confirming the positive reaction of private savings to tax policies, and few others who find tax increases to be an inefficient means of raising savings.

In our results, tax revenue is found to have a positive impact on saving rate with an elasticity of 0.29. Tax revenue collections of the government of India have been increasing steadily and substantially over the years. The trend growth rate of tax revenue is very high at 13.4 percent.

Our results are in consistency with the studies by Carroll and Summers [1987] and Poterba, Venti and Wise [1996] which have also found a positive relationship between tax revenue and savings. The empirical evidence however largely supports the negative impact of tax on savings.

Theory states that the positive effect of tax on savings is felt through tax incentives and tax shelters offered by the government. The tax incentives provided by lower-tax countries have often resulted in a more efficient use of productive resources by shifting resources from unproductive sectors to productive sectors, thereby increasing savings in the long-run. Studies also suggest that a tax-mix and tax-policy can promote savings in the country such as 'expenditure tax' which would discourage consumption and promote capital formation. In the Indian case too, tax revenue sharing a positive relationship with saving rate and a growth rate of over 13.0 percent has been effective in raising the saving rate in the country.

5. Exports

Our results confirm a positive relationship between export orientation and savings. The export rate elasticity of saving has been found to be 0.44. This result on export-saving relationship is consistent with that of the literature which has largely hypothesised a positive relationship between export orientation and savings. Maizels [1968], Lee [1971] and Papanek [1973] support the positive impact of exports on savings.

In case of India, export orientation has been augmenting the saving rates. This gets support from the theoretical explanation on the relationship between exports and savings which suggests a two-way impact of exports on savings. On one hand, export orientation augments government revenue from export taxes and hence government savings increase. On the other, an increase in exports may increase private savings, as exporters have a relatively higher propensity to save.

6. Terms of Trade

The literature is divided on the nature of relationship between terms-of-trade and saving. Some studies support a positive effect of terms-of-trade on saving while a few others found a negative relationship between them. Economic theory as well as empirical evidence on the nature of relationship between terms-of-trade and savings is ambiguous.

Our results confirm a negative impact of terms-of-trade on saving rate in India. Saving rate is found to share a weak elasticity of 0.21 with the terms-of-trade. After the mid-seventies, the terms-of-trade has experienced an overall rising rend with a trend growth rate of 0.9 percent only. With a very low elasticity between saving and terms-of-trade, along with a low growth rate of terms-of-trade, this variable turns out to be an insignificant determinant of saving rate in the country.

The negative relationship between terms-of-trade and saving rate arrived in the study is in confirmation with Obstfeld [1982], Macklem [1990], Sachs [1981] and Athukorala and Sen [2001] who also found a negative influence of terms-of-trade on

savings. Majority of these studies have tried to see the impact of permanent shocks of terms-of-trade on savings.

As in our analysis, the theory too suggests a negative influence of terms-of-trade on savings. When an economy suffers a terms-of-trade deterioration, the real wealth is lowered. In order to converge to the target level of wealth, it must increase savings.

7. Foreign Capital Inflows

The relationship between foreign capital inflows and domestic savings has been strongly debated in the literature. There is an ongoing debate as to whether foreign capital inflows are complementary or substitute to domestic savings.

In our results, foreign capital inflow rate [FCI/Y] has a negative impact on the domestic saving rate [S/Y] with a low elasticity of 0.02. This negative relationship between foreign capital inflows and domestic savings indicates the relevance of a substitution hypothesis in case of India. According to the *substitution hypothesis*, an increase in foreign capital inflows depresses domestic savings in the country since foreign capital receipts are used partly to finance consumption and only partly for increasing investment.

Our finding of an inverse relationship between foreign capital inflows and domestic savings gets support from a large group of economists such as Leff [1968], Rahman [1968], Chenery and Eckstein [1970], Griffin [1970], Griffin and Enos [1970], Landau [1971], Papanek [1972, 1973], Weisskopf [1972], Grinols and Bhagwati [1976], Wasow [1979], Gersovitz [1982], Joseph [1997], Reinhart and Talvi [1997] and Plies and Reinhart [1998].

