

SAVINGS BEHAVIOUR IN THE INDIAN ECONOMY

UPENDER, M.*

REDDY, N.L.

Abstract

An attempt has been made in the present study to examine the savings behaviour in the Indian Economy in terms of shift in the growth rates of domestic savings, and in magnitude of income elasticity of the domestic savings at the aggregate and disaggregate levels during post economic reform period. The results show that there is no shift in the growth rate of the domestic savings both at aggregate and disaggregate levels during post economic reform period. However there has been acceleration in the growth rates of domestic savings of household and private sectors and deceleration in public sector during 1950--2002. The estimate of constant income elasticity of household savings is found to be more than unity implying that the marginal propensity to save is higher than the average propensity to save, all else equal. Further the constant income elasticity of household savings is moderately higher than that of the income elasticities of domestic savings estimated for private and public sectors during pre economic reform period. The results point out that there is no shift in the magnitude of income elasticity of savings of household, private and public sectors during post economic reform period showing the homogeneity in the size of the income elasticity of domestic savings. Thus the economic reforms that have been initiated in 1992 could not bump up the growth rate of savings and magnitude of the income elasticity of domestic savings both at aggregate and disaggregate levels in the Indian Economy during post economic reform period.

JEL code: O53

Keywords: Savings, India

* Dr M Upender, Professor of Economics, Department of Economics, Osmania University, Hyderabad-500 007, Andhra Pradesh, India, mupender10@rediffmail.com, and Dr N Laxma Reddy, Branch Manager, Bank of Maharashtra [Government of India] Hyderabad-500 072, Andhra Pradesh, India.

Note: This article is based on the thesis entitled "Savings Behaviour in the Indian Economy" submitted by Dr N Laxma Reddy to Osmania University, for the award of PhD degree [Awarded in 2007] under the guidance of Prof M Upender.

1. Introduction

It is well-known fact that the rate of savings has been an important economic variable for economic development of, particularly, the countries like India. The extent of domestic savings is only ultimate source for capital formation, which is indispensable for rapid economic development in India. The excess of income over consumption expenditure is referred to as savings. The Policy of the government of India has been to promote savings and capital formation. Increased savings can be used for financing required investment. It is also known fact that an increase in the rate of investment is essential for rapid development. Increase in investment is possible only by increase in savings rate. Therefore the extent of domestic savings is an imperative factor for attaining high rate of investment. The gross savings in the economy can be increased by increasing the national income. Therefore propensity to save depends, inter alia, on the national income. Thus the aggregate savings, inter alia, is a function of national income. The generation of the theoretical savings function depends on the aggregate consumption function as the sum of the aggregate savings [GDS] and consumption expenditure [GC] is the aggregate income [GDP].

$$GDP=C+GDS$$

$$GDS=GDP- GC$$

The general equation for the linear consumption function is

$$GC=c_0+c_1GDP$$

Where c_0 is autonomous consumption expenditure and c_1 , $dGC/dGDP$, is the marginal propensity to consume.

The general equation for the linear savings function is

$$GDS=s_0+s_1YGDP$$

Where s_0 is the amount of the savings at the theoretical zero level of Income and s_1 , $dGDS/dGDP$ is the marginal propensity to save.

Substituting equation $[GC=c_0+c_1GDP]$ in equation $[GDS=GDP-GC]$, we have the following

$$GDS=GDP- (c_0+c_1GDP)$$

$$GDS= - c_0 - c_1GDP +GDP)$$

$$GDS=- c_0 + (1- c_1) GDP \quad \text{where } 1- c_1= s_1$$

Thus the domestic savings would, inter alia, depend on income. In view of the importance of the domestic savings, the empirical on the behaviour of the savings have been carried out in India using the macro time series data. In India domestic savings originate from three principal sectors namely: (i) household sector, (ii) private corporate sector and (iii) Public sector. The present study on the savings behaviour in the Indian Economy will be an extension to the empirical literature in terms of [1] using the macro time series data available till date [53 years] [2] searching the structural change in the savings function during the post economic reforms period and [3] estimating the speed of adjustment between the actual change in the domestic savings and desired change in the domestic savings in India. More specifically the present study has been carried out with the following objectives

1. To find out the presence of acceleration/deceleration in the growth rates of the gross domestic savings
2. To estimate the degree of income elasticity of gross domestic savings and
3. To examine the extent speed of adjustment between the actual change and desired change in gross domestic savings

The above objectives have been examined in the luminosity of the economic reforms that have been initiated in 1992 at the aggregate and disaggregate levels.

