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ABBREVIATIONS

AD	- Actual Deficit	CSO	- Central Statistical Organisation
ADs	- Authorised Dealers		
ADRs	- American Depository Receipts	DFIs	- Development Financial Institutions
AMS	- Aggregate Measure of Support	DGCI & S	- Directorate General of Commercial Intelligence and Statistics
AoA	- Agreement on Agriculture	DCF	- Debt Creating Capital Flows
AIFIs	- All-India Financial Institutions	DL	- Discretionary Liquidity
AL	- Autonomous Liquidity	EAC	- Economic Advisory Council
BIS	- Bank for International Settlements	ERR	- Economic Rate of Return
BoP	- Balance of Payments	ECBs	- External Commercial Borrowings
BA/NA	- Bid Amount/Notified Amount	EFC	- Eleventh Finance Commission
CAC	- Capital Account Convertibility	EU	- European Union
CAPM	- Capital Asset Pricing Model	EXIM	- Export - Import
CGE	- Computable General Equilibrium	FRBMB	- Fiscal Responsibility and Budget Management Bill
CRAR	- Capital to Risk-weighted Assets Ratio	FCNR (B)	- Foreign Currency Non-Resident (Banks)
CRR	- Cash Reserve Ratio	FCNRA	- Foreign Currency Non-Resident Account
CI	- Crowding-In	FCRCs	- Foreign Controlled Rupee Companies
CILI	- Composite Index of Leading Indicators	FCCBs	- Foreign Currency Convertible Bonds
CPI	- Consumer Price Index	FDI	- Foreign Direct Investment
CPI-IW	- Consumer Price Index for Industrial Workers	FIIIs	- Foreign Institutional Investors
CAD	- Current Account Deficit	GATS	- General Agreement on Trade in Services
CAG	- Comptroller and Auditor General of India	GCF	- Gross Capital Formation
CAS	- Credit Authorisation Scheme	GDCF	- Gross Domestic Capital Formation
CC	- Commodities Credit	GDS	- Gross Domestic Saving
CD	- Cyclical Deficit	GDP	- Gross Domestic Product
CMIE	- Centre for Monitoring Indian Economy	GDRs	- Global Depository Receipts

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GFD	- Gross Fiscal Deficit		Institutions
HP	- Hodrick-Prescott	NCF	- Net Capital Flows
ICOR	- Incremental Capital Output Ratio	NDA	- Net Domestic Assets
ICRA	- Indian Credit Rating Agency	NDTL	- Net Demand and Time Liabilities
IDA	- International Development Agency	NFA	- Net Foreign Assets
IIP	- Index of Industrial Production	NBFCs	- Non-Banking Financial Companies
IDB	- India Development Bond	NPAs	- Non-Performing Assets
IDBI	- Industrial Development Bank of India	NR(NR)RD	- Non-Resident (Non-Repatriable) Rupee Deposit
IIBI	- Industrial Investment Bank of India	NRERA	- Non-Resident External Rupee Account
IFCI	- Industrial Finance Corporation of India	NTR	- Non-Tax Revenues
IMD	- India Millennium Deposit	NRI	- Non-Resident Indian
IMF	- International Monetary Fund	NDCF	- Non-Debt Capital Flows
IT	- Information Technology	OECD	- Organisation of Economic Co-operation and Development
IPOs	- Initial Public Offerings	OPEC	- Organisation of Petroleum Exporting Countries
IP	- Intellectual Property		
LAF	- Liquidity Adjustment Facility	OCBs	- Overseas Corporate Bodies
LIBOR	- London Inter-Bank Offer Rate	OGL	- Open General License
MNCs	- Multi-National Corporations	OMO	- Open Market Operations
M ₃	- Broad Money	OMS	- Open Market Sales
MPC	- Marginal Propensity to Consume	OLS	- Ordinary Least Squares
MAPE	- Mean Absolute Percentage Error	OWS	- Other Welfare Schemes
MSP	- Minimum Support Price	PDs	- Primary Dealers
MFN	- Most Favoured Nation	PDS	- Public Distribution System
NASSCOM	- National Association of Software Services and Companies	POL	- Petroleum, Oil and Lubricants
NCAER	- National Council of Applied Economic Research	PSU	- Public Sector Undertaking
NBFIs	- Non-Banking Financial	RBI	- Reserve Bank of India
		R&D	- Research and Development
		RE	- Revised Estimate
		RNBCs	- Residuary Non-Banking

(Contd...)

	Companies	TFP	- Total Factor Productivity
RoW	- Rest of the World	TFCI	- Tourism Finance Corporation of India
RIBs	- Resurgent India Bonds	TNCs	- Trans-National Corporations
RIDF	- Rural Infrastructure Development Fund	UNCTAD	- United National Conference on Trade and Development
RMSPE	- Root Mean Square Percentage Error	TRIPs	- Trade Related Intellectual Property Rights
SBI	- State Bank of India	UCBs	- Urban Co-operative Banks
SCBs	- Scheduled Commercial Banks	UMA	- Unpleasant Monetarist Arithmetic
SD	- Structural Deficit	UTI	- Unit Trust of India
SEBs	- State Electricity Boards	VAT	- Value Added Tax
SIDBI	- Small Industries Development Bank of India	VAR	- Vector Auto Regression
SLR	- Statutory Liquidity Ratio	WEO	- World Economic Outlook
SDP	- State Domestic Product	WMA	- Ways and Means Advances
SD	- Structural Deficit	WPI	- Wholesale Price Index
TPDS	- Targeted Public Distribution System	WTO	- World Trade Organisation

FOREWORD

Encouraged by the response to thematic presentations that began a couple of years back, the Report on Currency and Finance for the year 2000-01 addresses the theme “Revitalising Growth” which has come to occupy centre-stage in the current debate on macroeconomic developments, both in India and abroad. A sense of lying somewhat apart from the global slowdown has turned the debate inward in India. A proliferation of views on the likely causes of the domestic deceleration and the possible remedies, including public policy interventions, has marked the evolution of ideas on the theme. In terms of sheer topical relevance, the theme of the Report selects itself in capturing the dominant national concern. As in the past, the approach is one of policy-oriented research and empirical verification so that public opinion is suitably empowered with information and specialised assessment.

The structure of the Report follows the tradition. An overview of macroeconomic developments in the Indian economy during 2001-02 is followed by six Chapters devoted to the theme of the Report, an exploration of the slowdown, the role of fiscal policy in reinvigorating growth, the conduct of monetary policy in the context of growth and inflation, external levers of growth embodied in trade and capital flows and the allocative efficiency of the financial system and the growth process. The final Chapter summarises the Report in the form of a macroeconometric model of the Indian economy and tests for the growth response of a panel of policy-induced stimuli to aggregate demand.

The work of the Report was co-ordinated in the Department of Economic Analysis and Policy under the guidance and supervision of M. R. Nair, Officer-in-Charge.

The Report was prepared by a team of officials led by Michael Debabrata Patra and comprising Himanshu Joshi, Partha Ray, Rajiv Ranjan, Sitikantha Pattanaik, Muneesh Kapur, Dhritidyuti Bose, Jeevan Kumar Khundrakpam, Indranil Sen Gupta, Bhupal Singh, Sarat Chandra Dhal, Siddhartha Sanyal and Binod Bihari Bhoi. Besides being primary contributors, the team undertook a wide array of empirical work and econometric research that forms the backbone of the Report. The team received considerable support from P.S.S. Vidyasagar and Rajeev Jain in preparing the Report.

The Report draws from ongoing research in several areas in the Department, including its regional offices. Chapter I, which presents an overview of the Indian economy during 2001-02, is the product of the Departmental review of macroeconomic developments.

Contributions to the Report were received from almost all the officers of the Department, in particular, Janak Raj, Jaya Mohanty, Tarlok Singh Sohal, B. N. Ananthaswamy, S. M. Pillai, C.L. Dadhich, A. Prasad, Abha Prasad, D.P. Rath, Prasanna

Nayak, R. Kausaliya, J.K. Mallick, Rajan Goel, Sujan Hajra, Achamma Samuel, Ajay Prakash, A.K. Mitra, M. Ramaiah, Dipankar Mitra, Rajmal, A. Samantaraya, Pallavi Chavan, Snehal Bandivadekar, Sangita Misra and Jai Chander.

The full Report is available at the Reserve Bank's website on the Internet at [URL : www.rbi.org.in](http://www.rbi.org.in). Constructive comments and suggestions on the Report would be highly appreciated.

January 14, 2002

Y. V. Reddy
Deputy Governor

I Overview

Macroeconomic Developments : 2001-02

Real Sector

Public Finances

Monetary Developments

Financial Markets

Financial Sector

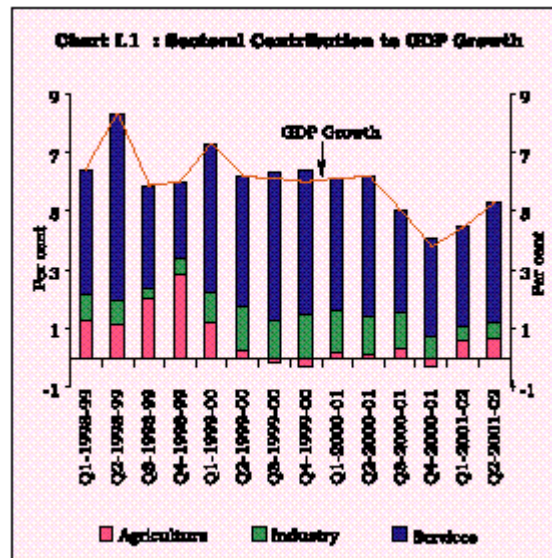
Global Economic Situation

External Sector

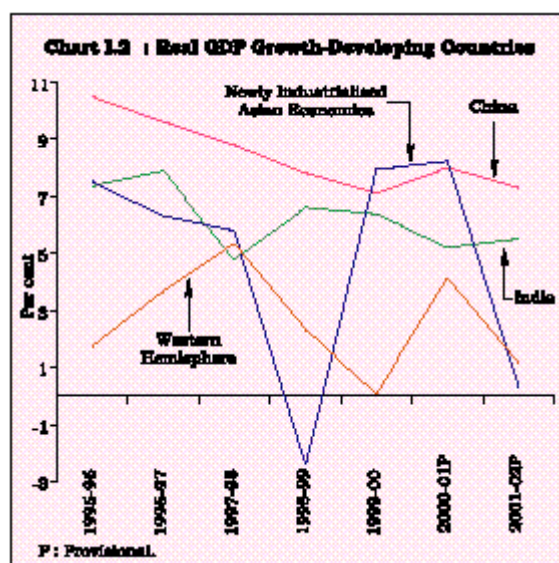
Macroeconomic Developments : 2001-02

1.1 Macroeconomic prospects for the year 2001-02 remain uncertain with the behaviour of various indicators of economic activity belying the initial expectations of an early upturn. The prevailing uncertainty was reflected in the revisions in growth forecasts for India for the year by various entities ranging widely from 4.5 to over 6.0 per cent.

1.2 According to the Quarterly Estimates of Gross Domestic Product (GDP) released by the Central Statistical Organisation (CSO), the growth rate of real GDP at 5.3 per cent in the second quarter of the financial year 2001-02 showed an improvement over 4.4 per cent recorded during the first quarter. However, the growth performance recorded during the first half of the current year remained below the growth rate achieved during the first half of 2000-01. The deceleration during the first half of the current year indicates that the slowdown which began with a decline in the growth rate from 6.6 per cent in 1998-99 to 6.4 per cent in 1999-2000 and then to 5.2 per cent in 2000-01 has continued to persist. The agricultural sector, however, recorded a distinct improvement in performance, supported by a well-distributed monsoon. The *kharif* foodgrains production touched a new peak in 2001-02. There has been noteworthy improvement in the production of key non-foodgrains such as oilseeds and cotton. The *rabi* production is also expected to improve over last year's level on account of a favourable North-East monsoon. Procurement operations have raised the stock of foodgrains to the level of 59.1 million tonnes at the end of November, 2001. The ongoing deceleration of growth has mainly reflected the sharp slowdown in the industrial sector. The index of industrial production rose by barely 2.2 per cent during the period April-October, 2001-02 as against 5.9 per cent during the corresponding period of the previous year. The slackening of growth was visible across all major sectors - manufacturing and electricity generation - with mining recording a low growth of 0.5 per cent. Business sentiment remained depressed and the capital markets witnessed subdued investors' interest. First quarter GDP originating in the service sector posted a growth of 6.4 per cent, reversing five consecutive quarters of deceleration. The improvement in services GDP continued in the second quarter of 2001-02 as it grew by 7.2 per cent. During the second quarter, a moderate improvement in growth was recorded by 'agriculture and allied activities', 'electricity, gas and water supply' and 'financing, insurance, real estate and business services' as compared to their growth in the corresponding quarter of 2000-01. Other sectors witnessed declines in their growth during the same period. The recent sectoral developments have ushered in shifts in the composition of GDP as well as in relative contributions to the overall growth process (Chart I.1).



1.3 The budgetary position of the Centre is experiencing some stress from a cyclical decline of receipts, dampened disinvestments and expansion in expenditure relative to budget estimates. The gross fiscal deficit (GFD) of the Centre is placed at Rs.79,133 crore in April-November, 2001, higher by 23.1 per cent over the level in the first eight months of 2000-01. Inflation conditions turned benign in the absence of demand pressures as well as the supply shocks - revision in fuel prices - which characterised the previous year. Headline inflation fell to a low of 2.2 per cent as on December 22, 2001 as against 8.6 per cent, a year ago; while underlying inflation, reflected in the movement of average wholesale prices also remained lower than the preceding year's level. Reserve money increased by 3.7 per cent during 2001-02 (up to December 28, 2001) as against an increase of 1.7 per cent during the corresponding period of the previous year. The increase in reserve money growth during 2001-02 has been mainly on account of expansion in the net foreign assets of the Reserve Bank. On the other hand, the net domestic assets continued to decline on account of low recourse to refinance and the offsetting of primary monetisation through strategic open market operations. Broad money (M_3), during the current fiscal year (up to December 14), grew by 10.4 per cent, marginally higher than the growth of 9.7 per cent (net of India Millennium Deposits (IMDs)) during the comparable period of the previous year. On an annual basis, M_3 growth was marginally higher at 15.0 per cent as on December 14, 2001 as against 14.7 per cent (net of IMDs) as on December 15, 2000. Growth in net bank credit to the Government, on a fiscal year basis, remained more or less steady at around 13.0 per cent. Non-food credit, adjusted for scheduled commercial banks' non-SLR investments, decelerated to 11.8 per cent from 18.7 per cent last year, on an annual basis, reflecting the industrial slow down.



1.4 Financial markets reflected the slack in real activity, but remained orderly in view of comfortable liquidity conditions. Call rates were range-bound by the liquidity adjustment facility (LAF) operations. Significant reductions in the Bank Rate and cash reserve requirements in October 2001 drove the call rate down to 3.7 per cent on November 6, 2001 - a low for the year so far - although it has firmed up thereafter. Interest rates on other money market instruments also declined. In the absence of any significant pressure from non-food credit demand, around 98 per cent of the Centre's budgeted gross borrowing programme for 2001-02 was absorbed in the primary segment of the Government securities market by December 28, 2001. The secondary market has been driven by large rallies reflecting surplus liquidity conditions leading to the yield curve shifting downwards and the yield on the benchmark 10-year paper reaching a historic low of 7.8 per cent on December 5, 2001. Subsequently, however, conditions in the gilt market turned volatile with the yields hardening by the end of December 2001. The foreign exchange market was relatively stable during 2001-02 with some fluctuations witnessed during the middle of September after the terrorist attacks in the US; however, stability returned rapidly. Stock prices tended to move generally downward between April-September 2001, with the BSE Sensex touching a 8-year low of 2600 on September 21, 2001 in the wake of market uncertainties. There has been some improvement in the market sentiment in the following months with the BSE Sensex strengthening to 3288 by end-November but thereafter declined to 3262 by end-December following border tensions.

1.5 India's real growth is forecast at 5-6 per cent for the financial year 2001-02 (Reserve Bank of India, October 2001), making it one of the few developing countries which weathered the sharp downturn in global economy (Chart I.2). According to the World Economic Outlook (WEO) of the International Monetary Fund (IMF), global growth for 2001 is now projected at 2.4 per cent and the expectations of an early recovery have also dissipated (December 2001). World trade is expected to grow by 1.0 per cent in 2001 as against 12.4 per cent in the previous year. Reflecting the depressed global demand conditions, India's exports increased only by 0.5 per cent during the first eight months of 2001-02 as against the increase of 21.0 per cent in April-November, last year. POL imports declined by 13.4 per cent while, non-POL imports increased by 8.4 per cent.

1.6 The current account deficit narrowed significantly to US \$ 938 million in the first half of 2001-02 as compared with US \$ 2,865 million in April-September, 2000 on account of sharp decline in imports. Capital flows during the current year were higher than in the preceding year on account of larger net inflows under foreign direct investment, portfolio investment by foreign institutional investors (FIIs) and external assistance. Reflecting these developments, the foreign exchange reserves rose to US \$ 48.1 billion as on December 31, 2001, higher by US \$ 5.8 billion over the level of US \$ 42.3 billion at end-March 2001 ([Table 1.1](#)).

Table 1.1: Macroeconomic Indicators

Indicator	2000-01	2001-02 (fiscal year so far)	(per cent) 2000-01 (corresponding period last year)
1	2	3	4
Real GDP	5.2	5.3 \$	6.2 \$
Agriculture and Allied Activities	0.2	3.4 \$	0.5 \$
Industry	5.3	2.4 \$	5.4 \$
Services	7.5	7.2 \$	8.5 \$
Index of Industrial Production (IIP)	5.1	2.2	5.9
Foodgrains Production (mt)	196.1	(up to October) 105.6	103.1
Food Stocks (mt)	45	(kharif) 59.1	(kharif) 44.5
GFD/GDP (ratio)	5.1 (RE)	(end-November) 2.3	(end-November) 1.9
Broad Money (M3)	16.7	(up to September) 10.4	12.0
Net Bank Credit to the Government	16.1	(up to Dec. 14) 13.0	13.1
Scheduled Commercial Banks' Non-food Credit (Adjusted for non-SLR Investments)#	16.0	(up to December 14) 11.8	18.7
WPI Inflation (Annual point-to-point)	4.9	(as on December 14) 2.2	(as on December 23) 8.6
Call Money Borrowing Rate (weighted average)	9.15	(as on December 22) 7.08	8.76
Yield on 10-Year Government Securities##	10.23	(December) 8.0	(December) 10.94
BSE Sensex (Average)	4269	(end-March) (end-December) 3283	(end-December) (end-December) 4330
Exchange Rate (Rupee/US\$)	46.64	(up to December) 48.18	(up to December) 46.75
Export Growth Rate (US \$ terms)	21.0	(as on December 31, 2001) 0.5	(as on December 29, 2000) 21.0
Import Growth Rate (US \$ terms)	1.7	(up to November) 1.2	7.4
Current Account Deficit (US \$ million)	-2,579	(up to November) -938	-2,865
		(up to September)	

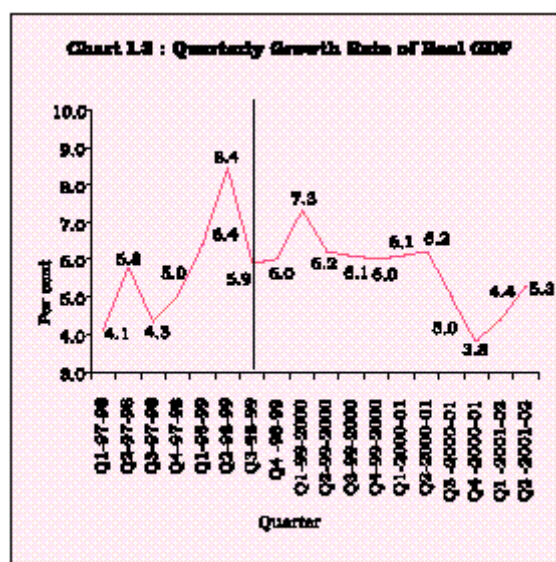
Foreign Investment inflow (US \$ million)	5,099	3,294 (up to October)	2,314
Non-Resident Deposits inflow (US \$ million)	2,317	1,522 (up to October)	1,125
Foreign Exchange Reserves* (US \$ million)	42,281	48,112 (December 31, 2001)	40,077 (December 30, 2000)

* : As at the end of the period. RE : Revised Estimates
: On a year-on-year basis mt : Million tonnes.
: On residual maturity basis.
\$: Data pertain to second quarter (July - September) of the respective year.

Real Sector

1.7 Real GDP growth in the second quarter of 2001-02 at 5.3 per cent was a moderate improvement over 4.4 per cent recorded in the first quarter of 2001-02 and the trough of 3.8 per cent recorded in the last quarter of 2000-01. However, real GDP growth in the second quarter of 2001-02 was lower at 5.3 per cent as compared with 6.2 per cent in the corresponding quarter of 2000-01. This decline in the growth of GDP is attributed to the declines in the growth rates of both industry and services sectors which have offset the improvement in the growth rate of agriculture. The behaviour of quarterly GDP growth suggests that the current deceleration has taken root since the third quarter of 1998-99 (Chart I.3).

1.8 The decline in GDP growth during the second quarter of the current year has been mainly due to the poor performance of 'mining and quarrying', 'manufacturing', 'construction', 'trade, hotels, transport and communication' and 'community, social and personal services'. On the other hand, 'agriculture and allied activities', 'electricity, gas and water supply' and 'financing, insurance, real estate and business services' experienced some acceleration of growth ([Table 1.2](#)).



1.9 Intra-sectoral variations in the growth performance of the service sector industries have brought about perceptible shifts in the contribution of each of these industries to the overall

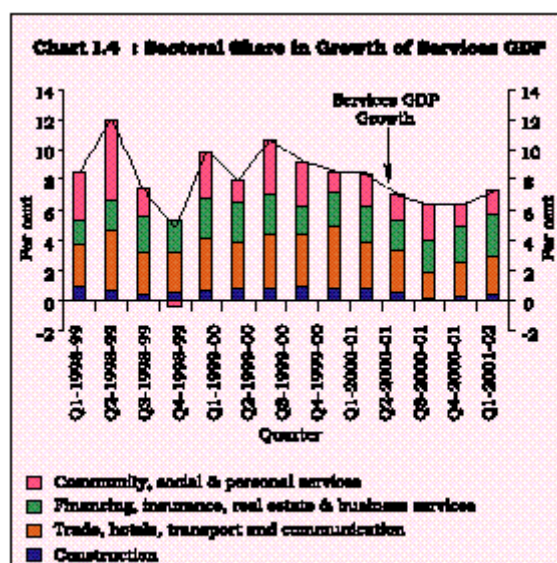
output of the services sector (Chart I.4).

Table 1.2 : Quarterly Estimates of GDP@

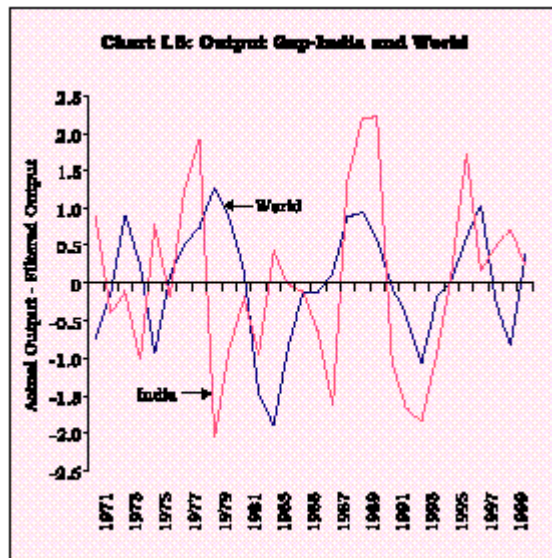
1	Gross Domestic Product (Rs. crore)						Percentage change over previous year			
	1999-2000		2000-01		2001-02		2000-01		2001-02	
	Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2
2. Agriculture, forestry and fishing	69,715	50,200	70,167	50,428	71,813	52,121	0.6	0.5	2.3	3.4
3. Mining and quarrying	6,162	6,242	6,473	6,481	6,473	6,519	5.0	3.8	0.0	0.6
4. Manufacturing	46,980	47,727	50,248	50,590	51,397	51,770	7.0	6.0	2.3	2.3
5. Electricity, gas and water supply	6,882	7,086	7,271	7,299	7,510	7,650	5.7	3.0	3.3	4.8
6. Construction	14,034	13,864	15,206	15,032	15,584	15,652	8.4	8.4	2.5	4.1
7. Trade, hotels, transport and communication	58,627	58,390	64,293	62,629	67,667	66,522	9.7	7.3	5.2	6.2
8. Financing, insurance, real estate and business services	34,958	35,371	38,270	38,842	42,060	43,124	9.5	9.8	9.9	11.0
9. Community, social and personal services	33,255	34,726	35,240	37,938	37,437	40,240	6.0	9.3	6.2	6.1
GDP at factor cost	2,70,613	2,53,607	2,87,168	2,69,241	2,99,941	2,83,599	6.1	6.2	4.4	5.3

@ : at 1993-94 prices.

Note : Q1: April-June and Q2: July-September.

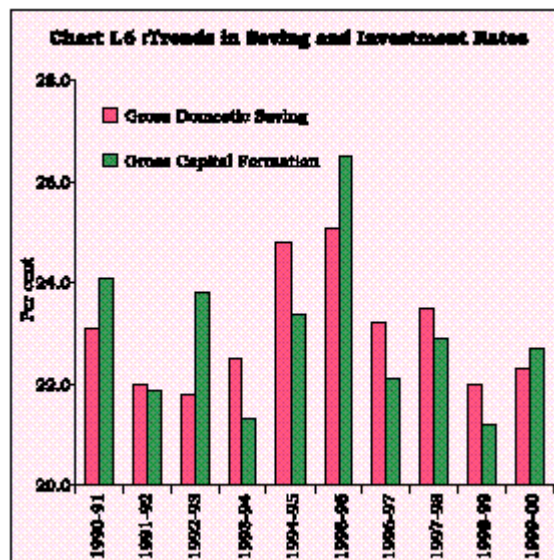


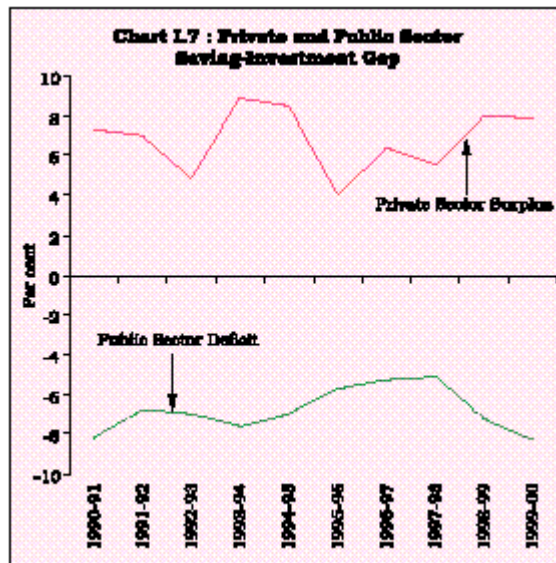
1.10 There is evidence of increasing co-movement between the variability of real activity in India and the variability of world output indicating that the Indian economy is not completely insulated from the turns and phases of the global business cycle. India's openness to cross-border trade and private capital has increased considerably in the 1990s in response to structural reforms including external financial liberalisation. The impact of globalisation on the economy has been somewhat symmetric with gains accruing from expansion in world activity as well as contraction occurring in tandem with global slowdown (Chart I.5).



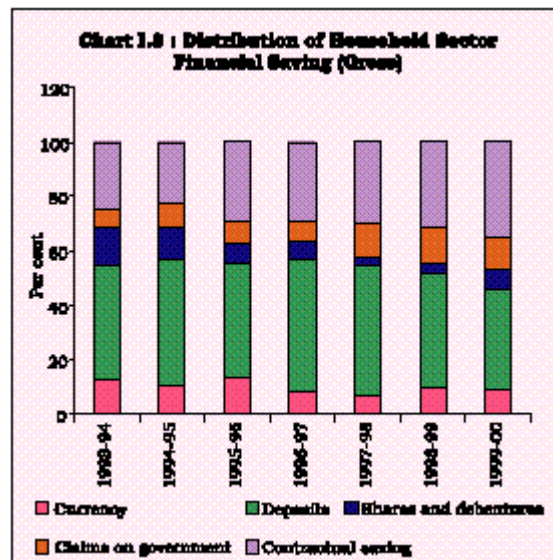
Saving and Investment

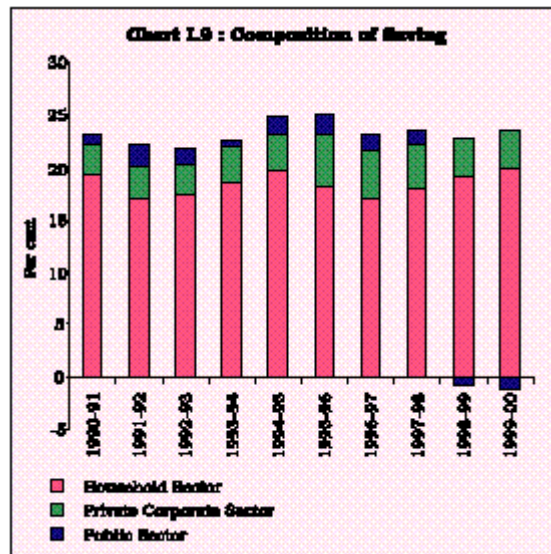
1.11 The saving and gross capital formation rates were estimated higher at 22.3 per cent and 22.7 per cent in 1999-2000, respectively, as compared to 22.0 per cent and 21.2 per cent, respectively, during 1998-99 (Chart 1.6). The process of consolidation of macro-balances continued during the 1990s. The saving-investment (adjusted for errors and omissions) gap narrowed down from 1.5 per cent in 1997-98 to remain at 1.0 per cent in 1998-99 and 1999-2000. Another underlying development is the deterioration in the rate of public saving-investment deficit without commensurate improvement in the rate of private sector surplus (Chart 1.7).



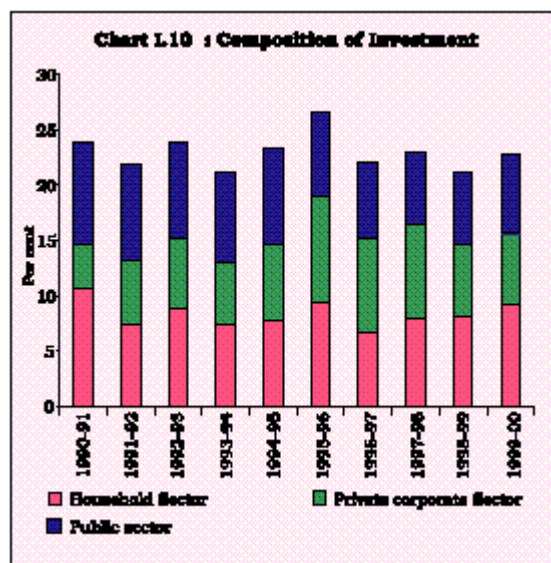


1.12 The household saving, which has a predominant share in domestic saving, has undergone shifts in the pattern of mobilisation with the share of deposits and contractual savings remaining high (Chart I.8). Corporate sector saving has shown a declining trend in the second half of the 1990s. Public sector saving became negative in 1998-99 and has worsened thereafter (Chart I.9).



