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***Comparing the Technical Efficiency of  
Indian Banks Operating Abroad and Foreign  
Banks Operating in India:  
A Stochastic Output Distance Function Approach***

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**Vivek Kumar, Vishal Maurya and  
Sujeesh Kumar S.\***

The aim of this paper is to compare the technical efficiency of Indian Banks operating abroad and foreign banks operating in India and to investigate the effect of openness of the country, ownership pattern of the banks on their technical efficiency. Furthermore, we test whether the banks operating in developed and developing countries have different level of technical efficiency. This paper is based on the information collected through annual surveys on International Trade in Banking Services conducted by the Reserve Bank of India for the period 2006-2007 to 2008-09 supplemented with the data collected from various issues of statistical tables relating to banks and bank scope database. The results reveal that Indian Banks operating abroad are more efficient than the foreign banks operating in India and banks operating in developed countries are found to be more efficient than the banks operating in developing countries. The effect of openness of the country as well as ownership pattern of the Indian banks operating outside India has no significant effect on their technical efficiency.

**JEL Classification** : G21, C13, C31.

**Keywords** : Stochastic output distance function, technical efficiency, openness, ownership

## **Introduction**

As a consequence of liberalisation and globalisation in Indian economy, trade between economies has increased tremendously. Besides, the financial institutions are getting the favorable environment to open

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branches/ subsidiaries abroad and provide the services in cost effective manner. Financial sectors play an important role in fostering the international trade in services among countries as all the international transactions are routed through the financial institutions directly or indirectly. There was a steady increase in the share of financial services in total services from 4.5 percent in 2003 to 9.0 percent in 2007. However, in 2008 and 2009, the share of financial services in total services reduced to nearly 7.5 percent reflecting the implication of global financial turmoil. Furthermore, foreign direct investment in banking in the form of branches, agencies and subsidiaries, or by the means of cross-border mergers and acquisitions, increased considerably between early 1980s and the late 1990s (Gkoutzinis, 2005).

It is important for policy makers to assess the services generated by the Indian banks operating abroad and foreign banks operating in Indian and also to assess the expansion of Indian banks branches abroad would be effective measured in terms of efficiency. The Reserve bank of India launched the survey 'International trade in banking services' to bridge the data gap to capture the services rendered by the Indian banks' branches / subsidiaries abroad and foreign bank's branches/subsidiaries operating in India. It has been observed that the foreign banks operating in India have been generating more fee income than Indian bank branches by rendering the services. It might be due to two reasons (i) Indian banks are not using the same amount of input as the foreign banks are using, (ii) Indian banks are not using their inputs efficiently, *i.e.*, Indian banks operating outside India are not as efficient as the foreign banks in India. In this paper, we attempt to compare the technical efficiency of Indian banks operating abroad with that of foreign banks operating in India. An attempt is also made to compare the performance of banks operating in developed countries with those operating in developing countries.

The remainder of the paper is organised as follows. Section II presents a brief overview of literature on bank efficiency with particular focus on Indian banking. Section III presents the methodology adopted in this study for the measurement of the efficiency levels. Section IV describes the data followed by Section V on the empirical results. Section VI summarises and concludes the study.



## **Section II**

### **A Brief Literature Review**

Recent years witnessed an explosion in research on bank performance across the globe [See Alam, 2001 and Berger and Mester, 2003 for discussions of recent literature]. Much of the literature is mainly based on comparisons of foreign banks and domestic banks operating within the same country. However, existing research on the comparative performance of foreign banks and domestic banks showed conflicting conclusions. Studies based on cross country samples found that foreign banks were more profitable than domestic banks in developed countries while it was the other way round in developing countries (Claessens *et al.*, 2000). To cite some country-specific studies, in the United States, foreign banks were found to be less efficient than domestic banks (Hasan and Hunter, 1996). In the contrary, other studies found that foreign banks were nearly as efficient as domestic banks in developed countries other than the U.S. (Vennet, 1996 and Hasan and Lozano-Vivas, 1998). For the transition economies of Central and Eastern Europe, it has been found that foreign banks are less efficient than domestically owned private banks and state-owned banks (Yildirim and Philippatos, 2007). In the case of Latin America, some studies found that foreign banks were more productive than domestic banks (Barajas *et al.* 2000) while some others reported little difference between the performance of the foreign and domestic banks (Crystal *et al.* 2001).

Among the earliest studies on the efficiency of Indian banking, Bhattacharya *et al.* (1997) found that state-owned banks (SOBs) were the best-performing ones and these banks improved their efficiency in the deregulated environment. Based on a nonparametric approach, Ram Mohan and Ray (2004) and Das *et al.* (2005) compared various efficiency measures of banks across different ownerships during the post liberalisation period. These studies broadly concluded that state-owned banks performed significantly better than private sector banks on revenue maximisation criteria, although the efficiency differential between state-owned and foreign banks was not significant. Sreeramulu *et al.* (2010) compared the efficiency of Indian banks during the period 1999-2008 using Cobb Douglas stochastic frontier model. They found substantial efficiency improvement in the Indian banking sector during 2004-08

compared with late 1990s. Also, domestic private sector banks were found to be most efficient in generating the banking output measured in terms of total business and total income. The improvements in the Indian banking sector are mainly attributed due to globalisation, deregulation and advances in information technology. Mahesh and Rajeev (2007) studied the Total Factor Productivity (TFP) of Indian commercial banks for the period 1985-2004 using Malmquist productivity index approach. They found that TFP improved significantly after liberalisation across bank groups. Recently, Sensarma (2006) found that foreign banks are less efficient than either public or private domestic banks in India.

While researchers have used a variety of approaches to measure bank performance, all the above studies were confined to banks operating within a particular country. Banks that operate in different nations often face very different prudential supervisory and regulatory conditions that may affect their performance. Similarly, measured efficiency differences could reflect differences in labor laws, usury ceilings, antitrust regulation and enforcement, or other legal conditions under which the banks function. Recently, Berger (2007), in an updated review paper, provided critical assessment of 100 studies across countries, mostly relating to the banking industry's transformation towards unprecedented consolidation and cross-border activities. If the existing literature concludes that foreign banks operating in India are less efficient than the domestic banks of India, then above-mentioned reasons might be the factors for their inefficiency. Therefore, it would be quite interesting to compare the technical efficiency of the Indian banks operating outside India with foreign banks operating in India, as then Indian banks will also face a different kind of supervisory and regulatory conditions as foreign banks operating in India are facing. The major objective of this study is, therefore, to compare technical efficiency of Indian banks operating abroad with foreign banks operating in India by controlling the factors that can affect their efficiency. The present paper uses data for period 2006-07 to 2008-09 to assess the relative performance of different groups of Indian banks, *i.e.*, public sector banks and private sector banks operating abroad and foreign banks operating in India. We also try to study the impact of trade openness of the economy on bank performance.

Traditionally, the methods to measure efficiency in production can be divided into two groups: one is linear programming model such as data envelopment analysis (DEA), and the other is stochastic frontier analysis using econometric regression. However, both of these approaches have a range of advantages and disadvantages probably influencing the results in a particular application. The principal advantage of the DEA approach is that it does not require the specification of a particular functional form for the technology, but it cannot measure the statistical noise. The principal advantage of the stochastic frontier analysis is that it considers the statistical noise and outliers, but it requires the assumed underlying technology and functional form. In addition, the non-parametric nature of the DEA approach makes it easy to handle multiple outputs and multiple inputs, but stochastic frontier analysis is limited by its assumed functional form and cannot be directly used for multi-output production analysis or multi-input cost analysis. The majority of econometric studies which attempted to model a multiple-output technology either: (a) aggregated the multiple outputs into a single index of output; or (b) modeled the technology using a dual cost function [Schmidt and Lovell (1979) or Ferrier and Lovell (1990) for details]. These approaches, however, require certain assumptions to be made. The first of these methods require that output prices be observable (and reflect revenue maximizing behavior), while the latter approach requires an assumption of cost-minimising behaviour. There are a number of instances, however, when neither of these requirements are met. In order to overcome such difficulties, this study employs the stochastic output-oriented distance function [e.g., Lovell *et al.* (1994), and Grosskopf *et al.* (1997)] which can accommodate both multiple outputs. With regard to the banking efficiency literature, studies using the distance function approach are very few as compared to those using the production or cost function approaches. For instance, Cuesta and Orea (2002) employed this procedure to Spanish savings banks, and Marsh *et al.* (2003) to the U.S. commercial banks. In contrast, the applications involving distance functions have become common in recent literature of public services industry (English *et al.* 1993; Fare *et al.* 1993; Coelli and Perelman, 1999; and Grosskopf *et al.* 1997). In the next section, we briefly describe the distance function method.

### Section III

#### Theoretical Framework

##### Distance Function method and efficiency estimation

In this study, the output distance function is used. It should be stated that a production technology should be determined before an output distance function is defined. Let a multiple-input and multiple-output production technology ( $S$ ) at time  $t$  be defined as:

$$S = \{(x^t, y^t) : x^t \text{ can produce } y^t\}, t = 1, \dots, T. \quad (1)$$

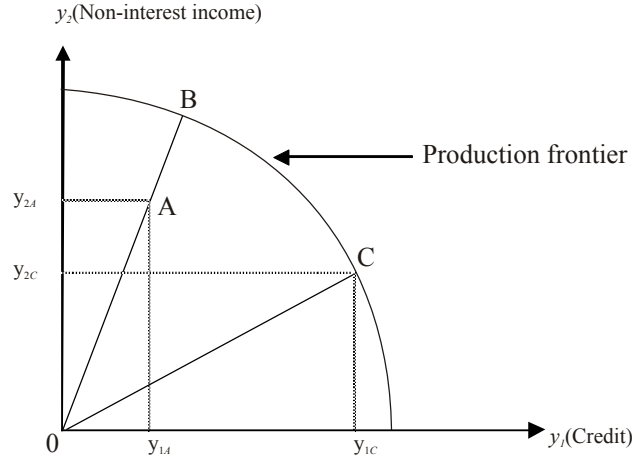
where  $x^t$  is an  $(N \times 1)$  input vector and  $y^t$  is an  $(M \times 1)$  output vector. Then the output distance function at time  $t$  is defined as:

$$D'_0(x^t, y^t) = \min\{\mu > 0 : (y^t / \mu) \in S\}, t = 1, \dots, T. \quad (2)$$

where the subscript O indicates the output distance function. It follows that  $D'_0(x^t, y^t) \leq 1$  if  $y^t \in S$ , and  $D'_0(x^t, y^t) = 1$  if  $y^t$  is located on the outer boundary of  $S^t$ . The output distance function is defined as the reciprocal of the maximum proportional expansion of the output vector,  $y^t$ , given input vector,  $x^t$ , under period  $t$  technology. The output distance function can be viewed as Farrell's output-oriented measure of technical efficiency. In other words if the output vector is on the boundary or frontier of technology, then the value of the distance function is one, *i.e.* the production is technically efficient, otherwise it is less than one, *i.e.* the production is technically inefficient. Also note that the output distance function is non-decreasing, positively linear homogeneous and convex in outputs and decreasing in inputs (Lovell *et al.*, 1994).

Figure 1 illustrates these concepts in a simple two-output setting. Let us assume that two decision-making units in frontier analysis terminology,  $A$  and  $C$ , dispose of equal input endowments to produce outputs *viz.*, credit ( $y_1$ ) and non-interest income ( $y_2$ ). Then  $C$  is efficient  $D'_0(x^t, y^t_A) \equiv \mu_C = 1$ , because it lies on the boundary of the output possibility set, whereas  $A$ , an interior point, is inefficient at a rate given by the radial distance function  $D'_0(x^t, y^t_A) \equiv \mu_A = OA/OB$  where  $D'_0(x^t, y^t) \equiv \mu \in [0, 1]$ .

**Figure 1. The Output Distance Function**



In this study, a translog functional form is used to specify the banks' output-oriented distance function. Thus, the translog distance function for the case of inputs  $(x_1, x_2, \dots, x_N)$  and outputs  $(y_1, y_2, \dots, y_M)$  is of the following form:

$$\ln D_0^t(y^t, x^t, t) = \alpha_0 + \sum_{k=1}^N \alpha_k \ln x_k^t + \sum_{j=1}^M \beta_j \ln y_j^t + \frac{1}{2} \sum_{k=1}^N \sum_{h=1}^N \alpha_{kh} \ln x_k^t \ln x_h^t + \frac{1}{2} \sum_{j=1}^M \sum_{l=1}^M \beta_{jl} \ln y_j^t \ln y_l^t + \frac{1}{2} \sum_{k=1}^N \sum_{l=1}^M \gamma_{kl} \ln x_k^t \ln y_l^t + \varphi_t + \frac{1}{2} \varphi_{tt} t^2 + \sum_{k=1}^N \alpha_{kt} t \ln x_k^t + \sum_{j=1}^M \beta_{jt} t \ln y_j^t \quad t = 1, \dots, T \quad (3)$$

where  $t$  is a time trend and is used as an index of technology.

The parameters of the translog output distance function presented in (3) can be estimated only if the restriction of homogeneity of degree +1 in outputs is imposed. This is achieved by using an arbitrary output,  $y$  as the numeraire to normalize the other outputs.

The property of homogeneity implies that the distance function can be written as:

$$D_0(wy, x, t) = w D_0(y, x, t) \text{ for any } \mu > 0 \quad (4)$$

Thus, by setting  $w = 1/y_M$ , (4) becomes:

$$D_0(y/y_M, x, t) = D_0(y, x, t) / y_M \quad (5)$$

Let the general form of a translog output distance function with homogeneity of degree +1 in outputs is represented as:

$$\ln(D_{0ij} / y_{Mij}) = \text{TL}(y_{ij} / y_{Mij}, x_{ij}, \zeta) \quad (6)$$

where subscript "ij" indicates i<sup>th</sup> bank operating in j<sup>th</sup> country and  $\zeta$  is a vector of parameters to be estimated. From Eq. (6) the following is obtained:

$$\ln(D_{0ij}) - \ln(y_{Mij}) = \text{TL}(y_{ij} / y_{Mij}, x_{ij}, \zeta) \quad (7)$$

and thus

$$-\ln(y_{Mij}) = \text{TL}(y_{ij} / y_{Mij}, x_{ij}, \zeta) - \ln(D_{0ij}) \quad (8)$$

The unobservable term  $\ln(D_{0ij})$  in (7) can be viewed as a random term referring to inefficiency. Furthermore, by appending a statistical noise term the stochastic form of (8) is obtained:

$$-\ln(y_{Mij}) = \text{TL}(y_{ij} / y_{Mij}, x_{ij}, \zeta) + v_{ijt} - u_{ijt} \quad (9)$$

where  $u_{ijt}$  is a non-negative random variable allowing for technical inefficiency and  $v_{ijt}$  is a two-sided random variable indicating random error, which is assumed to be independent of  $u_{ijt}$ . In order to specify (9) the flexible translog functional form of (3) with two outputs and two inputs and homogeneity of degree +1 in outputs imposed, is used to represent the technology of the banking industry, including a set of dummy variables to capture ownership-specific (public, private or foreign) and country-specific (Developed or Developing) factors. Thus (9) becomes:

$$\begin{aligned} -\ln y_{2ijt} = & \alpha_0 + \sum_{k=1}^2 \alpha_k \ln x_{kijt} + \beta_1 y_{1ijt}^* + \frac{1}{2} \sum_{k=1}^2 \sum_{h=1}^2 \alpha_{kh} \ln x_{kijt} \ln x_{hijt} + \beta_{11} (\ln y_{1ijt}^*)^2 + \sum_{k=1}^2 \gamma_{k1} \ln x_{kijt} \ln y_{1ijt}^* \\ & + \varphi_t + \frac{1}{2} \varphi_{tt} t^2 + \sum_{k=1}^2 \alpha_{tk} t \ln x_{kijt} + \beta_{1t} t \ln y_{1ijt}^* + \xi_{PUB} d_{PUBt} + \xi_{PRV} d_{PRVt} + \xi_{DEV} d_{DEVt} + v_{ijt} - u_{ijt} \\ & t = 1, \dots, T \quad (10) \end{aligned}$$

where  $y_{1ijt}^* = y_{1ijt} / y_{2ijt}$ ;  $y_{1ijt}$  and  $y_{2ijt}$  denote outputs of the i<sup>th</sup> bank operating in j<sup>th</sup> country at the t-th time period ( $t = 1, 2, 3$ ) and correspond to non-interest income (NI) and loans and advances (LO) respectively;  $x_{1ijt}$  and  $x_{2ijt}$  represent inputs of the i<sup>th</sup> bank operating in j<sup>th</sup>

country at the  $t^{\text{th}}$  time period and correspond to deposit (DE) and non-interest expense (NE) respectively;  $t$  is a linear time trend which is used as an index of technology;  $d_{PUBt}$  and  $d_{PRVt}$  are ownership dummies that take value one if the bank belongs to the public sector and private sector respectively at the  $t$ -th time period. The only other sector is foreign, which becomes the base for interpreting the ownership dummies.  $d_{DEVt}$  is a country specific dummy variable that takes value one if the bank is operating in developed country otherwise zero;  $v_{ijt}$  is the random error which is assumed independent and identically distributed  $N(0, \sigma_v^2)$  and depends on factors that beyond the control of the bank, *i.e.* errors due to extraneous factors;  $u_{ijt}$  is a non-negative random variable associated with technical inefficiency and measures the extent to which the observed output falls below the potential output for given levels of inputs and technology. It has usually been assumed that this component has an independent and identically half-normal distribution, even though a variety of other distributional assumptions are possible [Green, 1997]. However, in the Battese and Coelli (1995) model, is specified as a function of firm-specific factors, believed to influence technical inefficiency. More specifically, is defined by the truncation (at zero) of the distribution where the general form of the bank-specific mean, is specified as follows:

$$\mu_{ijt} = z_{ijt}\delta + \varepsilon_{ijt} \quad (11)$$

where,  $z_{ijt}$  is a vector of variables explaining technical inefficiency of banks,  $\delta$  is a vector of parameters to be estimated and  $\varepsilon_{ijt}$  accounts for statistical noise (Battese and Coelli, 1995). In this study, the technical inefficiency effects model (11) is specified as follows:

$$\mu_{ijt} = \delta_0 + \delta_{10} \ln O_{ijt} + \delta_{20} \ln n_{ijt} + \delta_t t + \delta_c c_{ijt} + \delta_{PUBt} d_{PUBt} + \delta_{PRVt} d_{PRVt} + \delta_{DEVt} d_{DEVt} + \varepsilon_{ijt} \quad (12)$$

where  $O_{ijt}$  represents the trade openness of the economy of the  $j^{\text{th}}$  country where  $i^{\text{th}}$  bank is operating and is measured as the total export plus total imports in goods and services divided by the Gross Domestic Product (GDP) at  $t^{\text{th}}$  time period;  $n_{ijt}$  indicates the number of branches for the  $i^{\text{th}}$  bank in  $j^{\text{th}}$  country;  $c_{ijt}$  is the service concentration, which is the sum of the squared ratios of the value of each output to total value of outputs of the  $i^{\text{th}}$  bank operating in  $j^{\text{th}}$  country.

The method of maximum likelihood is used for simultaneous estimation of the parameters of the stochastic frontier translog distance function (10) and the technical inefficiency effects model (12). Battese and Coelli (1993) present the likelihood function and its partial derivatives with respect to the parameters of the model. It is worth noting that the likelihood function is expressed in terms of the variance parameters  $\sigma^2 = \sigma_v^2 + \sigma_u^2$  and  $\gamma = \sigma_u^2 / (\sigma_u^2 + \sigma_v^2)$  because this transformation facilitates the estimation process (Battese and Corra, 1977). The variance parameter  $\gamma = \sigma_u^2 / (\sigma_u^2 + \sigma_v^2)$  takes values between zero and one. Values of  $\gamma$  close to zero indicate that the symmetric error  $v_{ijt}$  dominates the one-sided error  $u_{ijt}$ . This implies that the disparity between the observed output and the frontier output is primarily due to factors beyond the control of the banks. On the other hand, values of  $\gamma$  close to one indicate that the one-sided error  $u_{ijt}$  dominates the symmetric error  $v_{ijt}$  implying that the disparity between the observed output and the frontier output is mainly attributed to technical inefficiency. Predictions of technical efficiency of the  $i^{\text{th}}$  bank at the  $t^{\text{th}}$  time period are calculated according to the following equation:

$$TE_{ijt} = E[\exp(-u_{ijt}) | \varepsilon_{ijt}] \text{ where } \varepsilon_{ijt} = v_{ijt} - u_{ijt} \quad (13)$$

Eq. (13) indicates that predictions of technical efficiency are obtained utilising the conditional expectation of  $\exp(-u_{ijt})$  given the error term of the stochastic distance function,  $\varepsilon_{ijt}$  and evaluated using the estimated parameters of the distance function (Jondrow *et al.* 1982; Battese and Coelli, 1988).