Hypotheses of the Empirical Study. Keeping the objectives of the present Study in view, the empirical strength of the following hypotheses have also been examined

1. There has been acceleration in the growth rate growth rate of savings of the household sector
2. The marginal propensity to save of the household sector is relatively higher than that of the private and public sectors
3. The income elasticity of domestic savings of the household sector is relatively higher than that of the private and government sectors
4. The speed of adjustment between actual change and desired change in domestic savings of household sector is not quick

The generation of empirical knowledge out of the present exercise on the estimates of constant/variable growth rates of domestic savings and responsiveness of domestic savings to the changes in income at the aggregate and disaggregate levels will be handy in understanding the impact of the economic reforms on the behaviour of the domestic savings in India .

2. A Concise Review of Earlier studies on Savings Behaviour in India

There have been a plethora of empirical studies on the savings behaviour in India based on both cross-sectional and time series data. Some of the time series empirical studies related to the behaviour of savings in the Indian Economy have been examined to view the present study in a wider perspective . Of them the most important study that was carried out by Krishnamurthy and Saibaba¹ The important contribution of this study was that the rate of savings in India was rising during 1952-53 to 1978-79 with year to year fluctuations. In an other study, Majumdar² et al examined the behaviour of savings in the Indian Economy. They observed that the net income and the share of non-agricultural income in the total income were the important factors in explaining the variations in savings. Joshi³ analyzed the savings behaviour in India over a period of thirteen years. He observed that savings out of incremental income plays the key role in raising the rate of savings. Shetty⁴ Reviewed the trends in domestic saving rates in India. He observed the changes in consumption patterns seem an obvious explanation for the absence of any buoyancy in household savings. In an other study Krishnamurthy

¹ K Krishnamurthy and P Saibaba, Savings Behaviour in India, Institute of Economic Growth, Occasional Paper:New Series, No.6, Hindustan Publishing Corporation, Delhi,1982

²N A Majumdar, T R Venkatachalam and M V Raghavachary, "The high Saving Phase of the Indian Economy:1976-79-An Explorative Interpretation",Occational Papers, Reserve Bank of India,1980

³ Joshi, "Saving Behaviour in India",Indian Journal of Economics, Vol.50, April-June 1970,

⁴ S L Shetty ,,"Savings Behaviour in India – Some Lessons",Economic and Political Weekly, Vol.XXV,No.11,March 17, 1990

et al⁵ examined the trends in savings and its composition in India. In an empirical exercise, Upender⁶ estimated the elasticity of gross domestic savings with respect to gross domestic product during 1950-90 using the linear regression model. The numerical value of the elasticity was turned out to be unity. This study did not attempt to see the presence of acceleration and deceleration in the growth rate of the domestic savings and speed of adjustment. Thus the time series studies examined the savings behaviour till 1990 only in the Indian Economy. They have not attempted to examine the speed of adjustment between the actual change and desired change in the domestic savings. No study has been undertaken to scan the structural change in the savings function after the economic reforms initiated in India using the most recent data. Therefore there is a need to generate empirical information on these aspects for the Indian Economy. The present Study has been an endeavor in this direction.

3. Empirical Methodology

3.1 Data Base. In order to examine the above objectives and test the empirical validity of the hypotheses of the present study, the required time series data on domestic savings by household, private and public sectors, domestic income and Gross Domestic Product at market prices have been collected from various issues of the Economic Survey published by the ministry of finance [Economic Wing] National Accounts Statistics published by Central Statistical Organization, Ministry of planning and the Basic statistics relating to the Indian Economy by Reserve Bank of India for the period from 1950-51 to 2002-03.

3.2. Empirical Techniques.

3.2.1. Growth rates of domestic savings. The shift in the growth rates of the domestic savings during post economic reform period has

⁵ K Krishnamurthy, KS Krishna Swamy and P D Sharma, "Saving Behaviour in India – An Overview" in Development Process of Indian Economy edited by P R Brahmananda and V R Panchamukhi, Himalaya Publishing House, Delhi, 1982

⁶ M Upender, "Estimation of Propensities to save in the Indian Economy using the time series data 1950-51- 1989-90", Finance India, Vol.VII, No.2, June 1994, pp.365-370

been scanned by fitting the following form of the specification with dummy and interaction variables to the time series data.

$$\log GDS = \log \beta_0 + \beta_1 \text{ dummy} + \beta_2 \text{ time} + \beta_3 (\text{dummy} * \text{time}) \quad [\text{I}]$$

Where GDS = Gross Domestic Savings of the Household sector / Private sector / Government sector [Rs.crore], Time = Time in [53] years [1950-51 to 2002-2003], Dummy [proxy for policy variable] = 0 for the years from 1950-51 to 1991-92 [pre economic reform period] and 1 for the years from 1992-93 to 2002-03 [post economic reform period]

If β_1 is positively significant then there will be an upward shift in the average domestic savings during post economic reform period. If β_1 is negatively significant then there will be a downward shift in the average domestic savings during post economic reform period. If β_1 is negatively/positively insignificant then there will be no shift in the average domestic savings during post economic reform period

Annual growth rate of domestic savings during pre economic reform period = $d \log GDP / d\text{Time} = \beta_2$

The differential growth rate of domestic savings during post economic reform period = $\beta_3 < 0$ [downward shift] or > 0 [upward shift] subject to test of significance.

