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Improving India's Saving Performance[1]

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Abstract

This paper discusses recent trends in Indian saving behavior and reviews policy options to increase domestic saving. In the absence of forceful policy measures, private saving would continue to rise gradually, but probably not by enough to finance the government's growth target of 7 percent over the next decade. The most promising way to boost domestic saving would be through increased public saving and a strong structural reform program, including financial liberalization, which would initiate a virtuous growth-saving circle. To increase the efficiency of the savings allocation, particular attention should be paid to long-term saving instruments.

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SUMMARY

The double task of poverty alleviation and maintaining pace with fast-growing neighbor countries in Asia has prompted the Indian government to announce the target of achieving 7 percent annual growth or more over the next 10 years. Against this background, this paper discusses recent trends in Indian saving behavior and reviews policy options to increase domestic saving.

Domestic saving in India shows an uneven upward trend over the past decades, led by rising private saving. Although large errors and omissions in the data complicate the interpretation of recent fluctuations, an econometric analysis of fundamental saving determinants suggests that private saving is likely to continue to rise--albeit gradually--over the years ahead, driven by rising per-capita income and continued financial deepening. However, with public saving at a low level, total saving would most likely not be sufficient to finance the government's growth target.

How could India raise its domestic saving rate? Traditional tax and interest rate incentives are unlikely to lead to a strong response of the private saving rate. Rather, the most promising way to boost domestic saving is through increased public saving and a strong structural reform program, including financial liberalization, which would initiate a virtuous circle in which higher growth would prompt further increases in private saving.

The impact of financial sector reform could be potentially large. In India, the link between low growth and inefficient allocation of savings has become increasingly relevant, particularly in the infrastructure sector. Contrary to overall investment, investment in infrastructure has declined in recent years, and worsening infrastructure conditions have become a major obstacle to growth. The lack of long-term financing is a substantial hindrance to such investment, and thus the development of domestic debt markets and the effective use of long-term savings figure among the highest reform priorities.

I. INTRODUCTION

The double task of poverty alleviation and maintaining pace with fast-growing neighbor countries in Asia has prompted the Indian government to announce the target of achieving 7 percent annual growth or more over the next 10 years. While this target has been widely praised in the Indian public, one of the key questions asked has been whether India would be in a position to finance the necessary investment through increased domestic saving, thus avoiding a much greater recourse to foreign savings with its associated risks on the external front.

Against this background, this paper discusses recent trends in Indian saving behavior and reviews policy options to increase domestic saving. Saving in India--particularly private saving--has been relatively high compared to other developing countries, showing an upward trend in recent decades. However, a fall in saving in the early 1990s has--not for the first time--given rise to concerns about the continuity of this trend. While recent data show some rebound in the saving rate, there is still a lack of knowledge about the forces driving the volatility of the saving rate, prompting many authors to use the term "savings puzzle" when discussing developments in the 1980s and 1990s.

A strategy to improve India's saving performance needs to take account of recent insights in the saving literature. Over the past few years, several studies have found that tax and interest rate instruments to raise domestic saving have proven largely inefficient. Moreover, empirical results suggest that higher growth generally tends to precede higher saving. In light of this evidence, this paper suggests a different approach to raising saving, consisting mainly of raising public saving and fostering growth through improving productivity, notably through financial market liberalization.

Finally, a financial market segment of particular importance to both growth and saving is the market for long-term household saving (pensions, life insurance, and mutual funds). In India, however, unlike other countries, the market share of long-term saving instruments has shown a steady decline over the past thirty years, mostly related to government intervention. This paper reviews developments in this market segment, and considers reform options that could boost the mobilization of long-term savings.

In the following, Section II discusses recent developments in Indian saving, including a brief description of shortcomings in the saving and investment data. Section III analyzes saving determinants and presents a medium-term saving outlook. Section IV discusses a strategy for higher saving, and Section V reviews developments in long-term saving instruments. Section VI concludes.

II. Trends in Indian Saving

A. Recent Developments in the Saving Rate

The domestic saving rate has shown an uneven upward trend over the past four decades (Chart 1). Although climbing to a record level of 23½ percent of GDP in 1990/91, following the external crisis the saving rate declined by 2½ percentage points in the early 1990s. In 1994/95, the last year for which data are available, the saving rate rebounded to 24½ percent of GDP (Table 1).[2]

Fluctuations in the saving rate have been accompanied by considerable changes in its composition. Historically, domestic saving was dominated by *physical household saving*[3], which still accounted for almost half of domestic saving in 1990/91. However, the recent increase in saving has been driven mainly by *financial household saving*, which became the largest component of domestic saving in 1991/92; such saving climbed to 11 percent of GDP in 1994/95.[4] *Private corporate saving* has also shown a steady increase over the last twenty years, although it remains below 5 percent of GDP. *Public saving* weakened in the early 1990s to reach a low of ½ percent of GDP in 1993/94, a significant reduction compared to the levels of 4-5 percent of GDP in the early 1980s.

Financial household saving has been on a long-term upward trend, partly reflecting a continuing expansion of financial institutions' branch networks into rural areas and, more recently, the increasing availability of alternative investment opportunities to households. For most of the past, the financial system was tightly regulated, and financial wealth was mainly accumulated in the form of cash holdings, bank deposits, and investments in insurance and pension funds (Chart 2). This situation began to change in the early 1980s, when households were increasingly allowed to invest directly in government securities and to invest in shares and mutual funds. In the late 1980s, with financial liberalization underway and the stock market expanding, the proportion of saving in the form of shares and mutual funds increased rapidly, climbing from about 5 percent to more than 20 percent within five years. In recent years, however, subsequent to a stock market scandal and an ensuing price downturn in 1992, investment in shares and mutual funds has declined sharply, and financial saving has shifted largely back into deposits and government paper (Table 2).

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[2]Owing to lags in data compilation, the saving estimates for 1994/95 could still be revised by 1-2 percentage points, however.

[3]Household physical saving is measured as gross capital formation of households, including non-corporate enterprises (see below). It includes investment in housing, agricultural development, and cottage industries.

[4]However, preliminary data suggest that financial saving may have fallen to about 9 percent of GDP in 1995/96.