## Section IV

### The Data Specification of Inputs and Outputs

In this study, the data are drawn from the annual survey on International Trade in Banking Services (ITBS) conducted by Reserve Bank of India for the period from 2006-07 to 2008-09 supplemented with the data collected from various issues of Statistical Tables Relating to Banks and the Bank Scope database. The first survey on 'International Trade in Banking Services (ITBS)' was launched by the Reserve Bank of India in January 2008 for the period 2006-07. The latest article based



on the ITBS survey for the period 2008-09 was published in October 2010 issue of the monthly Bulletin of the Reserve Bank of India. The primary objective of the ITBS survey was to collect disaggregated information relating to various banking services rendered by the overseas branches of Indian banks as well as the banking services rendered by the foreign bank branches operating in India along with the primary information relating to their business such as total credit, total deposit, interest income, total number of employees *etc.*

Study covers 41 banks operating in 28 countries including India. Among these 41 banks, there are 11 Indian public sector banks and 2 private sector banks operating abroad in 27 and 5 countries, respectively. Remaining, 28 banks are foreign banks operating in India. The observation corresponding to  $i^{\text{th}}$  bank operating in  $j^{\text{th}}$  country is taken as a single observation. The final data set is an unbalanced panel of observations (a total of 244) on outputs and inputs. The descriptive statistics of the data for the period 2006-2007 to 2008-09 is presented in Table 1.

To select the relevant variables, we follow the asset approach proposed by Sealey and Lindley (1977) which views the institution as using labour, capital and deposits to produce earning assets. This approach is the most common in the conventional literature. In this approach, the bank accepts deposits from customers and transforms them into loans to clients. The inputs are labour, material and deposits, and output are loans and other income generating activities (banking services) (Mester, 1997). In the intermediation approach, banks perform two major

**Table 1: Full period descriptive statistics of selected variables**

(in thousands)

Descriptive Statistics	Fees and Commissions (FC) $y_1$	Loans and Advances (LO) $y_2$	Deposits (DE) $x_1$	Non-interest Expenses (NE) $x_2$
<b>Mean</b>	14,13,288	3,99,21,582	3,66,50,125	22,73,435
<b>S.D.</b>	42,31,090	8,97,15,610	96,49,41,86	66,88,144
<b>Max</b>	2,96,47,257	94,96,11,800	94,96,11,800	5,82,06,202
<b>Min</b>	76,829	26,03,781	36,51,768	1,73,749

roles of mobilising and distributing resources efficiently in order to smoothen investment activities in the economy. According to Colwell and Devis (1992), the disadvantage of this approach is the absence of the trust operation that causes increases in the unit cost of large banks. Moreover, banking literature has found that different approaches to measuring output have generally led to similar conclusions concerning the cost structures of financial firms (Mester, 1993).

More specifically, we include two different outputs and two different inputs whose information were available in the survey. The outputs are total fee or commission ( $y_1$ ) charged to the customers for financial auxiliaries services such as (i) deposit account management services, (ii) credit related services, (iii) financial leasing services, (iv) trade finance related services, (v) payment and money transmission services, (vi) fund management services, (vii) financial consultancy and advisory services, (viii) underwriting services, (ix) clearing and settlement services, and (x) derivative, stock, securities and foreign exchange trading services; total credit ( $y_2$ ) which includes total loans and advances provided by the banks. The inputs are total deposits ( $x_1$ ) which includes bank bonds and sight; saving and time deposits, and Non-interest expenses ( $x_2$ ) *i.e.* total operating expenses. The information related to important variables such as fixed asset, borrowings, investment are not available in the survey, therefore these variables are not included. Although, the data on total number of employees available but since this information is already captured by the variable ( $x_2$ ), as a part of “Payments to and provisions for employees” it has not been separately included in the study.

In the inefficiency model (12), various variables are included to explain the technical inefficiency of banks. First, the ownership-specific dummy variables  $d_{PUBt}$  and  $d_{PRVt}$  are included. The effect of each ownership-specific dummy variable indicates how the efficiency level of Indian public sector banks and Indian private sector banks operating outside India is changing in relation to the foreign banks operating in India. It should be noted that the same set of ownership-specific dummy variables is included in the distance function (10). In this case, the effect of each dummy variable indicates how the distance function of Indian public sector banks and Indian private sector banks operating outside India is shifting in relation to the distance function of foreign banks operating in India.

Second, the variable  $O_{ijt}$  indicates the trade openness of the economy. A negative (positive) coefficient of the variable signifies that inefficiency decreases (increases) with the trade openness.

Third, the variable  $n_{ijt}$  indicates the number of branches for the  $i^{\text{th}}$  bank operating in  $j^{\text{th}}$  country. The reasons for opening new branches by the banks are either for efficient utilisation of excess capacities or just for enlargement of the geographical coverage of the market. It should be stated, however, that banks facing entry (or threat of entry) by an out-of-market bank may have strategic motive to expand their branching network as a means of defending their market share. In this case, the setting up of new branches is not expected to have a favorable influence on the bank's efficiency. A positive (negative) coefficient of  $n_{ijt}$  indicates that inefficiency increases (decreases) with the expansion of branching network.

Fourth, country-specific dummy variable  $d_{DEVt}$  is included which takes value one if the bank is operating in developed country and zero if it is operating in developing countries. A positive (negative) coefficient of variable indicates that inefficiency increases (decreases) for the banks operating in developed countries.

Fifth, the variable  $c_{ijt}$  is the service concentration, which is the sum of the squared ratios of the value of each output to total value of outputs of the  $i^{\text{th}}$  bank operating in  $j^{\text{th}}$  country. Service concentration is used to measure a bank's degree of specialisation. Values of service concentration close to one indicate that a bank is specialized in a single product. A positive (negative) coefficient of this variable suggests that specialization increases (decreases) inefficiency. Sixth, the variable  $t$  is a linear time trend which indicates how efficiency changes with time. A positive (negative) coefficient of  $t$  shows that inefficiency increases (decreases) over time.

All variables have been mean-corrected prior to estimation. That is, each output and input variable has been divided by its geometric mean. In this way, the first-order coefficient can be interpreted as distance elasticities evaluated at the sample means. In addition, the linear homogeneity in outputs is imposed using the output ( $y_2$ ) as a numeraire.

## Section V

### Empirical Results

Following Battese and Coelli (1995), maximum likelihood estimation is employed to simultaneously estimate the parameters of the stochastic translog output distance function (10) and the technical inefficiency effects model (12). The model parameters are estimated using the FRONTIER 4.1 program (Coelli, 1996). The estimation results for the translog distance function (10) and the technical inefficiency effects model (12) are presented in Table 2. The t-statistics presented in Table 2 provide an indication of the statistical significance of the corresponding coefficients. The t-statistics of the coefficients of the translog distance function indicate that 18 out of 26 estimated coefficients are significantly different from zero, which suggests that the model provides a fairly good fit to the explanatory variable.

All the first order parameter estimates are statistically significant and they have theoretically consistent signs, indicating that the distance function is increasing in outputs and decreasing in inputs at the sample mean.

Inclusion of the ownership-specific dummy variables, *i.e.*,  $d_{PUBt}$  and  $d_{PVTt}$  allows the estimated distance function of Indian public banks and Indian private banks operating outside India in relation to the distance function of the foreign banks operating in India. The estimated coefficient corresponding to dummy variable  $d_{PVTt}$  is statistically significant indicating that the intercept of estimated distance function corresponding to Indian private banks operating outside India is shifted by the ownership-specific factors *vis-a-vis* the arbitrarily foreign banks intercept. Furthermore, the estimated coefficient of the developed-countries dummy variable, *i.e.*,  $D_{DEVt}$  is statistically significant indicating that the distance function is shifting for the banks operating in developed countries in relation to the banks operating in developing countries.

The parameter estimates for the inefficiency model, *i.e.* the  $\delta$ s which are presented in Table 2, suggest a number of factors which may explain technical inefficiency. 7 out of 8 parameters are statistically significant at the five percent level, which suggests a fairly good fit of the inefficiency model. All the estimated coefficients of the ownership-specific dummy

**Table 2: Maximum-likelihood estimates for parameters of the distance function (10) with the inefficiency effects model (12)**

Variable	Parameter	Estimated values	Standard error	t-statistic
<i>Stochastic distance function(10)</i>				
Constant	$\alpha_0$	0.0110	0.0298	0.3689
In DE	$\alpha_1$	-0.2751	0.0889	-3.0952**
In NE	$\alpha_2$	-0.3315	0.0927	-3.5767**
In (FE/LO)	$\beta_1$	0.2017	0.0879	2.2954**
(In DE) <sup>2</sup>	$\alpha_{11}$	-1.6502	0.3129	-5.2741**
(In NE) <sup>2</sup>	$\alpha_{22}$	-1.5409	0.3195	-4.8233**
(In(FE/LO)) <sup>2</sup>	$\beta_{11}$	1.0416	0.1619	6.4330**
(In DE)*(In NE)	$\alpha_{12}$	1.4397	0.2809	5.1254**
(In DE)(In (FE/LO))	$\gamma_{11}$	0.1403	0.2752	0.5098
(In NE)(In (FE/LO))	$\gamma_{21}$	0.1143	0.2209	0.5174
t	$\varphi_t$	-0.0484	0.0285	-1.6982*
t <sup>2</sup>	$\varphi_{tt}$	0.0212	0.0138	1.5298
t In DE	$\alpha_{t1}$	-0.0844	0.0402	-2.1013**
t In NE	$\alpha_{t2}$	0.0450	0.0396	1.1359
t In (FE/LO)	$\beta_{t1}$	0.0525	0.0369	1.4228
d <sub>PUR</sub>	$\xi_{PUR}$	0.0121	0.0145	0.8355
d <sub>PRV</sub>	$\xi_{PRV}$	-0.0504	0.0186	-2.7118**
d <sub>DEV</sub>	$\xi_{DEV}$	-0.0343	0.0106	-3.2242**
<i>Inefficiency model (12)</i>				
Constant	$\delta_0$	0.5226	0.1662	3.1447**
In O	$\delta_{10}$	-0.0012	0.0240	-0.0517
In n	$\delta_{20}$	-0.2308	0.0701	-3.2940**
t	$\delta_t$	-0.0592	0.0284	-2.0858**
d <sub>PUR</sub>	$\delta_{PUR}$	-0.2488	0.0807	-3.0826**
d <sub>PRV</sub>	$\delta_{PRV}$	-0.2524	0.0991	-2.5467**
d <sub>DEV</sub>	$\delta_{EEV}$	-0.4228	0.1591	-2.6578**
c	$\delta_c$	-0.4416	0.1546	-2.8566**
<i>Variance parameters</i>				
$\sigma^2$		0.0247	0.0073	3.4074**
$\gamma$		0.9497	0.0170	55.9242**
Log Likelihood		367.38		
Mean efficiency		0.9532		
** Significant at 5% level of significance. *Significant at 10 % level of significance.				

variables, *i.e.*,  $d_{PUBt}$  and  $d_{PVTt}$  are statistically significant indicating that the efficiency level of Indian public banks and Indian private banks operating outside India is shifted relative to the efficiency of the foreign banks operating in India. The estimated coefficient corresponding to the variable representing openness of the economy is found to be negative but statistically insignificant indicating that openness of the economy has no role to play in the inefficiency of the banks. The estimated coefficient of the number of branches, *i.e.*,  $n_{ijt}$ , is negative and statistically significant indicating that inefficiency decreases with the expansion of branch network. Thus the expansion of new branch network by banks signifies efficient utilisation of excess capacity. The estimated coefficient of the countries-specific, *i.e.*, developed-countries dummy variable is negative and statistically significant implying that inefficiency decreases for the banks operating in developed countries. The estimated coefficient of the service concentration, *i.e.*,  $c_{ijt}$ , is negative and statistically significant indicating that inefficiency decreases with specialisation. This finding is consistent with that of Rezitis (2006) but contradicts Christopoulos *et al.* (2001) whose results indicate that output diversification increases bank efficiency. Finally, the coefficient on time ( $t$ ) is negative and statistically significant showing that the inefficiency decreases with the time.

Table 3 presents the results of certain generalised likelihood ratio tests regarding the estimated parameters of the output distance function (10) and the inefficiency effects model (12). Test 1 examines the validity of the null hypothesis that there is not any technical change against the alternative of the presence of technical change. The null hypothesis is rejected by the likelihood ratio test at the five percent significance level and hence favors the presence of technical change. Test 2 verifies whether the null hypothesis that the Cobb–Douglas specification is an appropriate representation of the output distance function against the alternative translog functional form. The null hypothesis is rejected by the likelihood ratio test at the five percent significance level and hence favors the translog specification. Test 3 examines the null hypothesis that the variables included in the inefficiency effects model have no effect on the level of technical inefficiency, *i.e.* all the  $\alpha$ -parameters except the intercept term are zero. Again, the null hypothesis is rejected at the five

**Table 3: Generalized likelihood ratio tests of hypotheses for parameters of the distance function (10) and inefficiency effects model (12)**

Test	Null Hypothesis	$\lambda^a$	$\chi^2_{0.05}^b$	Decision
1.	$H_0: \varphi_t = \varphi_u = \alpha_{t1} = \alpha_{t2} = \beta_{t1} = 0$ No technical change	11.16	11.05(5) <sup>b</sup>	Reject $H_0$
2.	$H_0: \alpha_{11} = \alpha_{22} = \alpha_{12} = \beta_{11} = \gamma_{11} = \gamma_{21} = 0$ Cobb-Douglas	77.66	12.59(6)	Reject $H_0$
3.	$H_0: \delta_0 = \delta_{10} = \dots = \delta_c = 0$ The inefficiency model is not appropriate	52.56	15.51(8)	Reject $H_0$
4.	$H_0: \gamma = \delta_0 = \delta_{10} = \dots = \delta_c = 0$ Technical efficiency	81.78	16.92 <sup>d</sup> (9)	Reject $H_0$

<sup>a</sup>  $\lambda$  is the generalized likelihood ratio test.  
<sup>b</sup> Numbers in parentheses represent degrees of freedom.  
<sup>d</sup> The critical value for the generalized likelihood ratio test involving  $\gamma=0$  is obtained from Table 2 of the paper by Kodde and Palm (1986).

percent significance level indicating that the joint effect of the variables included in the inefficiency effect model is statistically significant. The final test examines the null hypothesis of whether the inefficiency model is appropriate. In other words, the null hypothesis examines if all the  $\delta$ -parameters and the intercept term are zero. The null hypothesis is rejected indicating that at least one of the parameters of the inefficiency effects model is different from zero at the five percent significance level.

**Technical efficiency estimates**

Table 4, 5 and 6 summarises the results of the output distance function model. The estimated mean technical efficiency is found to 0.953 during the period of 2006-08 (Table 2). Table 4 shows the time varying mean efficiency values of Indian banks operating abroad and foreign banks operating in India. The results reveal that the Indian banks

**Table 4: Time-varying mean efficiency values by bank groups**

Year	Indian Banks Operating outside India			Foreign Banks Operating in India		
	Mean	S.D.	Number	Mean	S.D.	Number
2006-07	0.961	0.034	47	0.927	0.061	25
2007-08	0.965	0.029	53	0.922	0.092	27
2008-09	0.967	0.024	64	0.940	0.050	28
Average	0.965	0.029	164	0.930	0.070	80

**Table 5: Time-varying mean efficiency values by bank groups**

Year	Public Sector Banks Operating outside India			Private Sector Banks Operating outside India		
	Mean	S.D.	Number	Mean	S.D.	Number
2006-07	0.963	0.032	42	0.941	0.051	5
2007-08	0.964	0.030	46	0.969	0.022	7
2008-09	0.968	0.025	57	0.963	0.025	7
Average	0.965	0.028	145	0.959	0.033	19

operating abroad are on average (0.965) more efficient than foreign banks operating in India (0.930). The Mann Whitney U- test indicates that mean difference of efficiency between Indian banks operating abroad and foreign banks operating in India is statistically significant at the 1% level (p-value =0.000). Another feature of technical efficiency is noteworthy. Our model allows us to assess the variations in technical efficiency over time. The mean technical efficiency goes from 0.961 in 2006-07 to 0.967 in 2008-09 for Indian banks operating outside India while for foreign banks operating in India, it first decreases to 0.922 in 2007-08 and then increases to 0.940 in 2008-09. However, as revealed by the standard deviation, which is higher than that for the Indian banks operating outside India, the efficiency differences among the foreign banks operating in India are quite large in each year.

Table 5 shows the time varying mean efficiency values of Indian public sector banks and Indian private sector banks that are operating abroad. The results reveal that the efficiency level of public sector banks is on average (0.965) marginally higher than private sector banks operating abroad (0.959). However, the Mann Whitney U- test indicates that mean difference of efficiencies between public sector banks and private sector banks operating outside India is not statistically significant even at the 10% level ( p-value = 0.3511). The technical efficiency of public sector banks increases from 0.963 in 2006-07 to 0.968 in 2008-09 while the technical efficiency of private sector banks first increases to 0.969 in 2007-08 than slightly decreases to 0.963 in 2008-09. Also, comparing Table 4 and Table 5, it is found that the both Indian public sector banks as well as Indian private sector banks operating abroad are more efficient than the foreign banks operating in India.



**Table 6: Time-varying mean efficiency values by country-specific group.**

Year	Banks Operating in Developed countries			Banks operating in developing countries		
	Mean	S.D.	Number	Mean	S.D.	Number
2006-07	0.969	0.018	31	0.934	0.057	41
2007-08	0.973	0.016	34	0.934	0.076	46
2008-09	0.974	0.018	39	0.947	0.042	53
Average	0.972	0.017	104	0.939	0.059	140

Table 6 shows the time varying mean efficiency values of banks operating in developed countries and in developing countries. The results reveal that the banks operating in developed countries are on average (0.972) more efficient than banks operating in developing countries (0.939). The Mann Whitney U- test indicates that mean differences of efficiencies between banks operating in developed countries and in developing countries are statistically significant at the 1% level (p-value = 0.000).

The technical efficiency of banks operating in developed countries increases from 0.969 in 2006-07 to 0.972 in 2008-09 while the technical efficiency of banks operating in developing countries remains same at 0.934 in 2006-07 and 2007-08 and then increases to 0.939 in 2008-09. Since India itself is a developing country, therefore, it may be a reason of having small efficiency of foreign banks operating in India in comparison to Indian banks operating outside India.

## Section VI

### Concluding Remarks

In this paper, the technical efficiency of Indian banks operating outside India was compared with foreign banks operating in India using an output distance function approach. The distance function has the advantage that it does not require information about prices, avoiding the possible market power problem. The main finding of the study is that the Indian banks operating abroad are more efficient than the foreign banks operating in India and banks operating in the developed countries are more efficient than those in developing countries. The openness of

the economy has no effect on the technical efficiency of the banks. It is also found that there is no statistical difference between the technical efficiency of Indian private banks and Indian public sector banks operating outside India. As the Indian banks are working efficiently abroad, it strengthens the case for easing the policy /giving incentives to the Indian banks to open their branches abroad. It will help to generate the foreign exchange receipts and also helpful for the Indian exporters/importers to get the financial services through the Indian bank branches abroad in an effective manner.

This paper is based on the information collected through annual surveys on International Trade in Banking services conducted by Reserve Bank of India from 2006-2009. This paper is limited to include some of the important variables like capital, investments, borrowings and total fixed asset of the banks in the distance function since the information were neither collected under the ITBS survey nor published anywhere. The present paper can be improved further if the data on the above cited variables are available.

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## ***Causal Relationship between Saving, Investment and Economic Growth for India***

### ***– What does the Relation Imply?***

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**Ramesh Jangili\***

This study investigates the relationship between saving, investment and economic growth for India over the period 1950-51 to 2007-08. The literature on the role of saving in promoting economic growth generally points to saving led growth. However, few studies show evidence for growth driven saving and some suggest no relationship. In theory, saving may stimulate economic growth, economic growth may also induce saving. This paper adds to the literature by analysing the existence and nature of these causal relationships. The present analysis focuses on India, where saving rate has been the most pronounced. The co-integration analysis suggests that there is a long-run equilibrium relationship. The results of Granger causality test show that higher saving and investment lead to higher economic growth, but the reciprocal causality is not observed. Further, it is empirically evident that saving and investment led growth is coming from the household sector. It may be inferred from the results that India is not too close to the technological frontier and hence not catching up with the new technologies.

**JEL Classification** : F43, E21, E22, C32

**Keywords** : Saving, Investment, Economic growth, Granger causality

### **Introduction**

The relationship between saving, investment and economic growth has puzzled economists ever since economics became a scientific discipline. Generally, a portion of income is saved and put into investment. In a closed economy, the economy as a whole can save only as much as its income. The economy as a whole may reduce the consumption expenditure in relation to a given level of income and consequently increase its propensity to save. An exogenous increase in the desire to save leads to an unchanged level of saving but at a lower level of income. If we define both saving and investment as the

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difference between gross domestic product and consumption, it may tend to be interpreted in terms of cause-and-effect relationship.

The role of domestic saving and domestic investment in promoting economic growth has received considerable attention in India and also in many countries around the world. The central idea of Lewis's (1955) traditional theory was that an increase in saving would accelerate economic growth, while the early Harrod-Domar models specified investment as the key to promoting economic growth. On the other hand, the neoclassical Solow (1956) model argues that the increase in the saving rate boosts steady-state output by more than its direct impact on investment, because the induced rise in income raises saving, leading to a further rise in investment. Jappelli and Pagano (1994) claimed that saving contribute to higher investment and higher GDP growth in the short-run, whereas, the Carroll-Weil hypothesis (Carroll and Weil, 1994) states that it is economic growth that contributes to saving, not saving to growth.