Growth rate of the domestic savings during post economic reform period = $\beta_1 + \beta_2$

If β_1 and β_3 in [I] are not significant, the following regression model will be fitted to know the variable growth in terms of acceleration / deceleration during the period under consideration

$$\log GDS = \log \beta_0 + \beta_1 \text{ time} \pm \beta_2 \text{ time}^2 \quad [\text{II}]$$

Annual growth rate of domestic savings = $d \log Y / d \text{time} = \beta_1 \pm 2\beta_2 * \text{time}$. If β_2 is significantly positive/negative then there will be acceleration/deceleration in the growth rate of domestic savings. If β_2 is not significant then there will be constant growth rate in the domestic savings

3.2.2: Income elasticity of Domestic Savings: Shift in income elasticity of domestic savings. The impact of economic reforms on domestic savings in terms of a shift in the income elasticity of domestic savings has been examined by fitting the following form of specification with an interaction variable⁷ [D*logGDP]

$$\log \text{GDS}_t = \log \beta_0 + \beta_1 \log \text{GDPT} + \beta_2 D + \beta_3 (D * \log \text{GDPT}) + \text{error III}$$

GDS = Gross Domestic Savings of the Household [GDS1]/ Private[GDS2] / Government sector[GDS3][Rs crore]

GDPT = Gross Domestic Product at market prices [Rs crore]

β_0 = Intercept during pre economic reform period [D = 0], β_2 = Differential intercept during post economic reform period [D = 1], β_1 = Magnitude of income elasticity of domestic savings during pre economic reform period (D = 0); $\beta > 0$, β_3 = Magnitude of differential income elasticity of domestic savings during post economic reform period (D = 1) ; ($\beta_1 \pm \beta_3$) = Magnitude of income elasticity of domestic savings during post economic reform period (D = 1), β_3 = differential coefficient of income elasticity of domestic savings [β_3 more than or less than 0] that allows a shift [an upward / a downward] in the income elasticity of domestic savings during post reform period [1992 to 2002] when D =1. As the interaction variable [D*logGDPT] enters the equation in dichotomous form [i.e., D = 0 in pre economic reform period and D = 1 in post economic reform period] the derivative of logGDS_t with respect to [D*log GDPT] does not exist. Instead, the coefficient of [D*logGDPT] subject to statistical significance, measures the discontinuous effect of the presence the attribute [D = 1] represented by an interaction variable on the domestic savings .The variable [D*log GDPT], which is called an interaction variable, has been introduced in model to capture the interaction effect of economic reforms and income on the domestic savings .The interaction

⁷ The methodology followed in the present study is the similar to the methodology followed by M Upender., *Estimates of Coefficients of Economic Relationships: Some Exercise for India*, Manak Publications 2002, New Delhi

variable takes a value equal to $\log \text{GDP}_t$ during post economic reform period [when $D = 1$] and 0 during pre economic reform period [when $D = 0$]; If $[\beta_1^* \pm \beta_3^*]$ more than or less than β_1^* then there will be an upward or a downward shift in the degree of income elasticity of domestic savings during post reform period; If $[\beta_1^* + \beta_3^{**}] = (1^*$, then there will be a homogeneity in the magnitude of income elasticity of domestic savings i.e., magnitude of income elasticity of domestic savings remains the same in pre and post economic reform periods implying the absence of differential income elasticity of domestic savings. Where * and ** denote statistically significant and insignificant respectively.

3.3.3:Distributed lag Domestic Savings Function: Speed of Adjustment. In order to examine the speed of adjustment between actual change in domestic savings and desired change in domestic savings a distributed lag model with the partial adjustment mechanism has also been estimated at aggregate and disaggregate levels.

$$\log \text{GDS}_t^* = \log \beta_0 + \beta_1 \log \text{GDP}_t + \text{error} \quad (\text{IV})$$

Where GDS_t^* =Desired level [long run/equilibrium level] of domestic savings in current [t] year, GDP_t = Gross domestic product at market prices [Income] in current year

The following mechanism [Marc Nerlovian's partial adjustment model] has been adopted to estimate the equation [IV] to know the speed of adjustment between actual change in domestic savings and desired change in domestic savings

$(\text{GDS}_t / \text{GDS}_{t-1}) = (\text{GDS}_t^* / \text{GDS}_{t-1})^\delta$ is transformed into log linear form

$$(\log \text{GDS}_t - \log \text{GDS}_{t-1}) = \delta (\log \text{GDS}_t^* - \log \text{GDS}_{t-1}) \quad (\text{V})$$