CHART 1

INDIA

COMPONENTS OF DOMESTIC SAVING
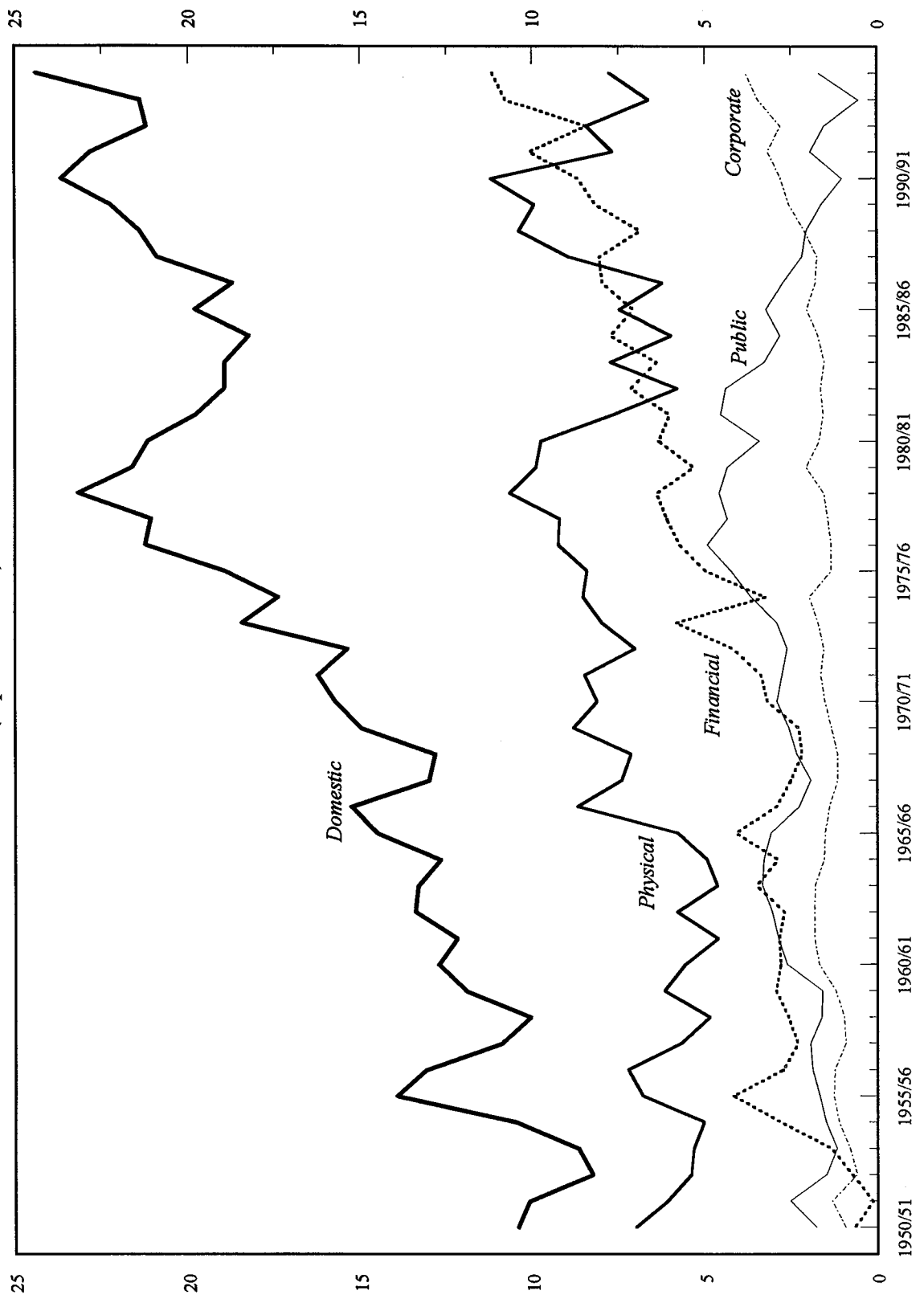
(In percent of GDP)

Source: National Accounts.

Table 1. Components of Domestic Saving

(In percent of GDP)

	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
Official saving statistics							
Gross capital formation (including errors and omissions)	24.5	24.9	27.0	23.4	23.1	21.6	25.2
Foreign saving	3.1	2.7	3.4	0.5	2.0	0.3	0.8
Domestic saving	21.4	22.2	23.6	22.8	21.2	21.4	24.4
Private	19.3	20.6	22.6	20.9	19.6	20.8	22.7
Household	17.2	18.1	19.8	17.7	16.8	17.4	18.9
Financial	6.9	8.1	8.7	10.1	8.4	10.8	11.1
Physical	10.4	9.9	11.2	7.7	8.4	6.6	7.8
Corporate	2.1	2.6	2.8	3.2	2.8	3.5	3.8
Public	2.0	1.6	1.0	1.9	1.5	0.5	1.7
Government administration	-2.0	-2.6	-2.8	-2.1	-1.9	-3.4	-2.8
Departmental enterprises	0.6	0.7	0.7	0.7	0.7	0.9	0.9
Nondepartmental enterprises	3.4	3.5	3.1	3.3	2.8	3.0	3.5
Errors and omissions	0.1	0.8	1.8	0.6	-0.9	0.3	2.1
Foreign saving	3.1	2.7	3.4	0.5	2.0	0.3	0.8
Net national saving	-3.0	-1.9	-1.6	0.1	-2.9	--	1.2
Private	4.9	6.5	7.1	7.3	4.5	8.1	8.4
Public	-7.9	-8.3	-8.7	-7.2	-7.4	-8.0	-7.1
Alternative saving estimate 1/							
Gross capital formation	24.4	24.1	25.2	22.7	24.0	21.3	23.2
Foreign saving	3.1	2.7	3.4	0.5	2.0	0.3	0.8
Domestic saving (adjusted for errors and omissions)	21.3	21.4	21.8	22.2	22.1	21.1	22.3

Sources: National Account Statistics; and staff estimates.

1/ The alternative estimate is derived by adjusting total saving to gross capital formation, i.e., subtracting errors and omissions from investment to obtain saving. See Chapter II for a detailed discussion of methodological aspects.

CHART 2

INDIA

COMPONENTS OF FINANCIAL HOUSEHOLD SAVING
(In percent of gross financial household saving)

Bank Deposits

Currency

Insurance and
Pension Funds

Claims on
Government

Shares and Debentures 1/
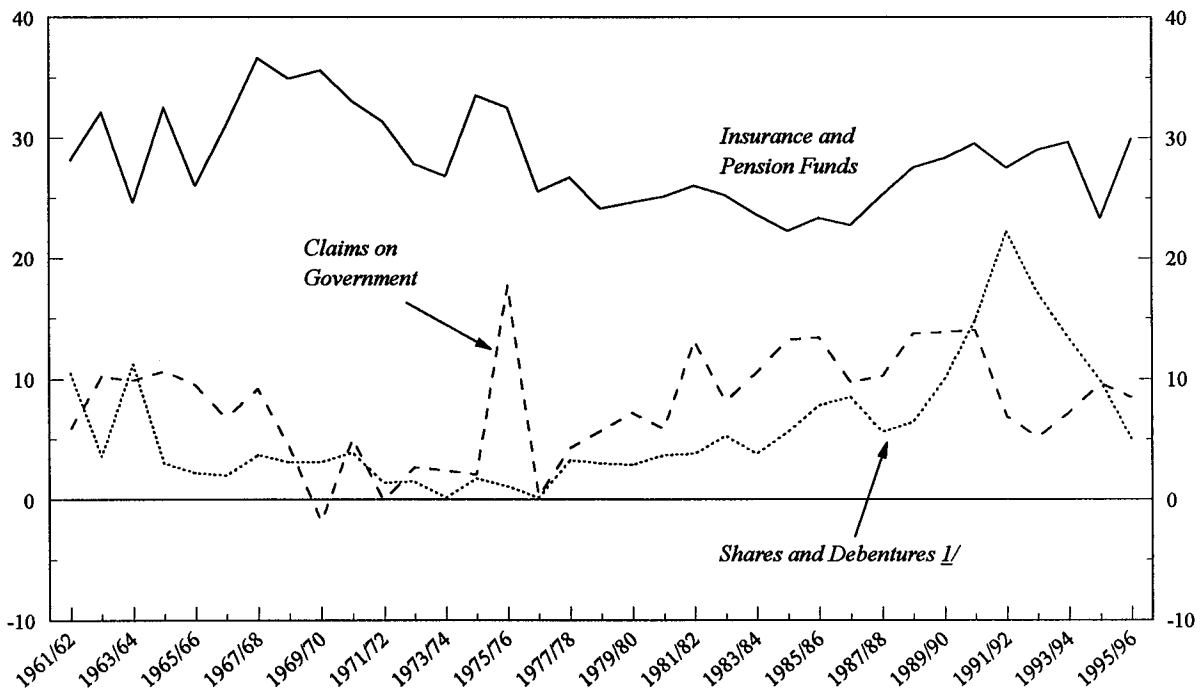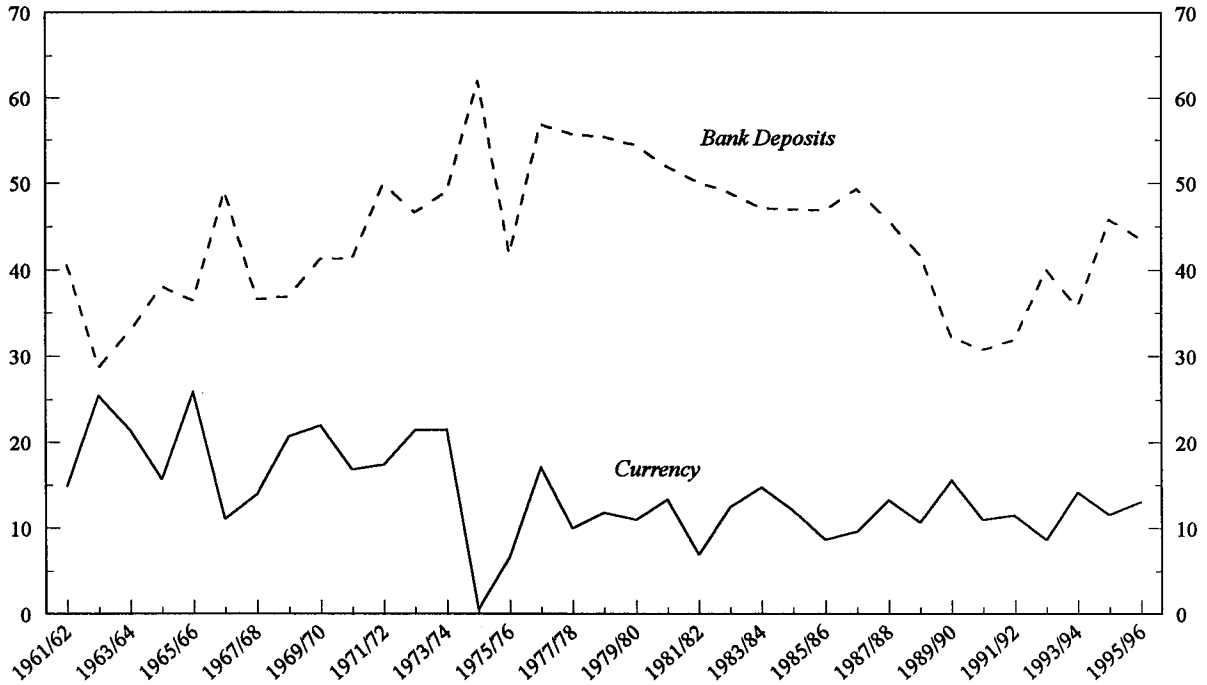
Source: National Accounts; **RBI Annual Report**, 1995-96.