8. National Income

National Income is a prominent real sector variable influencing savings. The relationship between national income and saving has generally been discussed in terms of the causal relationship between economic growth and saving. The economists are divided in their views on the growth-saving relationship. There are

contradictory views with some supporting a causal chain from growth to saving while others suggesting a causal impact from saving to growth.

We found a positive impact of change in income on saving rate in India. The saving rate is inelastic to change in national income, as suggested by low saving-income elasticity of 0.13. In conformity with the results of causality analysis for saving and national income in earlier chapter, the marginal propensity to save [MPS] was found to be quite low around 0.3.

9. Dependency Ratio

The literature on the nature of relationship between dependency ratio and savings is inconclusive. A large group of economists support a negative influence of dependency rate on saving rate while some of them support a positive impact of dependency rate on saving rate. Some of the studies have been unable to trace any significant relationship between dependency rate and saving rate.

The dependency ratio [ΔDEP] defined as the ratio of total number of dependents [0-14 years + 65 years and above] to the total working population [15-64 years] shares a positive relationship with savings, implying thereby that the rising working population [falling dependency of population] has been enhancing the savings in India.

This result is in consistency with the studies supporting the notion that a fall in dependency ratio tends to increase the saving rate in the country. These studies are Leff [1969], Gupta [1971], Mensbrugghe [1972], Kelley [1973], Mikesell and Zinser [1973], Snyder [1974], Gupta [1975], Simon [1975], Singh [1975], Mueller [1976], Ram [1982], Modigliani and Sterling [1983], Lahiri [1989] and Muhleisen [1997].

In India, the dependency ratio has been falling with increasing magnitude over the years. In the recent years, the downward change in dependency ratio was over 0.7 percent. The fall in the proportion of dependents to the working population has been a major factor influencing the rise in saving rates in the country.

The results of the present study confirm the existence of the Life-Cycle Hypothesis in India. The life - cycle hypothesis predicts that "the higher the share of the very young and the very old [who dissave] in the population, the lower would be the saving rate." Therefore, dependency exerts a downward impact on saving rate.

Overall Conclusions

The final model explaining the dynamics of inter-relationship between saving and macro economic variables includes eight macro economic variables. Out of these eight variables, five variables [fiscal deficit rate, tax revenue, export rate, change in national income and change in dependency ratio] share a positive relationship with the saving rate whereas three variables [wholesale price index, terms-of-trade and foreign capital inflow rate] share a negative relationship with saving rate. The rate of interest does not share a long-run relationship with the saving rate in India.

The constant elasticity of saving rate has been high in case of wholesale price index and export rate, low in case of tax revenue and terms of trade, and inelastic in case of fiscal deficit rate, foreign capital inflow rate and change in national income.

In the context of the present economic environment with rising inflation, improving terms-of-trade and increasing foreign capital inflow are saving retarding whereas widening fiscal deficit, increasing tax collections, rising export rate, high economic growth phase of the Indian economy and increasing proportion of working population are saving enhancing.

The empirical analysis in this chapter is macro in nature with the principle objective of finding out the inter-relationship of saving and macro economic variables from the macro economic perspective. The present study on Indian savings would be incomplete unless it further examines the instrument wise determinants of household savings, which is the largest contributor to the national pool of savings. This empirical issue has been discussed in the next chapter on the determinants of household savings.

Chapter 5: Determinants of Household Savings

Household saving is the most crucial component of the national pool of savings. The country's progress is largely dependent upon the household sector as its source of finance. This chapter makes an attempt to identify the determinants of household saving and its components by building various econometric models so as to study their impact on the household saving instruments.

In order to identify the determinants of household savings, the study undertakes an extensive review of literature on the determinants of household saving and the different saving instruments. A large number of studies on macro econometric modelling in India have also been reviewed for identifying some of the important determinants of household saving components in the country.