Actual change in domestic savings = δ [Desired change in domestic savings], δ = Actual change in domestic savings/ Desired change in domestic savings, where δ = Speed of adjustment <1

Substituting the equation [IV] in equation [V] we obtain the following

$$\begin{aligned}(\log GDS_t - \log GDS_{t-1}) &= \delta (\log \beta_0 + \beta_1 \log GDP_t - \log GDS_{t-1}) \\ \log GDS_t &= \delta (\log \beta_0 + \beta_1 \log GDP_t - \log GDS_{t-1}) + \log GDS_{t-1} \\ \log GDS_t &= (\delta \log \beta_0 + \delta \beta_1 \log GDP_t - \delta \log GDS_{t-1}) + \log GDS_{t-1} \\ \log GDS_t &= \delta \log \beta_0 + \delta \beta_1 \log GDP_t + (1 - \delta) \log GDS_{t-1} \quad (VI)\end{aligned}$$

The equation [VI] is known as the short run domestic savings function [to examine short run economic relationships]. The long run domestic savings function [IV] will be estimated by deflating the short run domestic savings function [VI] by the coefficient of adjustment $[\delta]$, ratio of Actual change in domestic savings to Desired change in domestic savings, and skip the $\log GDS_{t-1}$, as shown below

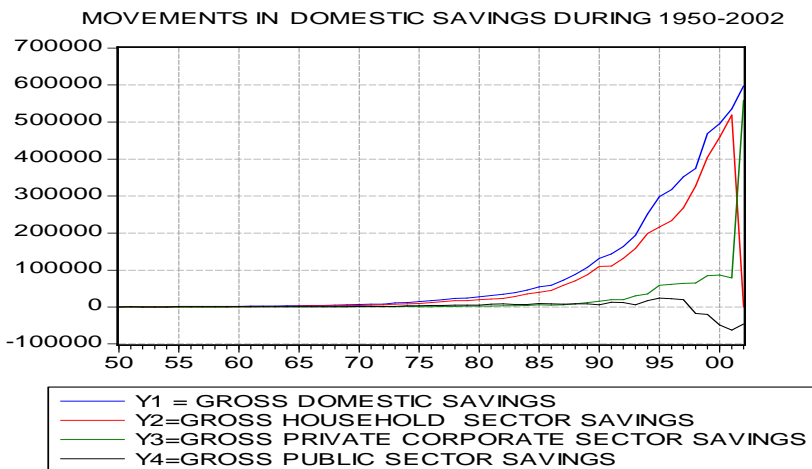
$$(\log GDS_t / \delta) = (\delta \log \beta_0 / \delta) + (\delta \beta_1 \log GDP_t) / \delta \quad (VII)$$

$$\log GDS_t^* = \log \beta_0 + \beta_1 \log GDP_t$$

Where $\log GDS_t^* = \log GDS_t / \delta$

4. Savings Behaviour in the Indian Economy :Empirical Results

4.1: A Visual Plot of the Time series Data. In order to get some insight in to the behavior of the tendency of the time series data on domestic savings at the aggregate and disaggregate levels in India the following graph is plotted for the period under consideration.



It can be perceived from the plot that there is an increasing tendency in the aggregate savings and increasing tendency with fluctuations in household, private and public sectors. In order to have a precise statistics on the growth rates, an attempt has also made fitting regression equations to the data [summary statistics are furnished in appendix]

4.2: Growth Rate Of The Domestic Savings at The Aggregate Level. With a view to scan the presence/absence of an upward or downward shift in the growth rate of the domestic savings at the aggregate and disaggregate levels during post economic reform period the regression model with dummy and interaction variables has been fitted to the macro time serried data. The results are furnished in the following tables. The estimate of the regression coefficient of the interaction variable is not significant showing that the absence of shift in the growth rate of the gross domestic savings during post economic reform period. The absence of shift in the growth rate shows that the results presented in table - 1 are valid for the entire period 1950-2002. Therefore the regression model with time and square of time has been attempted to see the presence of acceleration / deceleration, known as variable growth, in the growth rate of the gross domestic savings. The results of the same are set out in table -2. The estimates of the regression coefficients of time and that of its square are positively significant implying the presence of acceleration in the growth rate of the gross domestic savings during the period under consideration.

Table 1. Search For Shift In The Growth Rate Of Gross Domestic Savings

Dependent Variable: Gross Domestic Savings= Log(Gds1)			
Method: Least Squares Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	6.383195	0.042896	148.8047
Time*	0.128535	0.001801	71.35991
Dummy	0.516732	0.636936	0.811278
Dummy*time	-0.004252	0.013610	-0.312416
R-squared	0.995649	Durbin-Watson statistic 0.522005	
Adjusted R-sq.	0.995383		

Notes:* Significant at one percent level

Table 2. Acceleration/Deceleration In The Growth Rate Of Gross Domestic Savings

Dependent Variable: Gross Domestic Savings= Log(Gds1)			
Method: Least Squares Sample : 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	6.560347	0.043679	150.1962
Time*	0.103357	0.003884	26.60788
Time ² *	0.000597	7.22E-05	8.263268
R-squared	0.997316	Durbin-Watson statistic 0.632431	
Adjusted R-sq.	0.997208		

Notes:* Significant at one percent level

4.3: Growth Rate Of The Domestic Savings At The Disaggregate Level.