1/ Includes Mutual Funds.

Table 2. Household Saving in Financial Assets

(In percent of gross financial saving)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95 1/	1995/96 1/
Currency	15.6	11.0	11.5	8.7	14.2	11.6	13.1
Bank deposits	32.3	30.8	31.9	40.1	35.7	45.8	43.6
Insurance/pension funds	28.3	29.5	27.5	29.0	29.6	23.3	29.9
Claims on government	13.8	14.0	6.9	5.2	7.2	9.6	8.5
Shares and debentures	10.0	14.8	22.2	17.1	13.3	9.8	5.0
Of which: UTI	4.4	6.0	12.8	7.4	4.8	1.8	...

Source: National Account Statistics; RBI Annual Report 1995-96.

1/ Preliminary.

B. Measurement Problems

The interpretation of Indian saving trends is complicated by a number of weaknesses in the Central Statistical Office's (CSO) methodology for measuring both investment and saving (see Appendix I for a detailed description). The most important shortcomings are:

- The estimates for physical household saving are unreliable. This component is constructed to be equal to household investment, which itself is calculated indirectly using a residual method. Not surprisingly, measured physical household saving--the largest component of saving in the past--has been highly volatile.

- Errors and omissions originate in the estimation of both savings and investment, but adjustments are made only in the investment estimate. The CSO regards the saving estimate to be more reliable (on the basis of the greater accuracy of public, financial and corporate saving data), and therefore adjusts investment to equal the sum of domestic and foreign saving.

- The commodity flow method used to estimate total investment--based on fixed production coefficients--has remained unchanged over the past decades. While it might still be useful for comparing investment in adjacent years, new technologies and the growing amount of investment in the informal sector are not adequately reflected in the estimates. For example, imports of computer equipment are still recorded as consumption expenditure, regardless of their intended use.

- The estimates of saving and investment of the corporate sector are based on a small sample of balance sheets (maintained by the RBI) which relies largely on voluntary

responses from enterprises. This sample is not representative of the total Indian corporate sector.

- Finally, the CSO estimates do not cover some preferred assets for household saving, namely jewelry and gold. Household saving in gold is likely to have increased after import restrictions were liberalized in 1992, implying an increase in the underestimation of saving.[5]

C. Implications

What can be said about underlying saving trends in the face of these problems? This paper has made two attempts to generate alternative estimates of saving that could provide more accurate information on saving trends.

- First, reversing the present CSO practice, domestic saving has been adjusted to include errors and omissions, so that the sum of adjusted domestic saving and foreign saving equals the original investment estimate. This yields a much smoother, more plausible path of domestic saving (see Table 1, and top panel of Chart 3).

- The second approach is based on generating an alternative estimate of physical saving, the weakest component in the CSO's methodology. Some authors have argued that physical saving could be negatively related to financial saving because investment in the household and informal sectors is largely financed by the sale of financial assets. Taking up that argument, physical saving has been regressed on financial saving, a constant and a trend. By replacing physical saving with fitted values from this regression, a second modified path for domestic saving has been obtained (lower panel of Chart 3).[6]

Although these two alternative saving measures differ in some respects, they both suggest that the recent fluctuations in domestic saving may have been exaggerated. Both measures show a saving rate that was fairly constant for most of the 1980s. The lower panel of Chart 3 indicates that domestic saving could have picked up in the early 1990s, whereas the upper panel suggests that saving remained close to the 1980s average. Therefore, although it is probably premature to conclude that saving is again on an upward trend, it appears likely that the decline in domestic saving between 1991/92 and 1993/94 was less spectacular than indicated by official estimates.

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[5]Recorded gold imports amounted to 415 tons, worth some US$ 6 billion in 1994 (equivalent to 8 percent of domestic saving), and unrecorded gold imports are also likely to be sizable. There is no information on the proportion of gold imports purchased by households.

[6]Other saving components were also added to the regression. The outcome remained practically the same.

CHART 3

INDIA

DOMESTIC SAVING: ALTERNATIVE ESTIMATES

(In percent of GDP)

(Adjusted for errors and omissions)

CSO Estimate   Adjusted

(Physical saving estimated)