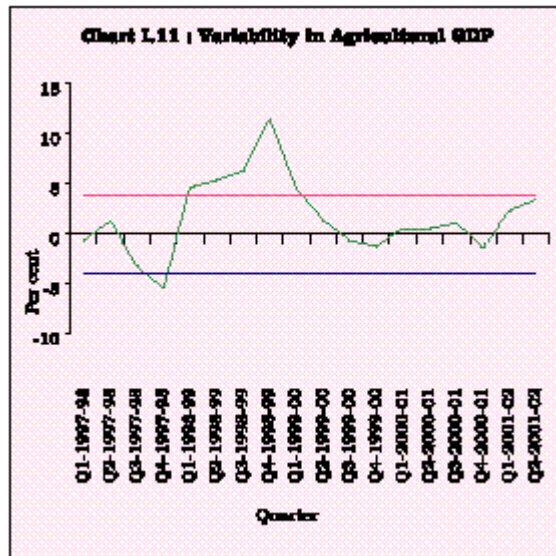


1.13 The investment rate has moved in tandem with the saving rate. All the constituent sectors, except the private corporate sector, recorded increases in the rates of capital formation during 1998-2000 (Chart I.10).

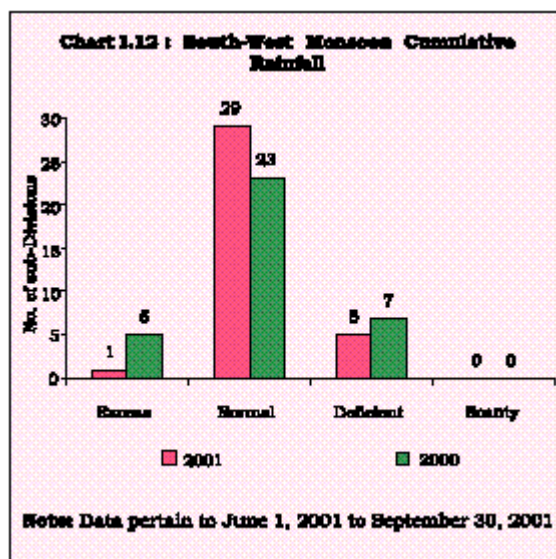


Agriculture

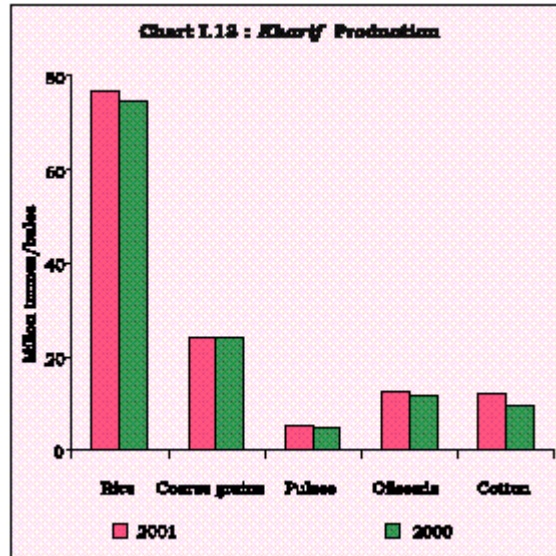
1.14 The GDP growth in 'agriculture and allied activities' improved to 2.3 per cent in the first quarter of 2001-02, as compared with 0.6 per cent in the corresponding quarter of the previous year, reversing the absolute decline which occurred in the last quarter of 2000-01. In the second quarter, the performance of the 'agriculture and allied activities' improved further to 3.4 per cent as against 0.5 per cent during the corresponding period of the previous year. In the recent period, there has been some dampening of the variability of GDP growth in agriculture (measured in terms of the deviations from limits set by +/- one standard deviation) although this appears to be associated with the slowing down of growth (Chart I.11).



1.15 According to the latest information available from the Union Ministry of Agriculture, the overall *kharif* foodgrain production for 2001-02 was at a record 105.59 million tonnes. Rice production at 76.4 million tonnes was higher by 2.0 million tonnes than in the previous year, while pulses also recorded a rise in production. The increase in rice production is mainly attributable to the favourable distribution of rainfall during South-West monsoon 2001, which resulted in yield gains, despite a reported fall in acreage. This year's South-West monsoon had a precipitation of 90 per cent of the Long Period Average, but was characterised by better spatio-temporal distribution (Chart I.12). Chattisgarh, Gujarat, Madhya Pradesh and Rajasthan received excess/normal rainfall, thus relieving the water scarcity conditions that were experienced in these States in the previous two years. The output of coarse cereals, however, witnessed a marginal decline to 23.9 million tonnes from the previous year's level of 24.0 million tonnes, despite an area increase.



The production of *kharif* oilseeds recovered from the poor performance of the previous two years, especially that of groundnut and soyabean, though the output of castorseed and sunflower declined. The improved performance of groundnut and soyabean took the *kharif* oilseeds production in 2001-02 to 12.5 million tonnes from the previous year's level of 11.6 million tonnes. Much of the increased production can be attributed to rise in productivity. Output of cotton at 12.3 million bales is also higher than that in the previous year (Chart I.13). The production of sugarcane at 280.0 million tonnes, however, is less than the previous year's record production of 300.3 million tonnes ([Table 1.3](#)).



1.16 The North-East monsoon 2001 has also been satisfactory with 23 sub-divisions receiving excess to normal rainfall, with the number of sub-divisions receiving deficient/ scanty rainfall declining from 31 in 2000 to 12 in the current year (up to December 31, 2001) (Chart I.14). In recent years, consistent increase in wheat production has blurred the compositional distinction between *kharif* and *rabi* foodgrains output, with the latter accounting for around 50 per cent of the total foodgrains production (Chart I.15).

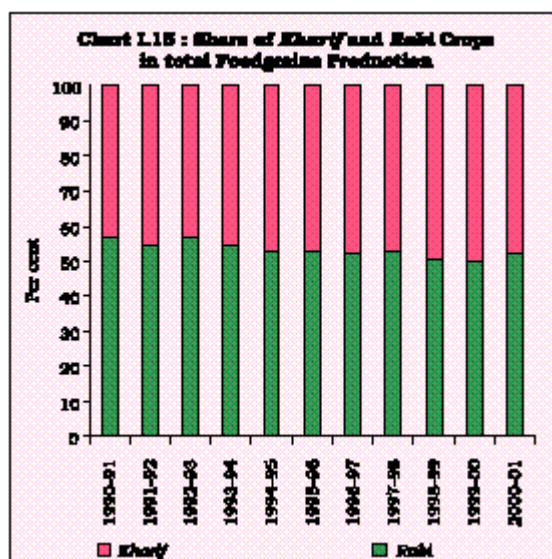
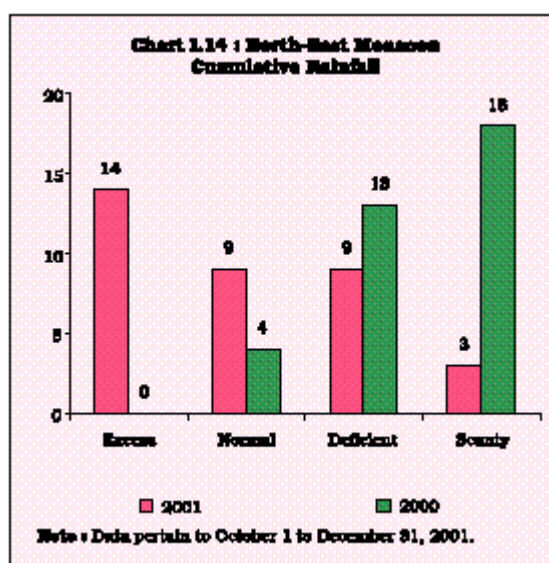
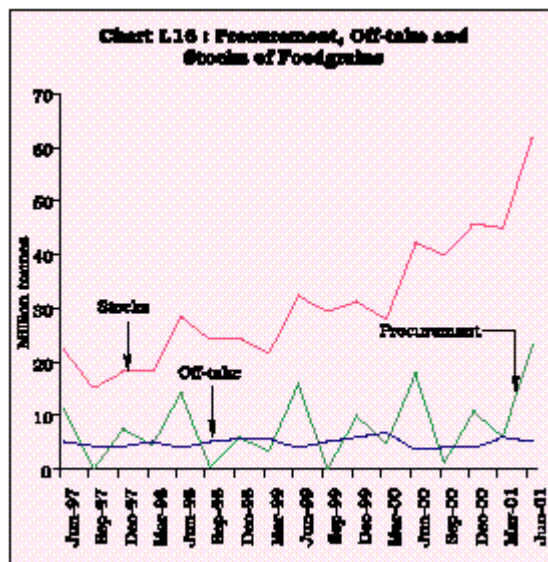


Table 1.3 : Targets and Achievements in Agricultural Production during 2000-01 and 2001-02

Crop	2000-2001				2001-2002		
	Kharif		Rabi		Kharif		Rabi
	T	A.E.	T	A.E.	T	A.E.	T
1	2	3	4	5	6	7	8
Rice	76.30	74.41	13.70	11.89	77.98	76.42	14.02
Wheat	—	—	74.00	68.46	—	—	78.00
Coarse grains	26.62	24.02	6.38	6.23	26.12	23.92	6.85
Pulses	6.00	4.68	9.00	6.38	6.00	5.25	9.00
Total Foodgrains	108.92	103.11	103.08	92.96	110.10	105.59	107.87
Oilseeds	16.50	11.58	11.50	6.62	16.50	12.54	11.50
Sugarcane	325.00	300.32	—	—	325.00	279.96	—
Cotton*	14.50	9.39	—	—	14.50	12.30	—
Jute and Mesta**	10.00	10.37	—	—	11.00	—	—

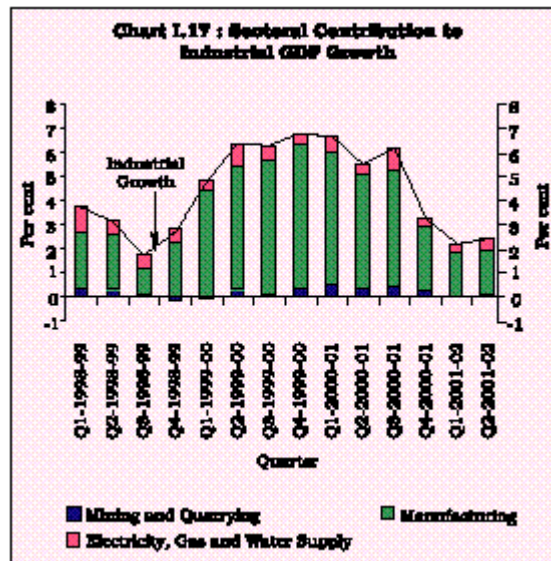
T : Target.
A.E. : Advance Estimates as on September 29, 2001.
* : Production in Million Bales of 170 kg. each.
** : Production in Million Bales of 180 kg. each.
Source : Ministry of Agriculture, Government of India.

1.17 During the current financial year up to December 31, 2001, the procurement of rice and wheat rose by 15.0 per cent to 34.8 million tonnes. The total off-take of foodgrains (up to end-November, 2001) increased substantially by 55.6 per cent on account of a sharp rise in the off-take under open market sales (OMS) and other welfare scheme (OWS). Off-take under Targeted Public Distribution System (TPDS) also increased by 6.0 per cent to 8.4 million tonnes from 7.9 million tonnes in the corresponding period of the previous year. With the substantial rise in procurement levels, the stocks of foodgrains rose to 59.1 million tonnes at the end of November 2001, indicating a rise of 30.0 per cent over the level in November 2000 (Chart I.16).



Industry

1.18 Real GDP growth originating from industry continues to be in the downturn phase which began from the first quarter of 2000-01. There was, however, a marginal improvement, with real GDP growth from industry increasing to 2.4 per cent in the second quarter of 2001-02 from 2.2 per cent in the first quarter. The industrial slowdown is concentrated in the mining and quarrying and manufacturing sectors which have experienced a continuous erosion in their contribution to overall industrial growth (Chart I.17).



1.19 The index of industrial production (IIP), however, recorded a growth of 2.2 per cent during April-October 2001 as against 5.9 per cent during April-October 2000 (Table 1.4). The monthly growth of the IIP has remained lower in all the months of the current year as compared with the corresponding months of 2000-01 (Chart I.18).

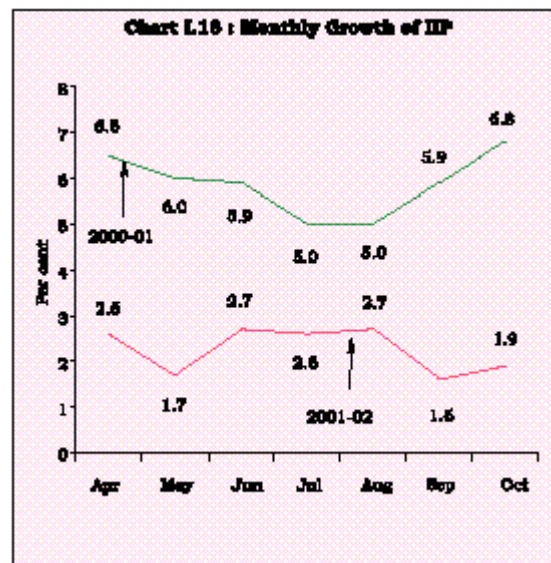


Table 1.4 : Sector-wise Monthly Growth of IIP

(Per cent)

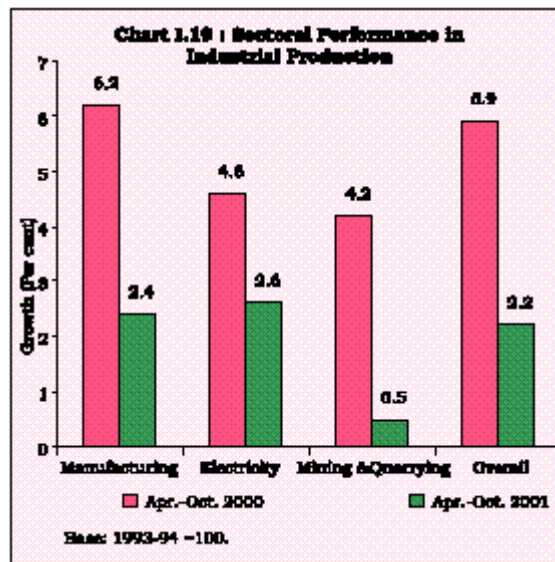
Month	General (100.00)		Electricity (10.17)		Mining and Quarrying (10.47)		Manufacturing (79.36)	
	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02
1	2	3	4	5	6	7	8	9
April	6.5	2.6	3.7	1.5	4.0	3.4	7.1	2.7
May	6.0	1.7	6.4	3.0	2.6	-0.5	6.2	1.8
June	5.9	2.7	5.0	2.1	4.4	-3.7	6.1	3.4

July	5.0	2.6	2.6	4.7	2.0	-2.0	5.7	2.9
August	5.0	2.7	1.0	2.7	4.0	-0.1	5.5	3.0
September	5.9	1.6	2.2	4.6	5.4	4.0	6.4	1.0
October	6.8	1.9	11.5	-0.6	6.6	2.4	6.2	2.2
April-October	5.9	2.2	4.6	2.6	4.2	0.5	6.2	2.4

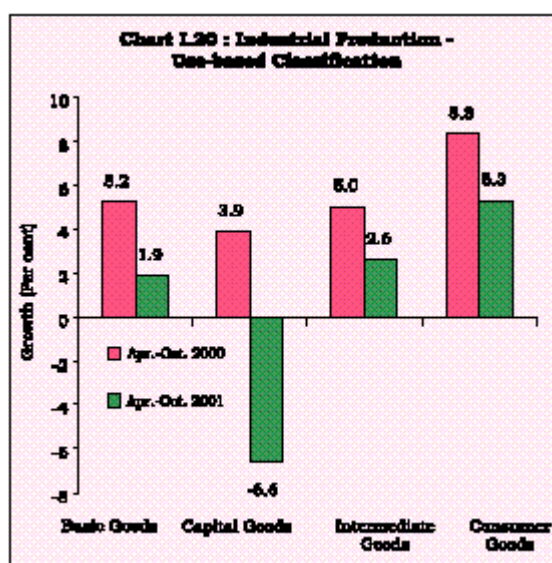
Note : 1.Data for 2001-02 are provisional.
2.Figures in brackets are weights in IIP.

Source: Central Statistical Organisation (CSO).

1.20 Manufacturing sector growth slowed down to 2.4 per cent from 6.2 per cent in April-October 2000. Electricity generation also decelerated to 2.6 per cent as against 4.6 per cent in the previous year, while the mining sector recorded a low growth of 0.5 per cent as compared with a growth of 4.2 per cent during April-October 2000 (Chart I.19).



1.21 On a cumulative basis, all the sectors of industry showed either deceleration or decline. The basic goods, intermediate goods and consumer goods sectors recorded lower growth of 1.9 per cent, 2.6 per cent and 5.3 per cent, respectively, during April-October 2001 as compared with 5.2 per cent, 5.0 per cent and 8.3 per cent, respectively, during April-October 2000. The capital goods sector registered an absolute decline of 6.6 per cent during April-October 2001 as against a positive growth of 3.9 per cent during the corresponding period of the previous year (Chart I.20).



1.22 Within manufacturing, eleven out of seventeen ‘two-digit’ industry groups recorded positive growth during April-October 2001. Out of the seventeen ‘two-digit’ industry groups, seven groups (25.9 per cent weight in IIP) registered accelerated growth and four groups (30.2 per cent weight in IIP) recorded decelerated growth as compared to eight groups in the previous year. The remaining six groups (23.2 per cent weight in IIP) registered a decline as against two groups in the previous year. Out of seven groups which experienced accelerated growth, ‘leather and leather and fur products’ (15.6 per cent), ‘rubber, plastic, petroleum and coal products’ (12.0 per cent), and ‘beverages, tobacco and related products’ (10.5 per cent) recorded the highest growth. On the other hand, ‘food products’, ‘cotton textiles’, ‘textile products (including wearing apparel)’, ‘jute and other vegetable fibre textiles (except cotton)’, ‘wood and wood products, furniture and fixtures’, and ‘metal products and parts (except machinery and equipment)’ recorded a decline ([Table 1.5](#)).

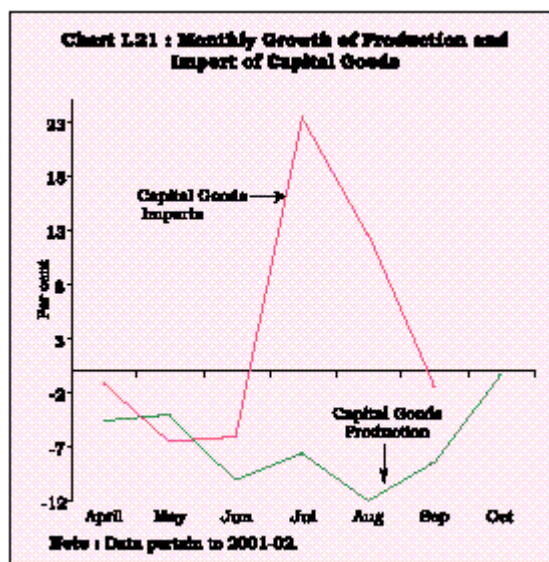
Table 1.5 : Classification of Groups of Manufacturing Industries by Growth Performance

Classification	April-October			
	2000-01		2001-02	
	No. of Industry Groups	Weight in IIP	No. of Industry Groups	Weight in IIP
1	2	3	4	5
Acceleration	7	26.0	7	25.9
Deceleration	8	46.7	4	30.2
Negative	2	6.6	6	23.2
Manufacturing (Total)	17	79.4	17	79.4

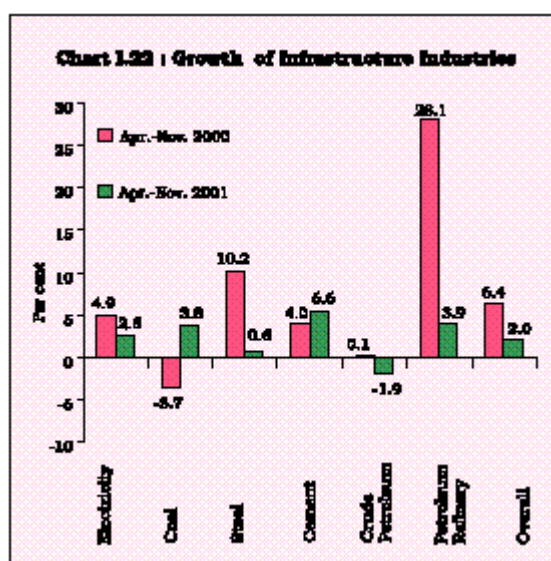
Source: Central Statistical Organisation.

1.23 Although the capital goods sector has a relatively low weight (9.26 per cent) in the overall

IIP, it has crucial importance as a leading sector with substantial forward linkages. Capital goods production has implications for the growth of productive capacity and future prospects of industrial growth. The production of capital goods has declined in all months during April-October 2001, although imports of capital goods showed some signs of revival during the months of July and August 2001, however, it declined again during September 2001 (Chart I.21).



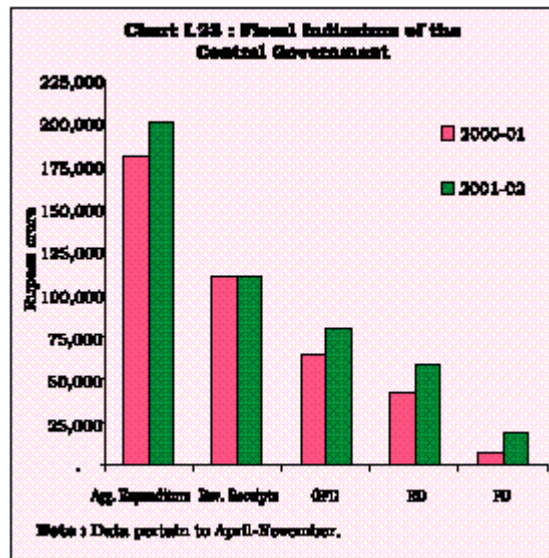
1.24 During April-November 2001, the overall growth of infrastructure industries was substantially lower at 2.0 per cent as compared with a growth of 6.4 per cent during April-November 2000. Petroleum refinery products registered a substantially lower growth of 3.9 per cent as against 28.1 per cent in the previous year. Production in the electricity and steel sectors also recorded lower growth of 2.6 per cent and 0.6 per cent, respectively, during April-November 2001 as against 4.9 per cent and 10.2 per cent, respectively, in the previous year. Production of crude petroleum recorded a decline of 1.9 per cent during April-November 2001 as against a growth of 0.1 per cent during April-November 2000. Coal sector has shown a positive growth of 3.8 per cent as against a negative growth of 3.7 per cent during April-November 2000 (Chart I.22).



1.25 The overall investment climate remained depressed during April-October 2001 as reflected in a sharp decline in resource mobilisation from new issues and private placement and deceleration in sanctions and disbursements of financial assistance by financial institutions and non-food credit off-take from commercial banks. The decline in agricultural production in the previous two years, deceleration in power generation, persistence of inventory accumulation in some industries, slowdown in infrastructure and the overall pessimism in the investment climate are the factors which would weigh heavily on the industrial outlook for 2001-02.

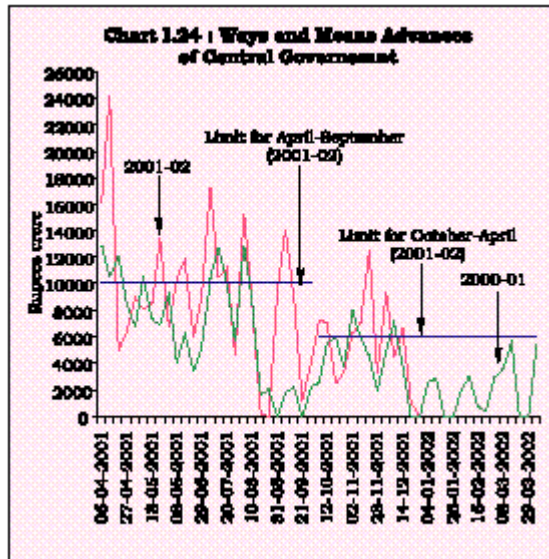
Public Finances

1.26 The budgetary position of the Central Government has undergone some deterioration during the first eight months of current fiscal year (April-November 2001) mainly due to decline in tax collection and steady rise in expenditure over the levels in the same period of 2000-01 (Chart 1.23). The gross fiscal deficit (GFD) at Rs.79,133 crore was higher by 23.1 per cent over April-November 2000 (Rs.64,269 crore) and constituted 68.0 per cent of the budget estimates (Rs.1,16,314 crore) for 2001-02. The revenue deficit at Rs.59,270 crore (75.2 per cent of budget estimates) was higher by 38.9 per cent over the level in the same period of the previous year (Rs.42,662 crore). The primary deficit, at Rs.19,333 crore, during April-November 2001 more than doubled over that in April-November 2000 (Rs.7,188 crore).

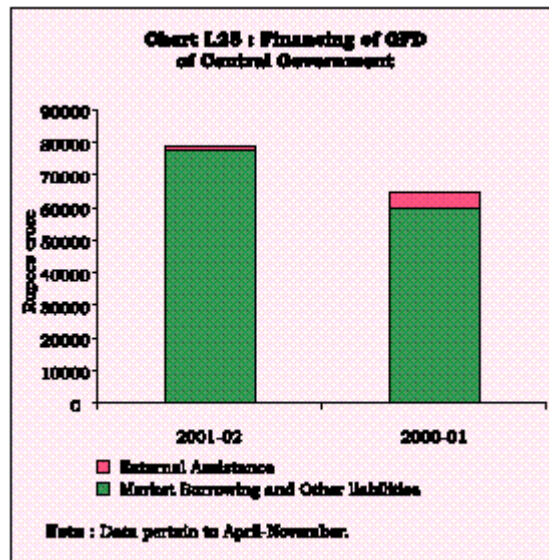


1.27 Revenue receipts during April-November 2001 increased by 0.5 per cent (as against 16.1 per cent growth in April-November 2000) and disinvestment collection was at Rs.206 crore during April-November 2001. The aggregate expenditure was higher by 10.9 per cent over April-November 2000 (8.8 per cent). The monthly trends indicate some easing of pressure on Central finances since August 2001 following improvement in revenues. Nevertheless, these developments indicate some pressure in meeting the targeted levels for important fiscal variables in the Union Budget 2001-02 such as gross fiscal deficit (GFD) at 4.7 per cent of GDP, the revenue deficit at 3.2 per cent of GDP, the primary deficit at 0.2 per cent of GDP, increase in aggregate expenditure at 11.8 per cent, revenue expansion at 12.4 per cent and mobilisation through disinvestment at Rs.12,000 crore.

1.28 The Centre's Ways and Means Advances (WMA) for the first and second halves of 2001-02 were fixed at Rs.10,000 crore (April-September) and Rs.6,000 crore (October-March), respectively. During the first half of 2001-02, the average of the fortnightly utilisation of WMA (inclusive of overdrafts) was Rs.8,138 crore, higher than in the same period of the previous year (Rs.7,024 crore). The outstanding WMA as on December 28, 2001 was nil (Chart I.24).



1.29 The gross market borrowings of the Centre for the fiscal year 2001-02 are budgeted at Rs.1,18,852 crore and net borrowings at Rs.77,353 crore. The net market borrowings are budgeted to finance 66.5 per cent of the gross fiscal deficit of the Central Government during 2001-02. During the current fiscal year so far (up to December 28, 2001), the Central Government has raised gross borrowings of Rs.1,16,002 crore and net market borrowings of Rs.79,002 crore. The Reserve Bank continued to combine auction issues with acceptance by private placement of dated securities of the Government in tune with market conditions. Devolvement/private placement with the Reserve Bank amounted to Rs.25,679 crore up to December 28, 2001. Market borrowings continued to form the dominant source of financing of the Centre's GFD (Chart I.25).



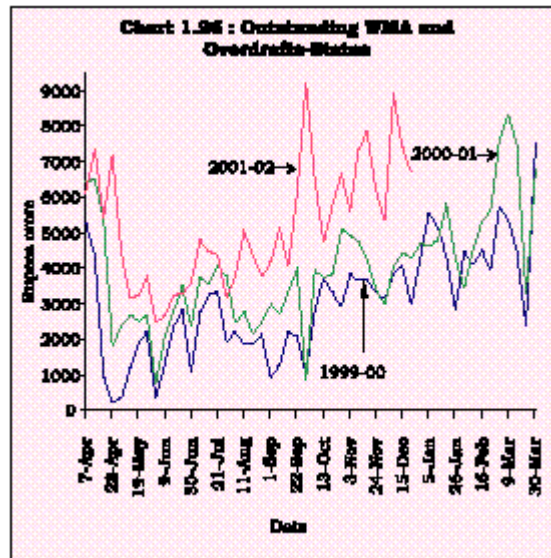
1.30 The interest rates on market borrowings have shown a persistent decline during the year so far. For instance, the interest rate on primary issue of government securities with a 10-year residual maturity declined from 10.25 per cent on April 12, 2001 to 9.22 per cent on July 25,

2001, and the yield on 15-year bonds declined from 10.71 per cent on April 18, 2001 to 8.1 per cent on December 5, 2001. Similarly, the yield on 25-year bond declined from 10.18 per cent on September 10, 2001 to 8.95 per cent on November 19, 2001. At the shorter maturity range, the yield on 364-day Treasury Bills declined from 8.85 per cent on April 4, 2001 to 7.10 per cent on September 5, 2001 and further to 6.68 per cent as on November 28, 2001. Similarly, the yield on 91-day Treasury Bills has declined from 8.50 per cent on April 4, 2001 to 6.63 per cent on October 24, 2001 and further to 6.50 per cent on November 28, 2001. However, cut-off yields on 91-day and 364-day Treasury Bills were at 7.25 per cent and 7.38 per cent, respectively, as on December 26, 2001.

1.31 The finances of State Governments during 2001-02 are budgeted to improve over the revised estimates for 2000-01 in terms of revenue deficit, gross fiscal deficit and primary deficit (from 2.3 per cent, 4.4 per cent and 1.9 per cent, respectively in 2000-01 to 1.9 per cent, 3.9 per cent and 1.2 per cent of GDP, respectively in 2001-02). The revenue receipts are budgeted to be higher by 14.2 per cent with States' own revenue receipts (tax revenue and non-tax revenue) expected to finance 53.0 per cent of the revenue expenditure and 43.9 per cent of the aggregate expenditure in 2001-02, as compared with 50.0 per cent and 41.1 per cent, respectively, in 2000-01 (RE). On the expenditure front, revenue expenditure continues to absorb a major portion of receipts. The growth in revenue expenditure is mainly due to non-developmental expenditure which is estimated to show a higher growth of 18.0 per cent as against 15.2 per cent in the previous year. The growth rate in developmental expenditure is estimated to sharply decelerate from 15.3 per cent in 2000-01 to 5.4 per cent in 2001-02. The share of social and economic services in aggregate expenditure is estimated to decline to 58.4 per cent in the budget estimates for 2001-02 from 61.2 per cent in the previous year. A noteworthy development is the focus on the need for increased budgetary allocation for natural calamities, which rose to Rs.8,185 crore in 2001-02 as compared with Rs.5,001 crore in the revised estimates for 2000-01.