The regression results furnished in table – 3 show that the coefficients of dummy and interaction variable are not significant showing the absence of the shift in the growth rate of the gross domestic savings by the household sector during post economic reform period. The absence of shift during post economic reform period shows that the empirical estimates presented in table- 3 are applicable for the entire period 1950-2002. In view of this the regression model with time and square of time has been estimated to observe the presence of acceleration / deceleration in the growth rate of the gross domestic savings by household sector [table – 4] .

Table 3. Search For Shift In The Growth Rate Of Gross Domestic Household Sector Savings

Dependent Variable: Gross Domestic Household Sector Savings= Log(Gds2)			
Method: Least Squares Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	5.974600	0.052429	113.9558
Time*	0.131677	0.002201	59.81268
Dummy	-0.291701	0.778478	-0.374707
Dummy*time	0.014604	0.016635	0.877904
R-squared	0.993953	Durbin-Watson statistic 0.449136	
Adjusted R-sq.	0.993582		

Notes:* Significant at one percent level

The estimates of the regression coefficients of time and that of its square are positively significant implying that there has been an acceleration in the growth rate of the gross domestic savings by the household sector during the period under consideration. The regression results furnished in table – 5 illustrate that the coefficients of dummy and interaction variable are also not significant in case of private corporate sector illustrating the absence of the shift in the growth rate of the gross domestic savings by the private corporate sector during post economic reform period. The absence of shift in case of private corporate sector during post economic reform period shows that the empirical estimates presented in table- 5 are pertinent for the entire period under consideration.

Table 4 Acceleration/Deceleration In The Growth Rate Of Gross Domestic Household Sector Savings

Dependent Variable: Gross Domestic Household Sector Savings= Log(Gds2)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	6.213857	0.046403	133.9111
Time*	0.097764	0.004127	23.69060
Time ² *	0.000796	7.68E-05	10.37162
R-squared	0.995649	Durbin-Watson statistic 0.522005	
Adjusted R-squared	0.995383		

Notes:* Significant at one percent level

Table 5 Search For Shift In The Growth Rate Of Gross Domestic Private Corporate Sector Savings

Dependent Variable: Gross Domestic Private Corporate Sector Savings= Log(Gds3)			
Method: Least Squares Sample: 1950 2002, Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	4.168093	0.074428	56.00199
Time*	0.124079	0.003125	39.70270
Dummy	0.537193	1.105117	0.486096
Dummy*time	0.008183	0.023615	0.346530
R-squared	0.988391	Durbin-Watson statistic 1.064254	
Adjusted R-sq.	0.987680		

Notes:* Significant at one percent level

For that reason the regression model with time and square of time has been fitted to the time series data to make out the presence of acceleration / deceleration in the growth rate of the gross domestic savings by private corporate sector. The results of the same are furnished in table -6

Table 6. Acceleration/Deceleration In The Growth Rate Of Gross Domestic Private Corporate Sector Savings

Dependent Variable: Gross Domestic Private Sector Savings= Log(Gds3)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	4.496744	0.090690	49.58363
Time*	0.072424	0.008065	8.979684
Time ² *	0.001325	0.000150	8.832906
R-squared	0.989743	Durbin-Watson statistic 0.808024	
Adjusted R-sq.	0.989332		

Notes:* Significant at one percent level

The estimates of the regression coefficients of time and that of its square are positively significant implying that there has been an acceleration in the growth rate of the gross domestic savings by the private corporate sector during the period under consideration

Table 7. Search For Shift In The Growth Rate Of Domestic Public Sector Savings

Dependent Variable: Gross Domestic Public Sector Savings= Log(Gds4)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	4.930187	0.092671	53.20096
Time*	0.115123	0.003891	29.58505
Dummy	-4.638735	3.255258	-1.424998
Dummy*time	0.094657	0.073172	1.293625
R-squared	0.964351	Durbin-Watson statistic 1.008623	
Adjusted R-sq.	0.961921		

Notes:* Significant at one percent level

The regression results relating to the growth rate of the savings by the public sector furnished in table – 7 demonstrate that the coefficients of dummy and the interaction variable are also not

significant in case of public sector showing the absence of the shift during post economic reform period. In view of the absence of shift the regression model with time and square of time has also been attempted to see the presence of acceleration / deceleration in the growth rate of the gross domestic savings by public sector .The regression results of the same are furnished in table -8

Table 8. Acceleration/Deceleration In The Growth Rate Of Gross Domestic Public Sector Savings

Dependent Variable: Gross Domestic Public Sector Savings= Log(Gds4)			
Method: Least Squares.Sample: 1950 2002.Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	4.742408	0.126216	37.57370
Time*	0.144338	0.012420	11.62096
Yime ² *	-0.000742	0.000256	-2.903182
R-squared	0.964006	Durbin-Watson statistic 0.945342	
Adjusted R-sq.	0.962406		

Notes: * Significant at one percent level

The regression results furnished in the above table show the regression coefficient of square of time is negatively significant implying that there has been deceleration in the growth rate of domestic savings by public sector during the period under consideration.