The optimism about the Indian economy has been on an ascent in recent years. This has led to a resurgence of interest in the linkages among saving, investment and economic growth in India. Further, the recent empirical literature on saving made the interest towards the themes of capital accumulation, technological progress and economic growth - a shift away from the 1980s and the 1990s when discourse on macroeconomic issues was dominated by concerns with short term stabilisation and adjustment. Since the inception of economic planning in India, the emphasis has been on saving and investment as the primary instruments of economic growth and increase in national income. One of the objectives of economic plan (for *e.g.*, Eleventh five year plan) is to increase the production in the economy and thus economic growth. To increase the production, capital formation is considered as the crucial determinant; and capital formation has to be backed by the appropriate volume of saving. Increase in saving, use of the increased saving for increased capital formation, use of the increased capital formation for increasing saving, and use of the increased saving for a further increase in capital formation constituted the strategy behind economic growth. Though, classical growth models support the hypothesis of saving promoting economic growth, Carroll-Weil hypothesis contradicts with the argument.

In the Indian context, though empirical studies exist on the role of saving and investment in promoting economic growth, these provide only partial analysis. Moreover, some empirical studies support the classical growth theory, some studies agree with the Carroll-Weil hypothesis and some do not support



either of these. To illustrate, Sinha (1996) looked at the causality between the growth rates of gross domestic saving and economic growth, and found that there was no causality running in either direction. In a study, Mühleisen (1997) found significant causality from growth to saving but rejected causality from saving to growth for all forms of saving. In another study, Sinha and Sinha (2008) examined the relationships among growth rates of the GDP, household saving, public saving and corporate saving for the period 1950 to 2001 and found that economic growth produced higher saving in various forms and never the other way around. Verma (2007) employed the ARDL co-integration approach to determine the long run relationship of GDS, GDI and GDP for the period 1950-51 to 2003-04 and supported the Carroll-Weil hypothesis that saving does not cause growth, but growth causes saving.

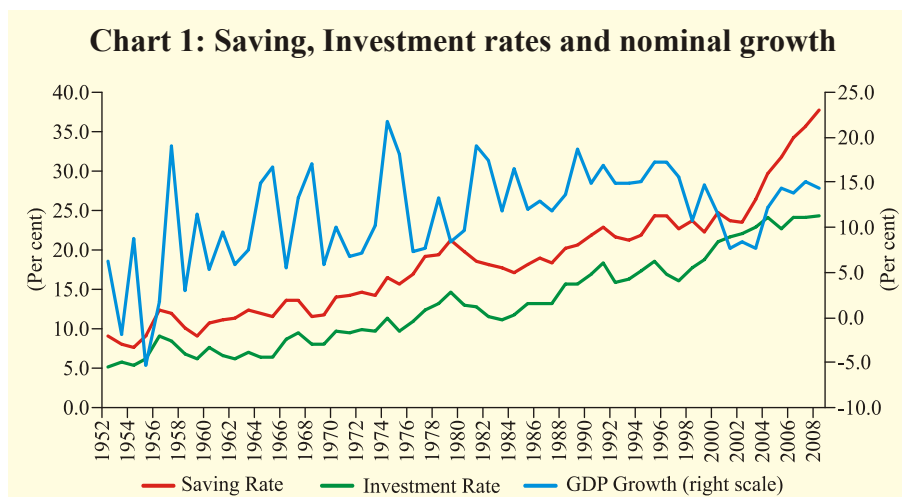
It appears that there is no comprehensive study available on the analysis of the interdependence between saving and investment of the household, private corporate and public sectors with that of economic growth. Therefore, this article investigates the possibility of saving investment led growth and growth driven saving investment hypothesis, in detail, by testing for Granger causality between the logarithms of saving, nominal investment and nominal GDP in India. The paper is organised in four sections. Section 2 presents the behavior of saving, investment and national income in India over the past few decades. Section 3 discusses the data and econometric analysis along with the empirical results. Finally, concluding observations are presented in section 4.

## Section II

### Saving, Investment and National Income

#### Trends

Saving rate has steadily increased over time, from an extremely low base of 9.0 percent in 1950-51 to 37.7 percent in 2007-08 (Chart 1). A significant positive and robust relationship between growth rate and saving rate was observed during this period, as growth rate was also rising during this period. At the same time, investment rate has steadily increased, from a low base of 10.7 percent in 1950-51 to an all time high of 39.1 percent in 2007-08. Given that India had a closed capital account before 1991 which restricted capital mobility through administrative controls and outright prohibition, domestic saving and domestic investment in India were highly correlated (correlation coefficient is 0.99 percent for the entire period). It may be observed that the divergence between saving and investment is persistent until the liberalization



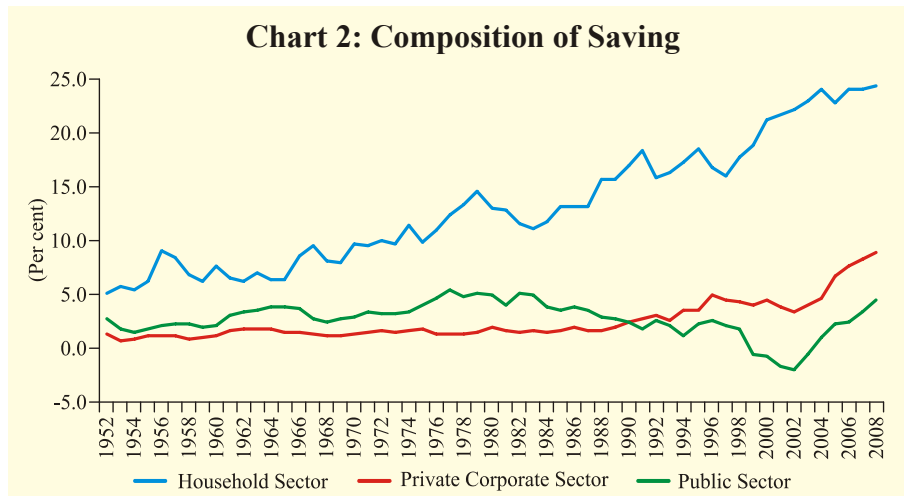
and was narrowed down after the 1991 balance of payments crisis and further narrowed down after the economy shifted to a flexible exchange rate regime in 1993. The correlation between saving and investment in the post reform period is more or less unchanged from the pre-reform period (correlation in the pre-reform period is 0.9973 and in post reform period is 0.9972), however the gap between them has narrowed.

As is evident from Chart 1, economic growth was largely led by investment demand, which is captured by the gross domestic fixed capital formation in national accounts. Though growing foreign investment, both direct and portfolio investment play a role, the rise in investment was largely financed domestically. From a low of 21.6 per cent in 1991-92, India's domestic saving rate jumped to a record high of 37.7 per cent in 2007-08. This fuelled investment, raising the demand for all types of investment related goods. This, in turn, had a multiplier effect on economic growth.

### Composition

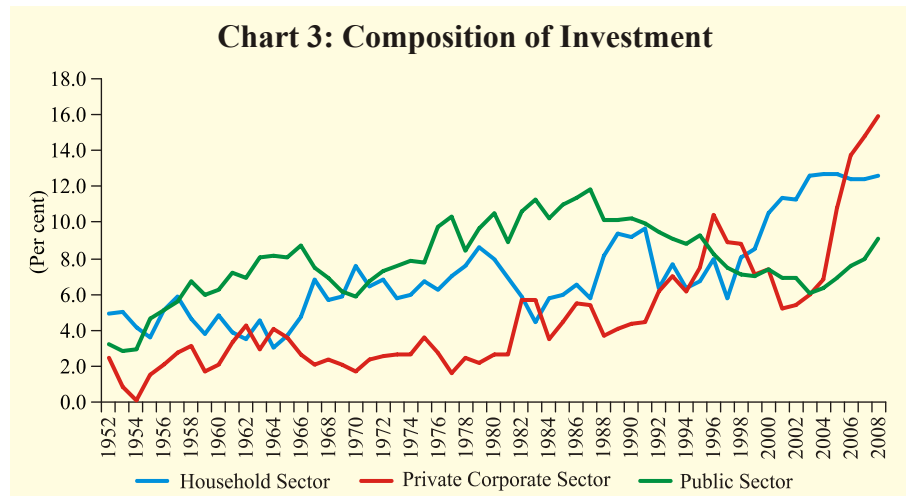
Domestic saving (Investment) of India is divided into two parts - Public Saving (Investment) and Private Saving (Investment). Private Saving (Investment) is further divided into two parts, those are Household Saving (Investment) and Corporate Saving (Investment).

While India's saving and investment rates have steadily increased over time, their composition has undergone a considerable change (Chart 2). The most noticeable trend is the growing divergence between the public and private saving. Public saving declined from its peak level of 4.9 per cent of GDP in



1976-77 to -2.2 per cent in 2001-02, from where it increased to 4.5 per cent in 2007-08. During the same period, saving rates of both the household and private corporate sectors have steadily increased, offsetting the decline in the public sector. The share of household saving in the total saving has increased from nearly 60 per cent in the early 1990s to a maximum of 94 per cent in 2001-02, after which it steadily declined to nearly 65 per cent in 2007-08. The private corporate sector, whose saving rate was stagnant till the late 1980s, has recently emerged as the sector with the fastest rising saving rate (1.8 per cent of GDP in 1987-88 to 8.8 per cent of GDP in 2007-08). The share of private corporate saving in total saving has increased from below 10 per cent in 1980s to more than 23 per cent in recent years.

Similar compositional changes have occurred in investment as well. Until late 1980s public investment rate was dominating and reached its peak of 12 per cent in 1986-87. Following the liberalisation in early 1990s, the role of public sector has gradually reduced in number of sectors, and its place has been taken over by the private sector. Hence, the private corporate investment has steadily increased offsetting the decline in the public sector investment. The share of public sector investment in total investment was stagnant at around 50 per cent till 1980s, and has declined to 23 per cent in 2007-08. On the other hand, the share of private corporate investment, which was little more than 20 per cent in 1980s, has steadily increased to 40 per cent in 2007-08. Household sector investment rate also increased from low base of 3.2 per cent in 1963-64 to 14.2 per cent in 2004-05 and it moderated thereafter. However, its share in total investment broadly remained the same.



### Section III

#### Econometric Analyses

##### Data

To understand the saving, investment led growth or growth driven saving and investment in India, we adopt Johansen methodology as given in Annex. The study uses the annual data to examine the causal relationships between domestic saving, investment and income for India. Annual time series data for gross domestic product (GDP), gross domestic saving (GDS), gross domestic investment (GDI), saving and investment of household sector, private corporate sector and public sector for the period 1950-51 to 2007-08 are collected from the National Accounts Statistics, published by the Ministry of Statistics and Programme Implementation, Government of India. All data are in terms of domestic currency and nominal prices.

##### Unit Root Test

One of the most important attributes of a time series variable is its order of integration. Hence, we first perform unit root tests in levels and first differences in order to determine the order of integration of the series. To test the order of integration, we employ the conventional augmented Dickey-Fuller (ADF) test (*Dickey and Fuller, 1979 and 1981*). ADF test examines the null hypothesis of a unit root against a stationary alternative. The results are presented in Table 1.

**Table 1: Unit Root Test using Augmented Dickey Fuller Test**

Variable	At level $\mu$		At level $\lambda$		At first difference $\mu$		Conclusion
	Optim- um Lag- length	ADF test statistic	Optim- um Lag- length	ADF test statistic	Optim- um Lag- length	ADF test statistic	
Gross Domestic Product (GDP)	0	3.47	1	-3.46	0	-5.34*	I(1)
Gross Domestic Saving (GDS)	0	2.14	0	-2.86	0	-6.45*	I(1)
Household Saving (HHS)	0	1.29	0	-3.22	0	-7.96*	I(1)
Private Corporate Saving (PCS)	0	1.36	0	-1.97	0	-8.31*	I(1)
Public Sector Saving (PBS)	2	0.68	0	-3.81**	-	-	I(0)
Private Sector Saving (PS)	0	1.83	0	-2.87	0	-7.10*	I(1)
Gross Domestic Investment (GDI)	0	1.29	0	-2.64	0	-7.84*	I(1)
Household Investment (HHI)	1	1.22	0	-3.41	0	-9.09*	I(1)
Private Corporate Investment (PCI)	8	0.65	0	-3.38	7	-4.01*	I(1)
Public Sector Investment (PBI)	0	-0.21	0	-2.53	0	-7.42*	I(1)
Private Sector Investment (PI)	2	2.13	0	-3.22	0	-7.41*	I(1)

**Note:** \* and \*\* indicate statistical significance at 1% and 5% levels, respectively. The subscripts  $\mu$  and  $\lambda$  indicate the models that allow for a drift term and a deterministic trend, respectively.

It is evident from the table that the calculated ADF statistics for level variables are less than the critical values in all cases, suggesting that the variables are not level stationary. Table 1 also shows that the ADF statistics for all the variables imply first-difference stationary, except for public sector saving (PBS). For further analysis, series whose order of integration is same as that of the GDP series are only retained for empirical analysis. Therefore, the series PBS has not been considered for further analysis.

### Co-integration Test

Having established that all variables, except PBS, are integrated of same order, we proceed to test for presence of co-integration among the variables. We employ Johansen co-integration test. It may be noted here that we are interested to check for the presence of co-integrating relationship among the variables, however, number of co-integrating vectors is not of our interest. Accordingly, in Table 2, we present only the results of the null hypothesis that there does not exist co-integration against the alternative that there exists co-integration.

Starting with the null hypothesis that co-integration ( $r=0$ ) does not exist among the variables, the trace statistic is well above the 95 per cent critical

**Table 2: Empirical Results of the Co-integration Test based on Johansen-Juselius method**

$H_0$ : There does not exist co-integration

Variables in the system	Trace statistic	Maximum Eigen value statistic	Conclusion
GDP and GDS	24.33 *	18.03 *	Co-integrated
GDP and GDI	34.06 *	29.55 *	Co-integrated
GDP, GDS and GDI	43.46 *	30.74 *	Co-integrated
GDP and PS	29.94 *	22.48 *	Co-integrated
GDP and PI	27.19 *	21.54 *	Co-integrated
GDP, PS and PI	50.01 *	24.33 *	Co-integrated
GDP and HHS	23.95 *	17.08 *	Co-integrated
GDP and HHI	19.75 *	16.36 *	Co-integrated
GDP, HHS and HHI	39.33 *	21.71 *	Co-integrated
GDP and PCS	15.22	10.47	Not co-integrated
GDP and PCI	39.59 *	34.93 *	Co-integrated
GDP, PCS and PCI	53.79 *	41.73 *	Co-integrated
GDP and PBI	32.69 *	32.63 *	Co-integrated

**Note:** \* indicate statistical significance at 5% levels. The critical values of Trace test and Maximum Eigen value test at the 5% significance levels are 15.4947 and 14.2646, respectively.

value for all the series except private corporate sector saving (PCS). Hence, it rejects the null hypothesis of no co-integration in favor of existence of co-integration for all the series except PCS. Turning to the maximum eigen value test, the null hypothesis that there does not exist co-integration is rejected at 5 per cent level of significance in favor of the specific alternative that there is at least one co-integrating vector for all series except PCS. Thus, both the trace and maximum eigen value test statistics suggest that there exist co-integration relationship among all series with GDP except PCS. Hence, we use Vector Error Correction (VEC) Model for all other series and Vector Auto Regression (VAR) Model for PCS to test for causality.

Since GDP is co-integrated with GDS and GDI individually as well as collectively for the Indian economy, one can infer that there is a long-run equilibrium relationship between the two series and existence of causality in at least one direction. Private sector's saving and investment is also co-integrated with the national income suggesting the existence of long-run equilibrium relationship between national income and saving and investment of private sector. It is evident from the empirical results that there does not exist co-integrating relationship between national income and private corporate sector saving. It may be noted that the existence of co-integration relationship between national income and saving and investment of private sector is mainly because of the households sector rather than the private corporate sector.

### **Granger Causality**

Given the results of the co-integration tests, one has to estimate the VECM/ VAR to determine the direction of causality between income, saving and investment. If co-integration exists, the Granger-Causality test is performed under the vector error correction methodology. Otherwise, as in the case of saving of private corporate sector and gross domestic product, the standard Granger-Causality test is performed under VAR framework. The results of the causality tests under the VECM/VAR framework are shown in Table 3.

The bivariate Granger causality tests performed under VECM framework between saving and income and between investment and income, show that there is uni-directional causality between gross domestic saving and national income and also between gross domestic investment and national income. In line with the existing literature, it is evident from the empirical results that the causality is running from saving to income rather than income to saving. It is further evident that investment leads to higher income, whereas, income does not lead to higher investment. Under three variable VECM framework, it is empirically found that saving and investment collectively lead to higher income in India. However, income does not lead to higher saving and investment.

Further, it is evident that private sector saving causes higher growth and vice-versa, whereas, private sector investment alone may not boost the economic growth. Moreover, private sector surplus both in the form of saving and investment would boost economic growth. The causation of growth from household sector and private corporate sector is further investigated separately. It is empirically found that household saving is endogenous to growth, but household investment is not endogenous to growth. On the other hand, household sector saving and investment collectively are endogenous to growth.

Bivariate granger causality test under VAR framework is employed for private corporate sector saving and national income and it is found that national income leads to private corporate sector saving but not the vice-versa. In the case of private corporate sector investment and national income, the test is performed under the VECM framework. It is found that private corporate sector investment leads to higher growth and growth causes higher investment in the private corporate sector. Further, it is found that saving and investment of private corporate sector are endogenous to growth collectively. Moreover, higher investment in the public sector improves economic growth, whereas, higher growth does not necessarily foster higher investment in the public sector.

**Table 3: Causality tests based on VECM/VAR: F statistic**

<b>Null Hypothesis</b>	<b>F-Statistic</b>	<b>Result</b>
<b>Entire economy</b>		
Gross domestic saving does not granger cause Gross domestic product	19.05	Reject
Gross domestic product does not granger cause Gross domestic saving	1.39	Do not Reject
Gross domestic investment does not granger cause Gross domestic product	18.88	Reject
Gross domestic product does not granger cause Gross domestic investment	2.53	Do not Reject
Gross domestic saving and investment does not granger cause GDP	21.33	Reject
GDP does not granger cause Gross domestic saving and investment	4.95	Do not Reject
<b>Private sector</b>		
Private sector saving does not granger cause Gross domestic product	9.94	Reject
Gross domestic product does not granger cause Private sector saving	7.07	Reject
Private sector investment does not granger cause Gross domestic product	1.28	Do not Reject
Gross domestic product does not granger cause Private sector investment	15.49	Reject
Private sector saving and investment does not granger cause Gross domestic product	10.29	Reject
Gross domestic product does not granger cause Private sector saving and investment	17.97	Reject
<b>Household sector</b>		
Household sector saving does not granger cause Gross domestic product	9.92	Reject
Gross domestic product does not granger cause Household sector saving	7.89	Reject
Household sector investment does not granger cause Gross domestic product	3.99	Do not Reject
Gross domestic product does not granger cause Household sector investment	17.32	Reject
Household sector saving and investment does not granger cause Gross domestic product	26.11	Reject
Gross domestic product does not granger cause Household sector saving and investment	8.80	Reject
<b>Private corporate sector</b>		
Private corporate sector saving does not granger cause GDP	1.78	Do not Reject
GDP does not granger cause Private corporate sector saving	7.50	Reject
Private corporate sector investment does not granger cause GDP	6.06	Reject
Gross domestic product does not granger cause Private corporate sector investment	19.78	Reject
Private corporate sector saving and investment does not granger cause GDP	8.60	Reject
GDP does not granger cause Private corporate sector saving and investment	9.00	Reject
<b>Public sector</b>		
Public sector investment does not granger cause Gross domestic product	22.03	Reject
Gross domestic product does not granger cause Public sector investment	1.07	Do not Reject



**Discussion of the empirical results**

All long-run growth theories imply that an economy can grow faster by investing more. An economy with open capital markets, *viz.*, India, may not need higher domestic savings to grow faster as investment can be financed by foreign sources. However, the empirical results suggest that higher domestic saving would boost economic growth. The positive correlation between saving and growth appears rather puzzling from the point of view of standard growth theory. Some researchers, for example Carroll-Weil (1994) have sought to explain the correlation as reflecting an effect of growth on saving. But this interpretation runs counter to mainstream economic theory in which the representative individual's consumption-Euler equation implies that growth should have a negative effect on saving. India being an open economy with domestic and foreign investors, domestic saving need not be endogenous to growth.

Growth in emerging economy results mainly from innovations that allow domestic sectors to catch up with the current frontier technology. But catching up with the frontier in any sector requires the cooperation of a foreign investor who is familiar with the frontier technology and a domestic entrepreneur who is familiar with the local conditions to which the technology must be adapted.

When domestic saving causes economic growth, as is empirically found for India, the question arises as to how far the country is from the technological frontier. Particularly, focus will be on the interaction between saving and the country's distance from the technological frontier. *Aghion et al (2006)* argues that saving affects growth positively in those countries that are not too close to the technological frontier, but does not affect it at all in countries that are close to the frontier. The reason explained is that, higher saving in an emerging economy increases the number of projects that can be co-financed by the local entrepreneur on terms that mitigate agency problems enough to make it worthwhile for a foreign investor to participate. However, in countries sufficiently close to the frontier, the local firms are more likely to be familiar themselves with the frontier technology, and therefore do not need to attract foreign investment in order to undertake an innovation project. In such a case, every *ex ante* profitable innovation project will be undertaken regardless of the level of domestic saving because there is no need for co-financing when there is just one agent participating in a project.