1.32 The continued emphasis on fiscal reforms at sub-national level has gained significance and become an important component of overall economic restructuring. The State Budgets for 2001-02 proposed measures reflecting the urgency to expedite the fiscal consolidation process, while focusing on infrastructure development and growth enhancing sectoral policies. The measures taken by the States include setting up of Consolidated Sinking Fund, Expenditure Review/Reform Committee, Guarantee Redemption Funds, Infrastructure Development Funds and Tax Reforms Commissions, placing statutory limits on guarantees, restructuring the public sector undertakings (PSUs) and comprehensive rationalisation of posts. The medium-term fiscal plan drawn up by some of the State Governments provide a time-frame for implementing fiscal reforms to achieve fiscal soundness. States have also focused on development of infrastructure including encouragement to private investment in the infrastructure projects and promotion of growth enhancing sectors like information technology, horticulture, agro-based industries, *etc.*

1.33 The information on the fiscal outturn of the State Governments during the current year so far is not available. However, the recourse to WMA from the Reserve Bank in the current fiscal year 2001-02 so far (up to December 21, 2001) generally remained higher than that in the previous year and reveals some pressure on State finances. The outstanding WMA and overdrafts from the Reserve Bank as on December 21, 2001 amounted to Rs. 6,720 crore as against Rs.4,305 crore as on December 22, 2000 (Chart I.26).



1.34 For the fiscal year 2001-02, States were allocated gross and net market borrowings of Rs.14,304 crore and Rs.12,857 crore, respectively. The State Governments have raised an amount of Rs.11,849 crore, constituting 82.84 per cent of the gross market borrowings programme for the full fiscal year (up to December 28, 2001). The amount was raised through pre-announced issues (including taps) as well as through auctions. The interest rate varied in the range of 8.37 per cent to 10.53 per cent in 2001-02 (up to December 28, 2001) as against 10.50 per cent to 12.00 per cent in the previous year (2000-01).

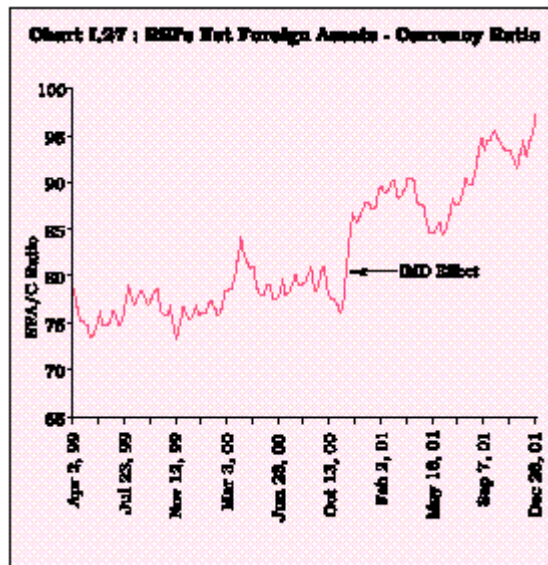
Monetary Developments

1.35 In April 2001, the monetary and credit policy for 2001-02 was announced against the background of comfortable liquidity conditions and orderly financial markets. In pursuance of the monetary stance of ensuring adequate credit consistent with price stability, the Reserve Bank undertook to continue its policy of active management of liquidity through the liquidity adjustment facility (LAF) supported by strategic open market operations (OMO) and further reductions in the cash reserve ratio (CRR) if warranted. The Reserve Bank also indicated its policy intention of maintaining the current interest rate environment with a preference for softening over the medium-term unless underlying conditions changed dramatically. In April 2001, monetary policy was framed in the context of a real GDP growth forecast at 6-6.5 per cent under the assumptions of an industrial recovery from the second quarter of 2001-02, a reasonable monsoon, and a good performance of exports. Inflation was placed within 5 per cent. Indicative projections for M3 at 14.5 per cent and commercial banks' non-food credit adjusted for non-SLR investments at 16-17 per cent were made consistent with the macroeconomic forecasts. The LAF, which has emerged as an effective and flexible instrument for influencing liquidity on a day-to-day basis, moved into its second stage in May 2001. Variable rate repos replaced the collateralised lending facility and Level I support to primary dealers (PDs). Standing refinance facilities were rationalised and a back-stop facility was introduced at market-related rates of interest. LAF operating procedures were recast to improve operational flexibility. In the first graduated move towards enabling the call money market to evolve into a pure inter-bank market,

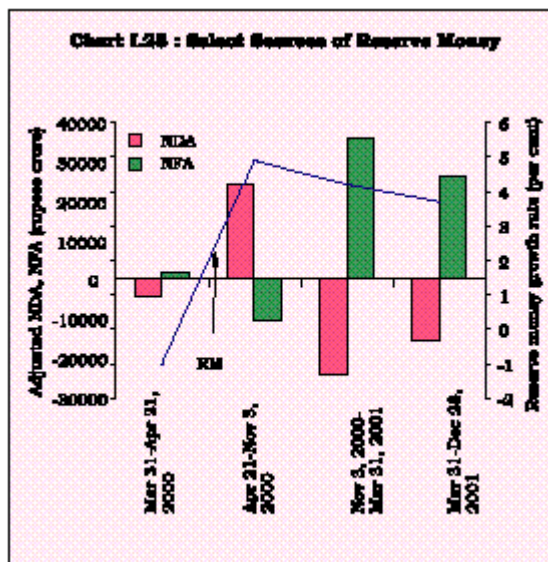
lending by non-banks was reduced to 85 per cent of their average daily lendings in the call money market in 2000-01 from May 5, 2001. Other measures such as shortening of the minimum maturity of wholesale deposits from 15 days to 7 days, revision in the daily minimum maintenance of CRR to 50 per cent for the first seven days of the reporting fortnight and 65 per cent for the next seven days and exemption of inter-bank term liabilities from the minimum CRR of 3 per cent on net demand and time liabilities were undertaken to improve the functioning of the money market and thereby, the transmission of monetary policy.

1.36 The mid-term review of the monetary and credit policy in October 2001 took into account the unfavourable performance of the industrial sector relative to initial expectations, the sluggishness in infrastructure industries, the decline in exports amidst a heightening of global uncertainty, and the slack in the off-take of non-food credit to revise the growth forecast for the year to 5-6 per cent. The announced stance of monetary policy was persevered with - to continue active liquidity management with strategic combinations of instruments. In keeping with the indicated preference for a softer interest rate environment, the Bank Rate was reduced by 50 basis points to 6.5 per cent and the CRR by 200 basis points. However, all the exemptions on the liabilities, except inter-bank liabilities, were withdrawn for the computation of net demand and time liabilities for the purpose of CRR. These measures are expected to contribute to money market development and to the conduct of monetary policy, besides the overarching objective of creating conditions for a revival of growth with low inflation. Financial sector reforms were carried forward and the development of the money and government securities segments of the financial market gathered momentum. The projections for monetary and credit growth remained unchanged.

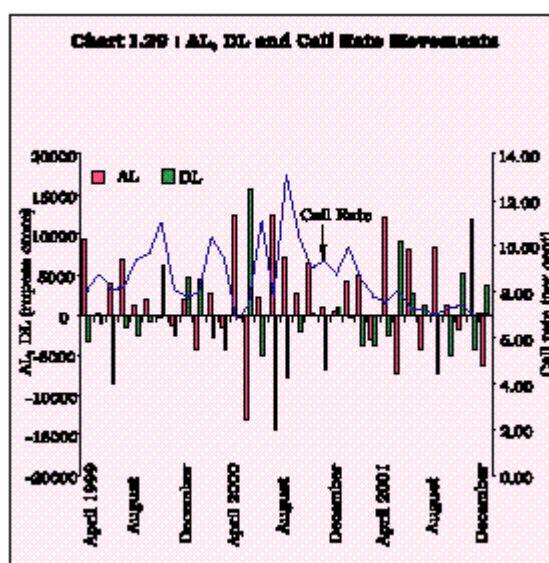
1.37 Reserve money expansion (up to December 28, 2001) was of the order of 3.7 per cent as against 1.7 per cent during the corresponding period of last year, primarily driven by the steady accretion to the Reserve Bank's foreign currency assets (net of revaluation) which rose by Rs. 26,217 crore during 2001-02 so far as against Rs. 12,900 crore last year. Currency in circulation expanded by 9.6 per cent as against 8.1 per cent last year. The ratio of net foreign assets (NFA) to currency, a leading indicator of the impact of the balance of payments on the domestic economy, has steadily improved during the year to reach 97.1 per cent as on December 28, 2001 (Chart I.27).



1.38 The net domestic assets (NDA) (adjusted for revaluation) of the Reserve Bank (upto December 28, 2001) underwent a compensating decline of Rs.15,141 crore on top of a decline of Rs.8,036 crore last year (Chart I.28). The net Reserve Bank credit to the Central Government declined by 3.7 per cent as against an increase of 2.2 per cent during the corresponding period of 2000-01. The Reserve Bank's subscription to the Centre's fresh dated securities at Rs.25,679 crore (at face value), was more than offset by net open market sales which amounted to Rs.30,187 crore. Recourse to refinance by commercial banks increased by Rs. 1,944 crore while that by PDs declined by Rs.1,814 crore.



1.39 Since 1999-2000, *i.e.*, with the introduction of the LAF as an interim facility, the Reserve Bank has been modulating market liquidity by strategically counterbalancing autonomous liquidity (AL)¹ with discretionary liquidity (DL) in order to ensure stability in the money market conditions (Chart I.29).



1.40 The progressive movement towards indirect instruments of monetary policy in India has impacted upon the behaviour of reserve money, as policy impulses embodied in changes in the Reserve Bank's balance sheet are being transmitted through the market to the balance sheets of commercial banks. Accordingly, the movements in selected elements of reserve money are increasingly reflecting the Reserve Bank's market operations ([Table 1.6](#)).

Table 1.6 : Net Reserve Bank Credit to the Centre

Variable	(Rupees crore)						
	June	September	December	March	June	September	December
	30,2000	22, 2000	29, 2000	31, 2001	29, 2001	21, 2001	28, 2001
	Over	Over	Over	Over	Over	Over	Over
	March	June	September	December	March	June	September
31, 2000	30, 2000	22, 2000	29, 2000	31, 2001	29, 2001	21, 2001	
1	2	3	4	5	6	7	8
Net Reserve Bank Credit to the Centre (1+2+3+4-5)	14,393 (10.3)	-6,225 (-4.0)	-5,127 (-3.5)	3,664 (2.6)	19,523 (13.3)	-20,140 (-12.1)	-4,770 (-3.3)
1 Loans and Advances	4,316	-5,298	0	5,395	3,619	-7,791	-1,223
2 Treasury Bills held by the Reserve Bank	5	2,001	-2,375	-1,019	-3	-480	0
3 Reserve Bank's Holdings of Dated Securities	7,936	-2,985	-2,593	1,944	13,150	-11,907	-3,529
3.1 Central Government Securities	7,700	-2,985	-2,593	1,944	13,150	-11,907	-4,327
4 Reserve Bank's Holdings of Rupee Coins	13	58	-159	63	39	38	-18
5 Central Government Deposits	-2,123	0	0	2,719	-2,718	0	-1
<i>Memo Items*</i>							
1 Market Borrowings of Dated Securities by the Centre #	33,683	30,500	26,000	10,000	46,000	31,000	24,000
2 Reserve Bank's Primary Subscription to Dated Securities	6,961	22,815	1,374	0	21,000	679	4,000
3 Repos (-) / Reverse Repos (+) (LAF), net position	0	-10,570	11,130	-1,915	1,355	1,410	-1,160

4 Net Open Market Sales #	1,528	4,259	13,304	128	10,929	13,985	5,273
5 Primary Operations	13,412	17,575	1,215	2,739	27,376	-7,074	2,759

* : At face value.

: Excludes Treasury Bills.

Parenthetic figures constitute percentage variations.

Table 1.7 : Monetary Indicators

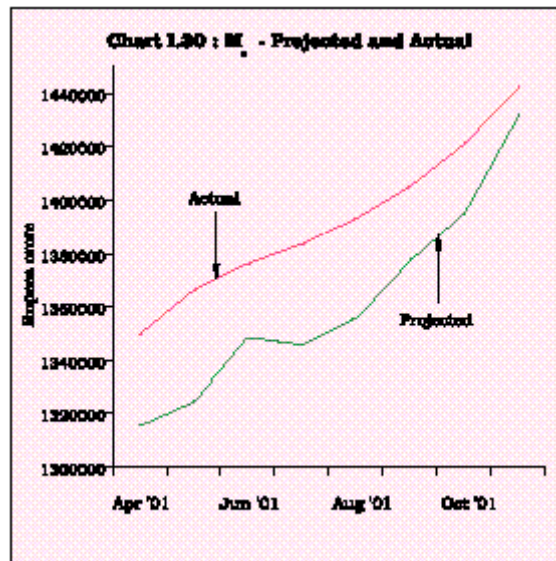
Indicator	2000-01		2001-02 (up to December 14)		2000-01 (up to December 15)	
	Point to Point (Per cent)	Monthly Average Basis (Per cent)	Absolute (Rupees Crore)	Per cent	Absolute (Rupees Crore)	Per cent
	1	2	3	4	5	6
Reserve Money *	8.1	7.8	11,076	3.7	4,864	1.7
Broad Money (M ₃)	16.7 (14.4)	15.8	1,35,921	10.4	1,34,729	12.0 (9.7)
Currency with the Public	10.8	9.2	24,245	11.6	18,197	9.6
Aggregate Deposits	17.8	17.3	1,12,227	10.2	1,17,158	12.6
Net Bank Credit to Government	16.1	13.8	66,579	13.0	57,644	13.1
Bank Credit to Commercial Sector	14.8	20.0	38,674	5.7	52,875	9.0
Net Foreign Exchange Assets of the Banking Sector	21.5	17.9	31,816	12.7	26,870	13.1

* Up to December 28, 2001 and the corresponding period of the previous year.

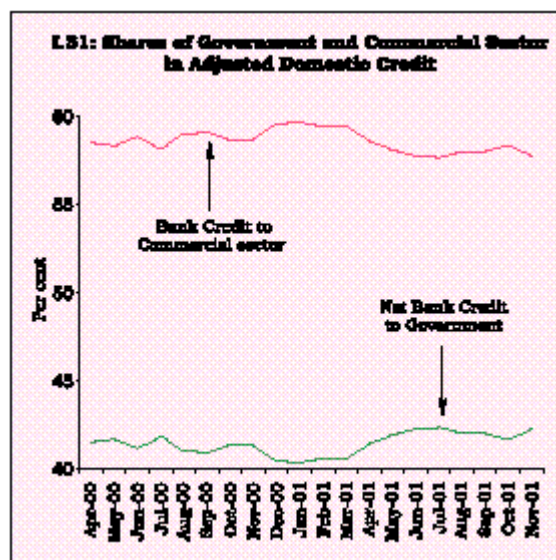
Data are provisional.

Parenthetic figures are net of IMDs.

1.41 Broad money (M₃) increased by 10.4 per cent during the current fiscal year so far (up to December 14) as against 12.0 per cent (9.7 per cent, net of IMDs) during the comparable period of 2000-01 (Table 1.7). Aggregate deposits increased by 10.2 per cent during the year so far from 12.6 per cent (9.8 per cent net of IMDs) last year. On an annual basis, the rate of growth was 15.0 per cent as on December 14, 2001 in M₃ as against 17.1 per cent (14.7 per cent net of IMDs) last year, broadly in alignment with the indicative projections set out in the monetary and credit policy statement for 2001-02 (net (Chart I.30). The average year-on-year M₃ of RIBs/IMDs) growth rate decelerated to 15.1 per cent as on December 14, 2001 from 15.8 per cent as on December 15, 2000.



1.42 Domestic credit (inclusive of commercial banks' non-SLR investments) decelerated to 8.7 per cent during the current fiscal year (up to December 14, 2001) from 10.7 per cent during the corresponding period of the previous year largely on account of lower non-food credit off-take. Net bank credit to the Government, during this period, increased by 13.0 per cent –comparable to 13.1 per cent during the corresponding period of the previous year. Bank credit to the commercial sector decelerated to 5.7 per cent from 9.0 per cent during the comparative period of 2000-01. In the absence of any noticeable pick-up in the demand for bank credit by the commercial sector in the first half of the year, banks predominantly invested in Government paper and accordingly, the share of net bank credit to Government was consistently around 42.0 per cent of adjusted domestic credit (Chart I.31).



1.43 An analysis of the behaviour of the commercial banking indicators during the year 2001-02 (up to December 14) based on the fortnightly returns received from scheduled commercial banks under Section 42(2) of the Reserve Bank of India Act, 1934 brings to the fore several

developments which assume relevance in the context of the current deceleration. First, time deposit growth at 12.2 per cent was somewhat higher than the level of the preceding year (11.7 per cent excluding IMDs) despite the decline in interest rates across the spectrum. This could be reflecting safe haven effects in the face of the general uncertainty prevailing in other segments of the financial market. The average fortnightly increase in time deposits works out substantially higher at Rs.5,267 crore during 2001-02 so far, as against Rs.4,216 crore (excluding IMDs) recorded during 2000-01 (up to December 15). Secondly, the average fortnightly increase in non-food credit, on the other hand, was much lower at Rs.1,341 crore than Rs.2,019 crore last year. The growth in non-food credit (adjusted to include the non-SLR investments), at 5.4 per cent during the current financial year was also lower than 9.3 per cent recorded in 2000-01 (up to December 15). Food credit, during this year, showed a lower growth of 29.4 per cent than 43.8 per cent recorded during the corresponding period of 2000-01. The strong deposit accretion without a commensurate credit off-take has resulted in a build up of substantial liquidity with the banks. Thirdly, the investment in government securities was higher at 17.4 per cent during 2001-02 so far as against 16.8 per cent during 2000-01 (up to December 15) (Table 1.8).

1.44 On an annualised basis, aggregate deposits of scheduled commercial banks showed a steady accretion of 15.3 per cent – comparable to 15.2 per cent (net of IMDs) last year. Non-food credit growth, adjusted for non-SLR investments of scheduled commercial banks, as on December 14, 2001, was lower at 11.8 per cent, as against 18.7 per cent as on December 15, 2000. Scheduled commercial banks' investments in government securities accelerated to 22.8 per cent as on December 14, 2001 from 20.5 per cent as on December 15, 2000. Commercial banks' holding of government securities during the year so far has consistently been around 35.0 per cent of the net demand and time liabilities (NDTL) - much higher than the prescribed Statutory Liquidity Ratio (SLR). The inflow of the excess liquid funds of the commercial banks into the government securities market contributed to reducing the secondary market yields of Government securities over the spectrum (Chart I.32).

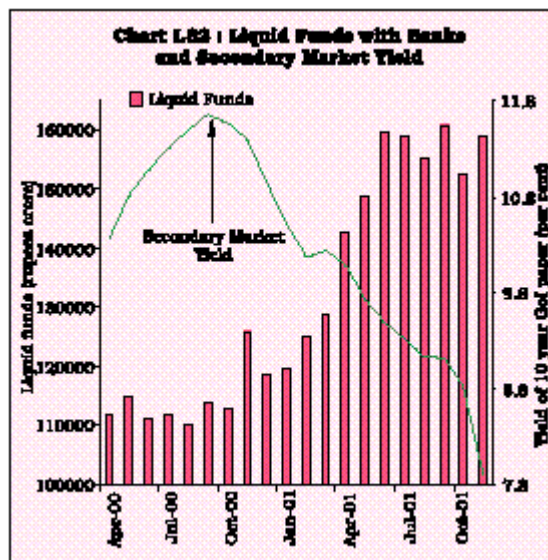


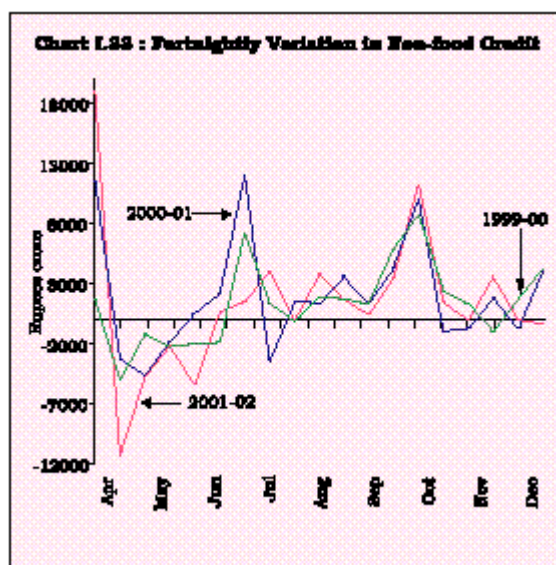
Table 1.8 : Select Banking Indicators : Financial Year Variations

Indicator	2000-01	1999-2000	2001-02P	2000-01
				(Rupees Crore)

1					(up to mid-December)		(up to mid-December)	
	Absolute	Per cent	Absolute	Per cent	Absolute	Per cent	Absolute	Per cent
	2	3	4	5	6	7	8	9
Aggregate Deposits	1,49,273	18.4 (15.2)	99,320	13.9	1,00,010	10.4	1,08,239	13.3 (10.2)
Demand Deposits	15,185	11.9	9,943	8.5	-64	0.0	2,478	1.9
Time Deposits	1,34,088	19.5	89,376	15.0	1,00,074	12.2	1,05,761	15.4
Bank Credit	75,476	17.3	67,121	18.2	37,256	7.3	49,615	11.4
Food Credit	14,300	55.7	8,875	52.8	11,772	29.4	11,255	43.8
Non-food Credit	61,176	14.9	58,246	16.5	25,484	5.4	38,360	9.3
Investments	61,215	19.8	54,349	21.3	59,510	16.1	46,664	15.1
Government Securities	61,579	22.1	55,238	24.7	59,325	17.4	46,770	16.8
Other Approved Securities	-364	-1.2	-889	-2.8	186	0.6	-105	-0.3

P: Provisional. Parenthetic figures are net of IMDs.

1.45 The low non-food credit off-take reflects, to a large extent, the sluggish performance of the industrial sector as well as the depressed investment climate. However, there has been an increase in non-food credit off-take since the latter half of September 2001 with the major part (Rs.19,830 crore) of the total incremental non-food credit (Rs.25,484 crore) during the current fiscal year so far attributable to the period of September 7 - November 16, 2001. (Chart I.33).



1.46 An analysis of the deployment of non-food gross bank credit of select scheduled commercial banks during 2001-02 so far (up to September) suggests that the priority sector credit off-take decelerated to 2.4 per cent (from 5.4 per during the corresponding period of the previous year) driven by lower credit off-take in agriculture (4.0 per cent as against 6.4 per cent last year) and other priority sectors (8.4 per cent from 14.1 per cent last year). Bank credit to the small-scale industries registered a decline (4.2 per cent on top of a decline of 1.1 per cent during April-September 2000). The credit availed by wholesale trade (other than food procurement) declined by 5.6 per cent (increased by 4.3 per cent last year) while that by the medium- and large-scale industries declined by 0.3 per cent (in contrast to an increase of 7.6 per cent last year).

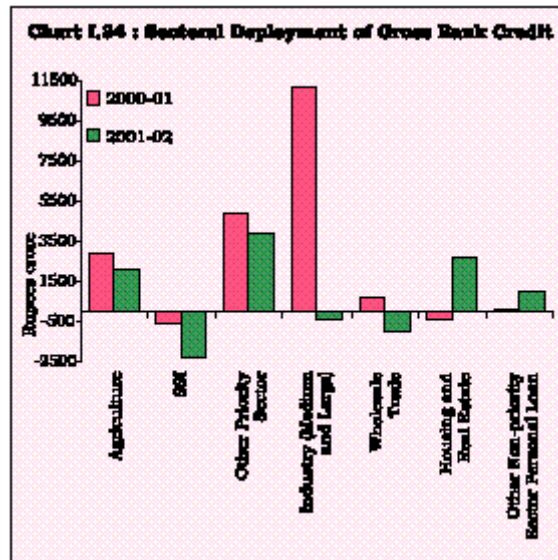
1.47 A sectoral analysis shows that the slowdown of credit off-take in medium- and large-scale industry had been the principal source of the overall slowdown of credit off-take during the year so far ([Table 1.9](#) and Chart I.34).

Table 1.9 : Sectoral and Industry-wise Deployment of Gross Bank Credit of Scheduled Commercial Banks (Fiscal Year Variations)

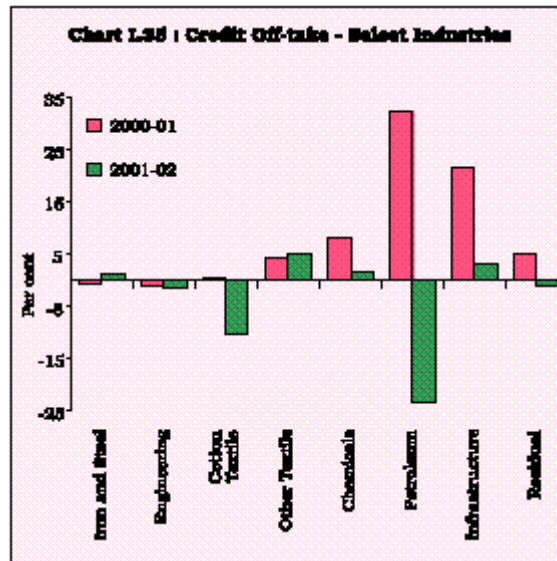
Sector/Industry	(Rupees Crore)			
	2000-01 (up to September)		2001-02 (up to September)	
	Absolute	Per cent	Absolute	Per cent
1	2	3	4	5
Priority Sector #	7,173	5.4	3,633	2.4
Industry (Medium and Large)	11,214	7.6	-419	-0.3
Whole Sale Trade (Other than food procurement)	721	4.3	-995	-5.6
Other Sectors	2,771	3.5	3,874	4.1
Export Credit	891	2.3	-4,748	-11.0
Petroleum	2,916	32.5	-2,712	-23.4
Infrastructure	1,561	21.6	361	3.2
Chemical Group	1,870	8.0	402	1.7
Electricity	1,560	21.0	207	2.4

:Excluding investments in eligible securities.

Note : Data are provisional and relate to 50 scheduled Commercial banks.

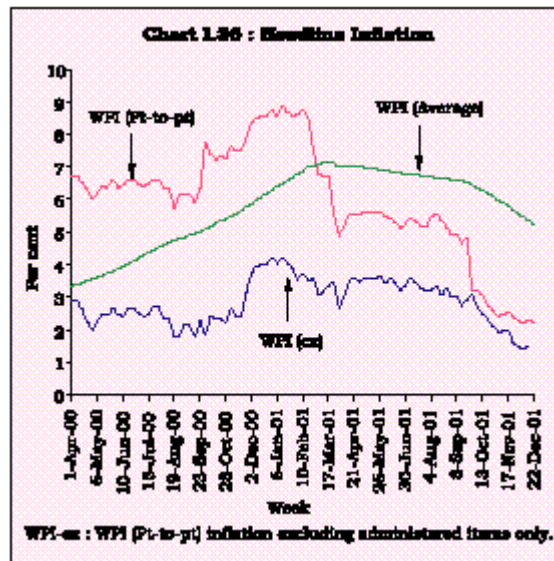


1.48 The industry-wise deployment of gross bank credit shows that most of the industries have exhibited deceleration/decline in terms of credit off-take during the financial year so far. Amongst the principal industries, credit off-take improved only in case of iron and steel (an increase of 1.1 per cent as against a decline of 0.9 per cent last year) and other textile (5.0 per cent as against 4.2 per cent) industries. On the other hand, for industries like infrastructure (3.2 per cent growth as against 21.6 per cent), cotton textiles (a decline of 10.0 per cent as against a growth of 0.5 per cent), chemicals, dyes, paints, etc., (1.7 per cent growth as against 8.0 per cent) and petroleum (a decline of 23.4 per cent as against a growth of 32.5 per cent), credit demand slowed down significantly (Chart I.35).

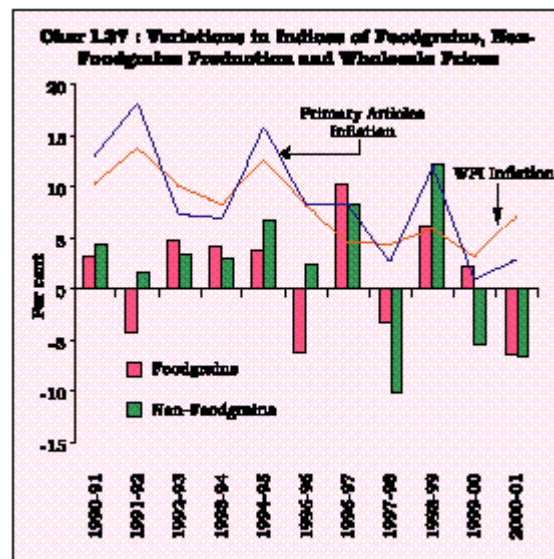


The Price Situation

1.49 Inflation in 2001-02 represents a combination of factors - waning of the effect of successive rounds of administered price revisions in 2000-01, the improvement in agricultural production and the continuing slack in manufacturing prices - and the absence of demand pressures - sluggishness in the investment demand, excess capacities in various industries and inventory accumulation - along with a moderate firming up of primary articles prices. The annual point-to-point wholesale price index (WPI) inflation declined from 5.1 per cent at the beginning of the year to a low of 2.2 per cent as on December 22, 2001 as compared with 8.6 per cent as on December 23, 2000. The upward movement in inflation on account of the administered price revisions in 2000-01 imparted a statistical bias, vitiating comparisons of the current year's inflation with that in the preceding year. This is further corroborated by the movement of WPI inflation excluding the effect of administered price hikes on a point-to-point basis (WPI-ex) which remains vertically below the actual inflation for a greater part of the year on account of the wedge caused by the price revisions last year (Chart I.36).

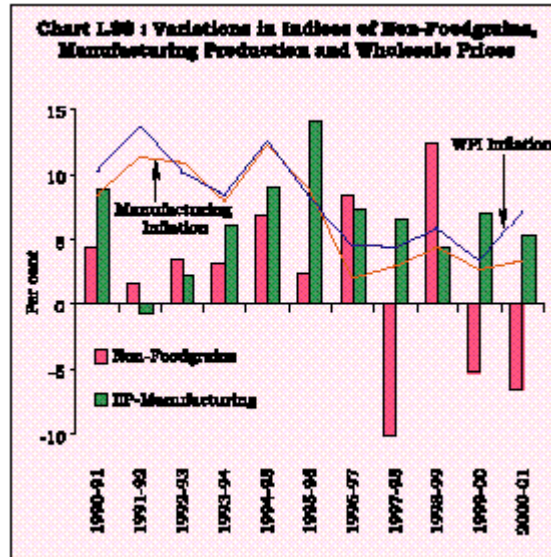


1.50 Average annual WPI inflation, measuring underlying inflation (as against the official measure of headline inflation on the basis of year-on-year WPI movements) has been falling consistently during the year, decelerating to 5.2 per cent as on December 22, 2001 from 6.2 per cent during the corresponding period last year. During the financial year so far up to December 15, 2001, on an average basis, primary articles inflation accelerated to 3.9 per cent from 3.2 per cent during the corresponding period last year, mainly on account of lagged effects of variability in agricultural production in terms of foodgrains and non-foodgrains production (Chart I.37). On the other hand, the fuel inflation dropped significantly to 8.6 per cent as on December 15, 2001 from 25.2 per cent a year ago. Manufacturing inflation also decelerated to 1.9 per cent from 2.6 per cent during the corresponding period of the last year, explained partly by the lower input costs for industrial production (including lower fuel price inflation), improved *kharif* production and the global decline in the prices of manufactures.