The determinants of household saving and its components have been identified as given in the following functions.

$$HHS = f\left(Y, INT, PCNB_{-1}, \Pi^{e}_{-1}, HHS_{-1}\right)$$

$$FA = f\left(Y, INT, PCNB_{-1}, \Pi^{e}_{-1}, FA_{-1}\right)$$

$$CUR = f\left(Y, INT, PCNB_{-1}, \Pi^{e}_{-1}, CUR_{-1}\right)$$

$$DD = f\left(Y, INT, PCNB_{-1}, \Pi^{e}_{-1}, DD_{-1}\right)$$

$$TD = f\left(Y, INT, PCNB_{-1}, \Pi^{e}_{-1}, TD_{-1}\right)$$

$$LF = f\left(PDI, \Pi^{e}_{-1}, LF_{-1}\right)$$

$$HH_{sh} = f\left(PCIND_{-1}, INT, \Pi^{e}_{-1}, HH_{sh-1}\right)$$

Where,

HHS = Household Saving

FA = Household Saving in Financial Assets

CUR = Currency

DD = Demand Deposits

TD = Time Deposits

LF	=	Life Funds
HH_{sh}	=	Household Investment in Shares and Debentures
Y	=	Income [income has been alternatively defined as national income, percentage share of non-agricultural income in national income, personal disposable income]
INT	=	1 to 3 years time deposit rate of interest
PCNB	=	Rate of Change in Number of Commercial Bank Branches
Π^e	=	Expected Rate of Inflation
PCIND	=	Rate of Change in Index of Industrial Securities [Ordinary Share Prices]

The subscript '$_{-1}$' denotes a Lag of one year.

The cointegration technique was employed for identifying the determinants of household saving and its components and to test the long-run relationship between them following the same steps as in the earlier analysis.

The following best fit estimated saving functions were used for the final analysis:

1. Household Saving

$$\log HHS = -0.557 + 0.494 \log Y - 0.108 \log INT - 0.038 \log PCNB_{-1}$$
[1.20] [2.05] [1.46] [1.26]

$$+ 0.034 \log \Pi^e_{-1} + 0.542 \log HHS_{-1}$$
[0.15] [3.53]

R Square: 0.998 Durbin's h: 0.112*

Adjusted R Square: 0.998 F-statistic: 2638.144

S.E. of regression: 0.031

2. Household Saving in Financial Assets

$$\log FA = -1.031 + 0.847 \log YNAY - 0.099 \log INT - 0.046 \log PCNB_{-1}$$
[0.83] [1.03] [1.08] [1.07]

$$+ 0.685 \log \Pi^e_{-1} + 0.581 \log FA_{-1}$$
[2.61] [4.62]

R Square: 0.997 Durbin's h: -2.603$^{\$}$

Adjusted R Square: 0.996 F-statistic: 1530.643

S.E. of regression: 0.042

3. Currency

$$\log CUR = -0.653 + 0.479 \log YNAY + 0.001 \log INT - 0.024 \log PCNB_{-1}$$
[1.26] [1.45] [0.03] [1.32]

$$- 0.041 \log \Pi^{e}_{-1} + 0.975 \log CUR_{-1}$$
[0.34] [16.64]

R Square: 0.999 Durbin's h: 0.729*

Adjusted R Square: 0.999 F-statistic: 6311.901

S.E. of regression: 0.017

4. Demand Deposits

$$\log DD = -0.077 + 0.227 \log YNAY - 0.039 \log INT - 0.053 \log PCNB_{-1}$$
[0.05] [0.23] [0.31] [0.99]

$$+ 0.242 \log \Pi^{e}_{-1} + 0.807 \log DD_{-1}$$
[0.74] [5.52]

R Square: 0.993 Durbin's h: -1.667*

Adjusted R Square: 0.992 F-statistic: 757.608

S.E. of regression: 0.051

5. Time Deposits

$$\log TD = -0.293 + 0.302 \log YNAY - 0.074 \log INT + 0.004 \log PCNB_{-1}$$
[0.36] [0.57] [1.36] [0.17]

$$+ 0.202 \log \Pi^{e}_{-1} + 0.89 \log TD_{-1}$$
[1.41] [13.85]