4.4: responsiveness of the domestic savings to the changes in domestic income. With a view to examine the degree of responsiveness of the domestic savings to the changes in income the domestic savings function with log linear specification has been estimated at the aggregate level and disaggregate levels. The results have been furnished in the following tables.

The numerical values of the regression results presented in table-9 illustrate that the estimate of constant income elasticity of savings at the aggregate level is more than unity and significant during pre economic reform period revealing that, on the average, a one percent increase in domestic product will lead to increase the domestic savings by 1.22 percent, all else equal. The regression coefficient of interaction variable, which is differential income elasticity of gross

domestic savings, is significantly negative showing that the income elasticity of gross savings is approximately unity during post economic reform period. The estimate of the income elasticity of gross domestic savings, which is just above the unity during pre economic reform period, has come down by 0.18 points during post economic reform period. The size and sign of the differential coefficient of income elasticity of gross savings show the absence of an upward shift in the degree of income elasticity of gross domestic savings during post economic reform period.

Table 9. Gross Domestic Savings Function - Income Elasticity Of Savings

Dependent Variable: Gross Domestic Savings= Log(Gds1)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	-4.284424	0.138841	-30.85850
log(GDP)*	1.215723	0.012602	96.46912
Dummy	2.391573	1.176332	2.033077
Dummy*log(GDP)**	-0.184689	0.083228	-2.219082
R-squared	0.997610	Durbin-Watson statistic 0.782627	
Adjusted R-squared	0.997463		

Notes: * Significant at one percent level & ** Significant at 5 percent level

Table 10. Gross Domestic Household Sector Savings Function - Income Elasticity Of Savings

Dependent Variable: Gross Domestic Household Sector Savings= Log(Gds2)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	-4.979960	0.152045	-32.75313
log(GDP)*	1.247834	0.013801	90.41804
Dummy	0.556306	1.288205	0.431846
Dummy* log (GDP)	-0.051395	0.091143	-0.563896
R-squared	0.997333	Durbin-Watson statistic 1.074421	
Adjusted R-sq.	0.997169		

Notes: * Significant at one percent level

The numerical values of the regression results presented in table- 10 illustrate that the estimate of constant income elasticity of

household sector savings is more than unity and significant during pre economic reform period illuminating that a one percent increase in income augments, on the average, the gross domestic savings by household sector by 1.25 percent, all else equal. The regression coefficient of interaction variable, which is differential income elasticity of gross domestic savings, is negatively insignificant showing that the income elasticity of gross domestic savings by household sector is stable both in pre and post economic reforms period. Thus the estimates of income elasticity of gross domestic savings are akin both in pre and post economic reform periods

Table 11. Gross Domestic Private Corporate Sector Savings Function -
Income Elasticity Of Savings

Dependent Variable: Gross Domestic Savings= Log(Gds2)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	-6.157206	0.266644	-23.09146
log (GDP)*	1.176091	0.024203	48.59370
Dummy	0.960648	2.259146	0.425226
Dummy* log (GDP)	-0.040495	0.159839	-0.253351
R-squared	0.992185	Durbin-Watson statistic 1.118271	
Adjusted R-sq.	0.991707		

Notes:* Significant at one percent level

The estimates of the regression results presented in table- 11 illustrate that the regression coefficients on dummy and interaction variable are not significant showing the absence of any shift in the private corporate sector savings function during post economic reform period. The regression coefficient of income, estimate of constant income elasticity of private corporate sector savings, is more than unity and significant during pre economic reform period illuminating that a one percent increase in income augments, on the average, the gross domestic savings by private sector by 1.18 percent, all else equal. The regression coefficient of interaction variable is negatively insignificant showing that the income elasticity of gross domestic savings by private sector is stable both in pre and post economic reforms period.