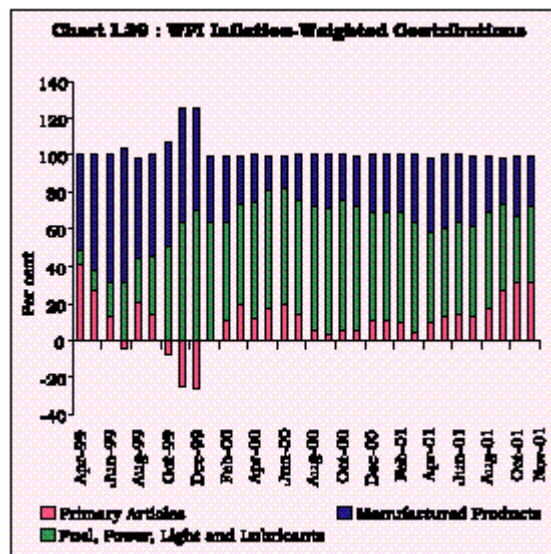


1.51 The fall in inflation during the year is the result of significant deceleration in fuel inflation

(on account of base effect correction) and low manufacturing inflation, as apparently industrial prices are leading the current disinflation (Chart I.38). Identifying and understanding the sensitivity of prices to cycles in agricultural and industrial activity will, therefore, help to gauge the prospects of the recovery.

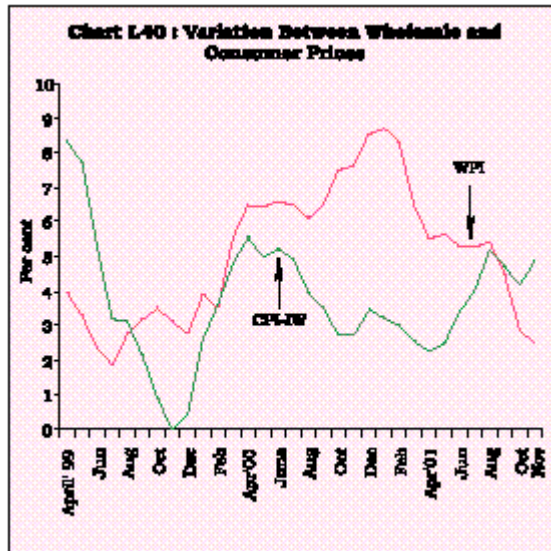


1.52 During the current financial year so far (up to December 15, 2001), on an average basis, the fuel group contributed the maximum to inflation with a share of 45.5 per cent even though it was substantially lower than that of 63.1 per cent during the corresponding period of the last year. This was followed by the manufactured products and primary articles groups' contributions at 30.7 per cent and 24.8 per cent as against 24.9 per cent and 12.2 per cent, respectively, during the comparable period a year ago. On a monthly average basis also the fuel group contributed the maximum to the price rise during the year so far (Chart I.39).

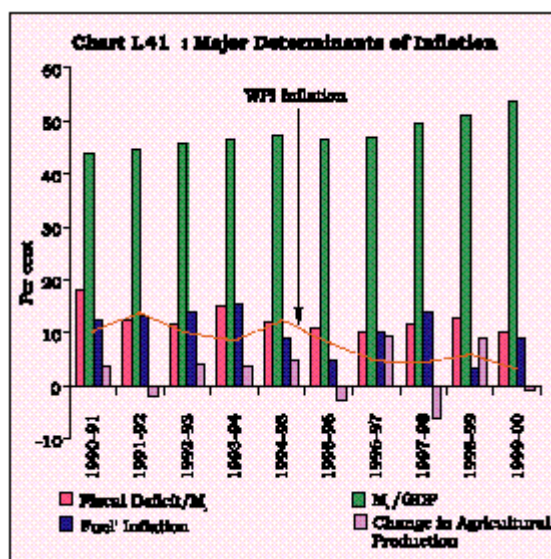


1.53 The inflation rate at the retail level, as measured by the annual variation in consumer price

index for industrial workers (CPI-IW) on a point-to-point basis, increased to 4.9 per cent in November 2001 from 2.7 per cent in November 2000 (moving within a range of 2.5-5.5 per cent in 2000-01), reflecting mainly the upward trend in the prices of food items. Thus, in recent years, there is divergent movement between the consumer price inflation and wholesale price inflation (Chart I.40).



1.54 The new lows reached in India's inflation record during 2001-02 and falling inflation worldwide has opened up the debate on the costs associated with the disinflation. This raises the issue of the effectiveness of monetary policy in a phase of economic slowdown in India. It also brings to the forefront the need to appropriately assess inflationary conditions - partly in view of the divergent movements of different measures of inflation in recent years - with a view to getting a 'fix' on inflationary expectations for setting forward-looking monetary policy (Chart I. 41).

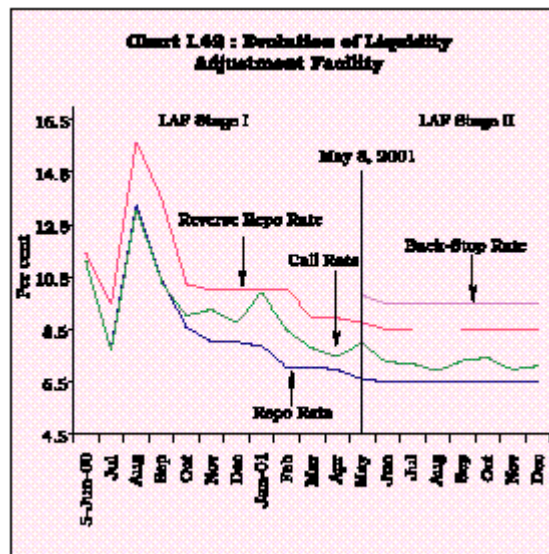


Financial Markets

1.55 Financial markets remained calm over most of the year except for a brief period of volatility witnessed during the middle of September 2001 after the terrorist attack on the US. The call money rates were range-bound as the liquidity conditions were comfortable. The foreign exchange market exhibited stable conditions with capital inflows creating conditions of comfortable supply. There was a fall in the yields across all maturities in the Government securities market. Reflecting the general economic conditions and the growing cross-border integration, the capital market was subdued during the first half of the year, with signs of moderate recovery emerging only during the third quarter of 2001-02.

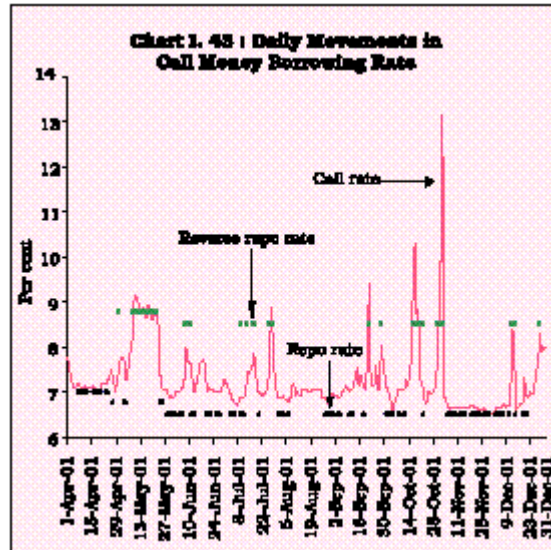
Call Money Market

1.56 The money market conditions remained comfortable during 2001-02 (up to December) with the Reserve Bank continuing to modulate liquidity appropriately in tune with underlying real and financial developments. The transition to the second stage of the LAF, introduced with effect from May 8, 2001 was smooth and barring a few exceptions, the overnight call money rate remained around 7.0 per cent, well within the repo-reverse repo corridor (Chart I.42). Ample liquidity conditions prevailed on account of the strong mobilisation of bank deposits without any commensurate off-take of non-food credit. The reduction in the CRR also enhanced liquidity in the system.



1.57 The current financial year commenced with the usual comfortable liquidity conditions up to May 8, 2001 reflecting seasonal easing of liquidity. The weighted average call money borrowing rate hovered slightly above 7.0 per cent during April 2001 edging beyond only in the first week of May 2001. The repo and reverse repo cutoff rates declined by 25 basis points each to 6.75 per cent and 8.75 per cent, respectively, reflecting easy conditions. The weighted average call money borrowing rate spurted to 9.13 per cent on May 9, 2001 and remained above the ceiling of the repo-reverse repo corridor till May 19, 2001 under the second stage of LAF as a result of the floatation of State government loans and the rally in the Government securities market. A series

of liquidity injections in the form of reverse repos (averaging an outstanding amount of around Rs.3,340 crore during May 8-25, 2001) as well as a cut in the CRR by 50 basis points to 7.5 per cent of net demand and time liabilities, effective May 19, 2001 could nudge the call rates back to the corridor by May 21, 2001 (Chart I.43).



1.58 The liquidity conditions remained comfortable throughout June-December barring stray spurts in the call money rate. The repo cut-off rate was further reduced by 25 basis points to 6.5 per cent on May 28, 2001 and the reverse repo cut-off rate was also reduced by 25 basis points to 8.5 per cent on June 7, 2001. Low advance tax outflows enabled the average of weighted average call money borrowing rates to remain comfortable around 7.2 per cent during June 2001, contrary to the usual seasonal pattern. The Reserve Bank absorbed excess liquidity through repos. Redemption payments augmented market liquidity and ensured easy call rates in July-August 2001. Excess liquidity was absorbed through repos as well as open market sales.

Notwithstanding the uncertainty created by the external disturbance of September 11, 2001, the weighted average call money rates remained within the repo-reverse repo corridor during the month, hardening somewhat to 9.4 per cent on September 21, 2001 in consonance with turbulence experienced in equity and foreign exchange markets. There was some tightness in liquidity experienced during October 16-19, 2001. The weighted average call money rates moved above the reverse repo cut-off rate mainly on account of a series of outflows (Rs.8000 crore on account of the twin gilt auctions held on October 15, 2001 and T-bills auctions) and the usual pressures from fulfilling the reporting requirements for maintenance of the CRR in the second week of the reporting fortnight. Thereafter, the average of the call money borrowing rate (weighted average) remained within the informal corridor.

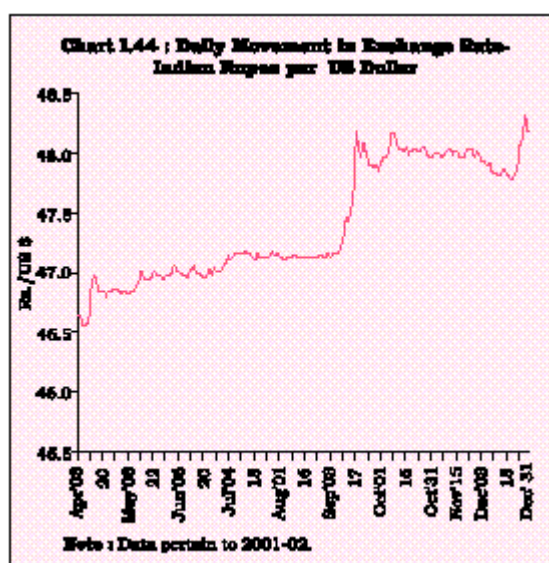
1.59 The money market conditions were strained in the second week of the fortnight ending November 2, 2001 as market participants rushed to fulfill their reporting requirements. The call money borrowing rate shot up to an intra-day high of 22.0 per cent with the weighted average-rate also peaking for the year to 13.1 per cent as on November 2, 2001. Liquidity was injected with the outstanding amount of reverse-repo averaging at Rs.5,917 crore during October 30-

November 2, 2001. Liquidity conditions improved with the first CRR cut becoming effective and the weighted average call money borrowing rate dropped to 6.9 per cent on November 3, 2001. Liquidity was further augmented in the system with inflow of funds in the form of coupon and redemption receipts as well as unsterilised expansion in the net foreign exchange assets of about Rs.8000 crore (net of revaluation). Heavy subscriptions in the repo auctions reflected considerable easing of liquidity conditions and the weighted average call money borrowing rate hovered mostly around 6.6 per cent.

1.60 The call money rates remained generally comfortable during December 2001. There was, however, a spurt during December 12-14, 2001 as well as some hardness in the call rates towards the end of the month. The liquidity conditions tightened in the first instance on account of outflows towards the twin gilt auctions in the first week of December 2001 amounting to Rs. 6,000 crore and open market sales (gross) of around Rs. 7,863 crore during the first fortnight of December 2001. The pressure of fulfilling the reporting requirements towards the second week of the reporting fortnight ended December 14, 2001 took the intra-day high rate beyond the repo-reverse repo corridor prompting some liquidity injection through reverse repos. After reverting to the corridor with the commencement of the new reporting fortnight, call rates hardened towards the end of December 2001 due to advance tax outflows and the intra-day high touched 12.0 per cent on December 28, 2001. As the second cut of 25 basis points in the CRR became effective from fortnight beginning December 29, 2001, the call rates declined. The weighted average call money rates remained, however, within the corridor during December 2001.

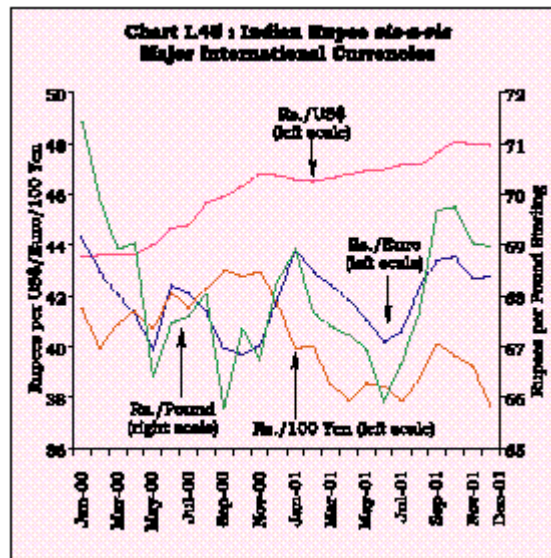
Foreign Exchange Market

1.61 The foreign exchange market generally exhibited stable conditions during April-December, 2001-02 on account of comfortable supply position due to inflows on account of FIIs, FDI, non-resident deposits and raising of resources from abroad through ADR/GDRs by Indian corporates. The exchange rate of the rupee moved within a range of Rs.46.56-Rs.48.34 per US dollar during this period, abstracting from minor episodes of sporadic volatility mainly on account of uncertain market sentiment, high oil prices and political events. The exchange rate of the rupee which stood at Rs.46.64 per US dollar as at end-March 2001 depreciated marginally by 1.1 per cent to Rs.47.15 per US dollar at end-August 2001. The downgrading of India's sovereign outlook in August 2001 from stable to negative by two international rating agencies, however, failed to have any significant impact on the market (Chart I.44).

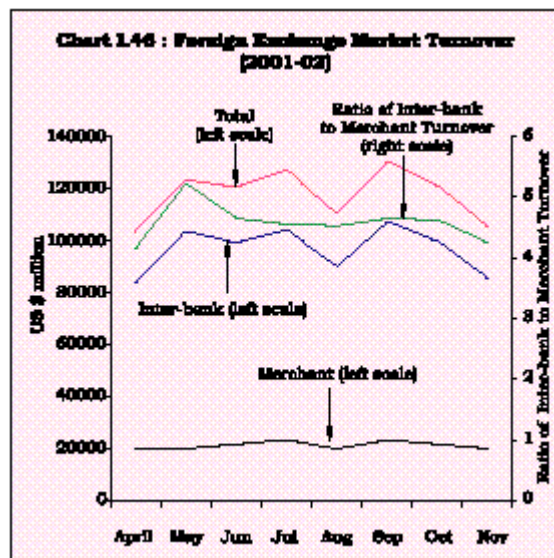


1.62 The foreign exchange market witnessed some uncertainty during September 2001, after the terrorist attacks in the US on September 11, 2001. The market sentiment was adversely affected by fears of US reprisal, deceleration in FII inflows after the attack and a further slowdown in India's exports. As a result, the Indian rupee experienced a depreciation from Rs.47.45 per US dollar on September 11, 2001 to Rs.48.18 per US dollar on September 17, 2001. Normalcy soon returned in the foreign exchange market. In October and November 2001, the foreign exchange market witnessed stable conditions amidst steady supply of dollars and modest corporate demand. Net FII investment, which turned negative during September 2001, resumed since October 2001 buoyed by the decision to increase the FII investment limit up to the sectoral cap/statutory ceiling of FDI, as applicable. The foreign exchange market witnessed heightened activity during the last week of December 2001, which led to depreciation of rupee by 0.4 per cent to close the month of December 2001 at Rs.48.18 per US dollar.

1.63 Against other major currencies like euro, pound sterling and Japanese yen, the exchange rate of the rupee appreciated since October 2001; the rupee had depreciated significantly against these currencies during the period July to September 2001 (Chart I.45).

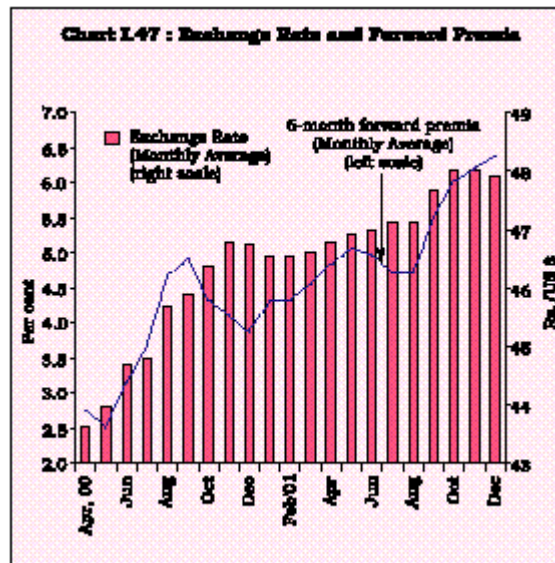


1.64 In the foreign exchange market, the average monthly total turnover increased to US \$ 119 billion during 2001-02 (April-September 2001), from US \$116 billion in 2000-01. Monthly turnover in the merchant segment of the foreign exchange market moved within the range of US \$ 19.8-23.1 billion, while in the inter-bank segment, the turnover moved in a range of US \$ 83.5-107.6 billion during the first two quarters of the year 2001-02. There was some decline in the market turnover during October and November 2001. The ratio of inter-bank to merchant turnover, an indicator of hedging activity in the market hovered around 4, indicating orderly conditions (Chart I.46).



1.65 The forward premia ruled easy for the first five months of 2001-02. The market tightened in the aftermath of the terrorist attack in the US and the disturbances in Afghanistan, with the 3-month and the 6-month forward premia hardening to 6.02 per cent and 6.03 per cent, respectively, in October 2001 from 4.5 per cent and 4.7 per cent, respectively, in August 2001 (Chart I.47). The 3-month and 6-month forward premia further hardened to 6.34 and 6.36 per

cent, respectively, during December 2001.



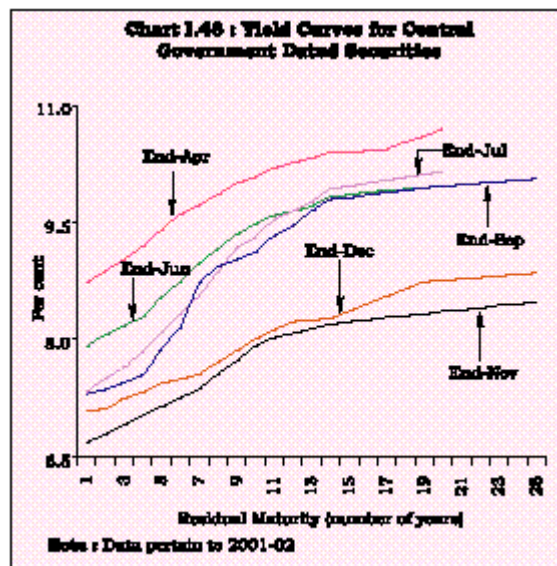
Government Securities Market

1.66 The Government securities market was driven by easy liquidity conditions facilitated by monetary easing. Furthermore, the series of interest rate cuts in the developed economies fuelled expectations of similar interest cuts in India and turned the domestic gilt market sentiment buoyant. Gilt prices surged across the spectrum with the yields of dated securities of 5-year, 10-year, 15-year and 20-year maturity declining by 226 basis points, 217 basis points, 217 basis points and 234 basis points, respectively, to 7.14 per cent, 7.91 per cent, 8.23 per cent and 8.36 per cent, respectively, during 2001-02 (up to November 30). However, the gilt market exhibited considerable volatility in December 2001. The yields across the entire maturity spectrum hardened by end-December 2001. The comfortable liquidity conditions enabled the Central Government to complete net market borrowings of Rs.79,002 crore (around 102 per cent) and gross market borrowings of Rs.1,16,002 crore (around 98 per cent) by December 28, 2001 with a sizeable amount raised in the early part of the year itself in the face of sluggish demand for non-food credit.

1.67 In the primary market, the Central Government completed around a quarter of its budgeted gross market borrowing programme for 2001-02 during April 2001 itself with ratio of bid amount/notified amount (BA/NA) of 1.7 reflecting favourable market response. The BA/ NA ratio remained more than unity at each of the auctions during 2001-02 (upto December). About 25 per cent of the Centre's fresh gross borrowing was privately placed with /devolved on the Reserve Bank. In order to neutralise the monetary impact of private placements, the Reserve Bank conducted outright OMO sales (net) of Rs.30,187 crore (up to December 28). The Central Government was able to elongate its weighted average maturity of borrowing to 14.1 years so far in 2001-02 (up to December) from 10.6 years last year. The Central Government auctioned a security with the longest tenor of 25-year on September 11, 2001 for a notified amount of Rs.2,000 crore which received a bid of Rs.3,844 crore. Apart from lengthening the maturity, the Government was able to reduce its cost of borrowing with the weighted average yield on

borrowings being lower by more than 100 basis points at 9.7 per cent as against around 11.0 per cent last year. The Central Government auctioned Floating Rate Bonds 2006 for the first time on November 21, 2001 for Rs.2,000 crore with the interest rate of the bond having two components, viz., a *variable* base rate linked to the 364-day Treasury Bill rate (average implicit yield in the immediate previous six auctions held prior to the relative half-year coupon period) and a *fixed* mark-up decided in the auction. A substantially high bidding amount in this auction reflected market propensity to a floating interest rate paper.

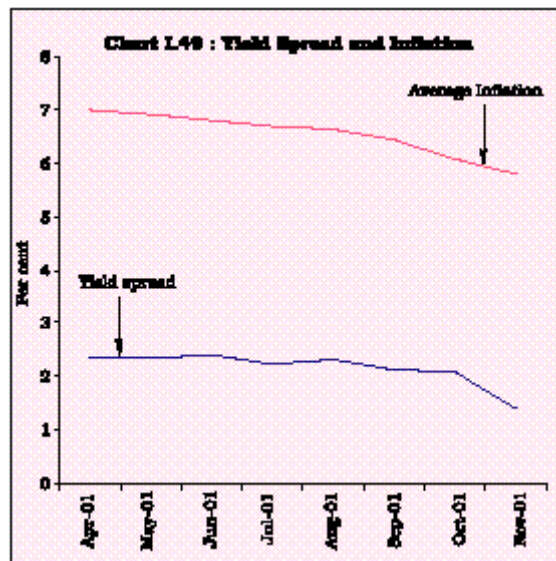
1.68 In the secondary gilt segment, there was a persistence of the rally in prices except for brief halts in July, September and December 2001 (Chart I.48). The easy liquidity conditions coupled with a softer interest rate environment enabled a reduction in the yields throughout the maturity spectrum, more prominently at the short-end, during April-June 2001. The rally was, however, arrested by the Reserve Bank's open market sales auction on July 12, 2001. Sentiment turned bearish for the securities at the long-end and there was a switch towards securities of short-tenor. During July 2001 the yield curve steepened with yields of gilts of 5-year and 10-year residual maturities moving down by 46 basis points and 18 basis points, respectively, while those of 15-year and 20-year residual maturities hardened by 11 basis points and 18 basis points, respectively. The easing of liquidity conditions and expectations of an interest rate cut amidst a softer international interest rate environment resumed the rally in the gilt market in August 2001.



1.69 The gilt market continued to evince interest for securities of short and medium-tenors in early-September with some uncertainty in the foreign exchange market adding a note of caution. Subsequent to the terrorist attack in the US, the gilt market turned bearish. A series of open market purchases amounting to Rs.5,084 crore were conducted to provide support to the gilt prices throughout the maturity spectrum and ensured stability in gilt prices during the month.

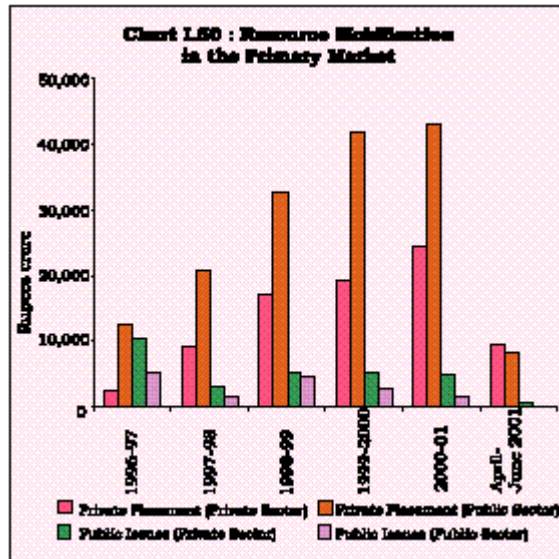
1.70 International interest rates continued to soften in October, 2001. Measures announced in the mid-term review of monetary and credit policy for 2001-02 fuelled a resurgence in the gilt prices throughout the maturity spectrum in October and November 2001. Amidst easy liquidity conditions, the yield level of the security of the longest tenor, i.e., 25-year, declined by 127 basis

points to 8.5 per cent during November 2001. The yield on the benchmark 10-year paper touched a historic low of 7.8 per cent on December 5, 2001. Subsequently, the OMO sales checked further rally and made the gilt prices range-bound. The bid-ask spread in the government securities market widened and turnover in the dated securities market fell sharply from Rs. 74,888 crore during the week ended December 7 to Rs. 22,161 crore during the week ended December 21, 2001. The yield curve shifted up by end-December 2001 in relation to a month ago with the yields moving up especially for short and long-tenors. While the yields of the securities with 5-year and 20-year tenors hardened sharply by 31 basis points and 40 basis points, respectively, the yield on the 10-year benchmark security moved up by 9 basis points during December 2001. During 2001-02 (up to November), the yield spread (difference between yields of 10-year Government securities on residual maturity basis and 91-day Treasury Bills) has moved synchronously with the path of the average inflation rate (Chart I.49).

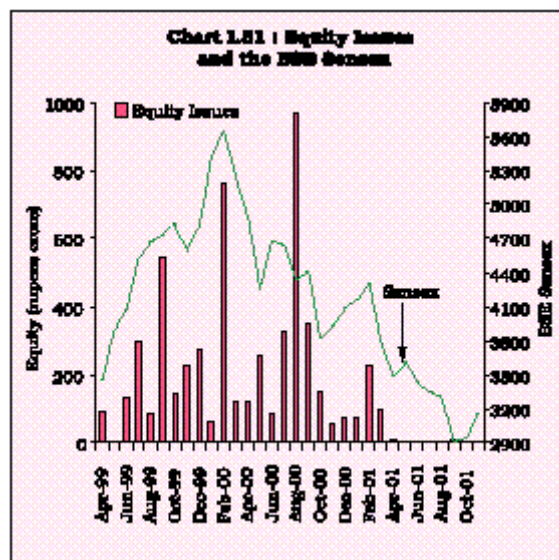


Capital Market

1.71 The capital market remained subdued for the greater part of 2001-02, reflecting the general economic conditions as well as the co-movement with international stock exchanges. Resource mobilisation from the new issues market continued to be depressed in line with recent trends. The private placement market, which has witnessed a manifold increase over the public issues market in recent years, continued to record substantial growth. During 2001-02 (up to June), the private placement market witnessed increased activity as Rs.17,657 crore was raised, registering a growth of 91.7 per cent as compared with Rs.9,213 crore raised during the comparable quarter of the previous year (Chart I.50).



1.72 The public issues market witnessed depressed conditions during 2000-01 (up to November) as only nine issues aggregating Rs.2,023 crore were floated by the non-Government public limited companies (private sector) as compared with Rs.3,266 crore raised through 116 issues during April-November 2000 and Rs.4,924 crore raised through 142 issues during the full year 2000-01. There were only three equity issues aggregating Rs.21 crore during 2001-02 (up to November) as compared with 110 equity issues aggregating Rs.2,261 crore during the corresponding period of the previous year, reflecting the downturn in capital market conditions (Chart I.51). Despite lower resource mobilisation, the average issue size increased sharply to Rs.225 crore from Rs.28 crore during the corresponding period of the previous year. Five bond issues from the ICICI of Rs.400 crore each constituted 98.9 per cent of the total resource mobilisation during April-November 2001. There was no issue from the public sector as against three issues aggregating Rs.772 crore during April-November 2000 and five issues aggregating Rs.1,472 crore during the full financial year 2000-01.



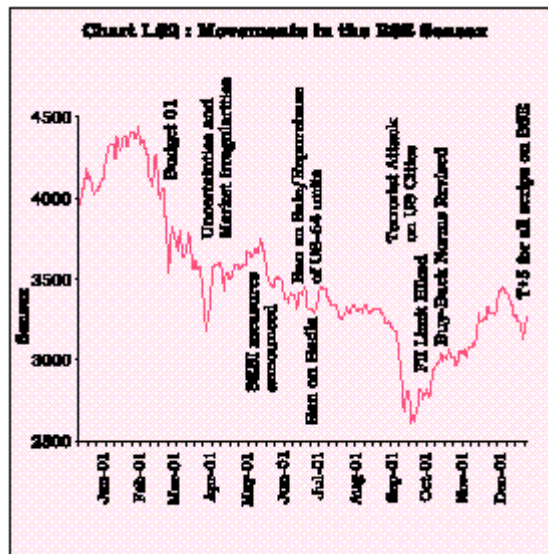
1.73 With a view to containing risks arising out of non-SLR investments' portfolio of banks and FIs, the mid-term review of monetary and credit policy for the year 2001-02 proposed to introduce further guidelines covering such aspects as strengthening of the internal rating system, fixing of prudential limits with separate sub-limits for unrated, unquoted and privately placed instruments, review by board in respect of issuers and non-performing investments and disclosures regarding issuer composition and non-performing investments, *etc.*

1.74 According to the SEBI, net resource mobilisation by mutual funds, at Rs.8,744 crore during April-November 2001, increased by 28.6 per cent as compared with Rs.6,800 crore during the comparable period of the previous year and Rs.9,128 crore during the full year 2000-01, mainly due to the substantial funds raised by the debt-oriented schemes. The Unit Trust of India (UTI), however, witnessed a net outflow of Rs.5,046 crore during the year. The share of resource mobilisation as well as assets under management by the private sector increased during the second half of the 1990s, while that of UTI declined.