## **Section IV**

### **Summary and Conclusions**

The study examines the direction of the relationship between saving, investment and economic growth in India at both aggregate level and sectoral level for the period 1950-51 to 2007-08 by using Granger causality test. It is empirically evident that the direction of causality is from saving and investment to economic growth collectively as well as individually and there is no causality from economic growth to saving and (or) investment.

The empirical results suggest that there exists reciprocal causality from saving and investment of the private sector to economic growth. This reciprocal causality emanates from the household sector, where saving and investment led growth and growth driven saving and investment was observed. It is empirically evident that private corporate sector saving does not lead to economic growth, however, saving and investment of the sector collectively lead to economic growth and vice-versa.

Saving led growth in emerging market economies implies that the economy is not catching up with the technology frontier and hence growth is not driven by the innovations that are taking place worldwide. The results indicate that though the Indian economy is opened to foreign investments, growth is still driven by the domestic saving. Furthermore, local firms may not be absorbing the technology which comes through the foreign investment in order to undertake more profitable innovation projects.

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## Annex

### Econometric methodology used

*Granger (1969, 1980)* is well known for his Granger causality test. The concept of Granger causality, by which we actually understand precedence, is based on the idea that a cause cannot come after its effect. More precisely, variable X is said to Granger cause another variable Y, if the current value of Y is conditional on the past values of X and thus the history of X is likely help to predict Y.

The Granger causality method regresses variable Y on its own lagged values ( $Y_{t-i}$ ) and the lagged values of another variable X ( $X_{t-i}$ ). If the coefficients of lagged values of X are significant, then X Granger causes Y. Similarly, to substantiate the reverse possibility, one regresses X on its own lagged values and lagged values of Y. Y Granger causes X if the coefficients of the lagged values of Y are significant. In summary, Granger causality tests can be placed in one of four categories: No causality, Y causes X only, X causes Y only, and a bi-directional causality, *i.e.*, Y causes X and X causes Y simultaneously.

Steps involved in implementing the Granger causality test:

1. Test for the stationarity of the data using Augmented Dickey Fuller (ADF) test.
2. If found non-stationary, difference the data and conduct the ADF test again on the differenced data.
3. Exclude the variables, whose order of integration is not the same as order of integration of GDP.
4. Test for the presence of co-integration using the same order of integrated variables.
5. Based on co-integration results, use VAR or VEC to test causality.

The first step in the causality testing procedure is to determine whether the data contains unit roots indicating the data is non-stationary. To formally test for the presence of unit root, the conventional augmented Dickey- Fuller (ADF) test (*Dickey and Fuller, 1979 and 1981*) is employed. The following regression equations are used to test for the presence of unit root.

$$\Delta Y_t = \mu + (\rho - 1)Y_{t-1} + \sum_{i=1}^p \theta_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

$$\Delta Y_t = \mu + \beta t + (\rho - 1)Y_{t-1} + \sum_{i=1}^p \theta_i \Delta Y_{t-i} + \varepsilon_t \quad (2)$$

where  $\Delta$  is the differencing operator

$Y_t$  is logGDP (or logorthim of GDS, HHS, PCS, PBS, GDI, HHI, PCI, PBI) at time t

p is the maximum lag length

$\varepsilon$  is the stationary random error.

Equation (1) is a test for random walk with drift term (intercept), whereas, equation (2) tests for random walk with drift term and linear trend. Basically, one would use the most general case and estimate a regression with both the drift term and linear time trend, and step-by-step estimate the restricted equations, if the test fails to reject the null hypothesis of unit root present in the general case. The null hypothesis is that unit root present in the series (*i.e.*,  $\rho=1$  or  $\rho-1=0$ ). The series is said to be stationary or do not have unit root, if  $1-\rho$  is negative and statistically significant.

Once we have the results of unit roots, the next step is to determine whether there exists co-integration, using the same order of integrated variables. To test for co-integration, the *Johansen and Juselius (1990)* procedure is used, which leads to two test statistics, trace test and maximum eigenvalue test, for co-integration<sup>1</sup>. The two test statistics,  $\lambda_{trace}$  and  $\lambda_{max}$  are used to estimate the co-integration rank r, *i.e.*, the number of independent co-integrating vectors.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \ln(1 - \lambda_i) \quad (3)$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \lambda_{r+1}) \quad (4)$$

where  $\lambda_{r+1}, \dots, \lambda_n$  are the estimated (n-r) smallest eigenvalues

T is the number of usable observations.

The distribution of statistics is subject to whether a constant or a drift term is included in the co-integrating vector and the number of non-stationary components under the null hypothesis.

If the rank r is zero, the variables are not co-integrated and hence the vector auto regression (VAR) method would be used to investigate causality. On the other hand, if the variables are co-integrated, the vector error correction (VEC) method is used to test for causality<sup>2</sup>.

<sup>1</sup> Trace test, tests the hypothesis that there are at most r co-integrating vectors, whereas, maximum eigenvalue test, tests the hypothesis that there are r+1 co-integrating vectors versus the hypothesis that there are r co-integrating vectors.

<sup>2</sup> See Toda and Phillips (1994) for a detailed discussion.





## ***Are Saving and Investment Cointegrated? A Cross Country Analysis***

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**Sanjib Bordoloi and Joice John<sup>1</sup>**

Saving is an important part of the economic process that gives rise to investment and economic growth. In this paper an attempt is made to explore the relationship between saving and investment in three diverse economies, viz., US, UK and China and compare it with India. We used Autoregressive Distributed Lag (ARDL) bounds testing approach for testing cointegration relationship between saving and investment in all the four countries. The temporal movements of the long term coefficients are also examined using recursive estimates. We found that saving and investment are cointegrated in all the countries examined but the magnitude of the long-run coefficient is different for different economies.

**JEL classification** : E21, E22

**Key Words** : Saving, Investment, Cointegration

### **Introduction**

The relationship between saving and investment plays a vital role in national income accounting. The System of National Accounts, 1993 (SNA93) (paragraph 9.19) defines saving as,

*'Saving represents that part of disposable income that is not spent on final consumption of goods and services. It may be positive or negative depending on whether disposable income exceeds final consumption expenditure, or vice versa.'*

In other words, saving is defined as that part of current disposable income that is not spent to consume current final goods and services. The non-current income, which pertains to previous years, and profit/ loss not related to the current business of economic units, such as sale of assets during the previous years, are not covered in the saving. Investment measures the amount of money spent to buy capital goods for future expansion of production capacity. Thus, saving withdraws some amount of money from the financial system, while investment injects some amount of money into the financial system.

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The precise relationship between saving and investment is somewhat complex. There is considerable theoretical debate on whether saving causes investment or investment causes saving. Classical theory depicts that an increase in savings will lead to a reduction of the interest rate causing investors to demand more for the available savings and thus causing increase in investments. Keynes argued that an increase in the investment will result in increase in the output which, in turn, will affect savings. Therefore, resolving the causality issue is more of an empirical matter than of a theoretical one.

Since the ground-breaking seminal work of Feldstein and Horioka (1980) on the relationship between saving and investment in 16 OECD countries where they found high correlation between saving and investment and explained it as an evidence of low capital mobility, several researchers investigated this relationship. Some of the researchers supported this puzzle<sup>2</sup> while others disagreed on the ground that it is not the high saving-investment correlation that determines capital mobility between nations rather capital mobility is explained by some other factors such as the economic size, international financial linkages, fiscal policy coordination, *etc.*

In this paper, an attempt is made to explore the relationship between saving and investment in different countries. We attempted the cases of three diverse economies, *viz.*, United States of America (US), United Kingdom (UK) and China and compared them with India. US is characterised by low domestic saving rate that fall short of investment. This shortfall is made up through net foreign borrowings by making use of foreigners' saving to finance part of domestic investment (Bernanke, 2005). Further, the flow of foreign capital to US may be attributed to high productivity growth and deep capital markets (Bernanke, 2007). On the other hand, China has been experiencing rise in both saving and investment rates, with higher rise in saving rate. This has led to an increase in China's current account surplus. China's saving rate increased at a greater pace than the investment rate, which may be attributed to the rapid growth in its income. As stated by Bernanke (2007), '*Chinese saving rates rose rapidly (by more even than investment rates); that rise in saving was, perhaps, a result of the strong growth in incomes in the midst of an underdeveloped financial sector and a weak social safety net that increases the*

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<sup>2</sup> Feldstein and Horioka (1980) argued that if there is perfect capital mobility, investors in one country do not need the funds from domestic savers and can borrow from international markets and savers can lend to foreign investor the entire domestic savings. Under this assumption domestic saving would have no relation with domestic investment. However, the data provides contrasting evidence which was widely known as Feldstein-Horioka puzzle.

*motivation for precautionary saving*<sup>3</sup>. The bulk of China's investment is financed through domestic saving, with foreign direct investment playing a relatively modest role. Much of China's high saving and investment is due to unusually high savings of enterprises and of the Government.

In India, household sector saving accounts for almost 70<sup>3</sup> percent of the total savings and the rest is contributed by the private corporate sector and government. The Indian economy has huge potential to grow that is somewhat constrained by capital scarcity. The domestic saving has not been able to finance the required investment. To mitigate the saving investment gap, India had to borrow funds from the overseas market. Accordingly the Government of India initiated steps to gradually remove various restrictions since the first half of 1990s and allowed Indian entities to access to the overseas funds through Foreign Direct Investment (FDI) and External Commercial Borrowings (ECB). The improved investment climate and sound macroeconomic fundamentals also led to upsurge in the inflows of FDI. The high investment rate has not only been able to absorb the domestic savings but also generated the capability to absorb capital inflows.

The rest of the paper is structured as follows; Section I discusses literature review; followed by Autoregressive Distributed Lag (ARDL) bound testing approach method in Section II. Section III reports the empirical results and the interpretation of the same. Section IV presents summary and conclusions emanating from the empirical study.

## **Section I**

### **Review of Literature**

The question of whether saving and investment are cointegrated has been inexplicable for decades, and is at the core of what has come to be known as the Feldstein-Horioka (FH) puzzle. Feldstein and Horioka (1980), in their pioneering study covering 16 OECD countries using data for the time period 1960-74, found high correlation between domestic saving and investment. They argued that due to limited capital mobility, most of the incremental saving tends to remain in the country where the saving is done.

Applying the Engle-Granger cointegration technique for the period 1946 to 1987 for US economy, Miller (1988) found that saving and investment rates were both integrated of order one and are cointegrated from 1946 to 1971, the

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<sup>3</sup> Average rate calculated over the period from 1950-51 to 2009-10.

period pertains to the fixed exchange rate period. However, no cointegrating relationship could be established between the two variables during the flexible exchange rate period. Later Gulley (1992) raised the validity of Miller's initial tests of the order of integration of the saving and investment rates as well as on exclusion of the constant term from the estimation, as both the variables had non-zero means. He found that both saving and investment were stationary in levels and they were not cointegrated during both fixed and flexible exchange rate regime. De Vita and Abbott (2002) applied the ARDL cointegration technique to reassess the existence of cointegration between saving and investment for US for the period from 1946:Q1 to 2001:Q2. The empirical findings suggest weaker saving-investment correlation during the flexible exchange rate period (post 1971:Q3) with a significant reduction in the saving rate coefficient compared to the fixed exchange rate regime (till 1971:Q2). These empirical findings provide some idea about capital mobility.

The relationship between savings and investment was examined for 21 OECD countries by Krol (1996) using pooled annual data for the period from 1962 to 1990 and found the impact of saving on investment to be considerably small. Apergis and Tsoulfidis (1997) found existence of long run relationship between saving and the provision of credit in 13 EU countries out of the 14 countries studied, which they argued as flow of money saved to the money that is finally invested. Their empirical findings indicated minor role of degree of capital mobility in the EU countries investment. Further the analysis found causal linkages in most countries from saving to investment.

Mamingi (1997) examined F-H hypothesis for 58 developing countries, including India, through the cointegration technique estimated using fully modified ordinary least square and found lack of capital mobility for 12 countries, while 17 countries were found to have perfect capital mobility and 24 in the intermediate position. The sample covers the period from 1970 to 1990. The study found intermediate position of capital mobility for India. Sinha (2002) studied the relationship between saving and investment rates for Japan and 11 other Asian countries and found existence of long-run relationship between the two variables in Japan, Indonesia and Thailand. Further, considering exogenously determined structural break, the study found existence of long run relationship between saving and investment in Japan, India, Malaysia and Thailand. Sinha and Sinha (2004) using annual data for 123 countries studied both short run and long run relationship between saving and investment rates under an error correction framework. Empirically, existence of long run relationship was found for 46 countries including India and US. Evidence of

capital mobility was found for 16 countries, of which only three were developed economies (Hong Kong, Norway and US), while existence of short run relationship between the two variables was found for 84 countries<sup>4</sup>.

Levy (2000) examined the relationship between saving and investment in US over the period 1897 to 1989 and found existence of long-run and business cyclical relationship, through frequency domain analysis, regardless of the time period covered. The study also found existence of short run relationship between investment and saving for the postwar period only. Levy argued that the variation in the extent of the saving- investment co-movement over the long run, business cycle and short run frequencies, emphasises the importance of separating the long run correlation between the two indicators from the short run and business cycle correlation.

Onafowara *et al.* (2011) studied the relationship between saving and investment in eight advanced economies of the European Union using the ARDL cointegration framework and found statistically significant evidence of cointegration for six countries. Existence of long-run unidirectional causality from saving to investment was established for UK and the Netherland. These two countries were characterized by highest share of financial activity in GDP<sup>5</sup>. Long-run bidirectional causality was found between the two variables for Belgium, while causality from investment to saving was found for Denmark, Germany and Luxembourg.

Narayan (2005) examined the relationship between saving and investment for China. The saving-investment relationship was examined over the two periods from 1952-1998 and 1952-1994. The second period represents the fixed exchange rate regime and restricted capital movement. Till 1994, China followed a fixed exchange rate regime and thereafter it has been following a managed floating exchange rate regime (Jin, 2003). Empirically, saving and investment were found to be cointegrated for China for both the periods and the results support the F-H hypothesis for the Chinese economy. The correlation between saving and investment was found to be stronger under the fixed exchange rate regime.

In the Indian context also, several studies have been made to examine the relationship between saving and investment. Sinha and Sinha (1998) found evidence of existence of a long-run equilibrium relationship between saving

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<sup>4</sup> Includes China, UK, US and India.

<sup>5</sup> The financial activity were measured by the ratios such as Private Credit/ GDP, Financial System Deposits/ GDP or Stock Market Capitalisation/ GDP.

and investment in India applying Johansen-Juselius framework and concluded that India is unlikely to suffer from macroeconomic instability in the long-run, based on the behavior of the past data. The empirical analysis was done using data over the period from 1950 to 1992 and was confined to the pre liberalisation period of India. Seshaiyah and Sriyval (2005) studied the nexus between saving and investment in the Indian context, using annual data from 1970-71 to 2001-02, under a cointegration framework and found that savings and investment are cointegrated. Further, the study found unidirectional causality from saving to investment, after considering interest rate into the cointegration framework also. Verma (2007) using an ARDL bound testing procedure for the period 1950-51 to 2003-04 found that domestic saving drives investment in both short-run and long-run for India. Rocha (2006) studied the F-H hypothesis for 22 developing countries through alternative specifications, including India, for the period from 1960 to 1996 and found capital to be immobile.

Bordoloi (2008) employing the Engle-Granger two-step method over the sample period from 1950-51 to 2005-06 found existence of cointegration relationship between saving and investment in India with a high coefficient. In a recent paper, Khundrakpam and Ranjan (2010) examined the F-H hypothesis for India for two separate periods using ARDL cointegration approach. The first period covers the period from 1950-51 to 1990-91 while the second period cover from 1950-51 to 2006-07, to examine the behavior of saving and investment post liberalisation of the Indian economy. The study found existence of a unidirectional cointegrating relationship from saving to investment and not vice-versa and the relationship was found to have weakened while incorporating post-liberalisation data. The various economic policies initiated by the Government of India post the Balance of Payments crisis in the early 1990s have gradually increased the flow of overseas saving into India leading to the weakening of the saving-investment relationship post 1990-91. Mishra *et al.* (2010) found existence of cointegration relationship between saving and investment for India over the period from 1950-51 to 2008-09 using annual data for the period 1950-51 to 2008-09 using the Johansen's cointegration technique. The study found bidirectional causality between the two variables.

## **Section II**

### **Research Methodology**

The coverage of the study and the econometric method used for the empirical analysis has been described in this section. The conventional wisdom

about three decades ago was that non-stationary variables should be transformed to make them stationary before incorporating under a multivariate framework. Engle and Granger introduced the concept of cointegration wherein it was proved that even if the variables are non-stationary, a linear combination of the variables may be stationary. In such a situation, the variables are said to be cointegrated. Subsequently, several methods have been developed for testing cointegration. These include Johansen (1988), Johansen-Juselius (1990) and Gregory-Hansen (1996). Pesaran and Shin (1995, 1998) and Pesaran *et al.* (1996, 2001) proposed ARDL approach for testing cointegration between the variables.

### *II.1 Coverage of the Study: Spatial and Temporal*

For empirical analysis, all the data have been collected from International Financial Statistics (IFS), IMF database for the period 1950 to 2010 for four countries, *viz.*, US, UK, China and India. For India, the calendar year relates to the corresponding financial year (April- March), hence data corresponds from 1950 to 2009. Macroeconomic aggregates for China are available in public domain from 1978 onwards and hence period of study for China is from 1978 to 2009.

### *II.2 Econometric Method Used: ARDL Bounds Testing Procedure*

The main advantage of the ARDL framework, given the power and testing of the long-run relationship, is that it can be applied irrespective of the order of integration,<sup>6</sup> while other cointegration techniques<sup>7</sup> require same order of integration for all variables. Further, the ARDL technique approach can be applied with small sample as well, whereas the robustness of the estimates of alternative methods depends on larger sample size. Thus, the ARDL approach avoids use of unit root tests and autocorrelation function tests for testing the order of integration.

Hendry *et al.* (1984) argued that the ARDL process of econometric modeling is an attempt to match the unknown data generating process with a validly specified econometric model, and thus economic theory restrictions on the analysis are essential. As per the Hendry-type approach, test for the adequacy of the ARDL model is defined in terms of its statistical properties, *i.e.*, the diagnostic tests for the error term, *viz.*, absence of serial correlation, homoscedasticity and the normality test.

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<sup>6</sup> The ARDL-Cointegration method has the advantage over other cointegration methods as it can be applied regardless of whether the variables are I(0), I(1) or fractionally integrated.

<sup>7</sup> Engle-Granger, Johansen techniques.

The F-H hypothesis requires the estimation of the equation:

$$\left(\frac{I}{Y}\right)_t = \alpha + \beta \left(\frac{S}{Y}\right)_t + u_t \quad \dots(1)$$

Where, I is investment measured in terms of gross fixed capital formation (GFCF), S is gross saving, and Y is gross domestic product (GDP). GFCF has been used as a measure of investment in the literature (Sinha (2002), Sinha and Sinha (2004)). The major advantage of using GFCF as a measure of investment can be attributed to the fact that it has a lesser tendency to behave procyclically due to the exclusion of the highly procyclical inventory component (Bayoumi, 1990).

Testing the cointegration of investment and saving using ARDL bounds starts with modeling Equation (1) as a conditional ARDL-ECM<sup>8</sup> defined as,

$$\Delta\left(\frac{I}{Y}\right)_t = c_0 + \pi_1\left(\frac{I}{Y}\right)_{t-1} + \pi_2\left(\frac{S}{Y}\right)_{t-1} + \sum_{i=1}^p \gamma_i \Delta\left(\frac{I}{Y}\right)_{t-i} + \sum_{i=0}^q \delta_i \Delta\left(\frac{S}{Y}\right)_{t-i} + \varepsilon_t \dots(2)$$

Where  $C_0$  is the drift component and  $\varepsilon_t$  is the white noise error term.

Following Pesaran *et al.* (2001), two separate statistics are employed to 'bounds test' for testing the existence of a long-run cointegration relationship:

- (i) An F-test for the joint significance of the coefficients of the lagged levels in (2) (so that  $H_0: \pi_1 = \pi_2 = 0$ )
- (ii) A t-test for the null hypothesis  $H_0: \pi_1 = 0$  (Banerjee *et al.* 1998).

Two asymptotic critical value bounds provide a test for cointegration when the independent variables are  $I(d)$  (where  $0 \leq d \leq 1$ ) with a lower value assuming the regressors are  $I(0)$  and an upper value assuming purely  $I(1)$  regressors. A long run cointegrating relationship between the variables exists in case the test statistics exceed the respective upper critical values. The null hypothesis of no cointegration cannot be rejected if the test statistic falls below the lower critical values. If the test statistic falls within their respective bounds no inference can be drawn.