CSO Estimate   Staff Estimate
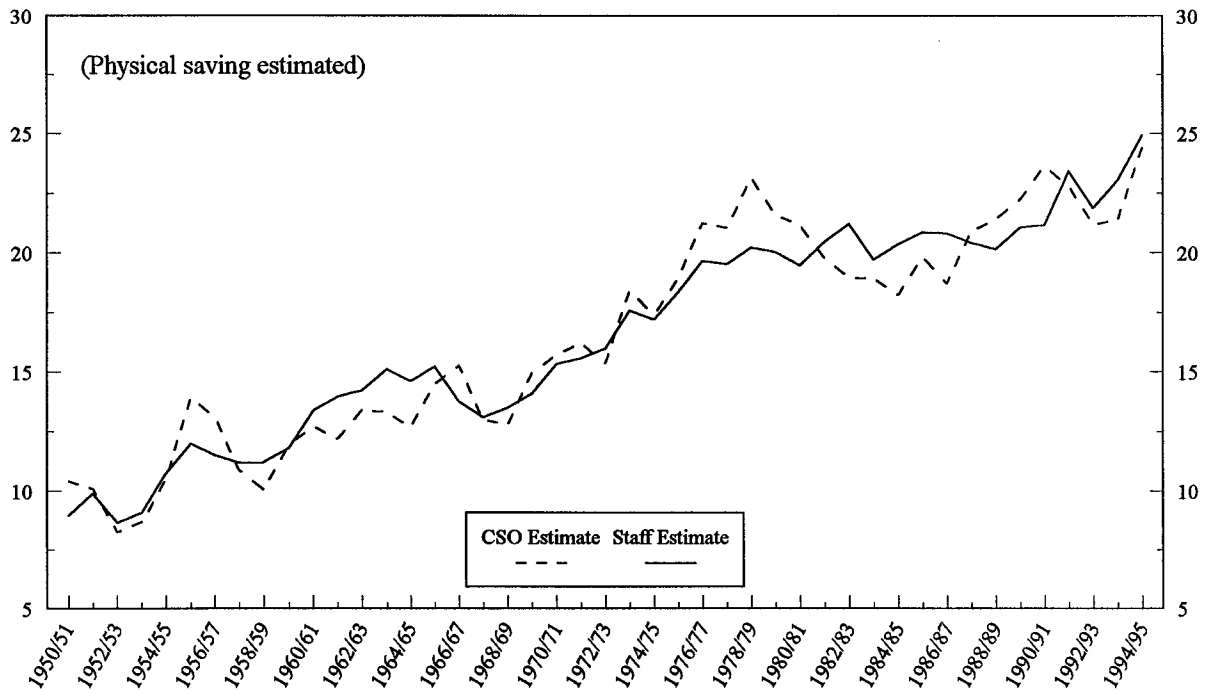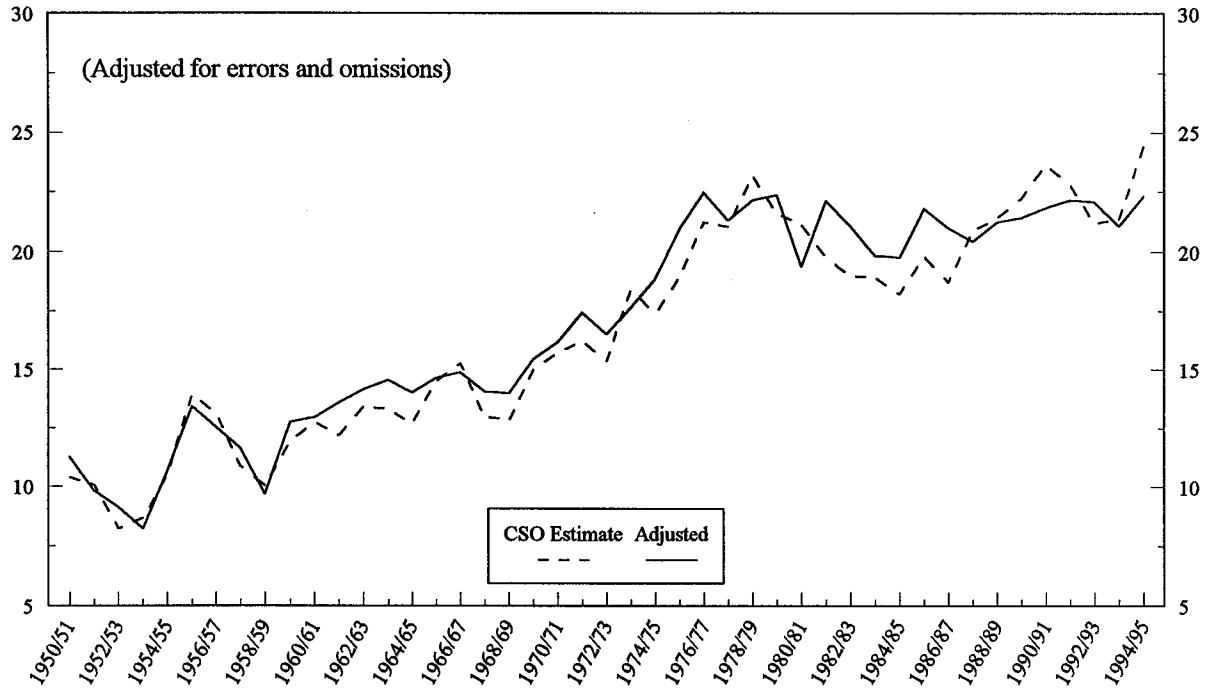
Source: Central Statistical Office; and staff calculations.

III. DETERMINANTS OF SAVING AND MEDIUM-TERM OUTLOOK

A. Studies on Indian Saving

Several econometric studies have recently attempted to identify determinants of the Indian saving rate.[7] Using a standard life-cycle approach, ordinary least-squares methods were employed to derive broadly the following results:

- GDP growth has had no significant impact on the saving rate. Rising per-capita income, however, was found to have a weak positive effect on private saving.

- The agricultural sector in India has a lower propensity to save compared to other sectors, so that a diminishing share of agriculture in GDP raises the saving rate.

- The effects of taxation on saving has been weakly negative. Higher government expenditure has depressed the overall saving rate.

- A higher real interest rate has apparently increased saving. Surprisingly, however, the interest rate has affected physical saving (i.e., investment) positively but has had no impact on financial saving. Financial deepening--as measured by the broad money to GDP ratio and by the number of bank branches--also has increased the saving rate.

- A worsening of the terms of trade, and an increasing availability of foreign savings, has tended to depress domestic saving.

- Contrary to other Asian economies, growth in the relative size of the working age population was not found to have a significant impact on saving. However, saving has been negatively related to the age dependency ratio.

While the results are broadly consistent with standard economic presumptions, some further analysis is warranted. The statistical significance of the estimates has generally been weak, and possible interdependencies between saving and some of the explanatory variables have not been addressed. In particular, the crucial relationship between growth and saving needs to be more closely examined in the light of evidence from other countries that causation generally goes from growth to saving (Carroll and Weil [1994]).

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[7]Krishnamurty et al. (1987), Lahiri (1989), Salgado (1995).

B. An Alternative Approach

In order to test the direction of causality between saving and growth for India, Granger causality tests have been employed for several combinations of saving and growth variables (see Appendix II.A). The test results reject the hypothesis that saving is a relevant explanatory variable in forecasting growth, while supporting a link from growth to domestic saving, including both its public and private components. This apparent link between growth and saving seems to be inconsistent with earlier studies that have not found growth to be a major determinant of saving. However, most of these econometric studies have relied on ordinary least-squares techniques that are not particularly powerful in the presence of a two-way interaction between variables.

This paper tries to supplement earlier studies by using a vector-autoregressive (VAR) approach for modeling the long-run dynamics of saving and growth (see Appendix II.B). While the regressions obviously have to be interpreted extremely carefully--being based on a weak database that contains large errors and omissions--the results point to a strong relationship between (per-capita) GDP growth and both private and public saving. They show that private saving is positively related to per-capita growth, and suggest a minor importance of Ricardian equivalence in India--in this specification, an increase of 1 percentage point in public saving would only result in a ¼ percentage point decline in private saving.

As for structural effects, private saving is positively related to the age dependency ratio, and negatively related to the share of agriculture in the economy, and money velocity. These results are consistent with prior expectations. An increasing dependency ratio indicates a higher burden on the working generation, increasing the need for retirement saving. The agriculture share and money velocity broadly represent the industrial and financial state of development of the economy: as the economy moves away from subsistence levels and the financial system offers more attractive investment options, saving is expected to increase.

C. Medium-Term Outlook

The domestic saving rate can be expected to increase gradually over the medium term. As explained in the Appendix, likely trends in explanatory variables suggest an upward trend for private saving (e.g., rising per-capita income, continued financial deepening, a diminishing share of agriculture, and a falling age dependency ratio). Moreover, assuming the government achieves its target of reducing the central deficit to 4 percent of GDP by 2000, public saving should be expected to rise to about 3 percent of GDP early in the next decade.[8] After taking into account some Ricardian offset, the private saving rate would be projected to rise to an average of 23½ percent of GDP, implying that overall saving would reach 26 ½ percent of GDP after 2000/01 (Table 3).

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[8]Corresponding medium-term scenarios for the Indian economy are described in greater detail in IMF (1997).

Table 3. Projected Increase in the Domestic Saving Rate

(In percent of GDP)

Average	Domestic Saving	Private Saving	Public Saving
1990/91-94/95	22½	21	1½
1995/96-99/00	24¾	22½	2¼
2000/01-05/06	26½	23½	3

Source: Staff projections.

Such an increase is unlikely to be sufficient to finance the investment required--particularly in infrastructure--for achieving the government's objective of 7 percent output growth or more over the medium term. As shown in Table 4, even strong reform countries have not necessarily experienced a dramatic downward shift in their incremental capital-output ratio (ICOR).[9] Absent a strong increase in the pace of fiscal adjustment and structural reform, and given the high infrastructure requirements of the Indian economy over the next years, it therefore appears likely that India's ICOR would remain between 4-4½ over the medium-term. This would imply that the investment rate needs to increase to well above 30 percent which--even assuming some higher recourse to foreign saving--would require a domestic saving rate of around 30 percent by the turn of the century. Hence, the projected increase in the saving rate would not be sufficient to achieve the government's growth target, thus calling for stronger action on both the public and private saving front.