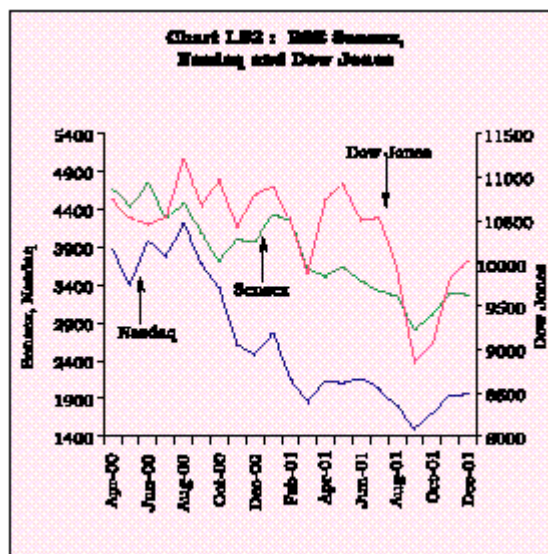
1.75 Financial assistance sanctioned and disbursed by the term-lending institutions at Rs.52,123 crore and Rs.37,367 crore, respectively, declined sharply by 26.9 per cent and 9.7 per cent, respectively, during April-November 2001 as compared with 12.3 per cent and 12.0 per cent growth, respectively, during the corresponding period of the previous year, largely reflecting the persistence of the industrial slowdown.

Secondary Market

1.76 The equity markets began the year on a depressed note with the BSE Sensex sliding below the 3500 mark by June 2001 and declined further to touch 3245 by end-August 2001 (Chart I.52). Market sentiment was dampened by certain adverse developments in domestic stock exchanges including apprehensions of payment difficulties (in March 2001) notwithstanding a market-friendly Union Budget 2001. The market was also adversely affected by the continuing decline in the Nasdaq, recessionary global conditions and the domestic economic slowdown. The ban announced by the UTI on the sale and repurchase of US-64 units in July 2001 also had a dampening effect on the market.



1.77 The markets witnessed a sharp downturn in September 2001 mirroring global reactions to the September 11, 2001 terrorist attacks on the US (Chart I.53). The BSE Sensex declined by 17.5 per cent to 2600 on September 21 - the lowest level since September 8, 1993. The Reserve Bank permitted banks to extend finance to stockbrokers for margin trading on September 18, 2001 and hiked FII investment limit from 49 per cent to sectoral limits allowed for FDI.

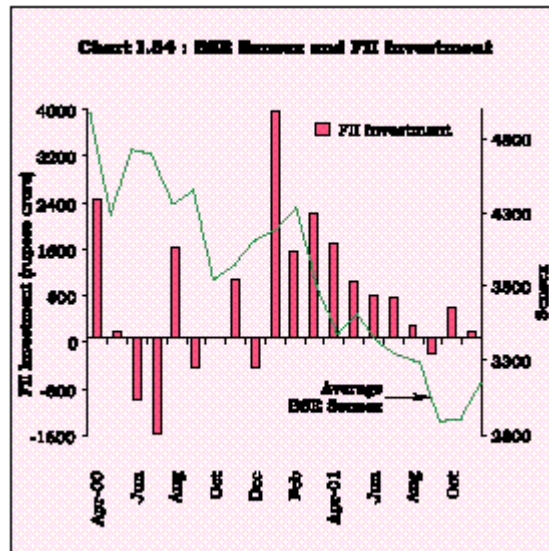


1.78 The stock markets recovered somewhat in October 2001 (with the BSE Sensex crossing the psychological 3000 mark for the first time on October 16, 2001 in intra-day trading) and November 2001, especially as fears relating to the disturbances in Afghanistan were discounted. Besides, the stronger-than-expected second quarter results of some major corporates, especially in the software sector, improved the market sentiment. Policy measures such as the Government's long awaited move to relax share buy-back up to 10 per cent with board approval instead of the shareholders' approval needed earlier, monetary easing (in October 2001) and introduction of stock futures in 31 scrips by the SEBI (in November 2001) also buoyed markets.

The BSE Sensex showed a steady rise to 3288 by end-November 2001 and 3443 as on December 10, 2001. Reflective of this, the turnover in the BSE rose to Rs.24,402 crore in November 2001 from Rs.21,593 crore in September 2001. However, the rally was somewhat arrested in December 2001 in the wake of a weakening market sentiment.

1.79 The monthly average of BSE Sensitive Index, which stood at 5262 during March 2000 declined to 3808 during March 2001 and declined further to 2918 during September 2001 but thereafter recovered to 3315 during December 2001. The volatility in share prices as measured by the coefficient of variation, at 7.6 per cent during April-December 2001, was lower than 9.0 per cent during the corresponding period of the previous year.

1.80 Foreign Institutional Investors' (FIIs) investments increased to Rs.5,116 crore during April-November 2001 as compared to Rs.2,394 crore during the corresponding period of the preceding year (Chart I.54). Net FII inflows in equity markets remained positive during 2001 so far with the exception of September 2001. In contrast, the mutual funds remained net sellers in equity markets during 2001 so far, with the exception of September 2001.



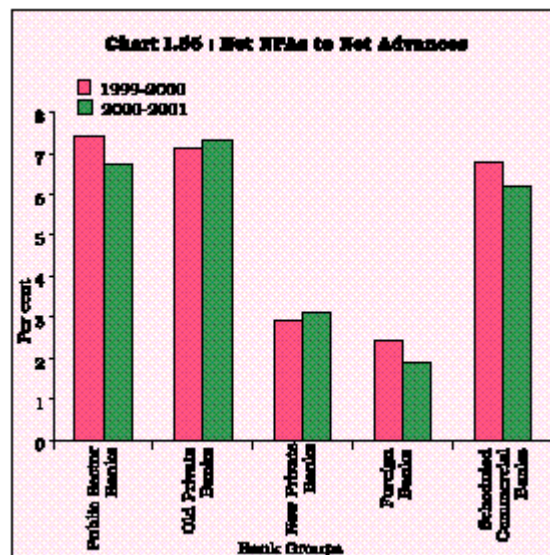
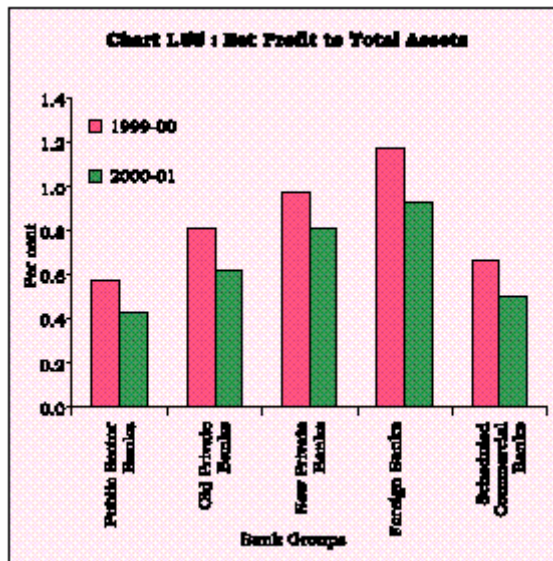
1.81 On May 14, 2001 the SEBI announced a ban on all deferral products in the cash segment including *badla* from July 2001 with a view to segregating the cash and futures market and introduced rolling settlement in the active scrips along with some other significant changes in the capital market in keeping with the international practices. On December 19, 2001, the SEBI announced that the T + 5 rolling settlement cycle would further be shortened to T + 3, effective April 1, 2002. On December 31, 2001 all the scrips listed on the BSE moved to compulsory rolling settlement mode.

Financial Sector

Scheduled Commercial Banks (SCBs)

1.82 During the financial year 2000-01, SCBs recorded a 7.9 per cent increase in operating

profits which went up to Rs.19,747 crore as on March 31, 2001. Net profits, however declined by 11.3 per cent to Rs.6,424 crore as on March 31, 2001, driven by the increase in provisions partly offset by higher operating profits. The ratio of net profit to total assets of SCBs declined from 0.66 per cent in 1999-2000 to 0.50 per cent in 2000-01 (Chart I.55). As at end-March 2001, gross non-performing assets (NPAs) as a percentage of total assets for SCBs declined to 4.9 per cent from 5.5 per cent as at end-March 2000. As a share of gross advances, gross NPAs of SCBs declined to 11.4 per cent as at end-March 2001 from 12.7 per cent in the previous year. The ratios of net NPAs to total assets and net advances declined to 2.5 per cent and 6.2 per cent, respectively, as at end-March 2001 from 2.7 per cent and 6.8 per cent, respectively, as at end-March 2000 (Chart I.56).



1.83 As at end-March 2001, 84 out of 100 SCBs recorded capital to risk-weighted asset ratio (CRAR) in excess of 10 per cent. Eleven banks had CRAR between 9 per cent and 10 per cent, while five banks had CRAR below the 9 per cent mark.

Co-operative Banks

1.84 At the end of March 2001, the number of urban co-operative banks (UCBs) stood at 2,084, of which 90 were salary earners' banks. Information on the financial performance relating to profits/losses during 1999-2000 are available for 1,747 banks, which roughly cover 84 per cent of the total UCBs. Of these UCBs, 1,499 banks registered profits while the rest incurred losses.

Scheduled UCBs

1.85 Total deposits and advances of the 51 scheduled UCBs as at end-March 2001 were Rs.33,164 crore and Rs.21,511 crore, respectively. The total income increased by 17.2 per cent during the financial year 2000-01. Interest income contributed 93.3 per cent of the total income of the scheduled UCBs. The total expenditure of the scheduled UCBs increased by 49.7 per cent in 2000-01.

Financial Institutions

1.86 The profitability analysis of the 10 FIs indicates that the combined net profits of these institutions registered a decline of 35.1 per cent during the year 2000-01. The ratios of net NPA to net loans as on March 31, 2001 in respect of ICICI, Small Industries Development Bank of India (SIDBI) and EXIM Bank were below 10 per cent, while that of Industrial Finance Corporation of India (IFCI), Industrial Development Bank of India (IDBI), Industrial Investment Bank of India (IIBI), and Tourism Finance Corporation of India (TFCI) ranged between 14-23 per cent. The CRARs of all the financial institutions (except IFCI) were well above the benchmark minimum of 9.0 per cent.

Non-Banking Financial Companies (NBFCs)

1.87 As at end-March 2000, the total quantum of outstanding public deposits reported by 1,005 reporting companies, was Rs.19,342 crore, equivalent to 2.2 per cent of the aggregate deposits (Rs.8,96,696 crore) of scheduled commercial banks. The aggregate assets of the NBFC sector increased to Rs.51,324 crore as on March 31, 2000, from Rs.47,049 crore, as on March 31, 1999. Some of the companies have converted themselves into non-deposit-holding companies by repaying the deposits held by them. At the disaggregated level, public deposits with the hire purchase companies and residuary non-banking companies (RNBCs) increased by 22.3 per cent and 3.4 per cent, respectively.

Global Economic Situation

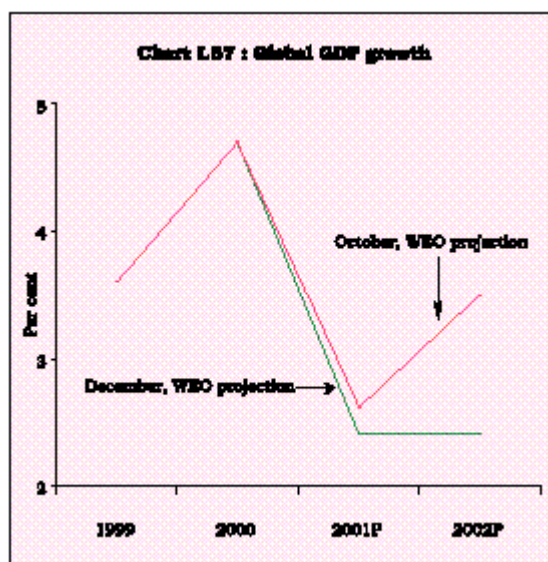
1.88 The deceleration in the global economy which started during the second half of 2000 deepened during 2001 with all the major regions of the world (excluding Africa) exhibiting a synchronised slowdown. The IMF revised downwards growth projections for the global economy in 2001 for the third time in December 2001 from 3.2 per cent (in May 2001) to 2.6 per cent (in October 2001) and finally, after incorporating the impact of the terrorist attack on the US on September 11, 2001, to 2.4 per cent *i.e.*, half the level of growth recorded in 2000 (4.7 per

cent) (Table 1.10 and Chart I.57). The recovery is now expected to be delayed well into the second half of 2002 with the uncertainties associated with the terrorist attack further compounding the existing risks to the global economy.

Table 1.10 : Prospects for Global Growth

1	(Annual percentage change)					
	December Projections				Difference from October 2001 Projections	
	1999	2000	2001	2002	2001	2002
2	3	4	5	6	7	
World Output	3.6	4.7	2.4	2.4	-0.2	-1.1
Advanced Economies	3.3	3.9	1.1	0.8	-0.2	-1.3
Developing Countries	3.9	5.8	4.0	4.4	-0.4	-0.9
World Trade (Volume)	5.4	12.4	1.0	2.2	-1.8	-3.1
Oil Prices (US dollar)	37.5	56.9	-14.0	-23.7	-9.1	-15.1
Non-Oil Commodity Prices (US dollar)	-7.0	1.8	-5.5	1.7	-2.8	-2.7

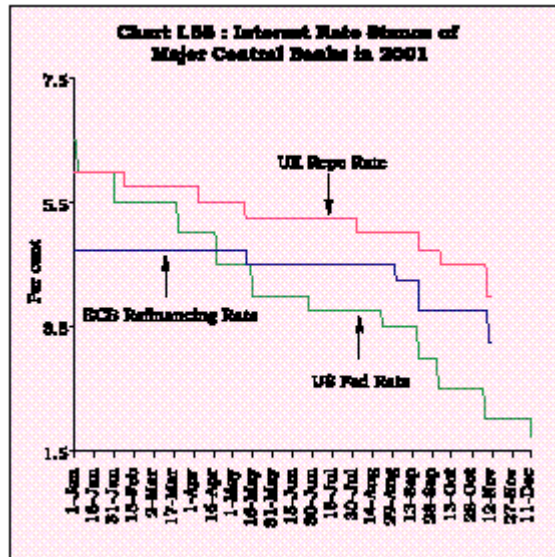
Source : World Economic Outlook, IMF, December 2001.



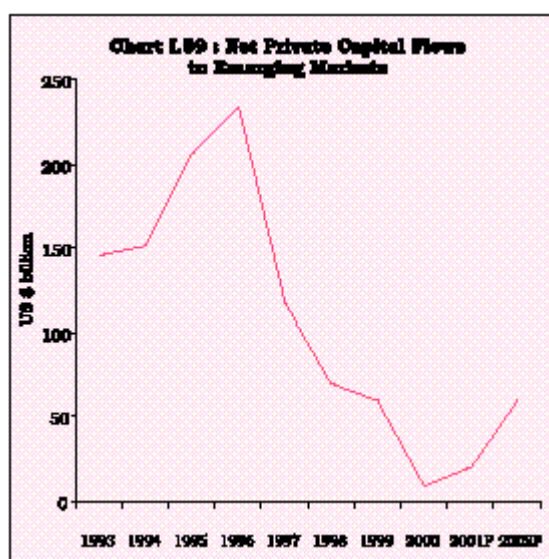
1.89 The impact of the global slowdown has been manifested in several associated developments: (i) growth in world trade volume (goods and services) which was projected in October 2001 to decelerate from 12.4 per cent in 2000 to 2.7 per cent in 2001 may suffer a further deceleration following the terrorist attack to 1.0 per cent (WEO, December 2001) owing to increased cost of transportation of goods and the expected further deceleration in economic activity; (ii) the positive effect of declining international interest rates on capital flows to emerging markets has been more than off-set by rising risk aversion of investors and deteriorating economic fundamentals in some of the emerging markets; (iii) there has been an accumulation of large scale macroeconomic imbalances with exchange rate misalignments; and (iv) there are distinct prospects of some deterioration in the terms of trade of developing countries.

1.90 A number of steps to counter the slowdown have been taken. Monetary policy in industrial

countries has been eased considerably. The US Federal Reserve has lowered the federal funds rate eleven times during 2001 by 475 basis points (four times -cumulatively by 175 basis points after September 11) and is now at its lowest level (1.75 per cent). Similarly, the European Union and the UK have lowered the key policy rates (main refinancing rate and repo rate, respectively) by 150 basis points and 200 basis points, respectively, during 2001 (100 basis points each in the post-terrorist attack phase) (Chart I.58). Japan has also lowered its official discount rate to near zero level (0.10 per cent) after the attack.



1.91 Emerging Asian economies have exhibited sharp slowdown in industrial production and exports since mid-2000. Besides the impact of global slowdown and the electronics cycle, political uncertainties and weakening confidence on account of slow paced structural reforms have contributed to the deceleration. The possibilities of a prolonged downturn in the US, a lagged recovery in the technology sector and the recession in Japan could further worsen emerging market growth prospects. Net capital flows to the emerging markets are projected to remain weak with modest recovery in 2001 (Chart 1.59)



External Sector

1.92 Reflecting the downturn in global economic activity, India's exports, which recorded a strong growth of 21.0 per cent in US dollar terms during 2000-01, increased marginally during the current fiscal year so far (April-November 2001) (Chart I.60). Provisional data of the Directorate General of Commercial Intelligence and Statistics (DGCI&S) for April-November 2001 show that exports at US \$ 28.9 billion increased by 0.5 per cent as against an increase of 21.0 per cent during the comparable period of the previous year ([Table 1.11](#)).

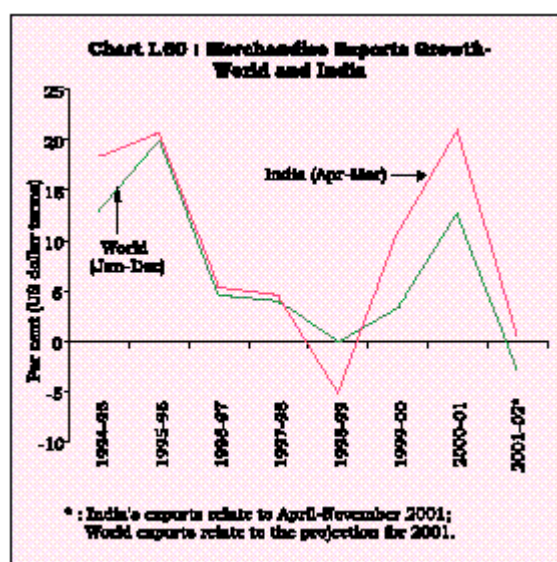


Table 1.11: India's Foreign Trade

Item	(US \$ Million)			
	1999-2000 (April-March)	2000-01	2000-01* (April-November)	2001-02*
1	2	3	4	5

Exports	36,822	44,560	28,729	28,864
	(10.8)	(21.0)	(21.0)	(0.5)
(a) Oil	39	1,870	993	1,443
	(-56.5)	(4709.7)	(3205.2)	(45.2)
(b) Non-Oil	36,784	42,691	27,735	27,421
	(11.0)	(16.1)	(17.0)	(-1.1)
Imports	49,671	50,536	34,317	34,718
	(17.2)	(1.7)	(7.4)	(1.2)
(a) Oil	12,611	15,650	11,361	9,844
	(97.1)	(24.1)	(71.3)	(-13.4)
(b) Non-Oil	37,059	34,886	22,956	24,874
	(3.0)	(-5.9)	(-9.3)	(8.4)
Trade Balance	-12,848	-5,976	-5,588	-5,854
(a) Oil	-12,573	-13,780	-10,368	-8,401
(b) Non-Oil	-276	7,804	4,779	2,547

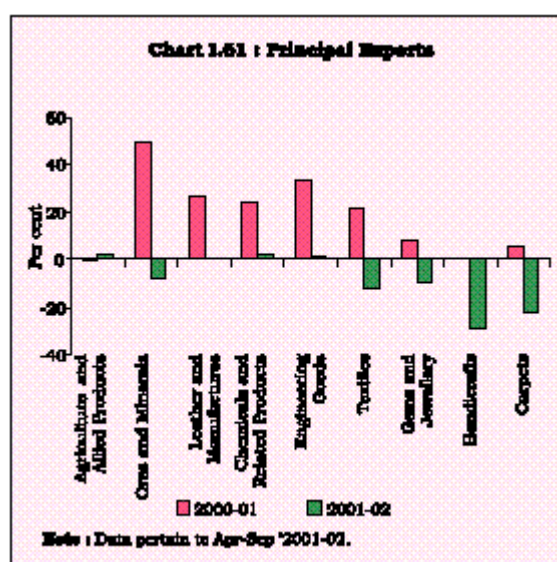
* Provisional

Note :Figures in brackets relate to percentage variation over the corresponding period of the previous year.

Source :DGCI & S.

1.93 Imports at US \$ 34.7 billion during April-November 2001 showed a lower order of increase of 1.2 per cent as compared with that of 7.4 per cent during the corresponding period of the previous year, reflecting the decline in oil imports (13.4 per cent) as also the subdued overall domestic demand. The trade deficit increased to over US \$ 5.8 billion during April-November 2001 from that of about US \$ 5.6 billion during the corresponding period of the previous year.

1.94 Detailed commodity/country-wise trade data are available only for the period April-September 2001. Although a general decline in the exports was observed across most of the commodity-groups, some of the major groups such as 'agriculture & allied products', 'chemicals and related products', and 'engineering goods' recorded positive growth (Chart I.61 and [Table 1.12](#)).



1.95 Destination-wise data on exports clearly brings out the role of external demand in shaping

India's export performance. Given the severe recession in several advanced economies, India's exports to the OECD group declined by 12.6 per cent during April-September 2001 as against an increase of 16.9 per cent recorded during the corresponding period of the previous year. Within the OECD group, exports to the USA and Japan fell by 15.1 per cent and 16.3 per cent, respectively, during April-September 2001.

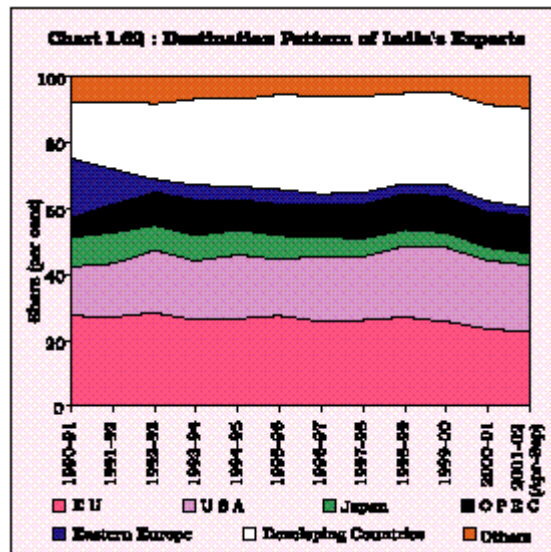
Table 1.12 :Growth Rates of India's Principal Exports

Item:	(Per cent)			
	(April-March)		(April-September)	
	1999-00	2000-01P	2000-01	2001-02P
1	2	3	4	5
I. Primary Products	-5.8	9.8	5.6	0.1
(a) Agriculture and Allied Products	-7.1	7.0	-0.7	1.7
(b) Ores and Minerals	2.5	26.4	49.4	-7.5
II. Manufactured Goods	15.2	16.1	20.5	-6.4
<i>of which:</i>				
(a) Leather and Manufactures	-4.2	22.7	27.2	-0.1
(b) Chemicals and Related Products	17.4	25.1	24.0	2.5
(c) Engineering Goods	15.4	33.2	33.8	1.3
(d) Textiles	9.9	17.9	21.9	-12.4
(e) Handicrafts	5.6	0.0	0.5	-28.7
(f) Gems and jewellery	26.5	-1.5	8.3	-9.4
(g) Carpets	18.7	-9.8	5.7	-22.3
III. Petroleum Products	-56.5	4709.7	1814.8	89.7
Total Exports	10.8	21.0	21.2	-2.0

P :Provisional

Source :DGCI & S.

Exports to Eastern Europe also declined by 6.1 per cent during this period. Exports to other regions, however, showed positive growth. Exports to the developing countries, which have gained considerable prominence over the years as a destination of India's exports, recorded a growth of 7.6 per cent during April-September 2001 (Chart I.62). The growth rates of exports to some of the Asian countries showed sharp improvement during April-September 2001 *vis-a-vis* the corresponding period of the previous year.



1.96 Commodity-wise data on imports reveal that the overall 2.0 per cent increase in imports during April-September 2001 was mainly on account of the sharp 22.2 per cent increase in the imports of gold and silver, which accounted for as much as 10.1 per cent of total imports during this period. Non-oil imports, excluding gold and silver, increased by 4.2 per cent during this period. Among the major import items, sharp declines occurred in respect of cashew nuts (67.1 per cent), 'pearls, precious and semi-precious stones' (16.7 per cent) and fertilisers (18.1 per cent). The imports of some of the industry-related items, however, showed sharp increases; 'metalliferous ores and metal scraps' (60.9 per cent), 'electrical machinery except electronics' (40.8 per cent), 'textile yarn, fabrics etc.' (28.3 per cent), 'non-metallic mineral products' (27.0 per cent), and 'chemical materials and products' (24.1 per cent). The import of bulk consumption goods rose by 36.9 per cent, mainly on account of the substantial increase in the import of pulses (550.8 per cent) reflecting the shortfall in domestic production *vis-a-vis* growing demand (Chart I.63 and [Table 1.13](#)).

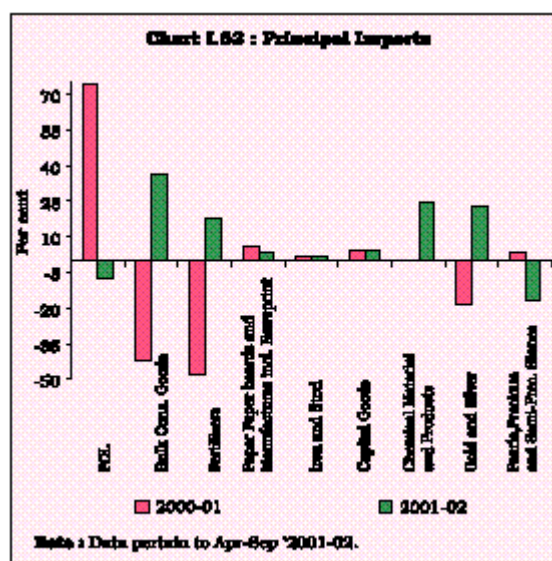


Table 1.13: Growth Rates of India's Principal Imports

(Per cent)

Item	April-March		April-September	
	1999-00	2000-01*	2000-01	2001-02*
1	2	3	4	5
1. Petroleum, Crude and Products	97.1	24.1	74.6	-7.1
2. Bulk Consumption Goods	-4.3	-40.7	-42.4	36.9
3. Fertilisers	30.0	-46.7	-48.4	-18.1
4. Non-Ferrous Metals	-8.5	-3.8	6.5	17.6
5. Paper, Paperboards, Manufactures including Newsprint	-3.8	0.7	5.7	3.1
6. Crude Rubber including Synthetic and Reclaimed	-1.5	5.4	24.2	6.8
7. Pulp and Waste Paper	8.3	9.3	9.8	-5.6
8. Metalliferrous Ores and Metal Scrap	20.8	-14.3	-3.9	60.9
9. Iron and Steel	-10.5	-18.7	2.0	2.1
10. Capital Goods	-10.9	-2.0	4.1	3.8
11. Pearls, Precious and Semi-Precious Stones	44.6	-11.5	3.4	-16.7
12. Chemicals, Organic and Inorganic	6.8	-14.9	-9.9	6.5
13. Textile Yarn, Fabrics, <i>etc.</i>	17.9	10.8	36.4	28.3
14. Cashew Nuts, Raw	20.1	-23.8	-0.9	-67.1
15. Gold and Silver	-7.2	-5.9	-18.9	22.2
16. Artificial Resins and Plastic Materials	6.5	-23.0	-21.4	5.2
17. Coal, Coke and Briquettes <i>etc.</i>	2.9	9.4	20.8	-3.1
18. Medicinal and Pharmaceutical Products	-2.9	-0.1	-0.4	0.5
19. Chemical Materials and Products	-7.4	-8.7	-0.8	24.1
20. Non-Metallic Mineral Manufactures	2.2	5.3	11.6	27.0
Total Imports	17.2	1.7	11.0	2.0

* : Provisional

Source : DGCI & S.

1.97 The recently concluded Ministerial Conference of the World Trade Organisation (WTO) at Doha represents a major landmark in the progress towards equitable and multilateral rules for international trade. The deliberations of the Conference are expected to have important implications for developing countries including India ([Box I.1](#)).

1.98 Invisible earnings continued to provide significant support to India's balance of payments during the first half of 2001-02, though such earnings in net terms were marginally lower at US \$ 5.3 billion during April-September 2001 as compared with US \$ 5.6 billion during the corresponding period of the previous year. Private transfers from nonresident Indians were at US \$ 5.9 billion as against US \$ 6.7 billion in April-September 2000. Software exports rose by about 16.1 per cent to US \$ 3.6 billion from US \$ 3.1 billion in the first half of 2000-01. The sizeable increase in earnings from communication services, construction services, financial services, software services, management services *etc.*, however, was partly offset by higher payments on account of financial services, management services, office maintenance, royalties, license fees *etc.*, resulting in a lower net miscellaneous earnings to the tune of US \$ 705 million during April-September, 2001 as compared with US \$ 1,341 million during the corresponding period in the previous year ([Table 1.14](#)).

Box I.1

The Doha Ministerial Conference - An Indian Perspective

The Fourth Ministerial Conference of the World Trade Organisation (WTO), took place during November 9-14, 2001 at Doha, Qatar. During the run-up to the Conference and during the actual deliberations at Doha, India's stand

on the principal issues was:

- ? The high level of protection provided to trade in agriculture by many developed countries be removed as they hurt the farm exports of developing countries. Adequate flexibility should also be provided to developing countries to take care of their concerns relating to food and livelihood security and rural development.
- ? Implementation issues of concern to the developing countries be satisfactorily addressed and non-trade related issues to be kept out of the agenda for negotiation.
- ? New issues (or Singapore issues) like investment, competition policy, trade facilitation and transparency in government procurement should not be brought under the fold of the WTO.
- ? India opposed the broadening of the jurisdiction of the WTO on issues relating to trade and labour standards and trade and environment. According to India, the existing WTO rules are adequate to deal with all legitimate environment issues.
- ? The TRIPs Agreement to be interpreted and implemented in a manner supportive of WTO member's right to protect public health and ensure access to medicines for all. WTO provisions on geographical indications for wines and spirits should be extended to other products and there should not be any misuse of the biological and genetic resources and traditional knowledge of the developing countries.
- ? The development deficit in various WTO Agreements to be recognised and necessary remedial action taken.
- ? Regarding market access, the issue of significant trade barriers in the form of tariff peaks and tariff escalation in the industrialised countries to be addressed as it affects exports of many developing countries.

The Doha Ministerial Declaration explicitly recognised that for effective functioning of the WTO it is crucial to safeguard the interests of the developing and least-developed countries. The Declaration also recognised the crucial role of the special and differential treatment extended to developing and least-developed countries within the WTO framework. Agreement has been reached to strengthen such provisions for more precise, effective and operational implementation. While upholding the right of the members to take measures to protect environment, it has been emphasised that such measures should be within the scope of the existing norms of the WTO. Similarly, the Declaration took note of the work in progress at the International Labour Organisation (ILO) for implementation of the core labour norms. Explicit cognizance has been taken of the concerns of the developing countries on the implementation issues. The Declaration also calls for removal of protectionism in trade in agricultural products and at the same time, recognises the non-trade concerns of the developing countries relating to agriculture. The Declaration on TRIPs also mirrors the concerns raised by the developing countries in the context of government action for maintenance of public health, extension of the scope of norms on geographical indicators and protection of traditional knowledge.