R Square: 0.999 Durbin's h: 0.391*

Adjusted R Square: 0.999 F-statistic: 5445.871

S.E. of regression: 0.025

6. Life Funds

$$\log LF = -1.508 + 0.594 \log PDI - 0.251 \log \Pi^{e}_{-1} + 0.666 \log LF_{-1}$$
[2.07] [2.03] [1.10] [4.67]

R Square: 0.999 Durbin's h: -0.861*

Adjusted R Square: 0.998 F-statistic: 6548.047

S.E. of regression: 0.029

7. Household Investment in Shares and Debentures

$$\log HH_{sh} = \underset{[1.42]}{-0.909} + \underset{[4.36]}{0.602\ PCIND_{-1}} - \underset{[0.40]}{0.393 \log INT} + \underset{[2.26]}{1.048 \log IT^{e}_{-1}} + \underset{[4.29]}{0.678 \log HH_{sh-1}}$$

R Square: 0.971 Durbin's h: -1.303*

Adjusted R Square: 0.965 F-statistic: 159.039

S.E. of regression: 0.153

Note:

*signifies that there is no problem of either positive or negative first-order autocorrelation in residual.

$ indicates the problem of negative first-order autocorrelation in residual.

As most of the determinants are common for the household saving variables, the study summarises the empirical findings with respect to each one of the determinants, and their respective influence on saving variables as follows:

i. Income

Income has been defined in three alternative ways - National Income [Y], Non-agricultural Income [YNAY] and Personal Disposable Income [PDI]. The equations confirming to a priori signs of an income variable have been selected for the analysis.

- National income [Y] has turned out to be statistically the most significant income determinant among the three alternative specifications [Y, YNAY, PDI] for aggregate household savings [HHS]. Non-agricultural income [YNAY] has been included for functions of household saving in financial assets [FA], currency [CUR], demand deposits [DD] and time deposits [TD]. Personal disposable income [PDI] has been the income determinant identified for life funds [LF].

- In consistency with the literature reviewed, our results confirm a positive relationship between income specifications and the saving instruments. The income elasticity of saving ranges from 0.23 to 0.85 for different saving

components with the highest elasticity for household savings in financial assets.

- Non-agricultural income is found to have a substantial influence on majority of the saving variables. This could be the possible outcome of the structural shift taking place in the macro economy from agriculture to non-agricultural income.

ii. Rate of Interest

The post-nationalisation period witnessed a complete transformation in the financial infrastructure of the economy. There was a phenomenal growth in the banking industry in India with a shift from commercial to social banking and from class to mass banking. The financial deepening taking place in the economy led to spread of bank branches into semi-urban and rural areas, setting up of Regional Rural Banks, expansion in the number of bank branch offices, rise in the size of population per branch, increase in the deposits with commercial banks and availability of a variety of financial instruments to save in.

In view of the financial expansion in the Indian economy, rate of interest and number of commercial bank branches in the country are important determinants influencing savings. A large number of studies have examined the influence of different measures of interest rate on saving variables. The hypothesised sign of relationship between rate of interest and saving variables is usually positive, except for currency.

In the functions estimated for the saving instruments, the rate of interest has largely been found to share a negative relationship with the saving instruments, against the a priori signs. Moreover, the rate of interest turns out to be a very poor determinant of saving instruments. It has almost a negligible effect on saving variables with an elasticity ranging from 0.00 to 0.04. Surprisingly, rate of interest has a comparatively moderate negative influence on household saving in shares and debentures with an elasticity estimate of 0.39. It also confirms to the a priori expected sign.

iii. Rate of Change in Number of Commercial Bank Branches

As stated earlier, the number of commercial bank branches has grown over the post-bank nationalisation period imbibing banking habits in the people and mobilising the savings in the country. There was only one study [Bose, 1994] found which has examined the influence of the number of commercial bank branches on saving instruments with a significant influence on time deposits.

The rate of change in number of commercial bank branches has been hypothesised to have a largely positive impact on the saving variables. In our results, the rate of change in number of commercial bank branches has in fact turned out to be the weakest determinant of saving instruments. It shares a negative relationship with majority of the saving variables except for time deposits. The rate of change in number of commercial bank branches fail to influence any of the saving instruments with almost a zero elasticity ranging from 0.00 to 0.05.

iv. Expected Rate of Inflation

In consistency with the literature reviewed, the study has also tried to find out the impact of inflationary expectations on saving variables. In order to analyse the impact of inflationary expectations, the inflation variable has been included in the saving functions along with the lag of the respective saving variable.