The estimates of the regression results pertaining to public sector savings function presented in table- 12 illustrate that the regression coefficients on dummy and interaction variable also not significant showing the absence of any shift in the public sector savings function during post economic reform period. The regression coefficient of income, is unity and significant during pre economic reform period illuminating that a one percent increase in income augments, on the average, the gross domestic savings by household sector by 1.07 percent, all else equal. The regression coefficient of interaction variable is insignificant

Table 12. Gross Domestic Public Sector Savings Function -Income Elasticity of Savings

Dependent Variable: Gross Domestic Public Sector Savings= Log(Gds4) Method: Least Squares. Sample: 1950 2002. Included Observations: 53			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	-4.461101	0.486797	-9.164192
log (GDP)*	1.073952	0.044185	24.30571
Dummy	-6.669153	8.370938	-0.796703
Dummy* log (GDP)	0.419883	0.602945	0.696386
R-squared	0.948412	Durbin-Watson statistic 0.735745	
Adjusted R-sq.	0.944894		

Notes:* Significant at one percent level

4.5: Distributed lag domestic savings function : speed of adjustment. With a view to examine the extent of speed of adjustment between the actual change and desired change in the domestic savings, a distributed lag model has also been estimated at aggregate and disaggregate levels. The estimates of the same are presented in the following tables.

The regression results of log linear distributed lag domestic savings function for the Indian Economy show that the regression coefficient of lagged domestic savings is statistically significant evincing the presence of lag in the adjustment of actual domestic savings to its desired level. The value of the coefficient of partial adjustment or speed of adjustment implies that eighteen percent of the discrepancy [disequilibrium] between actual change and desired

change in the gross domestic savings in the Indian Economy can be eliminated in a year, all else equal.

Table 13. Distributed Lag Gross Domestic Savings Function - Regression Results

Dependent Variable: Gross Domestic Savings= Log(Gds1)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 52			
Variable	Coefficient	Standard Error	t-Statistic
Constant	-0.628859	0.457933	-1.373255
log(GDP)**	0.206618	0.136732	1.511117
log(GDS1(-1))*	0.829715	0.117456	7.064024
R-squared	0.998306	δ = Speed of adjustment=0.18 Durbin-Watson statistic 1.628006	
Adjusted R-sq.	0.998237		

Notes:* Significant at one percent level &** Significant at 5 percent level

Table-14. Distributed Lag Gross Domestic Household Sector Savings Function-Regression Results

Dependent Variable: Gross Domestic Household Savings= Log(Gds2)			
Method: Least Squares. Sample: 1950 2002. Included Observations: 52			
Variable	Coefficient	Standard Error	t-Statistic
Constant*	-1.602218	0.604020	-2.652593
log(GDP)*	0.426114	0.155477	2.740694
log (GDS2(-1))*	0.655971	0.129073	5.082188
R-squared	0.997911	δ = Speed of adjustment=0.35 Durbin-Watson statistic 1.810173	
Adjusted R-sq.	0.997826		

Notes:*Significant at one percent level

The regression results of log linear distributed lag domestic savings function estimated for household sector show that the regression coefficient of lagged domestic is statistically significant revealing that there is a significant lag in the adjustment of actual domestic household sector savings to its desired [long run] level. The value of the coefficient of partial adjustment, known as speed of adjustment, is 0.38 implying that, all else equal, thirty eight percent of the discrepancy [disequilibrium] between actual change and desired change in the gross domestic savings by household sector in the Indian Economy can be eliminated in a year.

The regression results of log linear domestic savings function estimated for private household sector [Table-15] show that the regression coefficient of lagged domestic savings is statistically significant evincing that there is a significant lag in the adjustment of actual domestic private sector savings to its desired [long run] level. The value of the speed of adjustment implying that forty two percent of the discrepancy [disequilibrium] between actual change and desired change in the gross domestic savings by private corporate sector in the Indian Economy can be eliminated in a year, all else equal.

Table – 15. Distributed Lag Gross Domestic Private Sector Savings Function - Regression Results

Dependent Variable: Gross Domestic Private Sector Savings= Log(Gds3) Method: Least Squares. Sample: 1950 2002. Included Observations: 52			
Variable	Coefficient	Standard Error	t-Statistic
Constan*t	-2.837170	0.778766	-3.643163
log (GDP)*	0.520575	0.137628	3.782480
log (GDS3(-1))*	0.586922	0.111351	5.270940
R-squared	0.993327	δ = Speed of adjustment=0.42 Durbin-Watson statistic 1.854318	
Adjusted R-sq.	0.993055		

Notes:*Significant at one percent level

Table – 16. Distributed Lag Gross Domestic Public Sector Savings Function -Regression Results

Dependent Variable: Gross Domesticpublic Sector Savings= Log(Gds4) Method: Least Squares. Sample: 1950 2002. Included Observations: 52			
Variable	Coefficient	Standard Error	t-Statistic
Constant	-0.648634	0.455235	-1.424832
log (GDP)**	0.219191	0.099903	2.194038
log (GDS4(-1))*	0.768970	0.100409	7.658360
R-squared	0.968192	δ = Speed of adjustment=0.24 Durbin-Watson statistic 2.044703	
Adjusted R-sq.	0.966747		