The conditional long-run equation for  $(I/Y)$  can be derived from the reduced form solution of Equation (2) when  $\Delta\left(\frac{I}{Y}\right) = \Delta\left(\frac{S}{Y}\right) = 0$  and is defined as:

$$\left(\frac{I}{Y}\right)_t = \Theta_0 + \Theta_1 \left(\frac{S}{Y}\right)_t + v_t \quad \dots(3)$$

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<sup>8</sup> Error Correction Model.

where  $\Theta_0 = -c_0/\pi_1$ ,  $\Theta_1 = -\pi_2/\pi_1$  and  $v_t$  are random errors. These long-run coefficients are estimated by the ARDL approach to cointegration of Pesaran and Shin (1998).

When  $\Theta_1$  is equal to zero, there will not be any relationship between domestic saving and investment. Value nearer  $\Theta_1$  to zero indicates that the economy experiences high capital mobility while a value nearer to one indicates that capital is highly immobile. In case  $\Theta_1$  is equal to one, the domestic saving fully finances the domestic investment.

### Section III

#### Empirical Results and Interpretation

The ARDL bounds testing approach described above has been used to test for the existence of cointegration relationship between investment and saving in the four countries separately. Further, to track the behavior of the saving-investment relationship over time, recursive estimates with a window size of 30 has been used<sup>9</sup>.

The ARDL bounds testing cointegration approach does not require the variables to be of the same order. However, we have used the ADF unit root tests to identify the order of integration (Table 1)<sup>10</sup>. From the table, it is clear that investment and saving are integrated of order one for China and India, while in case of US and UK, the test does not provide a clear picture of the order of integration. As the test gives an indication that the order of integration for both the variables for the four countries lie between zero and one, we preferred using ARDL bound testing approach.

**Table 1: Augmented Dickey-Fuller Unit Root Test**

Variable	India	US	UK	China
$(I/Y)$	0.793	-2.451*	-2.498*	-0.644
$(S/Y)$	1.079	-0.2189	-1.452	0.451
$\Delta(I/Y)$	-4.538*	-5.323*	-4.306*	-4.264*
$\Delta(S/Y)$	-4.424*	-5.100*	-4.745*	-3.032*

**Note:** The Dickey-Fuller test statistic is reported. The critical values are the finite sample values suggested by Mackinnon (1991). (\*) indicates that the test statistic is significant at the 10% level.

<sup>9</sup> Starting from a 30 year window and augmenting one observation in each step.

<sup>10</sup> The results are also confirmed using Phillips - Perron test.



**Table 2: Bounds Tests for Cointegration**

India		US		UK		China	
F statistic	t statistic	F statistic	t statistic	F statistic	t statistic	F statistic	t statistic
6.91	-3.69	5.08	-3.51	4.56	-3.44	6.26	-3.51

**Notes:** The  $F$ -statistic is used to test for the joint significance of the coefficients of the lagged levels in the ARDL-ECM.

The  $t$ -statistic is used to test for significance of the coefficient of the lagged dependent variable. All test statistics are significant at the 10% level.

The lag lengths of the variables in the ARDL model are chosen using the general-to-specific method starting from 3 lags and progressively dropping the insignificant lags. The bounds test for each of the countries using the full data set is presented in Table 2.

The asymptotic critical value bounds computed by Pesaran *et al.* (2001) were generated for large sample sizes and may not be appropriate for small sample sizes. Accordingly, the critical values for  $F$ -statistics are taken from Narayan (2005). All the test statistics are found to be significant at the 10 percent level, leading us to reject the null-hypothesis of no cointegration in all cases.

In contrast, when saving was considered as the dependent variable, the calculated  $F$ -statistics are found to be lower than the lower bound of the critical value at the 10 percent level, suggesting that the null of no cointegration between saving and investment could not be rejected for all the countries. Thus, existence of long-run relationship between saving and investment could be established, only in case when investment is considered as the dependent variable. This validates the use of investment as the dependent variable. Thus domestic saving is the long-run forcing variable for explanation of investment for the selected countries during the sample period.

The estimates of the long-run coefficients from the ARDL specification of the short-run dynamics are presented in Table 3.

In case of India, the long run coefficient is found to be the highest (0.89). According to Feldstein and Horioka (1980), high correlation is an evidence of low capital mobility. Therefore, high correlation for India appears to confirm low capital mobility and heavy dependence on domestic savings for much of its investment as compared to other countries studied. For US, even though the saving and investment are found to be cointegrated, the long run saving coefficient is found to be lower compared to the other countries (0.32).

**Table 3: Estimated Long and Short-run Coefficients  
as per Equation 2**

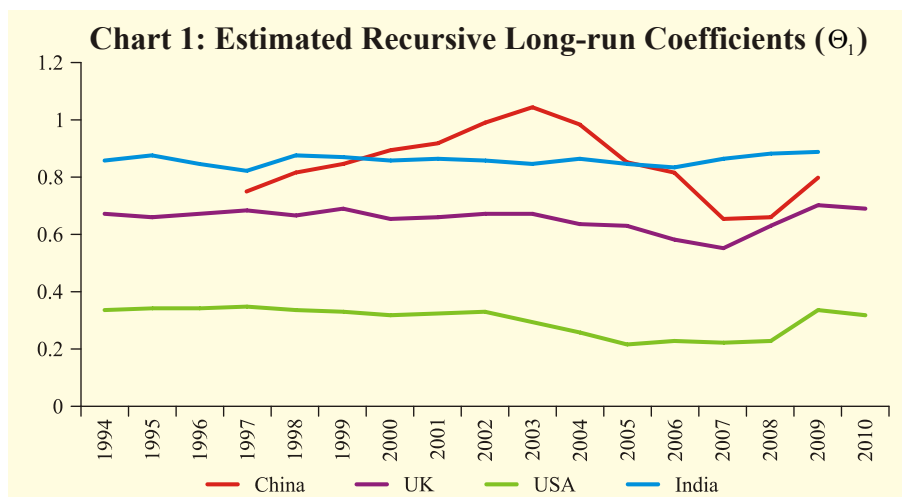
	India	US	UK	China
$c_0$	0.01* (0.004)	0.04* (0.01)	0.02* (0.01)	0.02 (0.03)
$\pi_1$	-0.38* (0.10)	-0.29* (0.08)	-0.22* (0.07)	-0.57* (0.16)
$\pi_2$	0.34* (0.09)	0.09* (0.03)	0.15* (0.06)	0.45* (0.13)
$\delta_0$	0.43* (0.07)	0.33* (0.05)	0.30* (0.11)	0.36* (0.21)
$\delta_1$	-0.02 (0.11)	-0.09 (0.07)	-0.10 (0.12)	-0.09 (0.24)
$\gamma_1$	0.01 (0.13)	0.49* (0.13)	0.30* (0.13)	0.59* (0.20)
$\Theta_0$	0.02	0.14	0.09	0.03
$\Theta_1$	0.89	0.32	0.69	0.80

(Standard errors in parenthesis) (\*) indicates that the test statistic is significant at the 10% level.

The adequacy of the ARDL bound testing approach can be tested using the diagnostic tests of the model (Hendry *et al.* 1984). We tested for the residuals for autocorrelation (using Durbin-Watson statistic), homoscedasticity (using Breusch-Pagan/Cook-Weisberg) and normality (using normal probability plots). The diagnostics tests are found to be satisfactory. Further, the residuals are also tested for their white noise property and found to be satisfactory.

The temporal movements of the long term coefficients ( $\Theta_1$ ) are obtained using recursive estimates starting from 30 year window and augmenting one observation in each step. In the case of China, due to lack of observations, a 20 year window has been used. The F and t statistics are also obtained recursively. It was observed that the hypothesis of no cointegration between investment and saving is rejected for all the four countries during the span of the study. Chart 1 provides the movement of the long term coefficient in the past 15 years (1995-2010).

It can be noted that the long term saving coefficients are fairly stable for India which hovered around 0.85. In China, the long term coefficient of saving on investment gradually increased till 2003. This may be attributed to the high domestic saving driven investment. During 2004 to 2008, the coefficient



declined. This is in line with the fact that the China's domestic savings grew at a faster rate (compounded annual growth rate of 21.2 per cent) than its investment growth (compounded annual growth rate of 19.2 per cent) during this period. Prior to the financial crisis of 2008, US and UK had witnessed decline in the long-run saving coefficients, which subsequently picked up during the crisis period (2008-09).

## Section IV

### Summary and Conclusions

The question of whether saving and investment are cointegrated has been baffling economists for decades, and is at the core of what has come to be known as the Feldstein-Horioka (FH) puzzle. In this paper, an attempt is made to explore the relationship between saving and investment and test for the FH puzzle for India with other three diverse economies, *viz.*, US, UK and China. For this, ARDL bounds testing approach has been used to test for the existence of cointegrating relationship between saving and investment for all the four countries. The temporal movements of the long term coefficients are also examined using recursive estimates.

Empirically, it has been found that saving and investment are cointegrated for all the four selected countries. The results suggest that India depends on its own saving for most of its investment. For US, even though the saving and investment are found to be cointegrated, the long run saving coefficient is found to be lower compared to the other countries. In China, the long term coefficient

of saving on investment gradually increased till 2003. This may be attributed to the high domestic saving driven investment. From 2004 to 2008, the coefficient declined. This is in line with the fact that the China's domestic savings grew at a faster rate than its investment growth during this period. US and UK had witnessed decline in long-run saving coefficients during the pre-crisis period of 2008, which subsequently picked up during the crisis period.

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## ***Structural Problems and Fiscal Management of States in India***

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**Dirghau Keshao Raut\***

This paper attempts to analyse structural fiscal problems and fiscal management of the State Governments based on the long term behavior of major fiscal variables during the last five decades starting from 1960. Analysis confirms that structural problems such as vertical fiscal imbalance, variation across States in imposing certain taxes and lower own non-tax revenues still exist and need to be addressed more progressively. Fiscal management of the States worsened from the second half of 1980s to 2003-04. However, fiscal reforms undertaken since 2004-05 benefitted States in managing their finances. The macroeconomic slowdown and the impact of pay revision on account of sixth pay commission halted the fiscal correction during 2008-09 and 2009-10 before the State governments resumed fiscal consolidation in 2010-11. Even though revenue receipts increased significantly over the last five decades, it was largely contributed by current transfers rather than States' own revenues. In spite of increasing total expenditure, the share of capital expenditure shows a declining trend raising issues for potential growth of States. Nonetheless, rising share of social sector expenditure in total expenditure, curtailment in committed expenditure, progress under rule based regime in terms of lower key deficits and debt could be seen as positive developments in fiscal management of States in the post FRBM period.

**JEL Classification** : H71, H72, H74

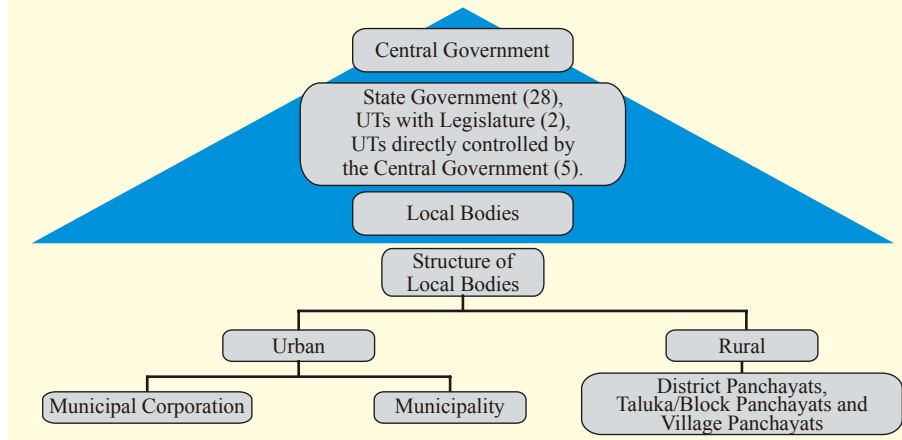
**Key Words** : State Revenue, State Expenditure, State Borrowing

### **I. Introduction**

The subject of fiscal federalism has received increasing attention from academics, analysts and policy makers in the recent years. Federalism is a universally accepted and acknowledged type of governance which promotes efficiency at different levels of government. India became a Constitutional republic in January 1950. The Indian Constitution provides the federal basis for governance in India. The Constitution has clearly specified all the statutory provisions, initially for two layers of government which was later expanded to

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**Chart 1: Structure of Electoral Governments at three layers**

three. The Constitution also provides for the fiscal institutions and mechanisms for intergovernmental transfers to address the vertical and horizontal fiscal imbalances across different levels of governments.

The Constitution incorporated States as sub-national entities with specified political and fiscal authorities. India now consists of twenty-eight States, two “Union Territories (UTs) with legislature” and five UTs controlled by the Central Government (Chart 1).

The financial resources and functions of Centre and the States are specified in Seventh Schedule of the Indian Constitution. The schedule specifies the financial resources and functions of the Centre (the Union list) and the States (the State list). The powers under joint jurisdiction are included in the Concurrent list. However, Indian federal system is considered to be quasi-federal due to high concentration of powers with the Central government (Rao, 2004). This allocation of powers and functions between Centre and the States creates vertical imbalance. Even though concentration of power at the Central government level creates imbalance between the Centre and the States, it was supported by keen observers to maintain unity in the diversity of India. To quote Dr. Ambedkar, *“it is difficult to prevent the centre from becoming strong. Conditions in the modern world are such that the centralization of powers is inevitable. One has only to consider the growth of the Federal government in USA, which, notwithstanding the very limited powers given to it by the Constitution, has outgrown its former self and has over shadowed and eclipsed the state governments. This is due to modern conditions. The same conditions are sure to operate on the Government of India and nothing that one can do will help to prevent it*

*from being strong. On the other hand, we must resist the tendency to make it stronger. It cannot chew more than it can digest. Its strength must commensurate with its weight. It would be a folly to make it so strong that it may fall by its own weight”<sup>1</sup>*

Fiscal policy of States assumes importance in the macroeconomic policies of India as the States account for around 57 per cent of the total expenditure incurred by both levels of government in India (Centre and States). As the States have assigned major expenditure responsibility due to their proximity to the local issues, their contribution in developmental and social sector expenditure, particularly on social services increased significantly. With the adoption of planning and emphasis on the decentralisation of the fiscal activities, the role of States in providing better social and economic services has widened. The State governments are dependent on Centre for resources as the resource mobilisation powers assigned to them fall short of their expenditure responsibilities. Expenditure pattern of the States is dominated by committed expenditure such as interest payments, pension and administrative services. Consequently, fiscal management of the States to a large extent is shaped by devolution of resources from the Centre and expenditure commitments that arise from time to time.

In this study, the objective is to analyse structural problems, fiscal management and other issues relating to State finances. Accordingly, the study has been organised into seven sections. While this section set out an introduction to the fiscal federalism in India, a brief review of literature is provided in Section II. The structural problems relating to State finances are presented in Section III. Fiscal management based on long-term behavior of key deficit indicators with special emphasis on phases of improvement/deterioration in revenue account discussed in Section IV. Receipts and expenditure management, with emphasis on their composition, is analysed in Section V. Financing pattern of gross fiscal deficit (GFD), outstanding debt and its composition are covered in Section VI. Issues in State finances are provided in Section VII.

## **II. Review of Literature**

There are many studies on various aspects of finances of the State governments. Bacgchi (2002), in an assessment of fiscal federalism observed that over-centralisation of economic policies, failure to ensure the development

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<sup>1</sup> Constituents Assembly Debates: Vol.VII, P.42, November 1948.

and smooth functioning of a common market, faulty design of intergovernmental transfers and inadequate Central oversight over States' borrowing resulting in the problem of subnational debt and deficit, as the weaknesses of fiscal federalism practised in India. Rao (2004) noted that even though the revenues of States grew faster than the Centre, States' fiscal dependence on Centre increased due to increase in expenditure at faster rate than revenue. Rao (1998) observed that inter-State differences in the ability to raise revenues and the coefficient of variation in per capita expenditure increased during 1990s. Bajpai and Jeffrey (1999) observed certain issues pertaining to stagnant tax-GDP ratio, rising share of non-developmental outlay in the total expenditure, large volumes implicit subsidies and increasing losses of State enterprises. Kurian (1999) noted that failure in containing wasteful expenditure and reluctance to raise additional resources resulted in deterioration of State finances. He also noted that States were unable to spend on investment in social and infrastructure sectors due to implementation of Fifth Pay Commission awards. Rajmal (2006) observed that State finances were under fiscal stress during the period 1986-87- 2003-04 due to growing interest burden, increasing wages and salaries, pension liabilities, losses incurred by State enterprises, inadequate user charges/cost recoveries and deceleration in the current transfers (States' share in Central taxes and grants-in-aid). He also noted a steady deterioration in revenue receipts-GSDP ratio, stagnating social sector expenditure, inadequate investment for basic infrastructure sectors, pre-emption of high cost borrowed funds for financing current expenditure and increasing debt stock and its servicing.

### **III. Structural problems in fiscal management of States**

#### ***Vertical fiscal imbalance between the Centre and the States***

The constitutional allocation of taxation powers between Centre and the States is based on some economic and administrative considerations such as minimising/avoiding the problem of double taxation, tax rivalry among States, and duplication of tax administration. While determining expenditure responsibilities, subjects of regional concern, such as, law and public order, agriculture, irrigation, public health and sanitation, roads and bridges are assigned to States due to their proximity to the local issues. However, this allocation of taxation powers and expenditure responsibilities between Centre and the States creates an imbalance referred to as vertical fiscal imbalance. States have the responsibility of development in areas such as education, health, agricultural and industrial growth, construction of roads, bridges and irrigation

schemes, *etc.* However, their revenue raising powers to meet these expenditure responsibilities are inadequate. This led to States' growing dependence on transfers from the Centre to finance their expenditure commitments. The expenditure policies of States are also influenced by the Centre under the objectives of planning (Centrally Sponsored Schemes).

Successive Finance Commissions have emphasized the need to reduce these imbalances by increasing the States' share in Central taxes. However, the imbalances did not show any marked reduction, as evident from the fact that the share of States' revenue receipts in combined revenue receipts of the Centre and the States declined from 63.7 per cent in 1980-81 to 62.8 per cent in 2010-11 (BE).

***Horizontal imbalances due to differences in revenue generation capacities and expenditure commitments across States***

The existence of region-specific disparities as well as diverse socio-economic structure across States causes variations in resource mobilisation and expenditure responsibilities across States. Populist fiscal measures such as non-levy of certain taxes, differences in tax rates, and State-specific expenditure schemes, also contribute to the differences in revenue generating capacity and expenditure commitments across States. These differences create fiscal imbalances, commonly referred to as horizontal fiscal imbalances. Table 1 shows that the extent of horizontal fiscal imbalance increased during 1990s, and in the first half of 2000s (the number of States in the fiscally imprudent category, *i.e.*, above 4.0 per cent gross fiscal deficit-GSDP ratio, increased gradually from 13 during 1980s to 15 during 1990s and further to 23 during 2000-01 to 2004-05) but declined during 2005-06 to 2010-11 (the number of States in the fiscally imprudent category, *i.e.*, above 4.0 per cent fiscal deficit declined to 11). Considering imbalance in the revenue account, horizontal fiscal imbalance increased during 1990s, and in the first half of 2000s (the number of States with revenue balance/surplus came down from 15 during 1980s to 8 during 1990s and further to 6 during the first half of 2000s) but declined during 2005-06 to 2010-11 (22 States recorded revenue surplus during 2005-06 to 2010-11). Measures such as specific purpose grants and incentives for rule based framework on the basis of the Twelfth Finance Commission's recommendation helped the States to reduce the extent of fiscal imbalances as well as horizontal fiscal imbalances across States during 2005-06 to 2010-11.

**Table 1. Horizontal Fiscal Imbalances during 1980-81 to 2010-11**

(Number of States)

Period	Gross Fiscal Deficit as per cent to GSDP			Revenue surplus/deficit as per cent to GSDP		
	Average					
	0 to 3.0	3.0 to 4.0	above 4.0	0 or < 0	> 0 to 1.5	above 1.5
1980s	3	9	13	15	10	-
1990s	5	5	15	8	8	9
2000-01 to 2004-05	2	3	23	6	5	17
2005-06 to 2010-11(BE)	11	6	11	22	3	3

-: Nil BE: Budget Estimates

Source: State Finances: A Study of Budgets, RBI, various issues.

***Lack of uniformity in tax rates and levying taxes across States***

Though the States have undertaken measures towards rationalisation of taxes and simplification of tax procedures over the years, levy of taxes and tax rates have not been uniform across States. For example, rate of major taxes such as Sales tax/Value Added tax (VAT) varies across States. In addition, observations based on data reported in the budget documents of the State governments show variations in the imposition of certain taxes across States. For example Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Punjab and Uttarakhand do not levy Agricultural Income Tax as there was no receipt from this tax in any of the years during 1990-91 to 2010-11. Similarly, there was no receipt from taxes on profession, trades, callings and employments in Arunachal Pradesh, Goa, Himachal Pradesh, Kerala, Punjab and Tamil Nadu during the same period. Arunachal Pradesh, Bihar, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Meghalaya, Mizoram, Nagaland, Orissa, Punjab, Sikkim and Uttarakhand did not record any receipts from urban immovable property tax during 1990-91 to 2010-11. It shows lack of uniform tax policies across States. Perhaps, introduction of Goods and Services Tax (GST) may have uniformity across the States in terms of tax and tax rates.