After the next Ministerial Conference, negotiations may take place in some of the issues relating to investment, competition and transparency in government procurement on the basis of explicit consensus among the members. The Declaration states that there would be negotiations on trade and environment without prejudging the existing WTO rules and specific trade obligations set out in multilateral environmental agreements. On the basis of the recommendations of the WTO Committee on Environment, the next Ministerial Conference would decide the future action including the desirability of negotiations on trade and environment. The Declaration has resolved to maintain the customs tax-free status of electronic commerce through electronic transmission.

Some of the implementation concerns raised by India have been adequately addressed in the Doha Declaration and the remaining items have been referred either to negotiations or to subsidiary bodies for further examination. The Declaration reaffirmed that the International Labour Organisation (ILO) is the appropriate forum to address the core labour standards. The key concerns of India in agriculture have been adequately safeguarded in the Declaration. The special and differential treatment for developing countries including recognition of food security and rural development have now become an integral part of the mandated Agricultural Negotiations. In services, the movement of natural persons has been given primary focus apart from reaffirmation of the guidelines and procedures of negotiations. On the four Singapore issues, it was decided that the study process would continue until the fifth Ministerial Conference and decision regarding any negotiation would be based on explicit consensus. Negotiations have also been mandated under the Anti-dumping and Subsidies Agreements. The various implementation proposals on these subjects will also become part of the negotiations. There is a clear commitment to review the provisions for Special and Differential treatment for developing countries in various WTO agreements to see how these provisions can be strengthened, made more precise, effective and operational.

Reference

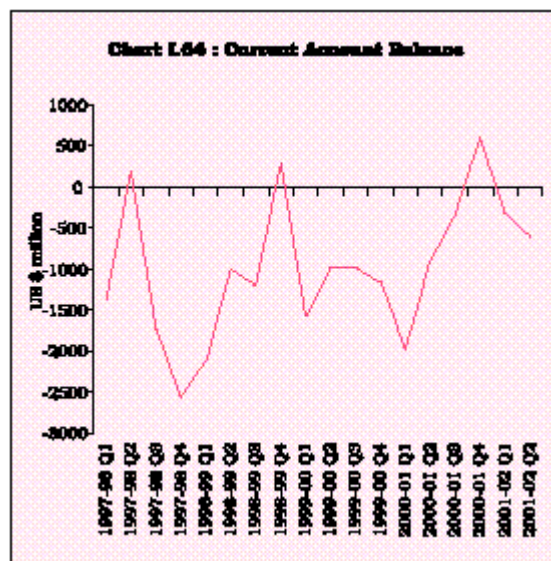
1. Government of India, (2001), *Statement by Shri Murasoli Maran, Minister of Commerce and Industry*, Press Release dated November 22.
2. World Trade Organisation, (2001), *Preparations for the Fourth Session of the Ministerial Conference: Communication from India*, WT/GC/W/459 (November 6).
3. (2001), India: *Statement by Shri Murasoli Maran, Minister of Commerce and Industry*, WT/ MIN(01)/ST/10, (November 10).
4. (2001), Ministerial Declaration, WT/ MIN(01)/DEC/1, (November 20).

Table 1.14 : Inflows under Invisibles by Category

		(US \$ million)			
		2000-2001	1999-2000	April-September	
				2001	2000
1		2	3	4	5
	Invisibles (Net)	11,791	13,143	5,316	5,569
a)	Services	2,478	4,064	524	845
	Travel	294	897	101	50
	Transportation	-1,257	-703	-411	-748
	Insurance	135	109	19	70
	G.n.i.e	316	312	110	132
	Miscellaneous	2,990	3,449	705	1,341
b)	Transfers	13,134	12,638	6,046	6,791
	Official	336	382	111	122
	Private	12,798	12,256	5,935	6,669
c)	Income	-3,821	-3,559	-1,254	-2,067
	Investment income	-3,918	-3,695	-1,304	-2,122
	Compensation to Employees	97	136	50	55

G.n.i.e : Government not included elsewhere

1.99 The current account deficit stood at US \$ 0.9 billion during the first half of 2001-02 as against US \$ 2.9 billion in April-September 2000 (Chart I.64).



1.100 Capital account developments in April-October 2001 were indicative of continuing international confidence in the fundamentals of the Indian economy. Total foreign investment inflows during April-October 2001 stood at US \$ 3.3 billion as against US \$ 2.3 billion during the corresponding period of the previous year. Foreign direct investment (FDI) inflows during April-October 2001 were US \$ 2.0 billion as compared with US \$ 1.4 billion during the corresponding period of 2000-01. FII inflows amounted to US \$ 0.7 billion during the first seven months (April-October) of 2001-02 as against US \$ 0.2 billion during the corresponding period of 2000-01 ([Table 1.15](#)). Net inflows under NRI deposits during April-October, 2001 amounted to US \$ 1.5 billion, as against US \$ 1.1 billion during the corresponding period of the previous year ([Chart I.65](#) and [Table 1.16](#)). The increase in capital inflows noticed during the first seven months of the current financial year is an encouraging development in the face of a global slowdown and subdued international capital mobility.

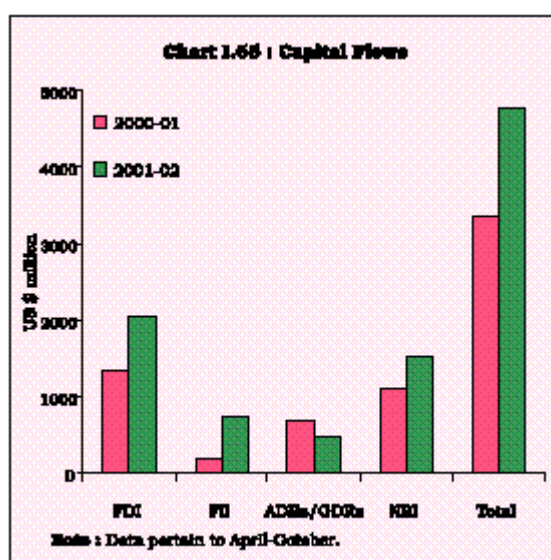


Table 1.15 : Foreign Investment Flows by Category

Item	2000-01P	1999-2000	(US \$ million)	
			April-October (P) 2001-02	2000-01
1	2	3	4	5
A. Direct Investment	2,339	2,155	2,049	1,355
a) Government (SIA/FIPB)	1,456	1,410	1,240	845
b) RBI	454	171	501	221
c) NRI	67	84	30	46
d) Acquisition of shares *	362	490	278	243
B. Portfolio Investment	2,760	3,026	1,245	959
a) GDRs/ADRs #	831	768	477	696
b) FIIs @	1,847	2,135	729	189
c) Off-shore funds and others	82	123	39	74
Total (A+B)	5,099	5,181	3,294	2,314

P Provisional.

* Relates to acquisition of shares of Indian companies by non-residents under Section 5 of FEMA

1999.

Represents the amount raised by Indian corporates through Global Depository Receipts (GDRs)/ American Depository Receipts (ADRs).

@ Represents net inflow of funds by Foreign Institutional Investors (FIIs).

India's External Debt

1.101 According to provisional data, India's external debt at US \$ 98.3 billion as at the end-June 2001 declined by 2.1 per cent from US \$ 100.4 billion at end-March 2001. Componentwise analysis reveals that all components of external debt, except long-term non-resident deposits declined during the the first quarter of 2001-02. The consolidation of external debt was carried further during the quarter as indicated by key indicators of debt sustainability.

Table 1.16 : Inflows under NRI Deposit Schemes

(US \$ million)

Scheme	Variation @			
	2000-01	1999-2000	April-October (P)	
			2001-02	2000-01
1	2	3	4	5
1. FCNR(B)	904	337	387	166
2. NR(E)RA	860	885	780	569
3. NR(NR)RD	553	318	355	390
Total	2,317	1,540	1,522	1,125

P Provisional.

@ All the figures are inclusive of accrued interest and valuation arising on account of fluctuations in non-dollar currencies against the US dollar.

The concessional debt as a proportion to total debt continued to be significant with a marginal increase to 36.5 per cent at end-June 2001 from 35.9 per cent at end-March 2001. The size of short-term debt remained modest both in regard to total debt and reserves. While the proportion of short-term to total debt declined to 3.2 per cent at end-June 2001 as against 3.4 per cent at end-March 2001; the ratio of short-term debt to foreign exchange reserves declined significantly from 8.2 per cent at end-March 2001 to 7.2 per cent at end-June 2001. ([Table 1.17](#))

Table 1.17: India's External Debt

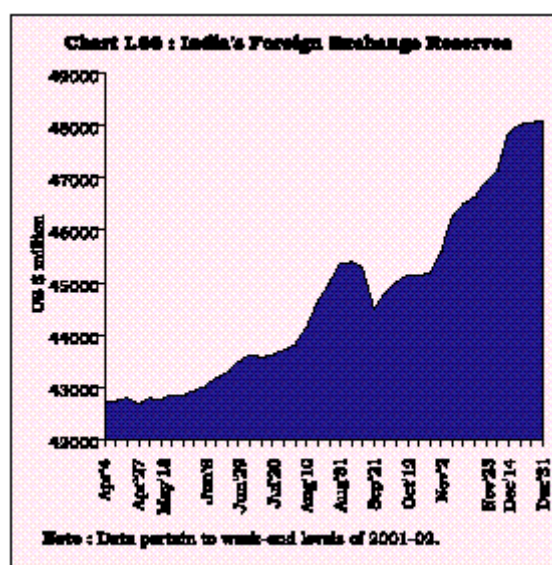
Item	At the end of				Variation during the quarter (April-June 2001) (per cent)
	June 2001		March 2001		
	Amount (US \$ million)	Share in total debt	Amount (US \$ million)	Share in total debt	
1	2	3	4	5	6
1. Multilateral	31,035	31.6	31,104	31.0	-0.2
2. Bilateral	15,810	16.1	16,624	16.6	-4.9
3. IMF	0	0.0	0	0.0	0
4. Commercial Borrowings (including trade credits)#	29,309	29.8	30,041	29.9	-2.4
5. NRI Deposits (long-term)	15,729	16.0	15,432	15.4	1.9

6. Rupee debt	3,230	3.3	3,693	3.7	-12.5
7. Long Term-Debt (1to 6)	95,113	96.8	96,894	96.6	-1.8
8. Short-Term Debt *	3141	3.2	3462	3.4	-9.3
9. Total Debt (7+8)	98,254	100.0	100,356	100.0	-2.1

Includes net investment by 100 % FII debt funds.

* Excludes suppliers' credit of up to 180 days.

1.102 During the year 2001-02 (April-December), there has been an accumulation of foreign exchange reserves of the order of US \$ 5.8 billion. As a result, India's foreign exchange reserves increased from US \$ 42.3 billion as at end-March 2001 to US \$ 48.1 billion as at the end of December 2001 (Chart I.66).



The import cover of reserves improved from 8.6 months of imports at the end of March, 2001 to around 10 months of imports at the end of December 2001. The overall approach to the management of India's foreign exchange reserves in recent years has reflected the changing composition of balance of payments, and has endeavoured to reflect the "liquidity risks" associated with different types of flows and other requirements. The policy for reserve management is thus judiciously built upon a host of identifiable factors and other contingencies. Taking these factors into account, India's foreign exchange reserves are at present comfortable.

¹ AL = Reserve Bank's net claims on the Government (adjusted for net open market (including repo) operations) + Claims on banks (other than credit to scheduled commercial banks) + Credit to the commercial sector (other than credit to PDs) + Net foreign assets – Notes in circulation – 'Other' deposits – Net non-monetary liabilities, in flow terms.

DL = Net open market (including repo) operations + Credit to scheduled commercial banks and primary dealers netted for cumulative changes in reserve requirements, in flow terms.

II The Theme of The Report

2.1 Against the backdrop of macroeconomic developments in India during 2001-02 set out in the foregoing Chapter, the Report on Currency and Finance for the year 2000-01 attempts to address the various issues relevant for “Revitalising Growth” as its theme. The choice of the theme is in recognition of the growing national impatience with the continuing deceleration in economic activity and the debate surrounding the effectiveness of macroeconomic policies in initiating the upturn. The approach of the Report is analytical, eclectic and indicative with a preference for verifying testable hypotheses that emerge in the treatment of the various inflexions surrounding the theme of the Report. The findings from these analyses are presented in the form of simple, explanatory charts and tables in the text of the Report. All through the Report, the endeavour is to employ charts and illustrative representation of the key points in the discussion. In a sense, the Report on Currency and Finance essentially picks up the cues given in the Reserve Bank’s Annual Report, 2000-01 and provides them with form, analysis and leading information content against the horizon of medium-term strategies being envisaged for the economy. Including this Chapter (II), the Report is divided into eight chapters.

2.2 The first Chapter entitled “Overview” provided a brief commentary on the Indian economy as a backdrop to the theme-based chapters which follow. It focused on developments during 2001-02 up to the end of December, 2001, dealing with them in terms of continuation of trends observed in 2000-01 and significant reversals, particularly in the context of the theme of the Report. Thus, the Report completes a quarterly cycle of reporting macro-developments, along with the “Macroeconomic and Monetary Developments” issued in conjunction with the Statement of Monetary and Credit Policy reviewing the economy up to March, the Bank’s Annual Report up to June-July and the mid-term review of Monetary and Credit Policy up to September-October.

2.3 Chapter III is entitled “Exploring the Slowdown”. Starting with a brief discussion on the current debate on the deceleration in the economy, the Chapter attempts to identify the underlying factors in the downturn. It undertakes an analytical examination of cyclical and structural influences on the actual and potential growth path of the Indian economy, the structural breaks in the growth process and the turning point beginning the downturn. A profile of aggregate demand in the economy – consumption, investment, net exports – is presented with a view to gaining an understanding of the cyclical changes in the growth process so as to provide pointers for the allocation of resources for reinvigorating the impulses for growth from the demand side. The Chapter also deals with the structural constraints to growth - gaps in the modernisation of agriculture, infrastructure, capacity utilisation and technology. In addition, the chapter addresses the role of services as a lever in the growth process, identifying various linkages which services sector growth has for the rest of the economy. Further, the regional dimensions of growth in India against the backdrop of state-level reform with an emphasis on various human development and demographic indicators among various Indian states are also examined in this Chapter.

2.4 The fourth Chapter entitled “The Role of Fiscal Policy in Reinvigorating Growth” addresses the ongoing debate in India on the role of fiscal policy in reversing the slowdown and stimulating the revival. The approach of the Chapter is in terms of a combination of a review of

the specific literature and the cross-country experience in the 1980s and 1990s. Fiscal strategies based on expenditure restraint, strengthening of the institutional framework for fiscal policy, raising accountability and improving credibility through transparent fiscal rules are reviewed in terms of their efficacy against a recession/downturn. The growth implications of alternative fiscal mixes are evaluated with the help of a small econometric model to determine growth stimulating combinations of fiscal instruments. An important exercise conducted in this Chapter is the estimation of the 'cyclical' and 'structural' components of the fiscal deficit in order to ascertain the effects of automatic and discretionary stabilisers in fiscal policy. The response of private consumption and investment to fiscal policy are tested to investigate 'crowding-in' and 'crowding-out' effects associated with fiscal activism. The Chapter also addresses the issue of fiscal sustainability from the point of view of the impact of fiscal policy on future growth performance. In view of the arguments in the current debate in favour of 'pump-priming' *via* monetisation, the Chapter examines the issue by testing the hypothesis of 'unpleasant monetarist arithmetic' in search of a critical mix between bond and money financing of the fiscal deficit in the context of the revival of growth. This is expected to be a key input in the context of the evolving framework of monetary-fiscal coordination in India.

2.5 Chapter V, which is entitled "Growth, Inflation and the Conduct of Monetary Policy", joins the current debate relating to the role of monetary policy in stimulating the revival. It undertakes an appraisal of the unsettled debate on the neutrality of monetary policy and explores the location of the threshold level of inflation in India as a proximate solution to the neutrality debate. The sacrifice ratio is estimated to check for the losses of output that can occur from disinflationary policy pursued at below the threshold inflation. The interest rate channel of monetary policy is examined in the context of the modern tradition of 'consensus monetary models' with a view to providing the analytical underpinnings of the current monetary policy framework. The credit channel of monetary policy is also empirically examined within the framework of a small, simultaneous model of the macroeconomics of the market for bank credit in India. The Chapter also deals with the constraints on monetary policy – the issue of time inconsistency, the threat of deflation in the context of the current global disinflation cycle and the solutions sought in the Indian context.

2.6 In the 1980s and 1990s, many developing countries have liberalised their policy regimes to employ foreign capital as an accelerator of growth. Chapter VI entitled "External Sector and the Growth Process" studies the role of capital flows in India's growth dynamics based on a review of the theoretical and empirical literature, an examination of the cross-country experience, and the stylised facts in India. The relative efficacy of export-led growth and capital-induced growth are contrasted and the evidence suggesting strong complementarity between capital flows and domestic investment is presented. The core of the Chapter is an empirical evaluation of the testable propositions relating to the growth-driving/ growth-driven characteristics of various forms of foreign capital. The growth-augmenting role of foreign capital in India appears to have been constrained by the low levels of actual and planned absorption of foreign capital, creating the illusion of 'abundance of capital' in India in the 1990s. These findings place the Tenth Plan growth objective and the associated external financing projections in a perspective.

2.7 Chapter VII entitled "Resource Allocation and the Financial System" examines the role

of the financial system in the development process in India, particularly its transition from a passive mobiliser of financial resources to an efficient intermediary with the phasing out of administrative controls over the capital markets and the banking sector. In order to assess allocative efficiency, the Chapter explores several alternatives. The role of the banking system, which is relevant in the context of a predominantly bank-based model of financial development as in India is compared against the capital market, which is progressively assuming greater importance in the distribution of national saving and investment.

2.8 The final Chapter, entitled “A Macroeconomic Summary of the Economy”, essentially summarises the principal findings of the preceding chapters with the objective of evaluating the consistency of the various points made in the Report in terms of a complete system of macroeconomic relationships. Various exercises conducted in the other Chapters feed into the core ‘model’ either recursively or in the form of off-model calibrations. The Chapter sets out the framework for assessing the behaviour of the real sector by examining the growth dynamics operating through the fiscal sector, the monetary sector and the external sector. The thrust of this Chapter is to outline an operational framework for analysing interaction of major economic agents (households, producers, government) behaviour in the medium to long run.

III Exploring The Slowdown

Macroeconomics of Growth

Structural Constraints in Indian Agriculture

Impediments to Industrial Growth

Services In The Indian Growth Process

Regional Dimension of Economic Growth in India

Concluding Observations

Introduction

3.1 The recent deceleration in the Indian economy has generated considerable concern with some apprehensions about the deepening of the slowdown and delay in revival. Several factors are attributed to the loss of growth. Infrastructural constraints, variability and shortfalls in agricultural output, erosion in the quality of public services and gaps in technology and human development are insidiously becoming binding constraints on growth. At the same time, recent developments indicate some cyclicity in output behaviour with the current phase of the cycle reflecting the general deficiency in aggregate demand, the inadequate response of private investment to reforms, deceleration in public investment, inventory accumulation, excess capacity and some evidence of consumption smoothing. In the current year, indicators of real activity, with the exception of agriculture, have underperformed in relation to the preceding year. A few positive signs are, however, visible in the improved capital flows and the steady build-up in the foreign exchange reserves. The principal policy, instruments, *i.e.*, fiscal and monetary policies have been shifted into counter-cyclical mode and the stance of policies is clearly in favour of further adjustments, if necessary, to create a congenial environment for the awaited upturn. There is also a growing recognition that the existing level of structural reforms is succumbing to the inexorability of diminishing returns, and bolder and more intensified reforms are required in the 'difficult areas' - agriculture, labour market, bankruptcy and exit procedures, social sector and legal reforms.

3.2 The persistence of the slowdown for the second year in succession has provoked intense debate on the underlying causes of the downturn. Although the views traverse a wide spectrum, a broad categorisation helps to place the debate in proper perspective.

3.3 There is an influential viewpoint which attributes the deceleration to forces operating on demand such as, low aggregate demand and adverse investment climate (NCAER, 2001), the sharp deceleration in the two major components of industrial demand-exports and investment (Acharya, 2001), the contractionary features inherent in public policies pursued in the 1990s (Shetty, 2001), and specifically, anti-cyclical fiscal policies, and the inappropriate budgetary stance (Rakshit, 2000). All of the above are reflective of a demand-constrained economy (Patnaik, 2001). Within the 'demand constraint' side of the debate, there is also the view that the declining trend in growth is to be attributed to demand recession as well as global slowdown (Institute of Economic Growth, 2001). The impact of contemporaneous global developments has also been emphasised as the overwhelming reason; one view cautions the government to be ready to handle the adverse consequences of continuing global slowdown (Venkitaramanan, 2001), while another suggests that "the government can do very little about it" (Economic Times,

2001). The contrarian viewpoint argues that the impact of the global slowdown on the domestic output growth may be minimal and the current phase may be temporary (Bhalla, 2001; Bhattacharya, 2001; Rao, 2001).

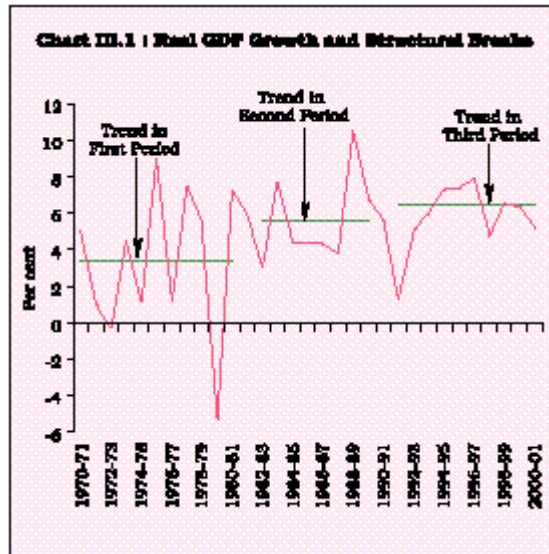
3.4 The other side of the debate ascribes the slowdown to factors operating primarily on aggregate supply. The slide in the pace of growth is attributed essentially to the growth of the commodity producing sectors— agriculture and manufacturing (Chandrasekhar, 2001). Pointing to the institutional impediments to growth, it is argued that the main reasons for the current slowdown are structural and should be addressed accordingly (Karnik, 2001). The slowing down of growth is also regarded as reflecting the effects of various shocks, such as, the Asian financial crisis, international oil prices, 'patchy' monsoon and natural calamities along with deeper structural factors at work, including infrastructure constraints, regulatory constraints in industry, agriculture and trade, and high real interest rates (IMF, 2001) as well as slow pace of reforms (International Finance Corporation, 2001). The current decelerating phase is also associated with relatively high unemployment, poor human and social development and ecological degradation (GoI, 2001). Finally, there is the view that the recent slowdown in economic activity seems to reflect a combination of both cyclical and structural factors with different weights assignable to either, depending on the changing conditions in the growth process (Reserve Bank of India, 2001).

3.5 Against the backdrop of the current deceleration, the impassioned debate generated in India and the diversity of views about the downturn, this Chapter undertakes an analytical examination of the dynamics of India's growth performance. The approach is exploratory and empirical with the objective of presenting the findings of a series of integrated analytical exercises on various facets of the deceleration for contributing to informed public judgement and choice. The following section deals with the macroeconomics of growth, in terms of aggregate demand and cyclical influences thereon, factors underlying the behaviour of aggregate demand such as consumption, saving, investment and net exports. Sections II and III address specific structural constraints on aggregate supply in agriculture and industry, respectively. Section IV examines the role of services as a lever of growth. Section V profiles the regional dimensions of the growth process. This is followed by concluding observations.

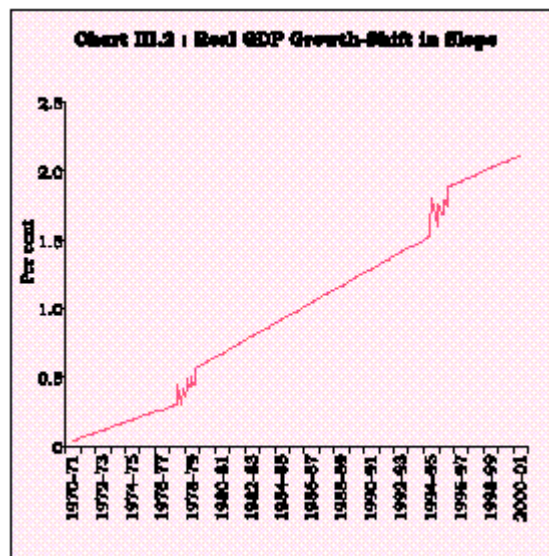
I. MACROECONOMICS OF GROWTH

3.6 As a starting point, it is useful to date the important turning points in the time path of the Indian economy. Real GDP at factor cost represents a summary measure of economic performance. The growth profile of real GDP in India has not been smooth and evenly paced. The Markov-switching model (Goldfeld and Quandt, 1973) can be employed to capture the dynamic patterns underlying switches or shifts in regimes which are independent over time. This procedure represents an improvement over the conventional techniques that rely on prior knowledge of the existence of those shifts. The exercise reveals that the growth of GDP encountered the first 'break' in 1981-82 followed by a second 'break' in 1990-91. The first break occurred in the wake of the second oil shock and a severe drought. The response to these supply shocks resulted in a step-up in the growth process with the trend growth rate rising from 3.4 per cent during 1970-81 to 5.6 per cent during 1981-90. The second break is detected amidst the unprecedented balance of payments crisis associated with the Gulf war in 1990. In a similar

sequence, the simultaneous implementation of structural reform and stabilisation brought about a quantum jump in the trend growth to 6.5 per cent in the ensuing years (Chart III.1).

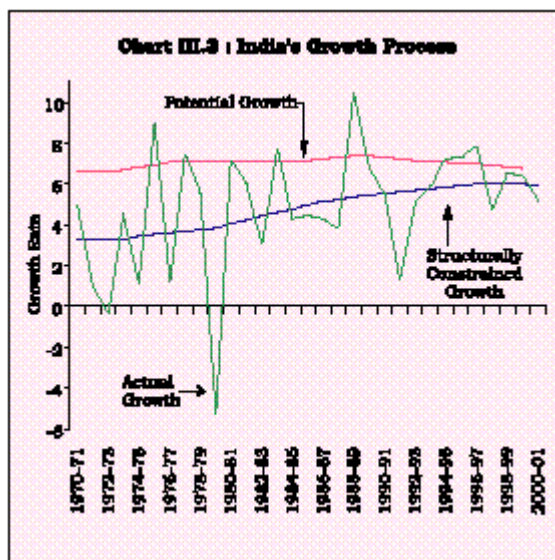


3.7 There is no evidence of a structural break in the trend growth during the 1990s when judged from levels; however, the growth process has also been subject to variations in pace as indicated by the recent downturn. Using the switching regression technique which employs consecutive trial searches over the entire sample period to identify acceleration/ deceleration in real GDP growth in terms of rates of change, an inflexion is discernible in 1978-79 showing an acceleration and again in 1995-96 with the wearing-off of the preceding high growth phases. These experiences suggest that the current phase represents a loss of speed rather than a 'break' in growth (Chart III.2).



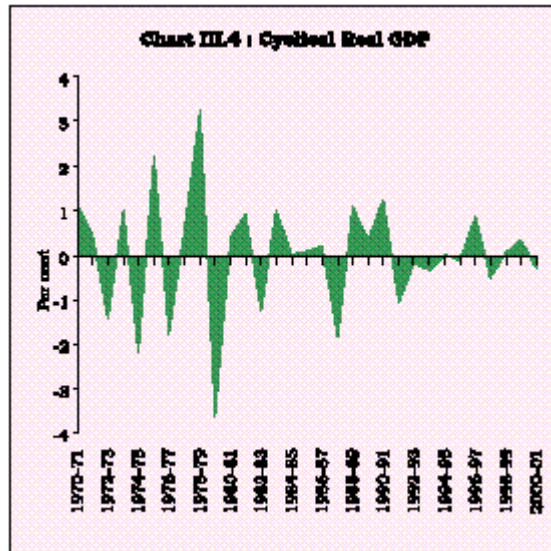
3.8 Taking the diagnosis further, an incision can be made into the growth path of real GDP by decomposing it into its 'time-series' components - trend, seasonal, cyclical and irregular

elements—depending upon the frequency and regularity of their recurrence. Seasonal components are discernible in monthly and quarterly data but not in the annual data. The cyclical and irregular components are collected together and removed by 'filtering' real GDP through the commonly employed Hodrick-Prescott (HP) filter over the period 1970-71 to 2000-01. Separating out cyclical and irregular influences from the actual growth of real GDP yields what can be termed as the 'structurally constrained' growth path of the economy determined by its production structure, institutional characteristics and the various impediments acting on aggregate supply. The path of structurally constrained growth has undergone a distinct upward shift in the early 1990s as liberalisation unlocked hidden capacities and unleashed repressed productive forces. In the following years, the impetus for growth was not sustained and the structurally constrained path tended to slope downwards in the second half of the 1990s. These movements have had a fundamental influence on the potential growth path of the Indian economy, *i.e.*, the growth which is realisable with the full utilisation of productive capacities in the economy. Empirical studies conducted in India show the sensitive nature of the estimates of potential growth to the choice of methodology (RBI, 1999). Applying the OECD (1995) method, the potential growth path is generated from the actual data on real GDP by obtaining a locus of the peak growth rates achieved in the period of study and then smoothing it with a three-year moving average. Movements in the potential growth are found to respond to the behaviour of the structurally constrained growth path. The liberalisation 'hump' of the early 1990s shifts the potential growth path upwards; again the dipping of the potential growth path appears to be associated with the slowing down of structurally constrained growth (Chart III.3). Thus, by releasing the structural constraints, it is possible to shift the long run growth to a higher trajectory.

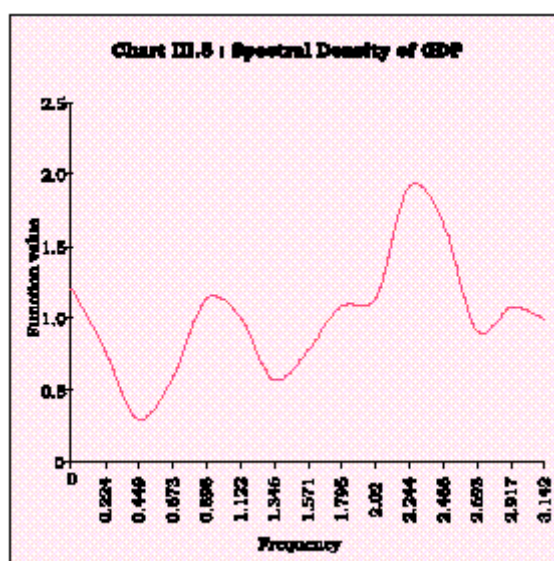


3.9 The exercise also provides some insights into the characteristics of cycles in the Indian economy. Cyclical and irregular components (which were jointly separated by using the HP filter) are disentangled further by using a conventional business cycle filter, *i.e.*, the Band-Pass filter (Baxter and King, 1999) which produces a smooth cycle by eliminating the outliers over the 'band' of frequencies. The cyclical component of real GDP is depicted in Chart III.4. Its behaviour suggests that during the 1970s and early 1980s, cyclical fluctuations were frequent and

sharp in magnitude, varying in the range of -3.6 per cent to 3.3 per cent, and emanating mainly from supply shocks (such as agricultural failures, terms of trade shocks and war). In the 1990s, the amplitude of cyclical fluctuations has become relatively small, varying in the range of -1.0 to 1.3 per cent. With the gradual weakening of the cycle, the behaviour of the structural component of growth has dominated the overall growth process.