Table 4. ICOR Measures for India and East Asian Countries

(Average values)

	1975-80	1981-85	1986-90	1991-95	1975-95
India 1/	4.70	4.16	4.02	4.65	4.35
China	0.82	3.54	5.92	3.48	3.44
Indonesia	3.07	5.59	5.27	4.98	4.73
Malaysia	3.20	4.29	7.21	4.34	4.76
Thailand	3.59	4.76	3.29	4.88	4.13

Sources: Staff calculations based on Indian National Accounts Statistics; and World Economic Outlook.
1/ Fiscal years; excluding 1979/80 and 1991/92. Data for 1995/96 not yet available.

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[9]The ICOR is calculated by dividing a country's investment rate by its real GDP growth rate.

IV. STRATEGY FOR HIGHER SAVING

While higher domestic saving is needed to finance a faster growth rate, policies aimed directly at mobilizing savings are not necessarily the best instrument to achieve this target. In the case of India, it has been argued (e.g., Bhagwati [1993]) that growth has suffered less from a low saving rate than from inefficient investment. While the Indian saving rate has been relatively high and has risen over the past 30 years, the efficiency of investment has remained low, in part because of the dominant role of the public sector in the economy.

There is also a growing literature which, based on cross-country studies, has found little evidence that policy efforts to boost savings have been very effective.[10] This research suggests that the main policy focus should be on initiating a virtuous growth-saving circle by fostering growth through fiscal consolidation and strong structural reforms, including privatization and financial liberalization. Under such a strategy, initially growth would need to be financed mainly through higher public saving. Private saving, which eventually would have to provide the bulk of additional investment financing, would follow with a lag, responding to higher growth. As financing requirements increased, financial liberalization--in particular, reforms of long-term saving instruments--would help to ensure that private savings were efficiently allocated.

The case for an indirect approach to higher private saving is supported by recent findings that traditional saving policy instruments--like higher interest rates or special tax incentives--fail to raise the private saving rate (e.g., Engen et al. [1994], OECD [1994]). Although these results were mainly established for industrial countries, they are likely to apply just as forcefully in developing countries. For example, Ogaki et al. (1996) have found that the elasticity of private saving to real interest rates is less at lower levels of per-capita income, as a higher share of income must be devoted to subsistence consumption. In their paper, the interest rate elasticity of saving in India was estimated to be among the lowest in the developing world. Moreover, Chelliah (1996) and others have pointed out that most Indian households do not pay income tax, either because their income is too low or because they fail to report to the tax authorities. Changes in the tax regime would therefore only affect a small part of the population, and would be unlikely to significantly alter the overall saving behavior.

A. Public Saving

Empirical results suggest that the most direct means to raise domestic saving is through generating higher public saving (e.g., Masson et al. [1995]). However, India has seen a steady decline in public saving over the past two decades, both at the central and state government levels (Table 5). This trend has been partly reversed since 1993/94, but further strong efforts--going significantly beyond the government's target of achieving a central

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[10]E.g., Carroll and Weil (1994), Masson et al. (1995), and Schmidt-Hebbel et al. (1996).

deficit of 4 percent of GDP by 2000--would be needed to restore public saving to the level of the early 1980s.

Table 5. India: Developments in Public Saving

(In percent of GDP)

	1980/81	1992/93	1993/94	1994/95	1995/96	1996/97
Net public saving 1/	-5.3	-7.4	-8.1	-7.1	...	...
Public saving	3.4	1.5	0.5	1.7	...	...
Public investment	8.7	8.9	8.6	8.8	...	...
Balance on current operations						
Central government	-1.5	-2.6	-4.1	-3.3	-3.1	-2.5 2/
State governments	1.1	-0.7	-0.5	-0.7	-0.8	-0.8 2/

Source: Indian Public Finance Statistics 1995; RBI Annual Report 1995-96.

1/ Including central and state governments; and public enterprises.
2/ Budget figures.

Such efforts would need to involve a series of actions in the areas of tax policy, expenditure management, center-state relations, and public enterprise reform (IMF [1997], World Bank [1996]). A broadening of the tax base, coupled with a shift toward more productive expenditure, would help in reducing the current account deficit of both center and states. A reform of state finances would aim at hardening budget constraints on states, which would foster fiscal adjustment and reform at the state level. Public enterprise reform would serve two purposes: first, raising profitability (or reducing losses) through efficiency-enhancing measures, including privatization or closure; and second, reducing interest costs by retiring public debt with privatization receipts.

To a degree, higher public saving would depress private saving through a Ricardian equivalence effect. However, judging from the estimated long-run relationship between private and public saving, the offset factor for India could be as low as 25 to 30 percent. This estimate compares with other studies for developing countries that have found widely varying offset factors, ranging from close to zero (Haque and Montiel [1989]) to around 50 percent (Corbo and Schmidt-Hebbel [1991], among others).

In the short run, the tradeoff could be somewhat larger as fiscal consolidation would have to be achieved partly through higher taxation. An increase in the tax ratio would imply a decline in disposable income, leading to a temporary decline in saving as subsistence consumption would be maintained. The short-run equation estimated in Appendix II indicates

that a 1 percentage point increase in the tax-to-GDP ratio could result in a decline of private saving by about 0.6 percentage points in the first year.

B. Incentives for Private Saving

While instruments to directly raise private saving have proven largely ineffective, structural reform measures could have a large indirect impact on private saving, mainly through increased allocative efficiency and higher total factor productivity growth. Broadly, the reform agenda for India would include public enterprise restructuring and privatization; increased private involvement in infrastructure; agricultural reform; labor market reforms and exit policies; lifting of small-sector reservations; and particularly financial reform (see Chopra et al. [1995]).

The impact of financial sector reform could be potentially large. In India, the link between low growth and inefficient allocation of savings has become increasingly relevant, particularly in the infrastructure sector. Although overall investment has increased in recent years, investment in infrastructure has declined, and worsening infrastructure conditions have become a major obstacle to growth. The Mohan Committee on infrastructure development recently concluded that the lack of long-term financing was a substantial hindrance to such investment, and listed the development of domestic debt markets and the effective use of long-term savings among the highest reform priorities (EGCI [1996]).

Consequently, efforts to raise private saving should focus on financial liberalization, particularly on the development of long-term saving instruments, such as pensions, life insurance, and mutual funds.[11] While also providing an attractive investment vehicle for individual savers, their main role would be to improve the allocation of savings, ensuring that funds would flow to the most productive investment projects, thus generating the highest rate of growth out of a given amount of investment. As a result, the virtuous growth-saving circle would become more dynamic, and savings could accumulate faster.

V. DEVELOPMENTS IN LONG-TERM SAVING INSTRUMENTS

In India, unlike other countries, the share of major instruments for long-term household saving--pension and life insurance--in gross financial saving has stagnated over the past 30 years. By contrast, mutual funds had growing success through the early 1990s, particularly after the sector was opened to competition from the private sector, but have also experienced considerable problems in recent years. These developments have reflected two fundamental weaknesses:

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[11]Financial liberalization could also lead to a direct increase in the private saving rate, mainly through the provision of a greater range of financial instruments and better consumer access to the banking system, particularly in rural areas (see Schmidt-Hebbel et al. [1996] for an excellent survey). However, empirical support for this hypothesis is weak.

- The markets are dominated by the public sector. The three largest institutional investors in India--the Life Insurance Corporation of India (LIC), the Unit Trust of India (UTI), and the Employees' Provident Fund (EPF)--account for about a third of total financial saving (Table 6). These are public institutions that face little competition in their respective market segment. In the pension and life insurance sectors, EPF and LIC hold a near monopoly, while UTI still accounts for more than 80 percent of the mutual fund business.