***Lower own non-tax revenues due to lower return on investment and inadequate user charges***

States' own non-tax revenues comprise receipts from interest on loans given by the State Governments, dividend and profits from State enterprises, State lotteries and non-tax revenues from various social and economic services. Losses of State enterprises particularly, state electricity boards contributed to lower non-tax revenues of the States. In addition, low recovery of economic

services and lack of proper user charges on social services are major drawbacks in improving non-tax revenues of the States. In order to improve revenues from non-tax sources, States should initiate reforms to ensure better performance of State enterprises, proper user charges and increase in recovery from economic services.

***Dominance of committed expenditure***

The revenue expenditure of States is dominated by committed expenditures such as interest payments, administrative services and pension. Higher committed expenditure resulted in deficit on the revenue account of the States. Consequently, resources borrowed through market and other sources had been utilised to finance revenue deficits rather than financing infrastructure in the 1980s and 1990s which was reflected in lower capital outlay as a ratio to GDP.

***Multiple channels of transfers and inappropriate distribution criteria***

There is an imbalance between revenue assignments relative to the expenditure responsibilities of States. Transfers from the Central government to the States seek to correct such imbalances. However, these transfers are determined/recommended by multiple agencies such as Finance Commission, Planning Commission and Central Ministries. Increasing dependence of States for current transfers from the Centre leads to weakening of their fiscal discipline. Formula for inter se distribution of taxes does not take into account important parameters such as poverty and unemployment levels in the State. The equalisation transfers should serve the objective of reducing inequality among States.

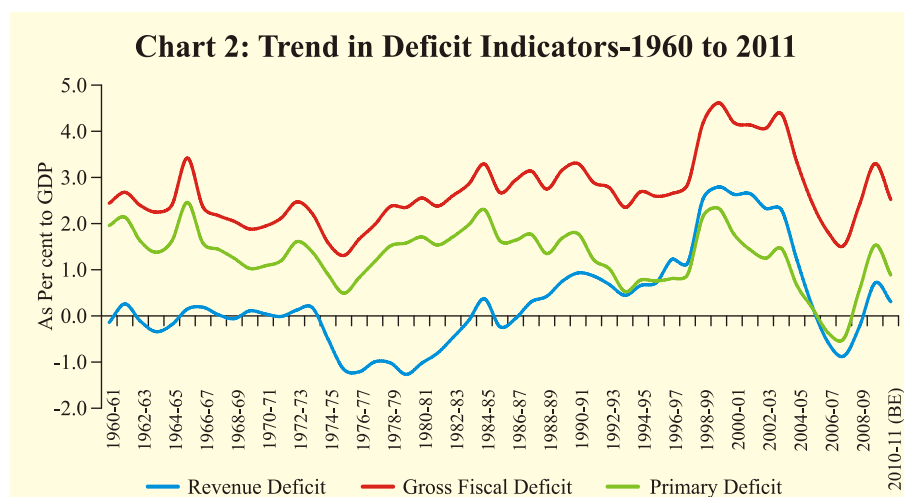
**IV. Fiscal Management -An Overview**

Fiscal position of States was not a concern till 1985-86 as revenue account was either in surplus or marginally in deficit while fiscal deficit of all States at the consolidated level was less than 3 per cent of GDP. In fact, remarkable improvement in terms of maintaining surplus in revenue account and reduction in fiscal deficit was observed between 1974-75 to 1986-87 (longest period of persistent revenue surplus) due to larger devolution of resources from the Centre and substantial debt relief on lines of the recommendations of the Sixth Finance Commission. However, deterioration in the finances of States started in 1987-88 in the wake of increased expenditure on salary and pension due to the pay revisions in some States which was supplemented by higher expenditure on relief and rehabilitation on account of floods in a number of States. Deterioration became sharper in the late 1990s due to the Fifth Pay Commission awards to

the State government employees. States witnessed sharp increases in their revenue and fiscal deficit in the subsequent years till 2003-04 on account of decline in States' own non-tax revenues due to losses of State enterprises and decline in transfers from the Centre due to low economic growth. Higher revenue and fiscal deficits resulted in accumulation of debt which, in turn, increased the interest burden of the States during this period. In view of considerable fiscal stress and the need to finance the requirement of investment in infrastructure, States extended guarantees to State enterprises. Consequently, outstanding guarantees as a ratio to GDP also increased substantially from 6.1 per cent in 1991-92 to 8.0 per cent in 2000-01.

Since 2002-03, the Central government and the States Governments, on their own as well as on the basis of the recommendation of the Twelfth Finance Commission, introduced systematic reforms in the areas of revenues, expenditure and fiscal discipline. First, realising the growing interest burden of the States, the Central government introduced the debt swap scheme under which high cost Central loans of the States having interest rate of above 13 per cent were swapped through fresh issuances of low cost market borrowings and securities issued to National Small Savings Fund (NSSF). Second, the Twelfth Finance Commission (TwFC) recommended Debt Consolidation and Relief Facility (DCRF) by linking it to the enactment of Fiscal Responsibility and Budget Management (FRBM) Act by the States. These measures resulted in significant decline in interest payments of the States in subsequent years and also brought about fiscal discipline for States which enacted their FRBM Acts. Third, State governments implemented Value Added Tax (VAT) to replace State sales tax which improved their revenue performance. Fourth, many States implemented New Pension Scheme (NPS) for their employees which enabled them to control their pension liabilities in the recent years (Box 1). Consequently, there was a remarkable improvement in the fiscal position through decline in revenue expenditure and increase in revenue receipts between 2005-06 and 2007-08. The revenue account of States at the consolidated level turned surplus in 2006-07 after the gap of 19 years and remained so during 2007-08 and 2008-09. States also recorded progressive reduction in GFD-GDP ratio and debt-GDP ratio during these years. However, the impact of the Sixth Pay Commission on the revenue expenditure and lower receipts due to macroeconomic slowdown halted the process of fiscal correction in 2008-09 and 2009-10. With the revival in economic growth during 2010-11, States, however, resumed fiscal correction path by reducing key deficit ratios (Chart 2).





An inter-temporal analysis of the revenue account<sup>2</sup> clearly shows five different phases. The contribution of receipts and expenditure in the correction/deterioration of revenue account has undergone changes from time to time in accordance with the emerging situation.

***Phase I: Improvement in revenue account entirely through higher receipts (1960-61 to 1976-77)***

In the first phase, revenue account was either in surplus or in a marginal deficit. Revenue surplus increased from 0.1 per cent of GDP at the start of the phase to 1.2 per cent by the end of the phase (1976-77). Thus, revenue account recorded an improvement of 1.1 percentage point of GDP during this phase which was due to higher revenue receipts, particularly from States' own revenues. In fact, the increase in revenue receipts not only contributed to the revenue account correction but also compensated for increase in expenditure over the same period (Table 2).

***Phase II: Deterioration in revenue account entirely through revenue expenditure (1977-78 to 1986-87)***

The revenue account of the States was in surplus in all the years (except 1984-85) during this phase. However, a decline in surplus by 0.9 percentage

<sup>2</sup> Revenue account is composed of revenue receipts and revenue expenditure. Revenue receipts of the States includes tax revenues (States own taxes and share in Central taxes) and non-tax revenues (States own non-tax revenue and Grant-in-aid from the Central government). Most of the committed items of expenditure such as interest payments, expenditure on wages and salaries and pension comes in the category of revenue expenditure. Excess of revenue expenditure over the revenue receipts leads to a deficit in the revenue account.

**Table 2: Contribution in the correction/deterioration in Revenue Account**

	Phase I 1960-61 to 1976-77		Phase II 1977-78 to 1986-87		Phase III 1987-88 to 2001-02		Phase IV 2002-03 to 2007-08		Phase V 2008-09 to 2010-11 (BE)	
	Vari- ation*	Contri- bution#	Vari- ation*	Contri- bution#	Vari- ation*	Contri- bution#	Vari- ation*	Contri- bution#	Vari- ation*	Contri- bution#
<b>I. Revenue Deficit (III-II)</b>	-1.1		0.9		2.3		-3.2		0.5	
<b>II. Revenue Receipts (1+2)</b>	4.1	388.1	2.5	264.6	-1.4	-57.6	1.4	42.6	-0.9	-159.1
<b>1. Own Revenue Receipts</b>	2.3	215.6	1.1	122.0	-0.5	-21.3	0.3	9.2	-0.5	-95.5
1.1 Own Tax Revenue	1.8	170.7	1.1	114.9	0.0	0.3	0.2	5.4	-0.4	-65.4
1.2 Own-non Tax Revenue	0.5	44.9	0.1	7.2	-0.5	-21.6	0.1	3.8	-0.2	-30.2
<b>2. Transfers from Centre</b>	1.8	172.5	1.3	142.6	-0.9	-36.3	1.1	33.4	-0.3	-63.6
2.1 Share in Central Taxes	0.9	82.6	0.9	96.6	-0.4	-17.4	0.7	22.8	-0.3	-63.4
2.2 Grants	1.0	89.9	0.4	45.9	-0.4	-18.9	0.3	10.6	0.0	-0.1
<b>III. Revenue Expenditure</b>	3.1	-288.1	3.4	-364.6	1.0	-42.4	-1.8	57.4	-0.3	59.1

\* Variation in percentage points of GDP. # Contribution in Variation (per cent).

Note: Minus (-) sign in variation in deficit shows improvement.

Source: State Finances: A Study of Budgets, RBI, various issues and authors calculations.

point of GDP was observed over the period of this phase. Deterioration in revenue account was due to substantial increase in expenditure by 3.4 percentage points of GDP, even though it was compensated by increase in revenue receipts (2.5 percentage points of GDP). Improvement in revenue receipts was mainly through current transfers (States share in Central taxes and grant-in-aid from the Centre).

***Phase III: Persistent and widening revenue deficit caused by lower receipts and higher expenditure (1987-88 to 2001-02)***

State governments witnessed persistent revenue account deficit during this phase. Over the period of this phase, revenue deficit increased by 2.3 percentage points of GDP to 2.7 per cent of GDP in 2001-02. The deterioration was on account of both lower receipts and higher expenditure. The share of revenue receipts and revenue expenditure in deterioration accounted for 57.6 per cent and 42.4 per cent, respectively. Within revenue receipts, the share of decline in current transfers in revenue account deterioration (36.3 per cent) was larger than that of States' own revenues (21.3 per cent).

***Phase IV: Remarkable improvement aided by buoyant receipts and lower expenditure (2002-03 to 2007-08)***

This period can be described as a combination of systematic reforms and a rule based fiscal framework. State governments initiated a process of fiscal reforms which helped in improving their revenue account. These reforms/initiatives include, successful implementation of VAT to replace sales tax by all the States, rule based fiscal framework enacting Fiscal Responsibility and Budget Management Act and New Pension Scheme. Apart from these, 'Debt Consolidation and Relief Facility' recommended by the TwFC and 'Debt Swap Scheme' introduced by Central government benefited States in turning their revenue account into surplus (Chart 2 and Box 1). The revenue deficit of 2.3

**Box 1: Institutional Reforms Initiated at State level**

- 1) Fiscal Responsibility and Budget Management (FRBM) Acts at State Level:** All States (except Sikkim and West Bengal) enacted between September 2002 (Karnataka) and May 2007 (Jharkhand). West Bengal and Sikkim enacted FRBM in 2010.
- 2) Value Added Tax (VAT):** VAT introduced by all the States to replace States sales tax.
- 3) Debt Swap scheme:** The Debt Swap Scheme (DSS) which was formulated by Government of India to enable the States to prepay Central loans, which had an interest rate of over 13 per cent, by raising lower cost debt from the market or through small savings schemes. DSS was operational from 2002-03 to 2004-05. During this period, outstanding Central loans amounting to Rs. 1.02 lakh crore were prepaid by the States.
- 4) Debt Consolidation and Relief Facility (DCRF):** Under the Debt Consolidation and Relief Facility recommended by the Twelfth Finance Commission (TwFC), Central loans to the States contracted till March, 31, 2004 and outstanding on March 31, 2005 were consolidated at an interest of 7.5 per cent and rescheduled for a term of 20 years (with repayment in 20 equal annual installments). These benefits were made available to the State Governments from the year in which they enacted Fiscal Responsibility and Budget Management Acts in line with the recommendations made by the Twelfth Finance Commission.
- 5) Consolidated Sinking Fund (CSF):** To cushion repayments of open market loans, 20 States (excluding Bihar, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Rajasthan and Uttar Pradesh) constituted CSF.
- 6) Guarantees Redemption Fund (GRF):** To provide a cushion to the servicing of contingent liabilities arising from the invocation of guarantees issued by the State governments, 15 States (Andhra Pradesh, Goa, Gujarat, Haryana, Jammu and Kashmir, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Rajasthan, Sikkim, Tamil Nadu and Uttarakhand) constituted GRF.
- 7) New Pension Scheme (NPS):** 20 States (excluding Arunachal Pradesh, Jammu and Kashmir, Meghalaya, Mizoram, Nagaland, Punjab, Tripura and West Bengal) introduced new pension scheme.

**Source:** State Finances: A Study of Budgets, RBI, various issues.

per cent of GDP in the initial year of the phase changed into a surplus of 0.9 per cent of GDP. Thus, over the period of this phase, revenue account witnessed an improvement of 3.2 percentage points of GDP. Both receipts and expenditure contributed in correcting revenue account during this phase. However, the contribution of expenditure was higher (57.4 per cent) than receipts (42.6 per cent). Within revenue receipts, the contribution of current transfers (33.4 per cent) was significantly higher than the States' own revenues (per cent 9.2).

***Phase V: Turnaround from surplus to deficit entirely due to lower receipts [2008-09 to 2010-11 (BE)]***

Impact of the Sixth Pay Commission awards on the revenue expenditure and macroeconomic slowdown on the revenues led to deterioration in revenue account during 2009-10. While revenue receipts continued to decline, significant reduction in revenue expenditure facilitated correction in revenue account during 2010-11. Thus, despite correction in 2010-11, revenue account witnessed deterioration of 0.5 percentage points during this phase (2010-11 over 2008-09). Within revenue receipts, States own revenues accounted for 95.5 per cent of the deterioration in revenue account during this phase.

***Fiscal and institutional reforms helped in improving gross fiscal deficit and its quality***

Gross fiscal deficit of the States is the excess of total expenditure (excluding debt repayments) of the State government over its revenue receipts and non-debt capital receipts. Thus, it reflects the borrowing requirement of the States to finance the expenditure to be incurred during a particular financial year. In order to analyse quality of fiscal deficit its decomposition into revenue deficit, capital outlay and net lending shows the utilisation of borrowed resources. Higher GFD utilised for capital outlay improves growth prospect of the economy while its use for meeting revenue deficit can put pressure on interest and debt levels of the government.

**Table 3: Phase-wise Averages of Key Deficit Indicators**

(As a ratio to GDP)

	Phase I 1960-61 to 1976-77	Phase II 1977-78 to 1986-87	Phase III 1987-88 to 2001-02	Phase IV 2002-03 to 2007-08	Phase V 2008-09 to 2010-11 (BE)
	Average				
Revenue Deficit	-0.2	-0.6	1.3	0.8	0.3
Gross Fiscal Deficit	2.2	2.6	3.2	2.9	2.7
Primary Deficit	1.4	1.7	1.4	0.4	1.0

**Note:** Minus (-) sign indicates surplus.

**Source:** State Finances: A Study of Budgets, RBI, various issues.

Gross fiscal deficit at the consolidated level was below the mark of 3.0 per cent of GDP in phase I and II (Table 3). GFD in the first two phases was used either for capital outlay or lending as revenue account in these phases was in surplus. Capital outlay and net lending together accounted for above 100 per cent of GFD during these phases (Table 4). However, GFD-GDP ratio crossed 3.0 per cent mark in 1987-88 and peaked at 4.6 per cent in 1999-2000 (highest during 1960-61 to 2010-11). On average, GFD-GDP ratio was 3.2 per cent during the third phase (Table 3). Causative factors for higher GFD during this phase were increase in expenditure on salaries and pension of State government employees in pursuance of the recommendations of the fifth pay commission, compensating losses of State public enterprises viz., State electricity distribution companies on account of populist measures such as free/subsidised power to farmers, reimbursement of losses incurred by State Transport companies for carrying certain categories of passengers such as students, physically challenged, freedom fighters, *etc.*, at lower fares (Gupta, 2007). The worrisome feature of the GFD during this phase was substantially higher proportion of revenue deficit (35.9 per cent of GFD) indicating that borrowed resources were being used to meet current expenditures (Table 4). While capital outlay was accounted for 74.0 per cent (average) of GFD, substantial decline in net lending was observed during this phase.

The fiscal reforms at the State level started from 2002-03 contributed to the foundation of fiscal consolidation of the State governments. Reforms such as implementation of VAT, enactment of FRBMs, debt consolidation and relief facility and robust growth in the economy benefited States in improving their finances during the fourth phase. Though GFD-GDP ratio during this phase averaged 2.9 per cent, it declined to 1.5 per cent in 2007-08. States governments during this period had not only taken initiatives for reducing fiscal imbalance but also had undertaken comprehensive reforms such as constitution of Consolidated Sinking Fund and Guarantee Redemption Fund (Box 1). Considering the growing emphasis on social and physical infrastructure, the decomposition of GFD of the States had also undergone changes with the passage of time. Consequently, capital outlay accounted for 84.1 per cent (average) of the GFD during this phase.

The process of fiscal consolidation experienced by the States in the fourth phase was paused during the fifth phase due to combined impact of Sixth Pay Commission awards and the macroeconomic slowdown. In order to boost aggregate demand in the economy, Central government allowed States to borrow additional 0.5 per cent of their GSDP by relaxing fiscal deficit target under

**Table 4 : Decomposition of GFD<sup>3</sup>**

(As a ratio to GDP)

	<b>Phase I 1960-61 to 1976-77</b>	<b>Phase II 1977-78 to 1986-87</b>	<b>Phase III 1987-88 to 2001-02</b>	<b>Phase IV 2002-03 to 2007-08</b>	<b>Phase V 2008-09 to 2010-11 (BE)</b>
	<b>Average</b>				
Revenue Deficit	-10.9	-24.1	35.9	10.8	8.2
Capital Outlay	71.3	78.7	48.8	84.1	88.1
Net Lending	39.6	45.4	15.4	7.0	4.4

**Note:** Minus (-) sign indicates surplus.**Source:** State Finances: A Study of Budgets, RBI, various issues.

FRBM to 3.5 per cent in 2008-09 and further to 4.0 per cent in 2009-10. Consequently, GFD-GDP ratio increased to 3.3 per cent of GDP in 2009-10 (RE) before declining to 2.5 per cent in 2010-11 (BE). Thus, on average, GFD-GDP ratio remained at 2.7 per cent during the fifth phase [2008-09 to 2010-11 (BE)]. It may be noted that while the proportion of capital outlay to GFD averaged higher at 88.1 per cent, net lending as a ratio to GFD continued to decline and reached at lowest level of 4.4 per cent during this phase (Table 4).

#### ***Improvement in primary deficit reflects trend in GFD***

States at the consolidated level incurred primary deficit<sup>4</sup> during all the years of last five decades (except 2006-07 and 2007-08). Broadly, primary deficit followed similar trend to that of GFD in the first and second phase. However, during the phase of extreme deterioration, *i.e.*, third phase, PD-GDP ratio was lower even though GFD was higher, thereby reflecting the dominance of interest burden in the expenditure of States. In the fourth phase, *i.e.*, the phase of consolidation, significant improvement was witnessed in PD-GDP ratio. In fact, primary deficit turned into surplus in 2006-07 and 2007-08. However, with the upward movement in GFD, PD-GDP ratio worsened again during the fifth phase (Table 3).

## **V. Receipts and Expenditure Management**

### ***Improvement in total revenue receipts aided by current transfers and States' own tax revenues***

Phase-wise average of revenue receipts as per cent to GDP shows that revenue receipts of the States witnessed gradual and significant increase during

<sup>3</sup> For the purpose of analysing the quality of expenditure, GFD is decomposed into revenue deficit, capital outlay and net lending which may not add-up to total as it excludes non-debt capital receipts.

<sup>4</sup> Primary deficit is fiscal deficit less interest payments and thus its shows the excess of non-interest expenditure of the States over its revenue receipts and non-debt capital receipts.

**Table 5: Phase-wise Performance of Revenue Receipts**

(As a ratio to GDP)

	Phase I 1960-61 to 1976-77	Phase II 1977-78 to 1986-87	Phase III 1987-88 to 2001-02	Phase IV 2002-03 to 2007-08	Phase V 2008-09 to 2010-11 (BE)
	<b>Average</b>				
<b>A. Revenue Receipts (1+2)</b>	<b>7.3</b>	<b>11.0</b>	<b>11.4</b>	<b>11.7</b>	<b>12.1</b>
<b>1. Own Revenue (a+b)</b>	<b>4.7</b>	<b>6.7</b>	<b>7.0</b>	<b>7.1</b>	<b>7.0</b>
a. Own Tax Revenue	3.2	4.8	5.3	5.7	5.6
b. Own Non-tax Revenue	1.4	1.9	1.7	1.4	1.4
<b>2. Current Transfers (c+d)</b>	<b>2.7</b>	<b>4.3</b>	<b>4.4</b>	<b>4.6</b>	<b>5.1</b>
c. Share in Central Taxes	1.4	2.4	2.5	2.6	2.7
d. Grants from the Centre	1.3	1.9	1.9	2.0	2.5

**Source:** State Finances: A Study of Budgets, RBI, various issues.

the last five decades. Both own revenues of the States and current transfers from the Centre contributed to increase in revenue receipts by 4.8 percentage points of GDP in the fifth phase as compared to the first phase. However, the contribution of current transfers which increased gradually over the period, was more than the own revenues of the States. While increase in the current transfers was contributed by States' share in Central taxes and grant-in-aid, increase in own revenues during the same period was entirely on account of own tax revenues of the States. However, improvement in States' own non-tax revenues witnessed during the second phase could not sustain over the period and declined during the third and fourth phase. Thus, own non-tax revenues of the States remained stagnant over the period (Table 5).