The nature of relationship between the expected rate of inflation and saving instruments is varied. Inflationary expectations have a negative influence on currency and life funds which confirms to their a priori signs. Inflationary expectations have a positive influence on other saving variables. The inflation elasticity of saving variables ranges from inelastic to very elastic, between 0.03 to the highest 1.05.

Inflationary expectations have an insignificant influence on most of the saving instruments except for a moderate impact on savings in financial assets and a strong positive impact on shares and debentures. The elasticity of household investment in shares and debentures to expected rate of inflation is over unity.

v. Rate of Change in Index of Industrial Securities

Index numbers of industrial securities refers to the annual average of ordinary share price indices in the country. There was only one study [Bose, 1994] found which has estimated functions for household investment in shares and debentures. Bose [1994] examined the impact of index of industrial securities on household investment in shares and debentures.

In consistency with the results of Bose [1994], we found the rate of change in index of industrial securities to have a positive and significant impact on household saving in shares and debentures.

vi. Lag of Saving Variable

The empirical literature on saving variables have often included the lag of saving variable [lag of dependent variable] as an explanatory variable in the saving functions. This is done to capture the effect of past values of explanatory variables on the dependent variable.

In our model, the lag of saving variables has turned out to be the most important determinant of current savings. Lag of saving shares a significant positive relationship with each one of the saving instruments with an elasticity value ranging from 0.54 to as high as 0.98. The past savings in currency is particularly influential in raising current savings in currency with an elasticity estimate of almost unitary. The lag of saving has a similar impact on majority of the saving instruments.

Overall Conclusions

The most important determinant of saving instruments is the lag of saving. Saving instruments are very sensitive to the past savings. Saving is a continuous process over time and it is the past patterns or behaviour in savings which seem to be influencing the current saving behaviour. A significant positive influence of past savings on current savings indicates the strong set preferences in the Indian household sector.

The second important determinant of saving instruments is income. Although the income elasticity of saving is only moderate, income is a significant variable explaining savings. Among the three measures of income identified in the study [national income, non-agricultural income and personal disposable income], non-agricultural income better explains the influence on household saving instruments. In view of the structural shift taking place in the Indian economy from agriculture to non-agricultural sectors, this finding suggests further enhancing of household savings.

Another important determinant of saving instrument is expected rate of inflation, with mixed results. The saving instruments - aggregate household saving and currency are absolutely inelastic to expected rate of inflation; demand deposits, time deposits and life funds show very little response to the expected rate of inflation; household saving in financial assets shares a moderately elastic relationship with inflationary expectations and household saving in shares and debentures shares a highly elastic relationship with expected inflation rate. The results indicate that to a certain extent, Indian households do consider expectations on future prices while making saving decisions. Current household savings are also based on expectation of future inflation. Although majority of the saving instruments respond only moderately or weakly to inflationary expectations, the household saving in shares and debentures increases substantially in response to an increase in inflationary expectations in order to earn higher income for the future rise in prices.

The other two determinants, rate of interest and rate of change in number of commercial bank branches are found to be weak determinants of saving instruments. Majority of the saving variables are inelastic to the rate of interest. The finding of a negligible interest rate elasticity of saving in India confirms to the findings in the literature on macro variable interactions of saving. Shares and debentures have turned out to be the only saving instrument witnessing a moderate impact of interest rate. As shares and debentures are a substitute to other saving assets, household preferences change in response to changing interest rates. With rise in interest rates, households start saving in other instruments that yield profits along with a certain degree of safety.

The rate of change in number of commercial bank branches has turned out to be an absolute insignificant determinant of saving instruments. The results indicate that it is not the banking structure in the economy which influences household savings. The nature and magnitude of household savings in India are neither influenced by the rate of return on saving instruments nor by the financial infrastructure. It is mainly the past years saving behaviour and the current income of households which influence household savings.