- The allocation of portfolios is heavily regulated, resulting in comparatively low returns and a lack of flexibility to react to market developments.

Owing to these weaknesses, long-term saving markets have failed to attract investors at a time when more lucrative alternatives have emerged in other markets, particularly as interest rates on bank deposits and corporate paper have increased. A sustained increase in long-term saving would require giving market participants greater flexibility in portfolio allocation, while greater private sector involvement would help to boost competition and more innovative product development. The has taken preliminary steps in this direction, but a stronger reform impetus is still required in some areas. The following reviews the situation in each sector.

A. Provident Funds

The Indian provident fund system--consisting of the EPF and a number of smaller provident funds--provides fully-funded, defined-contribution retirement schemes for about 8 percent of the labor force. Covered under the scheme are civil servants in central and state governments and public enterprises, and employees in larger enterprises in the organized private sector. Workers (and private employers) contribute between 8 1/3-10 percent of monthly salaries, to be returned to the worker in a lump-sum payment at retirement, including accumulated interest at a rate currently set at 12 percent. While there are no explicit employer contributions in the public sector, public employees receive an additional (budget-financed) government pension. Those not covered under these schemes--over 90 percent of the population--rely mainly on extended family networks and informal saving arrangements for old-age security.[12]

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[12]A small public social assistance scheme exists for the destitute.

Table 6. India's Largest Institutional Investors

(In millions of U.S. dollars)

March 1994	Total Assets	Domestic Equities	Foreign Equities	Domestic Bonds	Foreign Bonds	Cash	Other Assets
Life Insurance Corp. of India Group 1/	18,762	...	...	...	...	...	...
LIC Asset Management	500						
Life Insurance Corp. of India	18,262	1,018	1	11,510	75	280	5,378 2/
Unit Trust of India	16,235	8,324	--	3,697	--	649	3,564
Employees' Provident Fund	12,911	--	--	--	--	--	--
State Bank of India Group	12,510	663	--	11,456	23	39	330
State Bank of India	11,494	32	--	11,322	23	--	117
SBI Fund Management 1/	1,016	631	--	134	--	39	213
Canara Bank Group	4,363	...	...	...	...	...	...
Canara Bank Asset Management Co.	1,435	...	...	...	...	...	...
Canara Bank	2,928	201	--	2,718	5	3	--
Bank of Baroda	2,417	35	--	2,250	56	--	77
Bank of India	2,316	4	--	2,155	21	--	135
Central Bank of India	1,983	17	--	1,962	--	--	4
Coal Mines Provident Fund	1,881	...	...	...	...	...	...
General Insurance Corp. of India Group	990	...	...	...	...	...	...
GIC Asset Management Co.	500	...	...	...	...	...	...
General Insurance Corp. of India	490	108	--	272	--	16	94 2/

Source: Institutional Investor, October 1995.

1/ Assets as of March 1995.
2/ Includes loans to government and state-owned entities.

The entire portfolios of provident funds are invested in government or quasi-government securities and special deposit schemes.[13] The funds have been a sizeable factor in the financing of the public sector deficit; however, their investment yields have been relatively low. The average real rate of return was below 1 percent in the 1980s and only slightly higher--at 1½ percent--in 1994/95 (World Bank 1994). These returns are too low to generate a sizeable accumulation of pension assets during a lifetime, and they also encourage withdrawal of funds when allowed under certain defined circumstances. As a result, contributions to the EPF fell by 2 percent in real terms between 1990/91 and 1994/95, while fund withdrawals rose by 1 1/2 percent.

The government has begun to respond to these problems. Mutual funds have been allowed to offer pension plans--although these plans are still subject to provident fund portfolio allocation rules--and the recent introduction of an LIC pension plan (announced in the 1996/97 budget) was mainly directed at workers in the informal sector who did not have access to the system before. Moreover, the government has recently changed the investment schedule for private pension funds, increasing the ceiling for investment in debt instruments issued by the public financial institutions to 40 percent, and lowering the ceiling on special deposit schemes that earn a lower rate of return. As a result, their return on investment could increase by up to 2-3 percentage points.[14]

In a cross-country study of pension schemes, the World Bank (1994) suggested a three-pillar strategy under which pension systems should be built on mandatory, privately managed pension schemes, supported by a public minimum pension guarantee (financed through public revenue), and voluntary individual retirement saving. Following such a strategy, the Indian provident fund system would be reformed to follow the examples of countries like Chile that have successfully raised their saving rates through pension and financial market reforms. Key aspects of reforms would involve providing an increased role for private pension fund management and substantially liberalizing portfolio allocation rules, under an appropriate regulatory structure to ensure prudent investment allocation. In Chile, while private saving declined initially, financial liberalization has provided the ground for an increase in private investment, leading to higher productivity and growth, and finally to a strong increase in private saving (Diamond and Valdés-Prieto [1994], Holzmann [1996]).

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[13]In 1995/96, provident funds were required to place 15 and 25 percent of their new investments in state and central government securities, respectively; 30 percent in public financial institutions' securities; and 30 percent in special deposit schemes, which also provide financing for the central government.

[14]Nevertheless, the Indian pension system in its current form is unable to cope with the growing problem of old-age security. The age structure of the population is expected to change drastically in the next century as life expectancy rises and birth rates are falling. In addition, pressures of urbanization, migration, and increasing mobility lead to a deterioration of traditional means of support for the elderly.

B. Life Insurance

The life insurance sector was nationalized and consolidated into the LIC in 1956, jointly with the general insurance sector. Since then, the LIC has been a monopoly operator, charged with the tasks of making life insurance available throughout the country, particularly in the rural areas, and mobilizing savings by providing attractive insurance products. On the first count, LIC has been fairly successful. Having built up a large regional distribution network comprising some 2,000 branches, rural areas now account for about 45 percent of new policies by number and 40 percent by value. However, the Indian insurance market, with an estimated US$5 in annual premia paid per capita, has not made a significant contribution to savings mobilization (government of India (GOI) 1994).

Like other long-term saving instruments, life insurance has experienced a relative decline in its ability to attract financial saving in the recent past. Most of the decline has been caused by a comparatively low interest rate paid on life insurance funds. LIC is subject to similar, although somewhat less restrictive, portfolio allocation constraints as pension funds. While 75 percent of annual portfolio investments are required to flow into government securities or to be allocated for socially oriented purposes, the remaining 25 percent can be invested into private sector debt. Nevertheless, the average yield on investment has remained low, reaching only 1-2 percent in the early 1990s.[15] In addition, high administrative costs related to high staffing levels and insufficient computerization have also dampened profitability.

Based on far-reaching recommendations by the Malhotra Committee (GOI 1994), the government has been considering plans to open the insurance sector to private competitors, including from abroad, within the next four years. So far, an Insurance Regulation Authority (IRA) has been set up to establish a set of rules and regulations for the broader market structure. In order to prevent private competitors from focussing exclusively on profitable specialized (urban) markets, the Malhotra Committee recommended that new market entrants should be obliged to cover to some extent rural sectors and to contribute to the financing of socially oriented projects. Further, it also recommended strengthening the LIC's competitiveness by lowering the current mandatory investment norm to a level that allowed portfolio allocation more in line with international levels.

C. Mutual Funds

At the time of the liberalization of the mutual funds industry in 1992, UTI had held a monopoly in the market for almost 30 years. Indian retail investors (some 24 million shareholders) had been used to guaranteed high returns from their investments in UTI funds. This good historical record, combined with aggressive marketing by new entrants, led to

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[15]GOI (1994) notes that the low yield partly reflects conservative share valuation practices and is not entirely caused by investment restrictions.

expectations of high profits by investors who began to invest strongly in the new private mutual funds (Table 7). Investors were, however, generally unprepared for the risks they were taking after liberalization.

The net asset value of mutual funds declined when stock prices began to fall in 1992. The situation was exacerbated because existing market regulations did not allow portfolio shifts into alternative investments, leaving funds with no choice but to hold cash or continue investing in shares. Moreover, since only closed-end funds had been introduced in the market, investors who wanted to disinvest had to sell at a loss in the secondary market. These losses, the after-shocks of the 1992 stock market scandal, and the lack of transparent rules led to a sustained loss of confidence in shares and mutual funds. Partly as a consequence of a relatively weak stock market performance, mutual funds have not yet recovered, with funds trading at an average discount of 21 percent to their net asset value in December 1995.