Notes:* Significant at one percent level,** Significant at five percent level

The regression results based on log linear distributed lag domestic savings function for public sector show that the regression coefficient of lagged domestic savings is statistically significant implying the presence of significant lag in the

adjustment of actual domestic public sector savings to its desired [long run] level. The empirical value of the speed of adjustment implies that twenty four percent of the discrepancy [disequilibrium] between actual change and desired change in the gross domestic savings by public sector in the Indian Economy can be eliminated in a year, all else equal

5. Conclusions

On the basis of the results the empirical validity of the hypotheses that “There has been acceleration in the growth rate growth rate of savings of the household sector”, “The marginal propensity to save of the household sector is relatively higher than that of the private and government sectors” and “The elasticity of domestic savings of the household sector with respect to the changes in income is relatively higher than that of the private and government sectors” can be accepted. However the empirical validity of the hypothesis that “The speed of adjustment between actual change and desired change in domestic savings of household sector is not quick” can not be accepted as the coefficient of speed of adjustment in case of household sector is somewhat smaller as compared to private sector.

The savings behaviour in the Indian Economy has been empirically examined in terms of presence of acceleration/deceleration in the growth rates of domestic savings, responsiveness of the domestic savings to the changes in gross domestic product and extent of discrepancy between actual change and desired change in domestic savings at the aggregate and disaggregate levels during 1950 – 2002. The empirical results show that there is no shift in the growth rate of the domestic savings both at aggregate and disaggregate levels during post economic reform period. However there has been acceleration in the growth rates of domestic savings of household and private sectors and deceleration in public sector during the period under consideration. The estimate of constant income elasticity of household savings is found to be more than unity and relatively higher than the private and public sectors. The results point out that there is no shift in the magnitude of income elasticity of savings of household, private and public sectors

during post economic reform period showing the homogeneity in the size of the income elasticity of domestic savings. The extent of discrepancy that can be eliminated in a year between actual change and desired changes in the domestic savings is ranged from eighteen percent to forty two percent at the aggregate and disaggregate levels. In the light of the results it can be understood that the economic reforms that have been initiated in 1992 could not augment the growth rate of savings and income elasticity of domestic savings both at aggregate and disaggregate levels in the Indian Economy. It should be noted that the results emerged out the present empirical exercise though useful to understand the behaviour of the domestic savings in terms of shift in growth and income elasticity of domestic savings at the aggregate and disaggregate levels during post economic reform period, they are subjected to the specification of the relationship between savings and income and data used in the study.

Bibliography

Ashok Rudra, (1976). Consumption, Saving and Capital Formation – A trend Report in A Survey of Research in Economics, Vol II, Macro Economics, ICSSR, Allied.

Brahmananica, P.R. (1995), Planning for a Wage Goods Economy, Himalaya Publishing House, Mumbai.

Chakarvarty (1990): Overall Aspects of Saving in Real Terms, Datta Roy Choudar & Bagchi, (eds.), VikasPublication, New Delhi, 95-162.

Charan D Wadhava [ed.] (1978), Some problems of India's Economic Policy, Tata McGraw-Hill, New Delhi.

Joshi, V.H. (1970). Saving Behaviour in India, Indian Economic Journal, Vol. 15, 1969-70.

Pandit, B.L. (1985). "Saving Behaviour and Choice of Indian Households" The Indian Economic Review, Vol. XX.

Appendix-1

Domestic Savings By Sector. Summary Statistics: Whole Period :1950-2002

Summary statistic	Gross Domestic Savings	Gross Domestic Household Sector Savings	Gross Domestic Private Corporate Sector Savings	Gross Domestic Public Sector Savings
Mean	95758	69796	23532	843
Median	17408	9743	1413	1379
Maximum	597697	519040	559258	24065
Minimum	861	55	64	-62704
Std. Dev.	157072	123676	78830	15146

Domestic Savings By Sector. Summary Statistics: Pre-Economic Reform Period

Summary statistic	Gross Domestic Savings	Gross Domestic Household Sector Savings	Gross Domestic Private Corporate Sector Savings	Gross Domestic Public Sector Savings
Mean	24448	18669	2509	3270
Median	7008	4926	720	1361
Maximum	143908	110736	20304	12868
Minimum	861	583	64	143
Std. Dev.	35928	28827	4279	3454

Domestic Savings By Sector. Summary Statistics: Post-Economic Reform Period

Summary statistic	Gross Domestic Savings	Gross Domestic Household Sector Savings	Gross Domestic Private Corporate Sector Savings	Gross Domestic Public Sector Savings
Mean	368034	265007	103801	-8421
Median	352178	233252	63486	5445
Maximum	597697	519040	559258	24065
Minimum	162906	55	19968	-62704
Std. Dev.	141755	152430	152626	32012