***Higher own revenues in the post reform period reflecting better performance of own taxes***

Own tax revenue has remained major source of States' own revenues and witnessed gradual increase during the first four phases. It has increased substantially by 2.4 percentage points to 5.7 per cent in the fourth phase as compared to the first phase (3.2 per cent of GDP). Tax reforms such as rationalisation of taxes and simplification of procedures by States in 1991 mandated States to rationalise their taxes which helped them in generating more revenues. Implementation of VAT replacing State sales tax also improved tax collections of States. However, anti-recessionary measures of reducing/

**Table 6. Trend in Revenue from Major Own Tax and Non-Tax Sources**

(As per cent to GDP)

	1990-91 to 1994-95	1995-96 to 1999-00	2000-01 to 2004-05	2005-06 to 2009-10	2005-06	2006-07	2007-08	2008-09	2009-10 (RE)	2010-11 (BE)
	Average									
<b>Major Own Tax Sources</b>										
Stamps and Registration fees	0.41	0.45	0.52	0.68	0.67	0.76	0.75	0.65	0.60	0.58
State Sales Tax/VAT	2.41	2.35	2.61	3.01	2.84	3.00	3.07	3.20	2.92	2.85
State Excise	0.81	0.69	0.71	0.70	0.68	0.68	0.68	0.73	0.73	0.70
<b>Major Own Non-Tax sources</b>										
Interest Receipts	0.57	0.49	0.36	0.27	0.25	0.28	0.25	0.29	0.26	0.21
Dividends and Profits	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
General Services	0.38	0.41	0.33	0.43	0.32	0.43	0.53	0.40	0.46	0.35
Social Services	0.11	0.10	0.11	0.14	0.12	0.16	0.16	0.14	0.13	0.14
Economic Services	0.78	0.60	0.60	0.60	0.59	0.59	0.60	0.62	0.61	0.59

Source: State Finances: A Study of Budgets, RBI, various issues.

exempting taxes in the wake of macroeconomic slowdown resulted to marginal decline in own tax revenue to 5.6 per cent of GDP in fifth phase (Table 5).

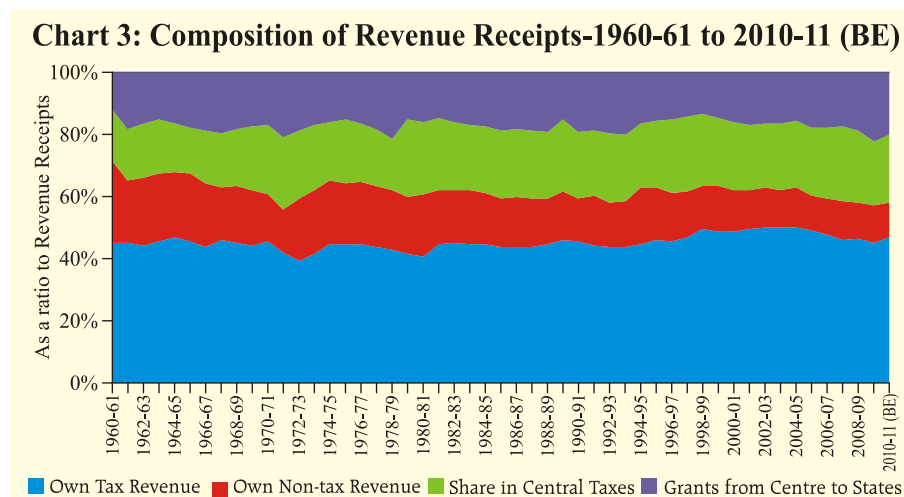
Table 6 shows that 'State sales tax/VAT' is the major source of States' own tax revenue followed by 'State Excise' and 'Stamps and Registration fees'. The trend in revenues from these taxes indicates that while VAT and State excise improved marginally, the revenues from Stamps and Registration fees declined during 2006-07 to 2008-09. On the States' own non-tax front, revenue from economic services constitutes major source of non-tax revenue, followed by interest receipts and general services (Table 6).

Revenues from major sources of own non-tax revenue has remained either stagnant or declined since 2006-07 (Table 6). Own non-tax revenues have remained subdued as the State enterprises such as State Electricity Boards have been incurring huge losses while the non-tax revenues from various social and economic services also remained poor due to lack of proper user charges and cost recovery. Both these factors resulted in decline in States' own non-tax revenue as a ratio to GDP.

#### ***Share of States' own revenues in total revenue receipts declined over the last five decades***

Composition of revenue receipts shows that the share of States own revenue has declined while the share of current transfers have increased over the last five decades. Within States' own revenue the share of own tax revenue recorded





marginal increase while own non-tax revenue witnessed decline over the same period. Within the current transfers, the States' share in Central taxes has registered marginal rise while the grant-in-aid witnessed decline in its share in total revenue receipts over the period (Chart 3).

### ***Substantial increase in total expenditure entirely due to revenue expenditure***

As per the Indian Constitution, expenditure responsibilities of the social sector and economic infrastructure are assigned largely to the State governments. In order to improve the social well being, the States need to step up their expenditure on social services such as education and health. However, expenditure of the States has been dominated by committed component. Given the budgetary constraint facing States, these expenditure commitments have been largely financed by borrowings. To improve the quality of expenditure, rationalisation measures aiming reduction in non-development expenditure and increasing development expenditure were adopted by the States over the period.

An evolution of the expenditure pattern of the States reveals that the average total expenditure as a ratio to GDP increased gradually from 11.1 per cent in the first phase to 16.3 per cent in the fourth phase before declining to 15.7 per cent in the fifth phase. The major issue in the composition of States expenditure is declining capital expenditure. In other words, given the composition of expenditure, increase in total expenditure is entirely on account of revenue expenditure which is considered to be less productive than the capital expenditure. In view of the limitation to enhance expenditure and dominance

of committed expenditure, the expenditure reforms remained priority area of the State budgets during the recent years.

***Decline in capital expenditure and widening gap between revenue and capital expenditure***

Quality of expenditure by State governments can be gauged from the fact that the average share of revenue expenditure in total expenditure increased from 65 per cent in the first phase to 79 per cent in fifth phase. Accordingly, the average share of capital expenditure in total expenditure declined sharply from 35 per cent in the first phase to merely 21 per cent in the fifth phase (Table 7).

**Table 7: Phase-wise Expenditure Pattern**

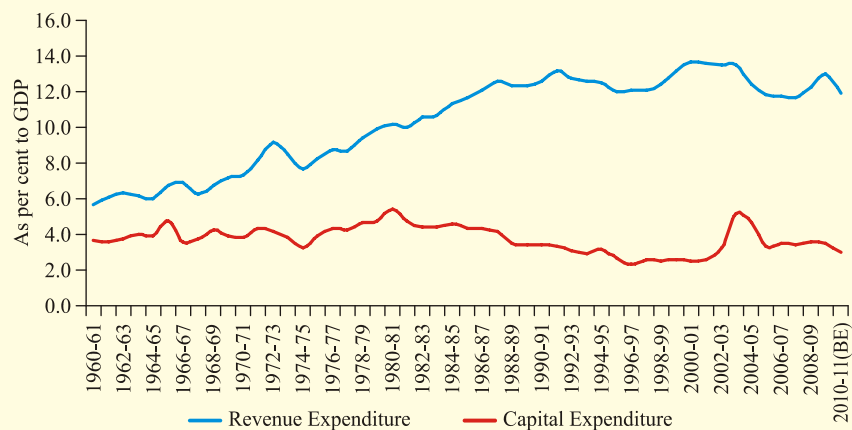
(As a ratio to GDP)

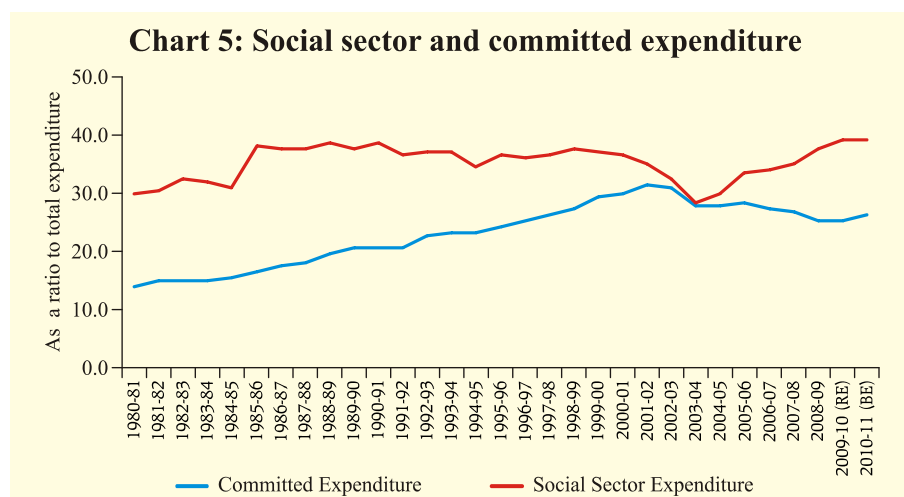
	<b>Phase I 1960-61 to 1976-77</b>	<b>Phase II 1977-78 to 1986-87</b>	<b>Phase III 1987-88 to 2001-02</b>	<b>Phase IV 2002-03 to 2007-08</b>	<b>Phase V 2008-09 to 2010-11</b>
	<b>Average</b>				
Total Expenditure	11.1	15.0	15.6	16.3	15.7
Revenue Expenditure	7.2	10.5	12.7	12.5	12.4
Capital Expenditure	3.9	4.6	3.0	3.9	3.4
	<b>(As per cent to total expenditure)</b>				
Revenue Expenditure	64.4	69.4	81.0	76.3	78.7
Capital Expenditure	35.6	30.6	19.0	23.7	21.3

**Source:** State Finances: A Study of Budgets, RBI, various issues.

Uptrend in revenue expenditure and downtrend in capital expenditure reflect concerns with regard to expenditure quality (Table 7 and Chart 4).

**Chart 4: Revenue and Capital Expenditure-1960 to 2011**





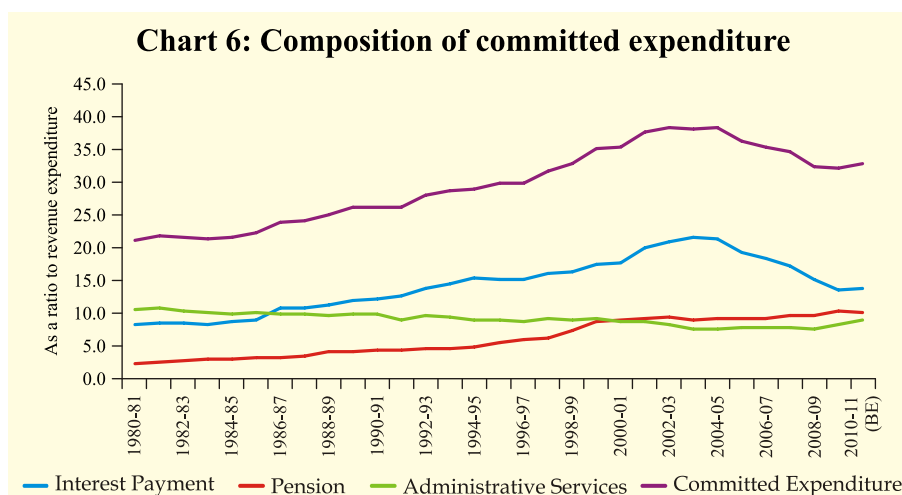
***Reduction in committed expenditure facilitated higher social sector expenditure in recent years***

Apart from analysing revenue and capital composition of States expenditure, social sector expenditure (SSE) which comprises expenditure on social services, rural development and food storage and warehousing assumes importance as these are the areas which fall in the domain of States. On average, SSE accounts for around one-third (average) of States total expenditure. The share of SSE in total expenditure has been rising in recent years. The share of committed expenditure in total expenditure has almost doubled during the past three decades even though some moderation was observed since 2003-04 due to reduction in interest burden (Chart 5).

***Committed expenditure is dominated by interest payments and pension***

Chart 6 shows that since 1985-86 committed expenditure (comprising interest payments, pension and administrative services) recorded substantial increase up to 2002-03. The share of committed expenditure in revenue expenditure increased from 21.1 per cent in 1980-81 to 38.4 per cent in 2002-03. However, it started declining since 2003-04 and recorded at 32.7 per cent in 2010-11 (BE). The share of interest payments and pension in revenue expenditure has increased while the same of administrative services has declined over this period (Chart 6).

During the first half of 1980s, the share of expenditure on administrative services in revenue expenditure was higher than interest payments and pension.

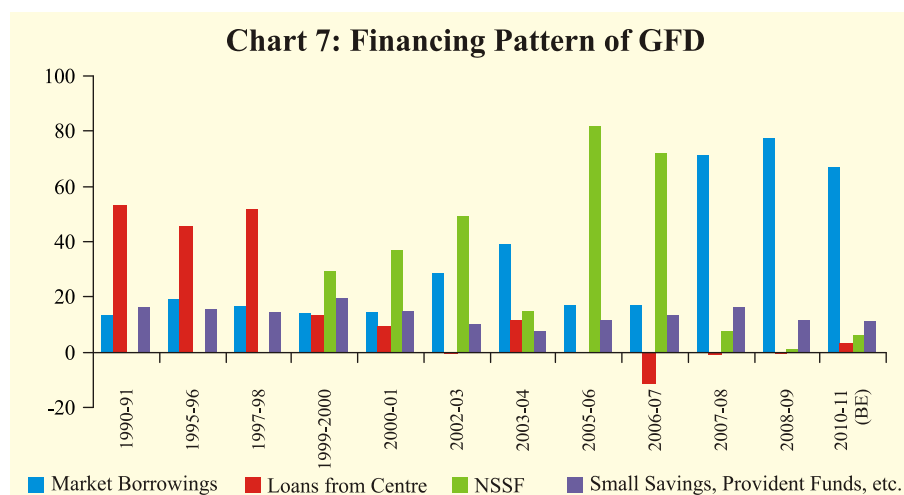


However, since 1985-86, interest payments have become highest component followed by administrative services till 1999-00. In 2000s, rising debt levels led to the dominance of interest payments in the revenue expenditure. However, the share of interest payments in revenue expenditure declined since 2004-05 due to decline in interest burden of States which was facilitated by debt swap scheme, Debt Consolidation and Relief Facility and decline in debt-GSDP ratio across States. Pension emerged as second highest component of revenue expenditure due to implementation of the fifth pay commission at the State level in the late 1990s which remained rigid in the subsequent years even though many State governments have taken initiatives towards new pension scheme in the second half of 2000s. However, expenditure on administrative services as a ratio to revenue expenditure declined marginally during 2000s.

## **VI. Financing pattern of gross fiscal deficit (GFD), Outstanding debt and its composition**

### ***Emergence of market borrowings as a major source of financing GFD***

Financing pattern of gross fiscal deficit was dominated by Central loans to the States during 1980s and 1990s. However, the share of Central loans has recorded decline since the second half of 1990s. This was attributable to the setting up of National Small Savings Fund and phasing out 'Central loans to States' as recommended by the Twelfth Finance Commission. Recognising stable characteristic of NSSF loans, the securities issued to NSSF emerged as the dominant component, financing around 82 per cent of GFD in 2005-06.



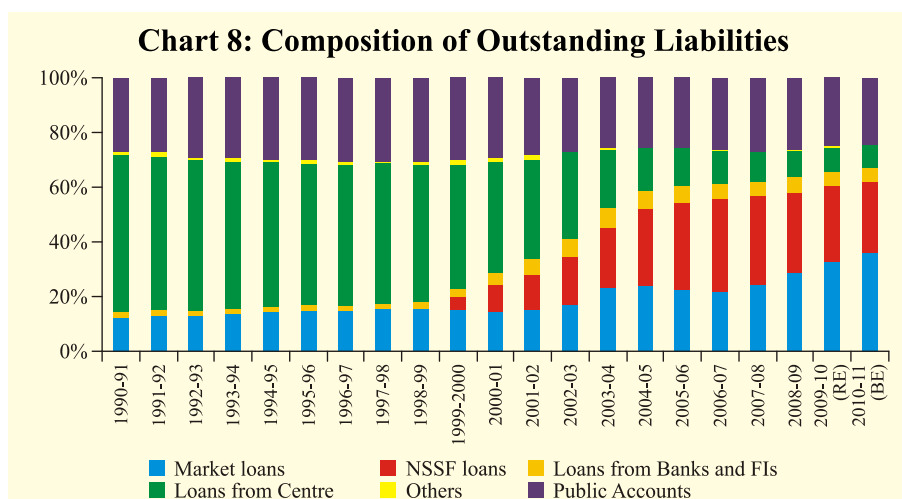
However, with the development in government securities market and increasing cost differentials between small savings and the market borrowings, States began to prefer market borrowings as a source of financing their GFD.

As evident from chart 7, financing pattern of States' GFD shows three distinct phases. In the first phase, during 1990-91 to 1998-99 (till the introduction of NSSF) loans from Centre to States financed around 50 per cent of GFD. Second phase started with the introduction of NSSF and securities issued to NSSF was major source financing GFD till 2006-07. However, in the third phase, *i.e.*, since 2007-08, market borrowings have clearly emerged as major source of financing States' GFD (Chart 7).

#### ***Decline in debt burden and shift in its composition***

The structural weaknesses in the fiscal position of States during the latter half of 1980s resulted in widening revenue and fiscal deficits, which consequently translated into substantial rise in the size of outstanding debt of the States. Increased borrowings to finance deficits also led to increased burden of interest payments and hence revenue expenditure. As a result States fell into vicious cycle of debt trap.

The outstanding stock of debt in absolute as well as in terms of GDP continued to deteriorate during 1990s and early 2000s. States' outstanding debt as a ratio to GDP was 22.5 per cent as at end-March 1991 which increased to 32.8 per cent as at end March 2004. Consequently, the expenditure on discharge of debt by way of loan repayments and interest outgo also increased significantly during the late 1990s and early 2000s. However, improvement in State finances



and DCRF helped States in bringing down debt to 23.1 per cent of GDP as at end-March 2011.

Composition of outstanding liabilities of the States shows that outstanding Central loan being a major source of financing GFD in 1990s, was the major component of States liabilities. However, in line with the trend observed in financing GFD, the share of outstanding Central loans in liabilities declined significantly since 1999-2000 due to setting up of NSSF. The Twelfth Finance Commission's recommendation of phasing out Central loans to States also resulted in lowering its share since 2004-05. Being a stable source of financing the GFD, the share of special securities issued to NSSF in States liabilities has increased steadily up to 2006-07. However, owing to the decline in the collections under NSSF, market loans emerged as the most important source of financing the GFD as well as major component of outstanding liabilities of State governments in recent years. Further, high cost loans swapped by additional market borrowing under debt swap scheme contributed to higher share of market loans in liabilities of the States (Chart 8).

## VII. Issues in State finances

Despite the efforts of the successive Finance Commissions, increasing share of the Centre in combined revenue receipts suggests that the issue of vertical fiscal imbalance continues to exist. Even though horizontal fiscal imbalances across States are still evident, efforts have been taken to reduce them through special purpose grants by the Finance Commissions (11th and 12th) which, to some extent, helped in balancing revenue account across States.

Structural problems such as, variation in imposing certain taxes, lower non-tax revenues and influence of the Centre through centrally sponsored schemes, need to be addressed in order to achieve the aim of greater fiscal decentralisation and reduction in horizontal fiscal imbalance.

The analysis of fiscal management of States over the last five decades brings forth a number of features. First, the revenue account management of States was guided by current transfers and committed expenditure. States need to focus on generating their own revenues and towards this end the introduction of GST is likely to be a good beginning.

Second, fiscal deficit and its composition were relatively favourable till the second half of 1980s. However, its magnitude and composition posed challenge for State finances in the subsequent years till 2003-04. Even though the fiscal deficit emanated from the higher capital outlays across States during 2002-03 to 2007-08, emphasis on revenue balance should continue to be a part of amended FRBM Acts of the States.

Third, the expenditure management of the States has been poor. It has been observed that during the phase of implementation of Pay Commission and macroeconomic slowdown in the Indian economy, capital outlay has often been compromised. States need to prepare for such adverse macroeconomic conditions by adopting sound fiscal strategies.

Going forward, the need is to put in place amended FRBM Acts so as to sustain the process of fiscal correction which ensures not only high growth potential but also provides fiscal room when counter-cyclical policies are required.