The stock market supervisory authority has recently adopted a set of measures creating a transparent and competitive playing field for mutual funds (SEBI 1996). These include the relaxation of investment restrictions into money market and debt instruments, the listing of open-ended funds, and the possibility for mutual funds to launch pension schemes. In response to these changes, UTI is to be reorganized internally into a number of separate, competing units, and foreign banks have again begun to launch new funds. The intention is that, as a result of these liberalizations, mutual funds could become the key instrument for long-term saving, offering a variety of investments ranging from pure equity funds up to pension plans and 401(k)-type investment schemes.

Table 7. Annual Investment in Mutual Funds

| | In Billions of Rupees | | | In Percent of Domestic Saving | | |
	Total	UTI	Non-UTI	Total	UTI	Non-UTI
1990/91	39.5	37.3	2.2	3.1	2.9	0.2
1991/92	144.2	104.3	39.9	10.3	7.4	2.8
1992/93	95.1	71.7	23.4	6.4	4.8	1.6
1993/94	143.1	130.0	13.1	8.4	7.6	0.8
1994/95	137.5	95.2	42.3	6.0	4.1	1.8
1995/96 1/	55.4	52.0	3.4	...	...	...

Source: SEBI (1996).

1/ Through December 31, 1995.

These measures directed at improving stock market transparency and investment possibilities for mutual funds should help to increase public confidence in the stock market. Nevertheless, the key for a revival of investor interest would be a solid recovery of the Indian

stock markets, which depends to a large extent on the government. As long as public financing needs continue to keep real interest rates high, both lower enterprise profitability and higher attractiveness of competing investment alternatives will impact negatively on Indian stocks.

VI. CONCLUSION

Domestic saving has followed an uneven upward trend over the past decades. Although large errors and omissions in the data complicate the interpretation of recent fluctuations, an econometric analysis of fundamental saving determinants suggests that private saving is likely to rise gradually over the years ahead, driven by factors such as rising per-capita income and continued financial deepening. However, with public saving low, total saving would most likely not be sufficient to finance the government's growth target.

How should India raise its domestic saving rate? Judging from econometric evidence, traditional tax and interest rate incentives are unlikely to lead to a strong response of the private saving rate. Rather, the most promising way to boost domestic saving is through increased public saving and a strong structural reform program, including financial liberalization, which would initiate a virtuous circle in which higher growth would prompt further increases in private saving. With a view towards increasing the efficiency of savings allocation and financing the heavy infrastructure needs of the Indian economy, particular attention should be paid towards long-term saving instruments.

A sustained increase in long-term saving would require two major policy changes. First, the government would need to strongly reduce its recourse to captive financing from pension funds and LIC, thus giving market participants greater flexibility in their portfolio allocation. At the same time, greater private sector involvement would be required to help to boost competition and more innovative product development, making saving instruments more remunerative and thus attractive to individual investors.

METHODOLOGY OF ESTIMATING SAVING IN INDIA

The CSO's method of estimating domestic saving has basically remained unchanged since the 1960s. The method consists of five basic steps (Chart 4):

1.   **Total investment** is estimated using a commodity flow method. This approach uses data on imports and domestic production of major intermediary goods (e.g., cement, iron and steel, and timber) to impute production levels for construction (separately for the organized and informal sectors), and machinery and equipment. Production coefficients have not been updated since the early 1970s. Total capital formation is then derived by adding estimates for imported capital goods and inventory changes.

2.   **Household investment** is derived as a residual by subtracting public and corporate investment from total investment. Information on public and corporate investment (and saving) is obtained from fiscal and public enterprise accounts and an ad hoc sample of company balance sheets. Under this approach, the household sector includes informal small-scale enterprises, non-profit organizations, and other non-corporate private organizations.

3.   **Gross national saving** is estimated as the sum of foreign, public, corporate, and household saving. Household saving is the sum of household investment ("physical saving") and accumulation of financial assets by households ("financial saving"). Physical saving is measured as the residual household investment item obtained in Step 2.[16]

4.   **Errors and omissions**. Theoretically, the two estimates for gross capital formation and gross national saving should be equal. In practice, however, the difference between the two estimates is considerable, at times as large as 2 percent of GDP. The CSO methodology is based on the view that the saving estimate is more reliable than the investment estimate; consequently, investment is adjusted by defining "errors and omissions" as the difference between the saving and investment estimates, and subtracting this item from the original investment estimate.

5.   **Domestic saving**. Finally, gross domestic saving is equal to gross national saving minus foreign saving.
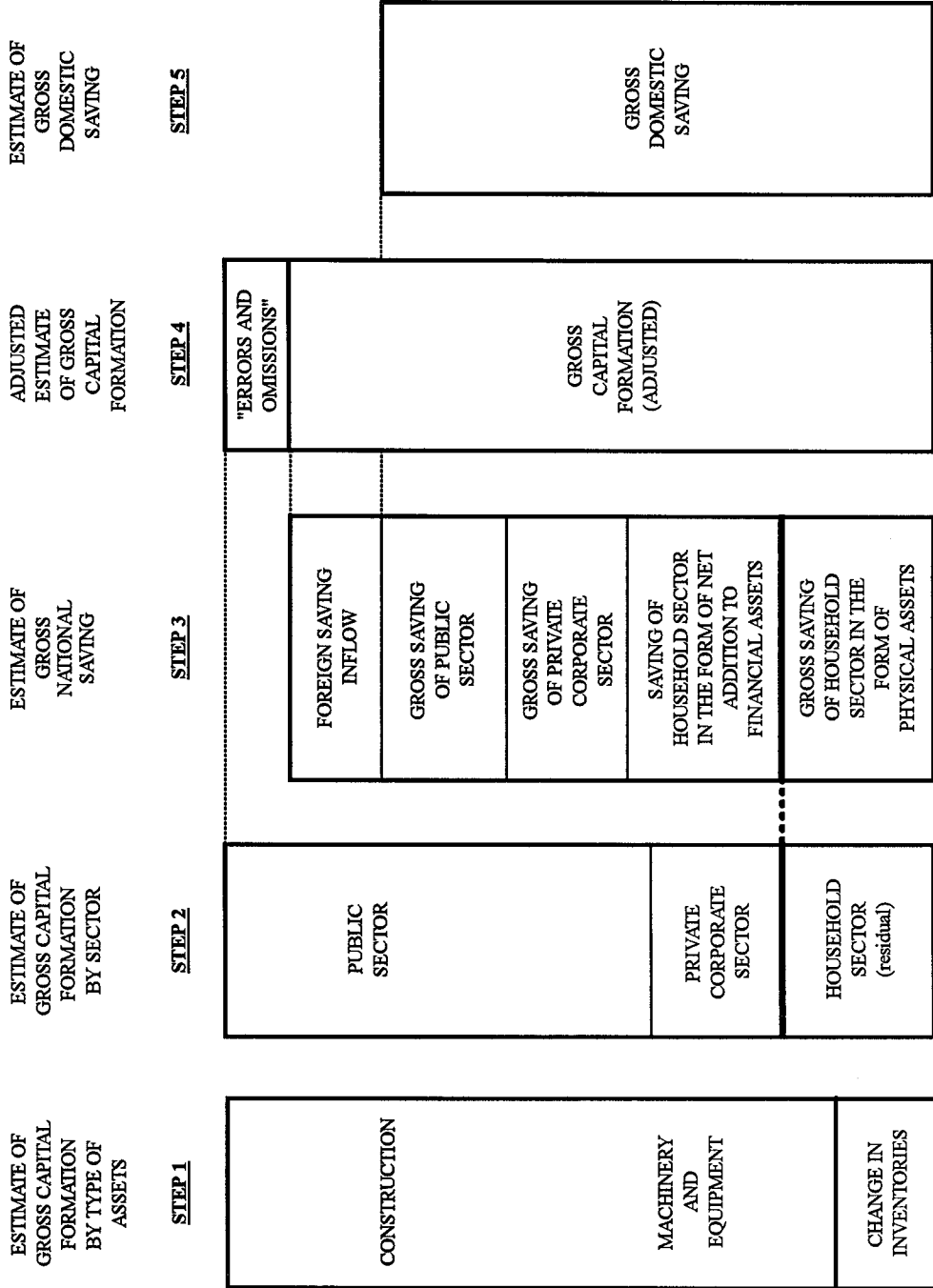
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[16]In the absence of other information on household investment or saving, a recent study by an Indian expert group concluded that despite its deficiencies, this "dual" approach remained the only feasible alternative for estimating Indian saving.