3.10 Spectral analysis enables further examination of the underlying nature of cycles in the Indian economy. A spectral density function using "Bartlett" weights in the estimation of long-run variances in time series over the frequency domain is fitted to data on real GDP (first differences of logarithmically transformed series) to ascertain the significance of the presence of cycles as well as to measure the duration and amplitude of the fluctuations. The spectral density function indicates the presence of short- to medium-term cycles (Chart III.5). It has a peak value corresponding to 2.8 years (2.2 in terms of frequency), suggesting that cycles in India are of a three-year duration which corroborates the use of a three-year moving average to obtain potential output from peak rates in the preceding exercise. The relative importance of permanent and transitory components of real GDP growth can be assessed from the spectral density over a long horizon (*i.e.*, at zero frequency) (Cochrane, 1988). The transitory component, representing cyclical effects, appears to account for up to one-third of the total variations in real GDP growth over the entire sample period (1970-2000).



Cyclical Influences on Aggregate Demand

3.11 In order to track the origins of cyclical patterns of activity, it is necessary to undertake the macroeconomic accounting of sources of aggregate demand. This makes it possible to reflect on the relative importance of various components of aggregate domestic demand -consumption and investment - and net exports in the growth process.

3.12 Decennial movements in domestic demand suggest that although private consumption has provided the underlying foundations of the growth process, it is investment which has enabled phases of acceleration and stability in periods of slowdown. The average relative contributions of government consumption increased in the 1980s but has remained stagnant in the 1990s ([Table 3.1](#)).

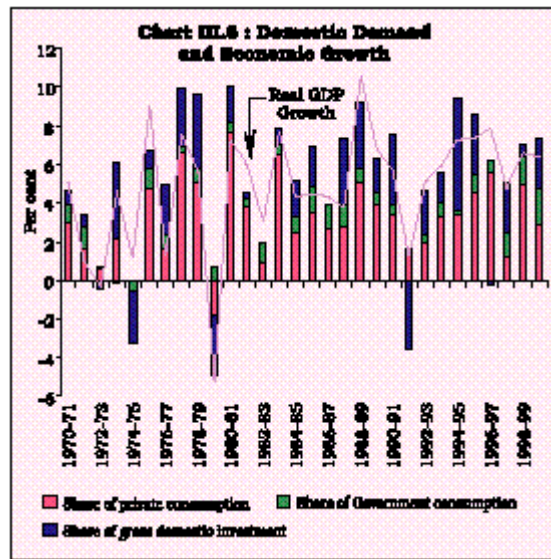
Table 3.1: Select Components of Domestic Demand: Relative Contributions to Growth

Period					(Per cent)
		Private Consum- ption	Government Consum- ption	Inves- tment	Overall Growth
1	2	3		4	5
	1970-71 to 1979-80	2.3	0.5	0.9	2.9
	1980-81 to 1989-90	3.9	0.9	1.6	5.8
	1990-91 to 1999-2000	3.3	0.8	1.9	5.8

Note : The relative contributions of the components will not add up to the total on account of statistical discrepancies and non-availability of net exports in real terms.

3.13 The relative contributions of the domestic demand components, except government consumption, have a pro-cyclical relationship with growth; periods of high growth are associated with higher growth of private consumption and domestic investment and lower growth in periods of downturn. Government consumption has a relatively small impact on the growth process. In the second half of the 1990s, especially since 1997-98, the deceleration in growth occurred on

account of slowdown in private consumption and investment demand. Since 1997-98, the slowdown in private consumption has been substantial; the average contribution to growth has slipped to 3.0 percentage points during 1997-98 to 1999-2000 as compared with 4.5 percentage points during the period 1994-95 to 1996-97. In the case of investment demand, its contribution to growth has slipped to 2.0 percentage points which is lower than that of 2.9 percentage point during the high growth phase 1994-95 to 1996-97. On the contrary, government consumption has witnessed a counter-cyclical movement, indicating that discretionary fiscal stabilisers in the form of the Pay Commission awards have had a role in the limited context of holding up aggregate demand over the period of the downturn (Chart III.6).



3.14 A robust association between aggregate output and demand components emerges from the synchronous movement of their cyclical components. The correlation coefficient between the cyclical components (estimated by using pure cyclical components involving two stage filtering process to remove irregular components) of the sources of domestic demand between (private consumption, investment and government consumption) and the cyclical component of GDP is higher between private consumption and GDP than between investment and GDP, indicating the primacy of consumption in generating effective demand in the Indian economy. Government consumption has negative, *albeit* low and insignificant contemporaneous correlation with GDP, but has positive correlation after a lag. Thus, an increase in government consumption may depress aggregate demand initially and it will be some time before the intended demand boost takes effect. These differentials in associations have critical relevance for designing the timing and stance of counter-cyclical policies ([Table 3.2](#)).

Table 3.2: Correlation Coefficients of the Cyclical Components of Demand with Cyclical GDP

	GDP	Private Consum- ption	Govern- ment Consum- ption	Gross Dom- estic Invest- ment
1	2	3	4	5
GDP	1.00			

Private Consumption	0.84	1.00		
Government Consumption	-0.08	0.17	1.00	
Gross Domestic Investment	0.34	0.02	0.20	1.00

Saving Behaviour

3.15 By developing country standards, India's saving rate continues to be fairly impressive; by the yardstick of some East-Asian economies, however, there is a considerable scope for improvement ([Table 3.3](#)).

3.16 The Indian savings experience has been marked by varied oscillations in the saving rate (Ray and Bose, 1997). After the initial phases of low saving, it reached a high during 1976-77 through 1979-80, reflecting, *inter alia*, the spurt in foreign remittances. Financial saving started assuming importance as a result of the financial deepening following bank nationalisation in 1969 ([Table 3.4](#)). After some lull during the first half of the 1980s reflecting deterioration in public savings as well as a step-up in the households' demand for consumer goods, the saving rate started recovering. The high growth phase of 1994-95 through 1996-97 is also accompanied by a high saving phase with the average saving rate touching a high of 24.4 per cent. The inflexion discernible in the growth rate in 1996-97 is also noticeable in the saving rates.

Table 3.3: Saving Rate in India vis-a-vis Select Asian Countries

Country	(Per cent)										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1990-99*
1	2	3	4	5	6	7	8	9	10	11	12
India	23.1	22.0	21.8	22.5	24.8	25.1	23.2	23.5	22.0	22.3	23.0
Singapore	43.4	44.7	45.1	45.3	47.3	49.7	49.5	50.4	50.6	49.9	47.6
Malaysia	34.4	34.1	36.7	39.1	39.6	39.7	42.9	43.8	48.5	47.0	40.6
Hong Kong	35.4	33.8	33.8	34.6	33.1	30.5	30.7	31.1	30.2	29.9	32.3
China	38.7	39.2	40.1	41.7	42.7	42.5	41.1	41.5	40.8	39.0	40.7
Republic of Korea	37.2	37.2	36.3	36.0	35.4	35.6	34.0	33.7	34.2	34.2	35.4
Indonesia	32.3	33.5	35.3	32.5	32.2	30.6	30.1	31.5	28.4	19.5	30.6

* Average for the period.

Source : Asian Development Bank.

Note : Data for India is for April-March and for others on calendar year basis.

3.17 Several factors influencing saving behaviour such as income, interest rates and other variables have been explored in the empirical literature, using cross-section and time series data. Real GDP growth has generally been found to have exerted a positive effect on the savings rate (Fry, 1980; Giovannini, 1985). Contrary to conventional wisdom, some empirical studies have found a negative effect of real interest rate on savings (Giovannini, 1985). The transformation of domestic savings into additional income *via* accumulation of capital was found to be not only operative, but a significant factor in the growth of incomes in developing countries (Gersovitz, 1988). Saving is not just about accumulation but about smoothing consumption in the presence of liquidity constraints and uncertainties including those associated with the full stream of income on part of the individual households, typically in developing economies (Deaton, 1990). The issues pertaining to the effect of various determinants of savings are, thus, yet to be fully resolved.

3.18 In the Indian context, income is identified as an important variable in explaining savings rate, particularly for the household sector (Krishnaswamy, Krishnamurty and Sharma, 1987). Granger causality tests found evidence for growth influencing savings and not *vice-versa*. Other important determinants of savings behaviour are found to be the size of the working population, dependency ratio, financial deepening and taxation (Mulheisen, 1997). The studies on the effect of interest rate on savings in India have showed mixed results. A disaggregated analysis on the effect of the real interest rate on saving found a favourable impact of the rate of interest on some components of savings, *i.e.*, currency and bank deposits (Pandit, 1985), and of the real interest rate on the savings rate of the households as well as for the economy as a whole (Krishnaswamy, Krishnamurty and Sharma, 1987), whereas other studies have yielded inconclusive results relating to the interest sensitivity of savings behaviour in India (Bhattacharya, 1985). Besides, spread of banking has been found to have a significant impact on savings (Krishnaswamy, Krishnamurty and Sharma, 1987).

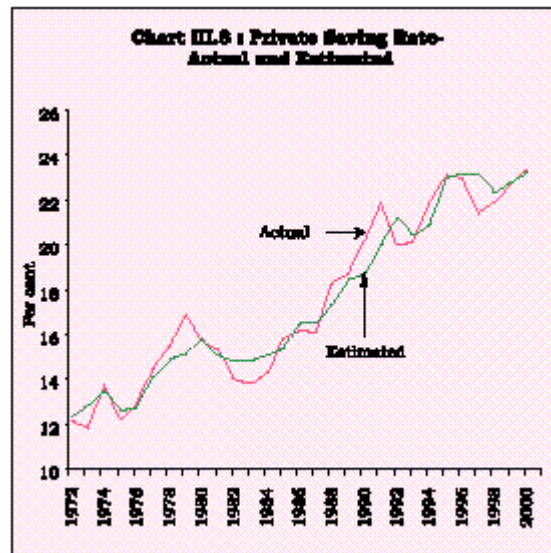
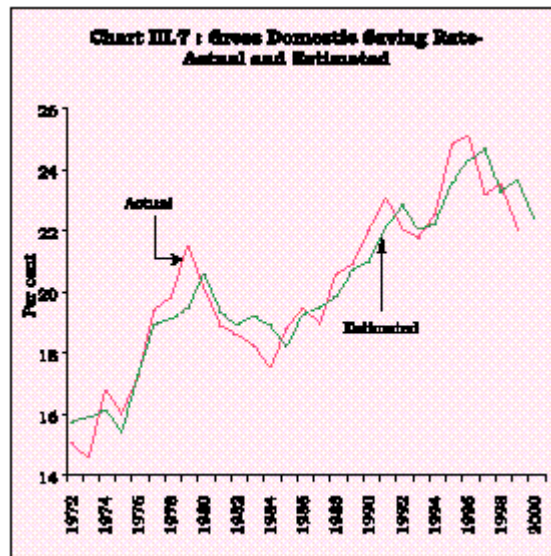
Table 3.4: Behaviour of Aggregate and Sectoral Savings

(As percentage of GDP at current market prices)

Period / Year	Households			Private	Public	Gross Domestic Saving
	Financial	Physical	Total	Corporate		
1	2	3	4	5	6	7
1976-77 to 1978-79	5.7	8.5	14.3	1.4	4.6	20.2
1979-80 to 1984-85	6.1	7.1	13.3	1.6	3.8	18.7
1995-86 to 1992-93	7.9	8.9	16.7	2.3	2.1	21.1
1993-94	11.0	7.4	18.4	3.5	0.6	22.5
1994-95	11.9	7.8	19.7	3.5	1.7	24.8
1995-96	8.9	9.3	18.1	4.9	2.0	25.1
1996-97	10.3	6.7	17.0	4.5	1.7	23.2
1997-98	9.9	8.0	17.8	4.2	1.5	23.5
1998-99	10.9	8.2	19.1	3.7	-0.8	22.0
1999-2000	10.5	9.2	19.8	3.7	-1.2	22.3

Source : Central Statistical Organisation.

3.19 The savings behaviour in the Indian context is analysed for the period 1970-71 to 1999-2000 by estimating savings functions at the aggregate level, and also for private saving. The empirical estimates indicate that real per capita income and financial deepening have significant positive effects on the aggregate saving rate (gross domestic saving rate) and are its main determinants⁴; other things remaining the same, a one per cent increase each in income and intermediation ratio (secondary issues to primary issues ratio, as used in flow of funds accounts) would induce an increase in aggregate savings rate by 6.6 percentage points and 3.4 percentage points, respectively. The interest rate, *i.e.*, real deposit rate, has a lesser but positive impact on gross savings rate; implying that as much as 12 percentage points change in the real interest rate is required to increase aggregate savings rate by one percentage point. The results indicate that the dynamic response of the private saving rate to per capita income (per capita disposable income is the relevant scale variable in studying private saving behaviour) works out to 7.8. The in-sample fits of the estimated equations for aggregate and private savings rates, are reported in Charts III.7 and III.8.

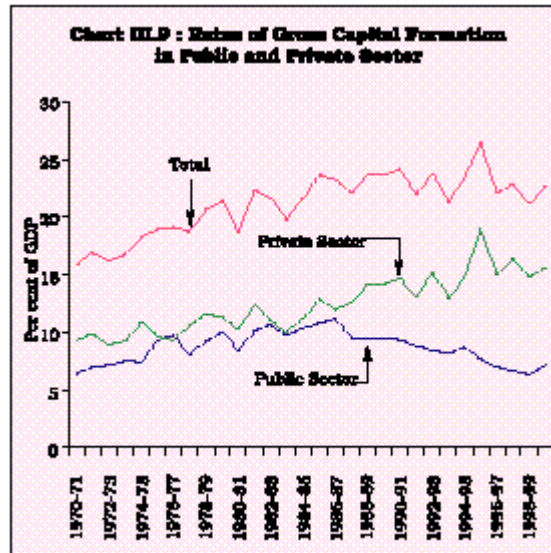


Investment Behaviour

3.20 The relationship between investment (*i.e.*, capital formation) and output assumes special importance in the case of capital-deficient developing countries, especially in the reinvigoration of growth. Studies have typically shown that capital accumulation contributes up to 60-70 per cent of the growth in per capita output (IMF, 2000) and continues to be the primary engine of growth. In India, the deceleration in growth in the second half of the 1990s is associated with slowing rate of investment. It is in this context that a study of investment behaviour in India assumes importance.

3.21 The rate of nominal gross capital formation (GCF) rose from 15.8 per cent in 1970-71 to 22.7 per cent in 1999-2000 undergoing two phases of deceleration, first in the early 1980s and again in the second half of the 1990s. The rate of capital formation has been rising in the private sector while in the public sector, it has been generally declining in the 1990s (Chart III.9). An

analysis of the behaviour of GCF in terms of industry of origin in the 1990s indicates that the rate of capital formation in agriculture exhibited a slow decline from 2.0 per cent in 1992-93 to 1.7 per cent in 1998-99. The rate of capital formation in industry underwent a steep fall from 1995-96 onwards. There was a declining trend in the rate of capital formation in the services sector in the 1990s until 1999-2000. In all, a clear slowdown in the investment demand across the sectors was visible in 1990s, especially in the mid-1990s. This has been reflected in the downturn of growth.



3.22 In order to assess the investment behaviour of the economy in relation to growth, it is necessary to study investment behaviour in real terms. The real investment rate (adjusted for errors and omissions) moved up from an average of 21.8 per cent in the 1980s to 27.2 per cent in 1995-96 before decelerating to 26.0 per cent in 1999-2000 ([Table 3.5](#)).

Table 3.5: Behaviour of Real Aggregate Investment Rates and Growth Rates

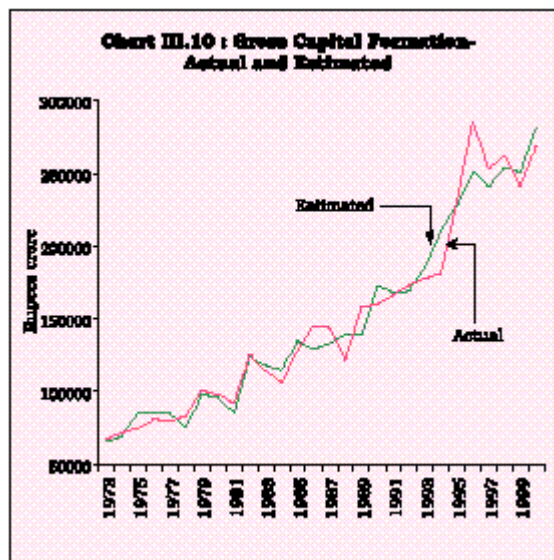
Period/Year	(Per cent)		
	Rate of Real Gross Capital Formation	Rate of Real Gross Domestic Capital Formation @	Growth of Real GDP at factor Cost
1	2	3	4
1970-71 to 1979-80	21.9	21.1	2.9
1980-81 to 1989-90	22.6	21.8	5.8
1990-91	23.2	25.4	5.6
1991-92	21.4	22.0	1.3
1992-93	23.0	22.9	5.1
1993-94	21.3	23.1	5.9
1994-95	23.7	26.4	7.3
1995-96	26.9	27.2	7.3
1996-97	22.7	25.1	7.8
1997-98	24.2	26.4	4.8
1998-99	23.4	25.4	6.6
1999-2000	25.4	26.0	6.4

@ Adjusted for errors and omissions.

Source : Central Statistical Organisation

3.23 The traditional view of investment in the context of growth cycles is in terms of its replacement cost. In a developing economy, apart from the rate of output growth, and replacement cost (or cost of capital), the rate of capacity utilisation, liquidity constraints faced by firms, and macroeconomic stability have been identified as major determinants of investment (Schmidt-Hebbel, Seren, and Solmano, 1996). An important issue in the study of investment in India is the relation between public and private investment, particularly in the context of the vacation of public investment in several areas to create space for private investment as part of the structural reforms in the 1990s. In India, the broad consensus favours a crowding-in relationship between public and private investment (Sundarajan and Thakur, 1980). The major determinants of corporate investment in India have been found to be credit availability and cost of capital (Athukorala and Sen, 1996).

3.24 An econometric investigation has been undertaken to estimate the behaviour of aggregate GCF, as well as private investment in various constituent sectors by industry of origin, *i.e.*, agriculture, manufacturing and services, over the period 1970-2000 in the conventional accelerator framework specifying lagged structures for output effects. Besides real GDP, important determinants of investment are postulated to be the real bank lending rate, and public investment in the services sector to capture possible 'crowding-in' effects². The in-sample fits of the investment rates are presented in Chart III.10. Two findings emanate from the exercise. First, the aggregate investment is positively and significantly influenced by income, both contemporaneously and with a lag reflecting the operation of the acceleration principle, *i.e.*, investment demand is induced by past output. Secondly, public investment in services favourably impacts private investment in manufacturing and services, corroborating the operation of a crowding-in phenomenon between appropriate types of public and private investment.



Nurturing Short-run Growth Impulses

3.25 In the tradition of growth models, investment simultaneously contributes to effective demand in the economy and augments the productive capacity, thus, providing the static

Keynesian analysis with a dynamic perspective. In this section, the analysis hopes to provide pointers for the allocation of resources in support of reviving growth. For this purpose, working out investment multipliers and accelerators as well as multiplier-accelerator interaction becomes crucial for gauging the strength and duration of virtuous cycles of investment and output so as to direct the deployment of investible resources. The multiplier determines the initial injection of investment that is necessary to generate a desired increase in income. The accelerator measures the response of investment to changes in demand conditions. The multiplier and accelerator together capture the simultaneous interaction of investment and income (demand).

3.26 A simple econometric investigation of the real private final consumption expenditure in relation to real GDP at factor cost over the period 1970-71 through 1999-2000 yielded the marginal propensity to consume with respect to current income of about 0.60, implying a multiplier value of 2.5. Thus, a one per cent increase in, say, government spending or autonomous private investment would raise income by 2.5 per cent ([Table 3.6](#)).³

Table 3.6: Estimated Multipliers

Variable	Multiplier
1	2
Private Final Consumption	2.5
Government Final Consumption	1.2
Overall Consumption	3.9

3.27 Increases in government spending and private investment could induce greater utilisation of the economy's productive capacity which, in turn, may increase income levels more than implied by the static multiplier. The inter-temporal effects of the initial stimulus to aggregate demand feeds into the income stream through a series of complex interactions between consumption behaviour and investment spending to produce cumulative expansions in income which have been described in the literature as 'super multiplier' (Rangarajan and Dholakia, 1999). Illustratively, an initial injection of spending in the form of government expenditure generates an increase in income *via* the conventional static multiplier. The increased income can induce changes in consumption demand as well as expansion in the demand for productive capacity (*i.e.*, investment demand), both private and public. Thus, fiscal policy intervention in the form of expenditure on consumption and investment is now determined within the dynamics of the income-expenditure propagation process (super multiplier) rather than exogenous to it. This brings in the key issue of the sustainability of the envisaged growth path and the role of fiscal policy. Specifically, there emerges a critical limit up to which 'pump-priming' can be undertaken without rendering the growth process unstable.

From the empirical exercise conducted here, the upper limit for counter cyclical deployment of government consumption can be worked out as close to 15-17 per cent of GDP. Given that the current ratio of government consumption to GDP is at 14 per cent, there appears to be very little leeway for any further pump-priming through government consumption. Beyond the limit, pump-priming would impart instability to the growth process.

3.28 The accelerator theory of investment focuses directly on the motivation for and purpose of investment expenditures to maintain and/or increase productive capacity so as to meet the future demand for the commodities produced by the firms. Specifically, the acceleration principle

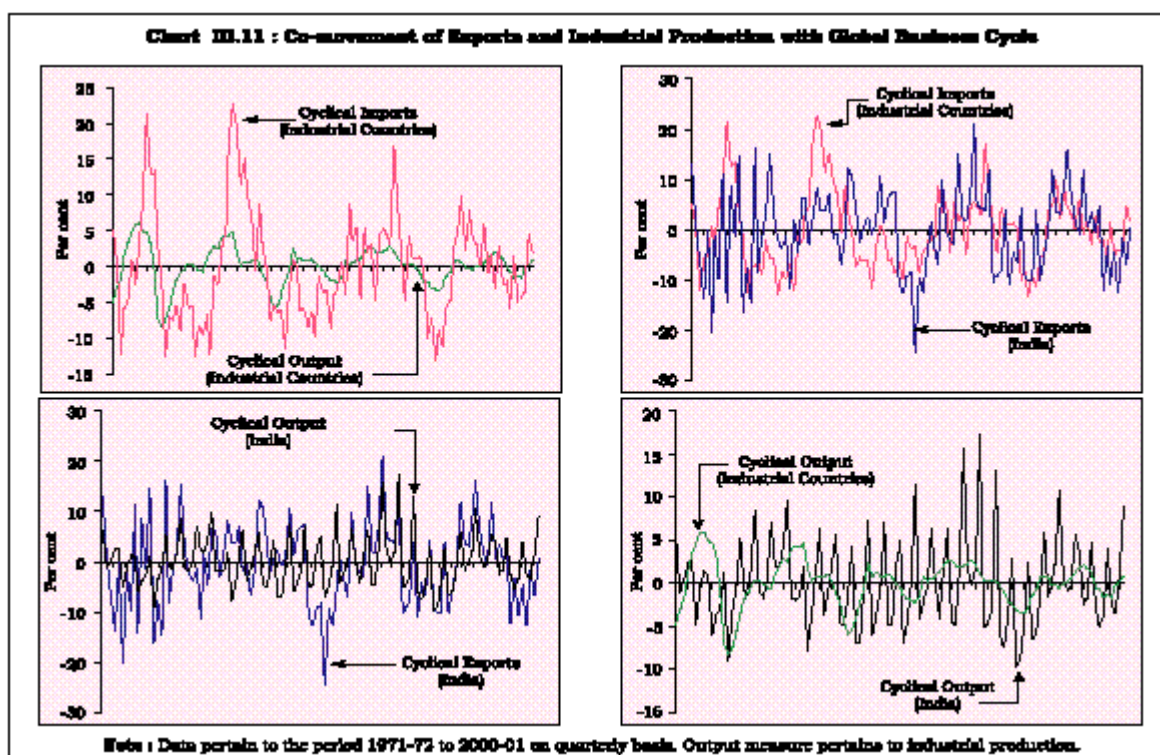
relates the desired investment demand to the changes in output in the previous period. The interaction of the multiplier along with the accelerator generates a dynamic income path in response to a shock to an autonomous component of demand. The accelerators, as derived from the earlier specifications of both aggregate investment as well as sectoral investments in the private sector are presented in [Table 3.7](#). Two features follow from the estimates. First, the estimated values of marginal propensity to consume and accelerator generated stability of the income path. Thus, the multiplier and accelerator interaction in the Indian economy would generate stable and converging cycles, thereby making room for counter cyclical policies. Secondly, sectoral accelerators show that greater investment needs to be directed towards manufacturing so as to revitalise growth. Illustratively, assuming a target growth path of 8 per cent, the multiplier-accelerator interactions suggest that a unit increase in government spending yields highest dynamic income multiplier effect for manufacturing at 4.73, followed by services at 4.12 and agriculture at 3.89.

Table 3.7 : Estimated Accelerators

Type of Investment 1	Accelerator 2
Private Investment in Agriculture	0.04
Private Investment in Manufacturing	0.61
Private Investment in Services	0.21

Net External Demand

3.29 External demand has played a relatively small role in influencing the course of the business cycles in India, given the low degree of openness. The empirical evidence, however, suggests that trade flows provide conduits for global integration which are stronger and larger than what any conventional measure of net exports would suggest. This is increasingly evident in India with the pattern of exports and industrial production exhibiting certain degree of co-movement with the global business cycle (Chart III.11).



3.30 'Granger' causality provides a simple test of the direction and intensity of causal relationships. Empirical analysis indicates that cyclical output in industrial countries 'Granger' causes imports of these countries unidirectionally, implying that cycles in the advanced economies have significant effects on their import demand. The causality between cyclical imports of advanced countries and India's exports is significant and strongly bi-directional. Cyclical output of advanced countries has unidirectional causal effects on cyclical output in India (Table 3.8).

3.31 In the 1990s, however, traditional measures of net external demand have lost operational relevance especially in view of the dominance of financing flows in the balance of payments. Moreover, the net capital flows are no longer viewed in a passive financing role. Considerations of reserve adequacy have ensured that the movements of capital are no longer dictated by current account outcomes (IMF, 1997). Growth in the volume of cross-border capital flows, however, clearly dominated every other form of cross-border transaction during the 1990s. Capital flows have emerged as the predominant engine of globalisation and growth convergence across nations. It is in this context that Chapter VI of the Report devotes itself to an examination of the obverse of net exports, *i.e.*, capital flows.

Table 3.8 : Global Business Cycle, Domestic Exports and Output: Granger's Causal Analysis

Null Hypothesis of Non Causality	'F' statistics	Inference
1	2	3
Cyclical Output does not Granger cause Cyclical Import in Advanced Economies	18.95*	Reject the Null
Cyclical Import does not Granger cause Cyclical Output in India	2.27	Accept the Null

Cyclical Output in Advanced Economies		
Cyclical Import of Advanced economies does not Granger cause Cyclical Exports of India	23.47*	Reject the Null
Cyclical Exports of India does not Granger Cause Cyclical Imports of Advanced Economies	12.44*	Reject the Null
Cyclical Exports does not Granger Cause Cyclical Output in India	2.65**	Reject the Null
Cyclical Output does not Granger Cause Cyclical Exports in India	4.65*	Reject the Null
Cyclical Output of Advanced Economies does not Granger Cause Cyclical Output of India	2.88*	Reject the Null
Cyclical Output of India does not Granger cause Cyclical Output of Advanced Economies	1.26	Accept the Null

* and ** Significant at 5 % and 10% level, respectively.

Empirical analysis is based on quarterly data for the period 1971-72 to 2000-01.

II. STRUCTURAL CONSTRAINTS IN INDIAN AGRICULTURE

3.32 There has been a growing concern in recent years about the constraints on growth on account of the high variability of agricultural output on one hand, and the deceleration of the agricultural output in the 1990s in relation to the high growth phase of the 1980s, on the other. There has been a near stagnation in yield levels and limits seem to have been reached in further expanding the area under cultivation. Equally important is a growing anxiety that the process of reforms has by-passed the agricultural sector (Reddy, 2001). Accordingly, extending reforms to the farm sector and achieving robust growth in the agriculture holds the key to reversing the industrial slowdown⁴. The search for realisation of the full growth potential of the agricultural sector has motivated extensive research in India. The critical constraining factors cited in these studies are declining public sector capital formation in agriculture (Gulati and Bathla, 2001); the low agricultural supply response to price incentives in the form of higher procurement prices (Balakrishnan, 2000); excessive dependence on input subsidies-particularly fertiliser, power, water and credit (GoI, 2000a); weak rural credit institutions and declining effectiveness of formal credit arrangements for agriculture (Vyas, 2001); the implicit indirect tax on agriculture as measured by the aggregate measure of support to agriculture (Hanumantha Rao, 2001); and overpopulation in agriculture and the resultant increase in the number of small sized farms which are economically unviable. Besides these studies, various impediments to agricultural progress have been identified by official assessments (GoI, 2000a, RBI, 2001): continued rain dependency of agriculture; poor adoption of new technology and its unsuitability to the varied soil and moisture conditions; inappropriate rural infrastructure; and weak marketing structure; and archaic land holding and tenancy laws. Accordingly, a growing consensus is emerging in India for prioritising policies for the modernisation of Indian agriculture (Rao and Jeromi, 2000).

3.33 International experience suggests that high agricultural growth and productivity generally precedes or accompanies industrial growth in most successful cases of economic development. Agriculture's contribution to the overall growth process of an economy has traditionally been in the form of: (a) supplying the surplus labour to the non-farm sector, (b) making available wage-goods at reasonable prices to sustain the labour force in the non-farm sector, (c) generating savings for investment in the non-farm sector, (d) earning foreign exchange through exports to finance critical imports, and (e) creating demand for the output produced in the non-farm sector.

The changing mix and the continuous interaction between the farm and the non-farm sector assumes critical importance in the growth process as it offers opportunities for internalising the synergetic growth impulses even in a period of decline in the share of agriculture in real GDP.

3.34 In India, agriculture occupies a special position in the development process. It continues to provide a ratchet to the overall GDP growth, in view of the continued dependence of up to two-thirds of the population on agriculture. In this section, an attempt is made to identify the constraints to higher agricultural growth. Drawing from an overview of the changing pattern of growth and productivity of Indian agriculture over the past three decades, an analysis of the major determinants of agricultural growth in India is undertaken to identify bottlenecks choking the growth prospects of Indian agriculture and to suggest proximate solutions.