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**The Myth of Too Big to Fail, Imad A. Moosa (Palgrave Macmillan Studies in Banking and Financial Institutions, UK), 2010; pp XV+223, £65.**

In the aftermath of recent financial crisis, the *too-big-to-fail* (TBTF) issue is at the forefront of the debate on financial regulatory reform as witnessed in most of the developed economies like the United States, United Kingdom, and Switzerland. In much of Europe and especially at the European Union level and in Asia-Pacific region, however, the TBTF problem sparsely present in substantial financial policy debates. This looks paradoxical at the first glance, but this very fact also makes it more intractable. Furthermore, the discussion on possible remedies is not a simple one, and many gaps remain in our analytical understanding. Moreover, given the potential risks to systemic stability, there is a case for policy action even in the absence of analytical certainty. There are different dimensions to the problem, each of which is associated with different policy options, including absolute bank size, market concentration, conglomeration, internationalisation, and complexity. However, these difficulties should not be taken as an excuse to avoid an in-depth debate. There is no book in recent times with a sweep as comprehensive and vast, insights as rich and thoughtful, and production as prolific and well done as the *Myth of Too Big to Fail* by Imad A. Moosa, an academician, an economist and a financial journalist as well.

The book is divided into ten chapters and highly critical of the TBTF doctrine and related issues such as *laissez faire* finance, the trend towards massive deregulation, and status of the financial sector in the world-wide economy. It is critical of not only the practice, but also the ideas that drive the practice – some of which are the products of academic work. Most of the discussion in this book pertains to developments in the United States, where the deposit insurance was invented and the term TBTF was coined. The author has mentioned that, it is a normative issue that you can't be neutral about and any discussion is bound to be highly opinionated. This book has been written to explain, by using economic analysis as well as empirical and historical evidence, the popular outrage about TBTF and taxpayers-funded bailouts of failing financial institutions. There was no ideological drive or a hidden agenda than to say frankly – *the too big to fail doctrine is a myth that must go like the dinosaurs, and quickly.*

### **TBTF and Global Financial Crisis**

The dramatic federal response to the current financial crisis has created a new reality in which virtually all systemically significant financial institutions now enjoy an implicit guarantee from the government that they will continue to exist (so also continue to exert moral hazard) long after the immediate crisis passes. The crisis has made it clear that the TBTF doctrine amounts to rescue banks from their own mistakes by using taxpayer's money. The TBTF problem has gained importance in March 2008 with the controversial rescue of 'Bear Stearns', when the US Federal Reserve backed J P Morgan Chase's purchase of that ailing investment bank, and then again symmetrically in September 2008 when the US authorities' decision to let 'Lehman Brothers' fail ushered in a sequence of major market disruptions. On October 10, 2008, a few weeks after the Lehman collapse, the finance ministers and central bank governors of G-7 countries met in Washington, and 'agreed to take decisive action and use all available tools to support systemically important financial institutions and prevent their failure'. The United States and European Union have different starting points for the TBTF debate, in part for reasons linked to their respective histories including the experience of the recent crisis.

The United States has a long tradition of suspicion and concern about large banks, which goes as far back as the controversy between Alexander Hamilton and Thomas Jefferson about the establishment of the First Bank of the United States in 1791. For a long time, the growth of a 'national' financial system was kept in check by initiatives to restrain banking. During the Great Depression of 1930s, the Glass-Steagall Act of 1933 forced a strict separation of investment banking activities from depository banks, leading to the breakup of major institutions. The banking crisis of the 1980s provided a rehearsal for some of the current arguments about the TBTF problem. The crisis surrounding Long-Term Capital Management (LTCM), a hedge fund that suffered heavy losses and liquidity tensions as a result of the Asian and Russian financial crises in 1997-98 and had to be bailed out by major banks under the auspices of the Federal Reserve Bank of New York in September 1998, illustrated a new dimension of the TBTF problem, sometimes referred to as 'too interconnected to fail'. LTCM with assets in excess of \$100 billion was not huge, but it was felt that its bankruptcy would cause a chain of reaction throughout the financial system that could have catastrophic consequences.

### **TBTF Debate**

In a report to G-20 Finance Ministers and Governors, the IMF, BIS, and FSB define systemic risk as ‘a disruption to financial services that: (1) caused by impairment to all parts of the financial system, and (2) has the potential to have serious negative consequences for the real economy. Systemically Important Financial Institutions (SIFIs), whether they are banks or non-banks can then be seen as institutions whose impending failure, inability to operate, and disorderly winding up could produce such systemic effects. The key criteria most often listed for identifying such SIFIs include size, concentration, interconnectedness, performance of systemically important functions, and complexity. Many analysts also include leverage and liquidity as tools to define SIFIs, although these can also be regarded as characteristics of vulnerability that apply to all financial institutions. The book has also recognised that TBTF also has a time-dependent or context-dependent dimension, that is, thresholds for TBTF can be much lower if impending failure occurs at a time.

The IMF explores four approaches for measuring interconnectedness: (1) network simulation that draw on BIS data on cross-border interbank exposures and that tracks the reverberation of a credit event or liquidity squeeze *via* direct linkages in the interbank market; (2) a default intensity model that uses data from Moody’s Default Risk Service and that measures the probability of failures of a large fraction of financial institutions due to both direct and indirect linkages; (3) a co-risk model that utilizes five-year credit default swap (CDS) spreads of financial institutions and that assesses systemic linkages among financial institutions under extreme duress; and (4) a stress-dependence matrix that incorporates individual CDS and probability of default data, along with stock prices, to examine pairs of institutions’ probabilities of distress.

Irrespective of the specific yardstick used to identify SIFIs, one non-trivial policy question is the following: if financial institutions deemed systemically significant are subject to a specific regulatory regime, should this list be made public? Some have argued that going public would undesirably confer official TBTF status on such institutions, thus reinforcing moral hazard. However, it appears unlikely that the identity of firms subject to a specific regulatory treatment can in fact be kept private, especially, since such firms would likely be able to challenge their designation as SIFIs. Indeed, such a challenge is part of the Dodd-Frank Act of 2010 in the new US financial reform legislation and similar concerns are likely to arise in other countries. Also, most large and

complex financial institutions already receive a funding discount and credit rating upgrade in the market (relative to smaller financial institutions) that can be at least partly linked to the formers' perceived higher probability of obtaining government support if they get into trouble. Thus, it is not as if the absence of a public SIFI list will eliminate perceptions of unequal bailout treatment. Most importantly, designation as a SIFI is not identical to deeming that institution TBTF; a SIFI can fail if other elements of the regulatory and/or supervisory regime make resolution credible and orderly and do not make liquidation too expensive for the taxpayer. Conversely, the cases of LTCM in 1998 and of Northern Rock in 2007 suggest that even institutions that would have been unlikely to be included in an official list of SIFIs can be considered too important to be allowed to fail.

### **Prohibiting Bigness**

A first set of policy options is to discourage TBTF and to internalise the externalities associated with bigness and complexity through curbs and incentives. The book has identified three main such options: capital and liquidity surcharges; size-related taxes or levies; and competition policy. The Basel Committee on Banking Supervision (BCBS), which prepares capital and liquidity standards, has discussed for some time the idea of imposing higher capital (and also liquidity) requirements on financial institutions deemed systemically important relative to those not so designated. A second approach would be to create disincentives to bigness through tax or tax-like instruments. This would be especially relevant in countries that envisage setting up a new contribution, tax, or levy on financial institutions as a form of compensation for the public support they receive in the event of crises. Yet a third approach in this category is to use competition policy to curb the size of the largest financial firms. In the European Union, the European Commission has extensively used its powers since the beginning of the crisis to keep a check on state rescues and on the size of rescued firms.

A more radical approach than curbing the size of financial institutions is to prohibit, or cap, them from growing beyond a maximum size. The Dodd-Frank Act of 2010 specifies that any insured depository or systemically important non-bank could be prohibited from merging or acquiring substantially all the assets or control of another company if the resulting company's total consolidated liabilities would exceed 10 per cent of the aggregate consolidated liabilities of all financial companies. This liability size-cap would not require

any existing US financial institutions to shrink, though, and does not prohibit their organic growth in the future.

### **Allowing Banks to Fail**

The book has prescribed a set of proposals to address TBTF relates not to the size of institutions, but to the possibility of their failure. If even huge financial conglomerates can fail without creating major market instability, then their bigness becomes less of an inherent problem. The financial crisis, and especially the successive decisions taken by the US authorities on Bear Stearns, Lehman Brothers, and AIG, has illustrated both the difficulties of applying a consistent policy framework to all crisis situations without creating massive moral hazard, and the disadvantages of taking different stances in different cases.

It is difficult to separate the debate about the possibility of financial institution failure from a more general conversation about competition in the financial industry, which is made more complex by its multifaceted links with financial stability. Competition simultaneously imposes discipline on financial firms, and can foster excessive risk taking. A bank failure can increase concentration, or on the contrary, provide opportunities for new entrants, depending on how open and competitive the banking system is in which it takes place. In a system, where all or most of the financial industry is in government hands, an actual bank failure is virtually impossible and a government bailout is almost guaranteed.

The availability of a resolution regime and resolution authority is a necessary condition to envision the orderly resolution of large financial institutions, but it is not sufficient. The resolution authority does not only need the legal powers to intervene, it must also have the operational capability to do so, which can prove to be a significant challenge in itself. The failure of a large financial conglomerate can be a hugely complex affair, especially as corporate structures in the financial sector have become ever more complex, partly as a result of continuous regulatory and tax arbitrage.

### **Basic Finance without TBTF**

There is only one perceived benefit that can be gained from bailing out financial institutions deemed too big to fail: avoiding a systemic collapse. However, corporate failure is an integral part of the so-called 'creative destruction', which is a feature of capitalism that the TBTF doctrine is inconsistent with. Avoiding systemic failure is a perceived benefit only because

regulators and managers of failed institutions use the language of fear to warn that failure to bailout the underlying institution will cause misery for millions of people. It is all nonsense because humans are resilient. If people can outlive an earthquake or a tsunami, they can surely survive and flourish in the aftermath of the collapse of a bank, an insurance company or a hedge fund.

Financial institutions, it seems, are too important to be left to financiers, and that is why it is prudent to intensify regulation and reverse deregulation. One way forward is to forget about the international harmonisation and unification of banking regulation and to leave every country to formulate its own regulation. This is what happened after the collapse of the Bretton Woods system of fixed exchange rates when countries were allowed to choose the exchange rate system they deemed appropriate for their economies. After all, the global financial crisis has taught us big lessons on financial regulation. The BIS and Basel Committee could still provide a forum for regulators to consult and exchange views. The book is interesting to read as it prescribes that we must return to and embrace the principle of capitalism that a failing firm must vanish with no life support offered by the government and financed by the taxpayer's money.

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**The Rise of Indian multinationals: Perspective of Indian Outward Foreign Direct Investment, edited by Karl P. Sauvant and Jaya Prakash Pradhan with Ayesha Chatterjee and Brian Harley (Palgrave MacMillan: New York), 2010; pp 284, £90.**

The book on ‘The Rise of Indian multinationals – Perspective of Indian Outward Foreign Direct Investment’ is one of the finest books recently published on Indian MNCs. The book, spread over nine different chapters contributed by noted experts on the subject, provides different perspectives on the rise of Indian multinational corporations. Broadly this book can be classified into three sections. First, an analytical perspective on the rise of Indian MNEs. Second, study of India’s outward foreign direct investment (OFDI) at industry level. Third, an analysis of OFDI at regional level. Analytically, this book offers dynamics of rise and evolution of Indian MNCs.

The first chapter by editors provides introduction to the book. The second chapter by Michael W. Hansen on ‘*In search of the Indianness of Indian Multinational Enterprises: Is There Anything Special about the Indian Path to Outward Foreign Direct Investment?*’ explains the trends in India’s OFDI in historical perspective and provides theoretical underpinning behind the different stages of OFDI. Author finds that India’s OFDI can be broadly classified into three phases. The first phase of 1970s and 1980s was mainly led by modest investments made in joint ventures (JVs) in Asia and Africa and was shaped by political and regulatory constraints and the policies of the Government of India. Second was the start up phase of 1990s and early 2000s which was largely an outcome of more liberal government stance on FDI. The third was the take-off phase which began in early 2000s. In the third phase, OFDI exhibited a totally different trend as compared to previous two phases in terms of growth, industrial composition, motives and destinations. While explaining the theoretical underpinning, author has elaborated three different conventional theories, *viz.*, the Investment Development Path Theory, the Latecomer Theory and the Country Specific Theory. In light of these theories, author attempts to explain the recent exponential surge in OFDI on three dimensions, *viz.*, the speed and direction of OFDI, the role of home country context in shaping ownership advantage and the motives behind OFDI. The author argues that all the three theories offer partial explanation of dynamics of OFDI in recent past but with important insights.

The third chapter on ‘*Political Factors behind the Rise of Indian Multinational Enterprises: An Essay in Political Economy*’ by Jørgen Dige Pedersen discusses about how the government policies directly or indirectly



were contributing to the OFDI. Author argues that state involvement was limited in the early period but a variety of state support mechanisms were put into place which benefitted the Indian MNEs and subsequently active investors abroad. Apart from the government policies, friendly diplomatic relations with most of the countries in the world were also one of the key determinants in deciding the composition and destinations of the Indian OFDI.

The fourth chapter by Joel Ruet on '*When a Great industry Globalizes: Indian Conglomerates Pioneering New Trends in Industrial Globalization*' provides analytical insight about the current dynamics of Indian OFDI and the Indian form of capitalism. It highlights that the Indian business houses which survived the licensed raj during the restrictive policy regime are now reinventing themselves under the new liberalised regime. The key factor that author underlines in explaining the success of Indian MNEs is their conglomerate structure. It helped them in catching up in production process-efficiency and technology while multiplying the opportunities for partnerships amongst Indian MNEs. Such conglomerate structure raised their borrowing capacity in the international market as well. Indian MNEs are increasingly rethinking their supply chains and entering new value chains of global opportunities. Indian MNEs also benefitted from the rising valuations of their stocks closely linked with rapid and steady growth. Another positive factor that bodes well for growing internationalisation of Indian companies is their increasing exposure to external competition from global MNEs in the domestic economy itself. Going forward, this will prepare them better to face global competition. Nonetheless, Indian MNEs need to accumulate technological skills and build their brand image. The author suggests (i) MNEs from EMEs like India need to have global strategies as they are likely to redefine world production system, (ii) low costs advantages have to be leveraged into double comparative advantage of fast capitalisation with powerful technological and brand based catching up, and (iii) explore dynamic links between the processes of growth and technological catching up using strategic joint ventures and acquiring technology portfolios. The message that author intends to convey is that expanding business houses from India reflect the growth of new business model of industrial globalisation by way of catching up through low cost innovation and the rapid use of capital to acquire new overseas units to enhance their global competitiveness.

There are two chapters in this book devoted to industry analysis of India's outward foreign direct investment supported by some theoretical approach. The fifth chapter by Giovanni Balcet and Silvia Bruschiery produces the case study highlighting the driving factors and strategies of select MNEs belonging to automotive and pharmaceutical Industries. In their analysis, authors have

observed that the growth of MNEs in these industries has been an outcome of capacity creation and capability formation supported by the government policy during mid 1970s. The capability formation was achieved through the continuous creative assimilation, accumulation of human capital and managerial skills improvement of production efficiencies and adaption of imported technologies and alliances with MNEs in developed countries. However, the era of liberalised regime, *i.e.*, post 2000, Indian MNEs have graduated to next developmental stage learning from the experiences of domestic market driven phase and leveraging acquisition in order to grow rapidly in global markets. Author also observes that there was wide heterogeneity and diversity among different firms in terms of corporate practices, competitive asset bundling and their linkages and leverages. Another case study done by Vinish Kathuria on two most important knowledge based industries, *viz.*, pharmaceutical and software tries to look in to the factors that explain the extent of OFDI in the IT and pharmaceutical industries and examined whether these factors are the same for both the industries. The author finds that drivers of OFDI of these two industries differ significantly. The possible reason of these differences may be due to different industrial sector, different history and uneven government policies in addition to firm specific diversity.

Last three chapters of this book have been devoted to the pattern of destination of India's ODFI. Nandita Das Gupta in a Chapter on "*Indian Companies Investing in the United States: An Inquiry into Recent Pattern and Trends*" has examined the recent trends and patterns of India's OFDI in the United States. The chapter provides details of the volume of OFDI going to the US, their industrial composition, age profile and size distribution of Indian MNEs investing in the US. Author also analyses the entry routes of OFDI like green-field and M&A, push and pull factors driving the OFDI from India to the US; and existing Indian ODFI projects in the US. Analysis shows that the Indian OFDI to the US has taken off since 2000. The major drivers behind this take off could be explained by the potential to give them access to better R&D and skill infrastructure, established brand names and available strategic assets available in the US. Author estimates that during 1975-90, more than one third FDI approvals to developed countries were directed to the US. In terms of actual flows, the share of US has risen from 6 per cent in 1975-90 to nearly 24 per cent in 1991-2001. With respect to the composition, during pre-2000 period, Indian FDI was dominated by manufacture sector particularly chemical and transport equipment with consistent rise over the time. However, knowledge based industries, *viz.*, software and IT, depository institutions, professional, technical and scientific services, have invested heavily since 2000. Based on

the age profile of 150 Indian MNEs in the US, the author reveals that around 54 per cent of them are less than 20 years old. One of the interesting findings of age profile and nature industry shows that the younger companies are predominantly invested in the service sector, while the older companies have concentrated mainly on the manufacturing sector. The liberalisation policies of the Government also changed the size distribution of the Indian MNEs from big industrial houses with minority stake in pre-1991 period mainly due to the prevailing restrictive regime to small firms. New MNEs also preferred acquisitions to Greenfield investment as their primary means to market entry. Author identifies that OFDI flows to the US can be attributed to a host of factors which includes host country factors (pull factors) as well as home country factors (push factors). Some of the important pull factors identified in this study are market size, liberal inward FDI policy, low taxes, high level of physical and institutional infrastructure and the need to acquire strategic resources while push factors include high domestic growth, increased corporate profitability, access to global financial markets, knowledge spillovers, competition from inward FDI and liberal and pro FDI government policy. Another remarkable finding in this chapter has been that the Indian MNEs are creating more job opportunities by bailing out US companies from closure or bankruptcy.

Chapter 8 on '*The Emergence of Indian Multinationals: An Empirical Study of Motives, Current Status, and Trends of Indian Investment in Germany*', by Rajnish Tiwari and Cornelius Herstatt, presents the results of an empirical survey conducted among Indian subsidiaries operating in Germany. Survey brings out the fact that the majority of Indian companies investing in Germany are from service sectors like software and IT industry (more than half of Indian companies), pharmaceuticals and the automotive industry. Important factors behind the Indian OFDI to Germany are long tradition of economic relations between these two countries, proximity to their customers and suppliers, large access to German market and availability of skilled labour. Another interesting finding of this survey study is that Indian MNEs are net job creators in the Germany. The study also finds that Indian subsidiaries have generally performed well and look forward to strengthen their operational presence in Germany, including research and development activities. However, the survey also highlights the challenges, including cross-cultural issues, being faced by Indian MNEs in Germany.

The last chapter authored by Parthapratim Pal on '*The Surge of Indian Outbound Foreign Direct Investment to Africa: A new Form of South-South Cooperation?*' is basically a case study of south-south co-operation. Author has studied the presence of Chinese MNEs and Indian MNEs in the African

countries and found that the presence of latter is far less than that of the former. India's total OFDI to African countries amount to US\$ 73 million during 1961-89 but their share in India's total OFDI was very high in those years. However, during recent years, these flows have increased phenomenally mainly in sectors, viz., chemicals oil and gas industries contributing around half of the total flows during 2000-07. Indian state owned oil companies are building an increased presence in natural resource based industries and becoming an established trend in African countries. In fact, author perceives African region as an increasingly contested economic battleground due to its resource richness and improved growth prospects.

To conclude, the book provides a sharp analysis of trend and issues pertaining to Indian MNEs. The contributors explore the rapid growth of Indian MNEs and provide different perspectives in terms of patterns and factors that led to their increasing presence in global economy. Some of the chapters throw light on the some of the interesting issues that have come up pertaining to the surge in outward FDI from India particularly during 2000s. Besides, there are some explicit messages for Indian MNEs for strengthening their presence in global markets. While growing presence of Indian MNEs has been largely attributed to the liberalised policies for outward investment pursued in recent years, the book is silent on a number of aspects. First, whether growing outward FDI partly reflects the low investment opportunities in domestic economy. In other words, the issue whether OFDI has been at the cost of domestic investment remains unanswered. Second, the book is based on industry-specific and country-specific case studies which highlight various aspects of OFDI from the perspective of industrial organisation and global business strategies. A chapter on macroeconomic perspective, particularly in the context of impact of OFDI on domestic investment, balance of payments, *etc.* could have added to utility of the book. This aspect is important as the policies with regard to OFDI are largely formulated keeping in view their macroeconomic implications. Third, in some chapters, Indian MNEs have been compared with those of China, a comparison on a broader set of EMEs could have been better, as from the analytical and policy perspective, other EMEs are perhaps more comparable with India than China in terms of domestic policy respective. Lastly, the chapter provides more on past trend in OFDI and strategies of MNEs but not much on outlook for the medium and long run.

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