CHART 4

INDIA

DIAGRAMMATIC PRESENTATION OF THE STEPS IN THE
METHOD OF ESTIMATION OF GROSS CAPITAL FORMATION AND SAVING

ESTIMATE OF GROSS CAPITAL FORMATION BY TYPE OF ASSETS — **STEP 1**

ESTIMATE OF GROSS CAPITAL FORMATION BY SECTOR — **STEP 2**

ESTIMATE OF GROSS NATIONAL SAVING — **STEP 3**

ADJUSTED ESTIMATE OF GROSS CAPITAL FORMATION — **STEP 4**

ESTIMATE OF GROSS DOMESTIC SAVING — **STEP 5**

STEP 1
- CONSTRUCTION
- MACHINERY AND EQUIPMENT
- CHANGE IN INVENTORIES

STEP 2
- PUBLIC SECTOR
- PRIVATE CORPORATE SECTOR
- HOUSEHOLD SECTOR (residual)

STEP 3
- FOREIGN SAVING INFLOW
- GROSS SAVING OF PUBLIC SECTOR
- GROSS SAVING OF PRIVATE CORPORATE SECTOR
- SAVING OF HOUSEHOLD SECTOR IN THE FORM OF NET ADDITION TO FINANCIAL ASSETS
- GROSS SAVING OF HOUSEHOLD SECTOR IN THE FORM OF PHYSICAL ASSETS

STEP 4
- "ERRORS AND OMISSIONS"
- GROSS CAPITAL FORMATION (ADJUSTED)

STEP 5
- GROSS DOMESTIC SAVING

Source: **Capital Formation and Saving in India 1950-51 to 1979-80 (Report of the Working Group on Savings)**, RBI 1982.

ECONOMETRIC ANALYSIS OF SAVING

A. Saving and Growth: Granger Causality Tests

The Granger test helps to assess the direction of causation between two variables. Strictly speaking, the Granger method tests whether a series x helps *forecast* another series y, rather than whether x causes y. Hamilton (1994) noted that, under certain circumstances, the Granger test could offer useful evidence about the direction of true causation, but the test is also widely perceived as being sensitive to misspecification. In this paper, the test is used as a first pass in investigating causation.

The test was conducted by running bivariate vector autoregressions (VAR) on real GDP growth and total, public, and private saving in turn, using annual data over the period 1950/51 to 1994/95. Growth is said to "Granger cause" saving if the lagged growth coefficients in the saving equation are jointly significant, and vice versa. Since growth could affect *changes* in saving rather than *levels*, the tests have also been run on differences in the saving rates.

Table 8. Significance Levels for Granger Causality Tests

Saving Variable		Direction of Granger Causality	
		Growth → Saving	Saving → Growth
Total saving	Level	.01	.73
	Difference	.01	.78
Public saving	Level	.03	.96
	Difference	.12	.72
Private saving	Level	.00	.48
	Difference	.15	.89

Table 8 shows the significance levels for the respective coefficients (values smaller than .05 indicate Granger causality). The results provide evidence that growth affects saving, but not vice versa. The tests consistently reject causality from saving to growth, independent of which saving variable is used. On the other hand, causality from growth to saving is mostly accepted; particularly for saving in levels. This outcome was robust with respect to variations in the VAR lags, the choice of the growth variable, and other saving components.

B. Determinants of Private Saving

The results from the Granger test suggested that it would be worthwhile to reappraise some of the results of earlier papers by applying a VAR approach to the long-run dynamics of saving and growth.[17] Most earlier papers used ordinary-least squares techniques to analyze saving, which do not allow for possible interactions between saving and growth. However, owing to large errors and omissions in the saving estimates, the data base for a VAR-cointegration exercise is relatively weak. Therefore, the following results should be interpreted extremely carefully.

The relationships between the private saving rate and growth, and between private and public saving rates (i.e., Ricardian equivalence) were jointly modeled by a VAR process (in logarithms):

$$y_t = \sum_{i=1}^{I} A_i\, y_{t-i} + \sum_{i=0}^{I} B_i\, x_{t-i} + v_t$$

where y_t is a vector containing real per-capita GDP growth (g_y), and the public and private saving rates (s_p and s_g, respectively).[18] The vector x_t contains the following variables: the share of agriculture in GDP (agr), the age dependency ratio (dep), and broad money velocity (v). Applying this model to annual data for 1966/67 to 1994/95, all variables were found to be non-stationary, indicating the need to test for co-integration. A Johansen test yielded one co-integrating relationship, estimated as:

$$s_p = 1.29\, g_y - 0.27\, s_g - 1.5\, agr + 9.98\, dep - 0.03\, v + \varepsilon$$

No. of observations: 27
Lag length: 3
Probability for no co-integrating relationship: 54.02 (95% = 21.0)
Probability for one co-integrating relationship: 12.17 (95% = 14.1)

Short-term behavior

The short-run dynamics of private saving have been estimated by an error-correction model (ECM) in first differences, using the lagged residual of the co-integration equation. Under this first-difference approach, the model is stationary and it was possible to include

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[17]For the econometric techniques used in this appendix, see Doornik and Hendry (1994) or Enders (1995).

[18]Prior to the model selection process, the set of explanatory variables contained a larger number of variables, comprising largely those used in the studies discussed in section B. Real per-capita growth yielded more robust statistical relationships than GDP growth; it was therefore used in the final specification.

other stationary variables that were not part of the original co-integration model, such as the tax to GDP-ratio (tax). The final equation was estimated as follows (standard errors in parenthesis):

$$\Delta s_p = \quad -23.65 \quad +0.33\,\Delta g_{y,-1} \quad +1.08\,\Delta g_{y,-2}$$
$$(7.0) \qquad (0.46) \qquad (0.40)$$

$$-0.02\,\Delta s_{g,-1} \quad +0.19\,\Delta s_{g,-2}$$
$$(0.05) \qquad (0.06)$$

$$+2.9\,\Delta dep \quad +18.6\,\Delta dep_{-1} \quad -45.5\,\Delta dep_{-2}$$
$$(9.5) \qquad (12.5) \qquad (10.8)$$

$$-0.54\,\varepsilon_{-1} \quad -0.58\,\Delta tax$$
$$(0.16) \qquad (0.32)$$

$R^2 = 0.72$ No. of observations: 27
$AR(1) = 0.68\ (p = 0.52)$ Normality $= 0.08\ (p = 0.96)$

Unfortunately, this equation does not provide much insight into the short-term dynamics. The overall fit is not particularly good and a variable like the age dependency ratio would be expected to have no particular short-term impact on saving. At the same time, interest rates or changes in foreign saving were not found to have any significant influence. The difficulty in finding an economically more plausible specification may well reflect the large measurement problems.

Based on the short-term equation, private saving is projected to increase to 23 ½ percent of GDP in the first half of the next decade. More specifically, through 2005/06, it is assumed that per-capita GDP growth would average 4-4 ½ percent; money velocity would decline by 2 percent per annum; the age dependency ratio would decline by ½ percentage point; the share of agriculture in GDP would fall from 31 percent in 1995/96 to 22 percent; and tax revenues would amount to 19 ½-20 percent of GDP, an increase of 2 percentage points compared to 1995/96. With an increase of public saving to 3 percent of GDP, overall domestic saving would increase to 26 ½ percent of GDP.

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