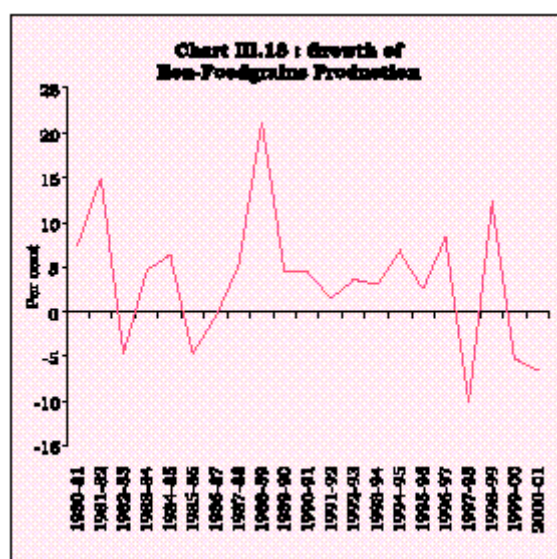
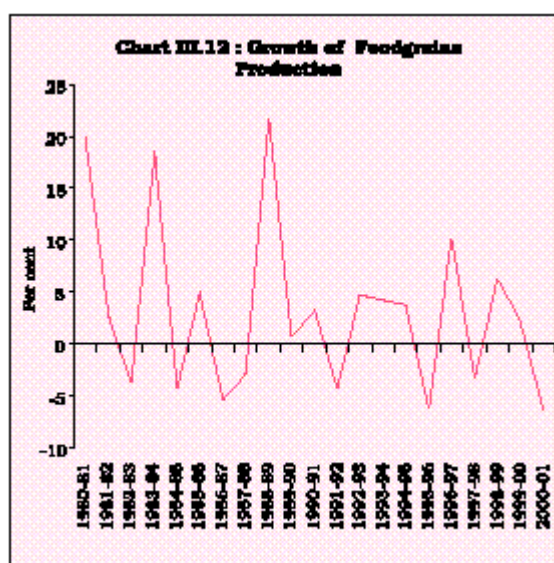
Changing Patterns of Growth and Productivity

3.35 Agricultural output growth registered a sharp increase in the immediate post-green revolution phase largely due to a growth in yields; however, the growth pattern has not been uniform with a tendency towards deceleration in the 1990s ([Table 3.9](#) and Charts III.12 and III.13).

Table 3.9: Trend Growth Rates in the Indices of Area, Production and Yields of Foodgrains, Non-Foodgrains and All Crops during 1970-71 to 2000-01

Period	(per cent)								
	Foodgrains			Non-Foodgrains			All Crops		
1	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
	2	3	4	5	6	7	8	9	10
1970-71 to 2000-01	-0.03	2.52	2.13	1.46	3.31	1.66	0.35	2.83	1.93
1970-71 to 1979-80	0.44	1.91	1.06	1.10	2.15	1.00	0.59	1.99	1.03
1980-81 to 1989-90	-0.22	2.81	2.71	1.11	3.70	2.28	0.09	3.13	2.52
1990-91 to 1999-2000	0.07	1.98	1.30	1.29	2.77	1.08	0.41	2.30	1.19

Note : Trend Growth Rates are based on semi-logarithmic function.



3.36 The yield pattern in case of both foodgrains and non-foodgrains indicates that highest growth in yield levels occurred during the 1980s. Much of the growth in agricultural production in India is yield-driven as the growth in area is marginal; however, Indian agriculture suffers from lower yield levels *vis-à-vis* major agricultural producers in the world, despite India being one of the largest producers of most of the major crops (Table 3.10). The yield of 6,059 kg per hectare attained in China during 1998 in the production of paddy was more than double that of 2,890 kg per hectare in India. Similarly, wheat yield in China stood at 3,667 kg per hectare in 1998 in comparison with 2,578 kg per hectare in India.

Table 3.10 : India's Global Rank in Major Agricultural Crops

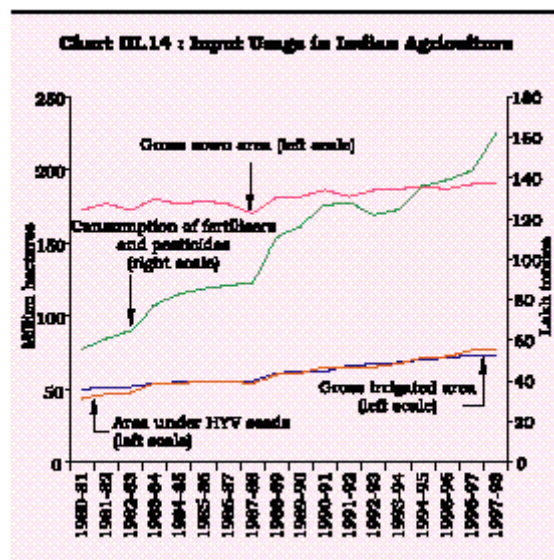
Crop	Rank in 2000		
	Area	Production	Yield
1	2	3	4

Rice (Paddy)	1	2	52
Wheat	1	2	38
Coarse Grains	3	4	125
Pulses	1	1	138
Oil Crops (Primary)	2	5	147
Cotton Seed	1	4	77
Jute and Jute Like Fibres	1	1	7
Tea	2	1	13
Coffee (Green)	7	7	14
Sugarcane	2	2	31

Source : Food and Agricultural Organisation.

The Role of Technology in Indian Agriculture

3.37 One of the main reasons for the low levels of yield attained in India is the unsatisfactory spread of new technological practices, including cultivation of High Yielding Varieties (HYV) of seeds. The adoption of new technology, mainly the cultivation of HYV seeds requires intensive use of fertilisers and pesticides under adequate and often assured water supply. The use of HYV seeds entails a higher yield risk (as measured by variance in yield) as compared with the traditional seed varieties, in the absence of proper irrigation facilities (Ganesh Kumar, 1999; Saha, 2001). The lower spread of new technological practices to a wide variety of crops other than wheat and rice as also across regions could be attributed to the higher yield risk associated with the cultivation of HYV seeds, caused by inadequate spread of irrigation facilities. There is considerable co-movement between the area under HYV seeds and area under irrigation, probably on account of reduction in yield risk due to irrigation facilities (Chart III.14).



3.38 It is mainly paddy and wheat, which are cultivated under the HYV seeds, while the areas under HYV seeds for other cereal crops are very low and vary across different States of the country. Low growth experienced during the past two decades in the production of coarse cereals (0.5 per cent) and pulses (0.8 per cent) in comparison to rice (2.8 per cent) and wheat (4.0 per cent) is on account of lower adoption of HYV seeds or non-availability of appropriate seeds

(apart from the usual dry-land farming accorded to these crops), given the diverse soil and moisture profiles of different parts of the country. The pattern of adoption of HYV seeds across various states has accordingly been disparate ([Table 3.11](#)).

3.39 One significant factor limiting the adoption of HYV seeds is the generally low level of irrigation cover for most of the crops as compared with rice and wheat. Nearly 64 per cent of the total cultivated area in the country is rain-fed. In fact, as compared with 79.1 per cent of the total geographical area as drought prone, the irrigation coverage of 38.2 per cent is quite unfavourable. The Ninth Plan document placed the irrigation potential at 139.89 million hectares. With this irrigation potential, the cropping intensity coefficient can be raised up to 149.0 as against the current level of 134.20.

Table 3.11 : State-wise Coverage of Area Under HYV Seeds for Cereals during 1996-97

State	(Lakh hectares)						
	Paddy	Wheat	Jowar	Bajra	Maize	Ragi	Total Cereals
1	2	3	4	5	6	7	8
Andhra Pradesh	36.99	0.07	5.99	0.72	3.22	—	46.99
Assam	14.22	1.03	—	—	0.12	—	15.37
Bihar	35.00	25.00	—	—	7.50	—	67.50
Gujarat	5.33	4.10	1.80	7.95	2.11	—	21.29
Haryana	5.15	19.38	—	3.58	0.12	—	28.23
Karnataka	10.16	1.34	14.01	2.70	3.53	10.45	42.19
Kerala	4.00	—	—	—	—	—	4.00
Madhya Pradesh	34.71	30.00	7.88	0.34	5.08	—	78.01
Maharashtra	12.93	7.40	47.91	18.70	2.62	—	89.56
Orissa	30.27	0.15	0.02	—	0.98	—	41.42
Punjab	20.41	32.30	—	0.03	1.47	—	54.21
Rajasthan	0.43	17.42	0.13	20.32	0.24	—	38.54
Tamil Nadu	21.20	—	5.20	1.86	0.69	1.01	29.96
Uttar Pradesh	50.18	88.83	—	4.67	6.04	—	149.72
West Bengal	44.63	3.51	—	—	—	—	48.14
All India	333.99	237.26	82.94	60.98	37.64	11.47	764.28

Source : Ministry of Agriculture, Government of India.

It has been found that the States of Rajasthan, Gujarat and Jammu and Kashmir have a higher probability (in excess of 20 per cent) of the incidence of drought in any given year. Moreover, agriculturally important States such as Andhra Pradesh, Uttar Pradesh, Haryana and Punjab have been found to have more than 10 per cent probability of the incidence of drought in any year (Sinha Ray and Shewale, 2001). Of these, only Punjab has a good irrigation cover, while Haryana has a moderately good irrigation coverage ([Table 3.12](#)). Wheat and rice among foodgrains and sugarcane among non-foodgrains enjoy the maximum irrigation coverage across all States. Even in the States with lesser irrigation coverage, such as Karnataka, Madhya Pradesh, Kerala, *etc.*, the irrigation cover for rice and wheat is much higher in comparison with other crops. Thus, in India irrigated area generally tends to be used for the growing of rice and wheat, while the other crops are grown mostly in rain-fed and unirrigated conditions.

Table 3.12 : State-wise Percentage coverage of Irrigated Area Under Principal Crops during 1997-98

State	(Per cent)							
	Rice	Wheat	Pulses	Total Food-grains	Oil Seeds	Sugarcane	Cotton	All Crops

1	2	3	4	5	6	7	8	9
Andhra Pradesh	96.4	72.7	1.2	55.1	19.7	95.2	18.9	42.5
Bihar	40.4	89.0	2.1	47.8	20.2	30.6	—	46.6
Gujarat	61.2	75.6	10.7	32.2	26.0	100.0	37.7	34.3
Haryana	99.6	98.3	22.5	77.5	70.0	97.9	98.9	78.6
Karnataka	69.2	38.2	3.9	22.5	21.3	100.0	19.3	24.9
Kerala	52.2	—	—	49.3	16.0	100.0	—	14.0
Madhya Pradesh	23.6	69.2	18.5	30.4	5.7	98.6	39.4	25.0
Maharashtra	28.1	69.6	7.3	13.3	11.1	95.0	2.8	14.5
Orissa	36.2	100.0	5.0	26.7	11.0	100.0	—	26.8
Punjab	95.0	94.8	89.8	93.8	62.2	75.1	99.6	91.7
Rajasthan	41.5	94.7	7.7	23.6	43.9	100.0	98.0	29.9
Tamil Nadu	93.2	—	6.4	62.0	40.9	100.0	34.6	53.7
Uttar Pradesh	62.7	91.7	27.7	64.7	39.5	95.0	91.7	65.9
West Bengal	25.9	73.0	4.5	27.6	63.5	30.8	—	27.1
All India	50.2	85.0	11.8	40.6	24.4	92.6	36.3	38.2

Source : Ministry of Agriculture, Government of India.

3.40 In such a scenario, the technological development in terms of the adoption of HYV seeds is mostly limited to the cultivation of rice and wheat on account of higher yield risk imparted by these seeds. It is pertinent to note in this connection that the foodgrains production in 1999-2000 was at a record high of 208.9 million tonnes despite acute drought conditions in the central stretch of India, mainly on account of record production of rice and wheat. Most of the other crops - mainly oilseeds - suffered significant fall in production in that year. This could be indicative of the disproportionate adoption of technology and irrigation benefits, underscoring the need for spreading the irrigation benefits to all crops.

3.41 Another important factor affecting the dissemination of modern technology in general and HYV seed technology in particular is the small size of average farms in India. It has been argued that the small size of land holdings limits the adoption of new technology due to reasons other than the scale of operation. Share-cropping, which is generally undertaken by the small and marginal farmers, limits the scope for adoption of new technology as the farmer has to pay a fraction of (generally around half) the production to the land-owner, while the whole cost of adoption of the green revolution inputs such as HYV seeds and fertilisers will have to be borne by the tenant. In such an arrangement, it is imperative that the gains in marginal product due to adoption of these inputs should at least be twice that of the investment for the farmer to break even. Such dramatic increases in production are difficult to come by in the absence of other infrastructural facilities and hence, the scope for adoption of green revolution inputs by the share-cropper is clearly undermined.

3.42 The per hectare consumption of fertilisers and pesticides is quite low in India in comparison with international standards and there is a lot of scope for improvement in this sphere. For instance, the per hectare consumption of fertilisers in India at 88.6 kg was much lower than 256.6 kg and 110.4 kg in China and USA, respectively, in 1997-98. The growth in the consumption of fertilisers during the past two decades has also quite varied across different States ([Table 3.13](#)). Another factor that is responsible for lower productivity of Indian agriculture is the skewed distribution of N:P:K (Nitrogen : Phosphorus : Potassium) fertiliser mix. Currently, the N:P:K ratio stands at 6.9:2.9:1.0, which is quite skewed in comparison to the optimal mix of

4:2:1. The skewed consumption of fertiliser accentuates the risk of salination and leaching of soil, thus hampering the long-term productivity of the land. This skewed fertiliser consumption pattern is the result of high subsidies extended to the urea producers.

Table 3.13 : State-wise Trend Growth Rates of Area Under HYV Seeds and per Hectare Fertiliser Consumption

State	Area under HYV seeds	(per cent)
		Per Hectare Fertiliser Consumption
1	2	3
Andhra Pradesh	1.15	6.21
Assam	2.74	10.63
Bihar	2.09	8.03
Gujarat	0.68	5.18
Haryana	1.09	6.80
Himachal Pradesh	2.12	3.97
Jammu & Kashmir	2.16	5.02
Karnataka	5.68	5.27
Kerala	-4.83	3.51
Maharashtra	3.63	7.10
Madhya Pradesh	5.99	8.36
Orissa	6.14	7.40
Punjab	1.77	1.81
Rajasthan	2.72	9.26
Tamil Nadu	1.62	3.54
Uttar Pradesh	3.40	4.53
West Bengal	5.50	6.62
All-India	3.10	5.29

Notes : 1) The growth rates for area under HYV seeds pertain to 1980-81 to 1996-97, and those for per hectare consumption of fertilisers relate to 1980-81 to 1999-2000.

2) Trend Rates are based on semi-logarithmic function.

Capital Formation

3.43 Notwithstanding the view that the extent of capital formation in agriculture, particularly in the public sector is underestimated (ICRA, 2001), the declining capital formation in agriculture has emerged as an issue of paramount concern ([Table 3.14](#)). This has been compounded by the decline in the share of public sector investment in agriculture to total public sector investment (Chart III.15). The lack of new capital assets has slowed down the pace and pattern of technological change in agriculture, thus having adverse effect on Total Factor Productivity (TFP). Fixed capital formation in agriculture seems to respond positively to public sector capital formation in canal irrigation. Indian farmers devote a small proportion of both own and borrowed funds for fixed capital formation, as private sector capital formation in agriculture responds positively to technical progress and availability of institutional credit and negatively to rainfall (Dhawan and Yadav, 1995).

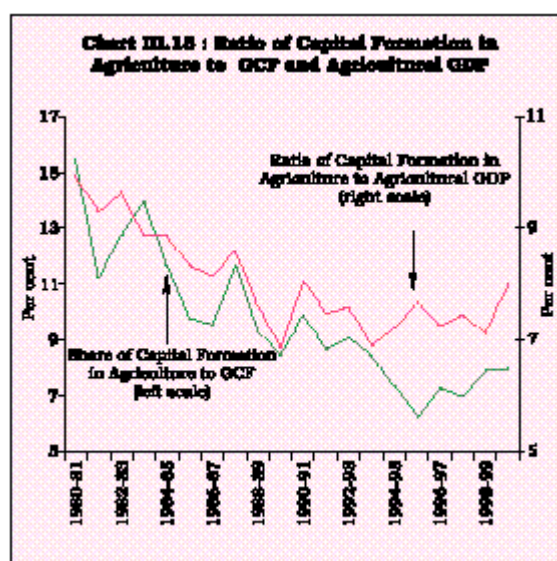


Table 3.14 : Gross Capital Formation in Agriculture (1993-94 Prices)

Year	Ratio of Capital Formation in agriculture to	
	GCF	Agricultural GDP
1	2	3
1970-71	14.27	7.08
1980-81	15.44	9.92
1981-82	11.19	9.29
1985-86	9.76	8.33
1990-91	9.88	8.03
1991-92	8.66	7.46
1992-93	9.06	7.57
1993-94	8.42	6.87
1994-95	7.30	7.20
1995-96	6.22	7.68
1996-97	7.26	7.22
1997-98	7.00	7.42
1998-99	7.88	7.13
1999-00	7.96	8.02

Source : Ministry of Agriculture, Government of India.

3.44 Unlike the 1970s and the 1980s when the foodgrain-led growth pattern was dependent to a large extent on the public sector capital formation, agricultural growth seems to have been driven more by market considerations and demand in the 1990s (Gulati and Bathla, 2001). The relative decline in the importance of public sector capital formation in the 1990s, however, does not undermine the role of such investments, given their complementarity with private sector capital formation in agriculture, even though by allowing greater role for market forces - as could be evidenced through the evolution of terms-of-trade with declining intervention in the price formation process - the degree of dependence of agricultural growth on public sector investment could be contained without affecting the prospects of growth in agriculture.

Storage, Processing and Marketing

3.45 The lack of proper storage and marketing facilities at the village level results in distress sales, particularly by the small and marginal farmers which adversely affect their incomes. This has a direct bearing on their ability to invest in agriculture. Indian agricultural marketing scenario is characterised by the existence of segmented markets on the one hand and inter-linked markets on the other (Reddy, 2001). There is a geographical market segmentation characterised by lack of market access to farmers, while there are inter-linkages in factor and product markets, which lead to lower and exploitative prices. It has been argued that the interlinked markets result in a suboptimal situation by denying the producer an economic and market determined price for his product (Gangopadhyay, 1994). The inter-linkage between factor and product markets contributes significantly towards limiting the adoption of new technological inputs by way of reducing the farmer's income. Similarly, the inter-linkages in the factor markets (for instance, between credit and labour markets) limits the technology adoption by the small farmers, by way of putting extra-economic demand on farmer's labour at the crucial time, say sowing: thus it contributes to lower production and hence lower income of the small farmers⁵.

3.46 Other important factors adversely affecting the efficiency of agricultural markets are the lack of proper futures markets, the absence of price discovery and the failure of the market in providing proper price signals. In the absence of proper price signals, the farmers' decision to cultivate any crop may depend on less efficient criteria such as administered prices, rather than demand and supply, leading obviously to inefficient resource allocation. Further, the existence of a large section of unregulated middlemen and traders reduces the market efficiency to a significant level. Bringing these middlemen into the framework of institutional market mechanism with proper regulatory ambit will result in transforming the middlemen into market facilitators, while direct marketing (by producers) provides an opportunity to minimise the role of middlemen (Reddy, 2001).

Agricultural Credit

3.47 Institutional credit to small and marginal farmers plays an important role in replacing informal credit market mechanisms and the inter-linkages arising between informal credit and other factor/product markets. The deceleration in the growth of loans outstanding for the small land holdings during the 1990s as compared with the 1980s is indicative of a combination of better repayment of loans in the 1990s (since most of these loans are of small values and in the nature of crop loans, *etc.*) as well as low disbursement rate. For small and marginal farmers, the deceleration in the credit disbursal has been the maximum in the 1990s. Small and marginal farmers, thus, continue to be both credit and demand constrained.

3.48 The lack of capital has been a primary factor impeding the adoption of new technological inputs, which are capital intensive. The size and flow of financial resources to agriculture, both in terms of investment and working capital have shrunk significantly. Despite the stipulation of sub-targets for agriculture at 18 per cent under priority sector, credit has not flowed to the desired extent. There exist many escape routes with regard to priority sector lending targets, such as the option to invest in RIDF and place deposits with SIDBI. Direct finance to small and marginal farmers (with land holdings up to two hectares) has been slowing down in recent years

(Table 3.15). The average growth in loans outstanding to marginal farmers has decelerated sharply during the 1990s as compared with the growth recorded in the 1980s (Charts III.16 and III.17).

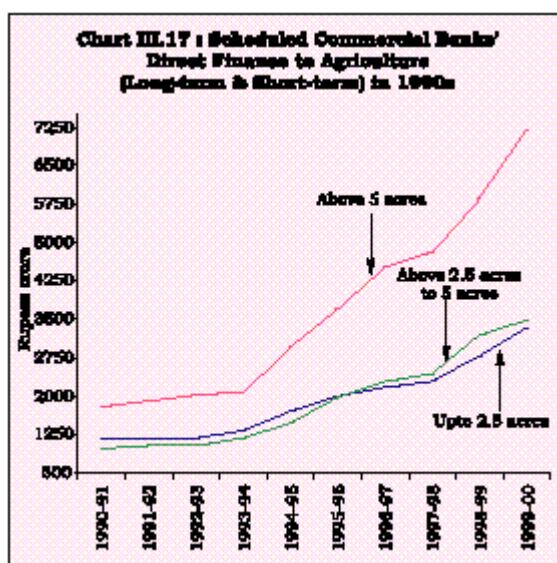
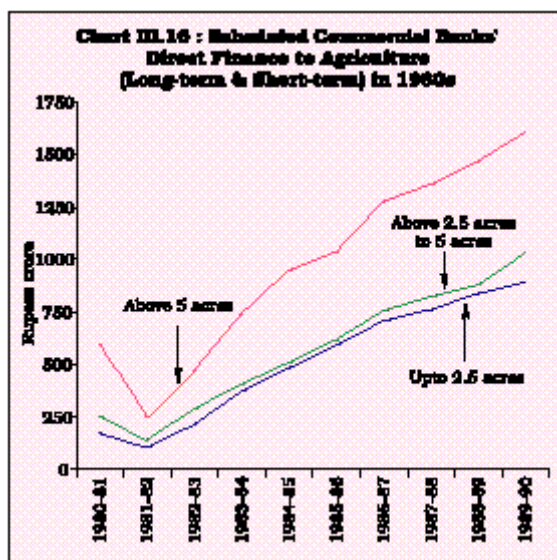


Table 3.15 : Trend Growth Rates of Scheduled Commercial Banks' Direct Finance to Farmers(Short-term and long-term loans)

Year (July-June)	(Per cent)								
	Up to 2.5 acres		Above 2.5 acres to 5 acres		Above 5 acres		Total		
	Accounts	Amount	Accounts	Amount	Accounts	Amount	Accounts	Amount	
1	2	3	4	5	6	7	8	9	
Loans Outstanding									
1980s	8.61	19.33	11.80	21.48	7.41	16.96	9.17	18.39	

1990s	-3.69	7.65	-1.58	8.95	-0.92	8.05	-2.27	8.17
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Loans Disbursed

1980s	7.51	18.38	11.45	21.55	7.21	17.51	8.51	18.61
1990s	2.16	11.84	5.72	15.88	8.55	16.31	4.95	15.01

Note: Trend Growth Rates are based on semi-logarithmic functions.

Public Distribution System (PDS)

3.49 The PDS has attracted considerable debate in recent years on the ground that the benefits of PDS are not reaching the poor on account of, *inter alia*, poor targeting and leakages in the system, despite its restructuring in 1997 (Mooij, 1999, GoI 2000b, 2000c and 2000e). It has also been argued that despite the huge food subsidy and the large-scale of intervention, the food security of many households is still marginal or insufficient. In recent years there has been a substantial rise in procurement of foodgrains by the public sector agencies on account of consistent increases in Minimum Support Prices (MSP), despite the recommendations of the Commission for Agricultural Cost and Prices to freeze the same (GoI, 2000d). It is argued that consistent increases in the MSP have distorted relative prices between alternate agricultural activities, land use patterns as well as the consumption of inputs (ICRA, 2001). The stock of 59.14 million tonnes at the end of November 2001 is around two and a half times the norm of 24.30 million tonnes for end-September 2001 ([Table 3.16](#)).

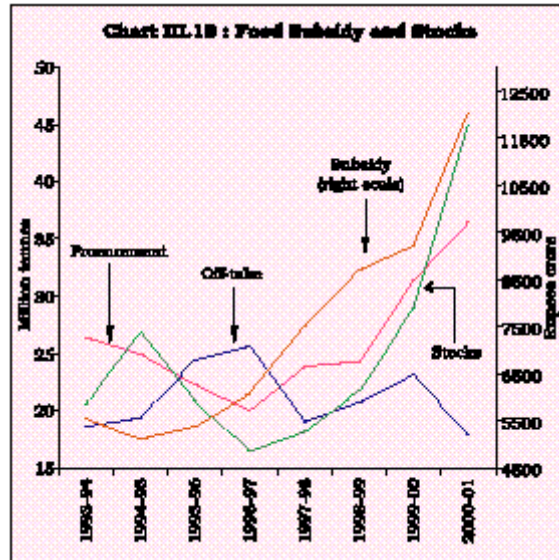
3.50 Considerable concern regarding the mounting stocks has been expressed of late, as substantial amount of food credit and food subsidy have been required to finance these operations.

Table 3.16 : Procurement, Off-take, Stocks and Food Subsidy

Year	Procurement (Million Tonnes)	Off-Take (Million Tonnes)	Stocks (Million Tonnes)	Food Subsidy (Rupees crore)
1	2	3	4	5
1993-94	26.40	18.61	20.54	5537
1994-95	24.99	19.44	26.80	5100
1995-96	22.24	24.35	20.82	5377
1996-97	20.03	25.63	16.41	6066
1997-98	23.82	18.96	18.12	7500
1998-99	24.22	20.73	21.82	8700
1999-00	31.43	23.05	28.91	9200
2000-01	36.47	17.95	44.98	12042
2001-02	34.83	16.15	59.14	N.A.
(up to end-November, 2001)				
N.A. : Not available				

Food subsidy, which amounted to Rs.6,066 crore in 1996-97, has increased to Rs.12,042 crore in 2000-01. During 1997-98 to 2000-01, the outstanding food credit witnessed a rise from Rs.7,597 crore to Rs.39,991 crore, indicating a phenomenal average annual growth of 51.9 per cent (Chart

III.18). The share of consumer subsidy in food subsidy has been declining over these years, indicating that much of the increase in food subsidy goes towards carrying costs. Carrying cost of foodgrains increased to Rs.220.35 per quintal in 2000-01 from Rs.158.26 per quintal in 1996-97. Consumer subsidy on rice for below poverty line



(BPL) consumers declined to Rs.565.00 per quintal in July 2000 from Rs.589.33 per quintal in 1997-98. Similarly, the consumer subsidy on wheat for BPL consumers decreased to Rs.415.00 per quintal in July 2000 from Rs.536.35 per quintal in 1997-98. Given the present scenario, the effectiveness of food subsidy in supporting the public distribution programme has been questioned (GoI, 2000e).

3.51 A gradual reduction of the food stock to scale down outstanding food credit and food subsidy needs to be considered. Measures to increase the off-take of foodgrains such as Food for Work Programme and increased open market sales including exports, may help to achieve the objective of gradual scaling down of stocks. There is also a need to streamline the procedure for evaluating the quality of stocks, as this will have an impact on the outstanding advances of commercial banks to the Food Corporation of India.

3.52 Free and fair international trade in agricultural commodities can act as an engine of growth for the economy as a whole. It is interesting to note that agriculture was placed for the first time on the negotiating agenda of the Uruguay Round (1986-1993) ([Box III.1](#)).

Determinants of Agricultural Growth

3.53 In view of the many shades in the growing consensus seeking the reform of agriculture, it is useful to undertake an empirical verification of the determinants of agricultural output in the context of the country specific conditions. The determinants considered for this exercise are area under cultivation (chosen over gross sown area so as to take cognisance of the relative importance of various crops through explicit weights in the index), labour and "technology indicators" such as irrigation intensity (ratio of gross irrigated to net irrigated area), cropping

intensity and ratio of area under HYV seeds to gross sown area, rainfall, and time trend.

Box III.1 WTO and Indian Agriculture

The Agreement on Agriculture (AoA), which aimed at the liberalisation of the world trade in agricultural commodities was negotiated and signed by India, along with other countries in April 1994 at Marrakesh, Morocco as a part of the Final Act of the Uruguay Round and was made effective from January 1, 1995. The AoA aims at removing the distortions in world trade in agriculture arising from excessive protection and subsidisation of agriculture. AoA contains provisions with respect to three areas: market access, export subsidies and domestic support. Existing non-tariff barriers in agriculture, which are considered trade-distorting, are to be abolished and converted into tariffs so as to provide the same level of protection and subsequently the tariffs are to be progressively reduced by a simple average of 36 per cent by the developed countries over 6 years (year ending 2000) and by 24 per cent by the developing countries over 10 years (year ending 2004) (Table 3.17). The minimum market access opportunities are to be provided at 3 per cent of the domestic consumption in 1986-88 (to be established by the year 1995) and rising up to 5 per cent by the end of the implementation period.

Table 3.17 : Reduction Commitments Under AoA

1	Developed Countries (1995-2000) 2	Developing Countries (1995-2004) 3
Tariffs (Base 1986-88) Average cut for all Agricultural products	36%	24%
Domestic support, Total AMS (Base 1986-1988):	20%	13%
Export Subsidies (Base 1986-1990)	36%	24%
Budgetary outlays for export subsidies		
Volume of subsidised exports	21%	14%

The domestic support to farmers is divided into three categories, *viz.*, Amber Box, Blue Box and Green Box. All domestic support measures considered to distort production and trade (with some exceptions) fall into the category of Amber Box. Subsidies which do not, or at the most cause minimal distortion come under the purview of Green Box. The support under Amber Box directly affects the quantity produced by the producer and the price of the product, whereas the support under the other two heads are neutral in this respect. Subsidies like input subsidies for fertilisers, electricity, support in the form of lower interest rates and market price support fall under the Amber Box category. The Green Box support includes assistance given through environment assistance programmes, services such as research, training and extension, marketing information, certain type of rural infrastructure, *etc.* Subsidies under Blue Box include direct payment given to farmers in the form of deficiency payment (*i.e.*, the difference in the Government's minimum support price and market price is paid directly to farmers, as practiced in the USA), direct payment to farmers under production limiting programmes, *etc.*

The support under Green Box is excluded from any reduction commitments and is not subjected to any upper limit. Support under Blue Box is also exempted from any reduction commitments but it has an upper limit. The support under Amber Box is related to the trade distorting support, unlike that under the other two heads. AoA aims at removing this trade-distorting support. The trade distorting support, called as Total Aggregate Measure of Support (AMS) is expressed as a percentage of the total value of the agricultural output. The Agreement stipulates the reduction of total AMS by 20 per cent for the developed countries over a period of six years, while the developing countries are needed to reduce the total AMS by 13 per cent over a period of ten years. Reduction commitments refer to total levels of domestic support and not to individual commodities. Policies which amount to domestic support, both under product specific and non-product specific categories at less than 5 per cent of the value of production for developed countries and less than 10 per cent for developing countries are also excluded from any reduction commitments. Policies which have no, or at the most minimal trade distorting effects on production, are excluded from any reduction commitments.

The developed countries are required to reduce the volume of subsidised exports by 21 per cent over six years and the budgetary outlays for export subsidies by 36 per cent with respect to the base period of 1986-90. Developing countries are required to reduce the volume by 14 per cent and budgetary outlays by 24 per cent over 10 years.

Implications of AoA for India

In India, quantitative restrictions on agricultural imports imposed for balance of payments (BoP) considerations have been removed and these imports are placed in the open general license (OGL) list. In order to provide adequate protection to domestic producers in case of a surge in imports, India can raise the tariffs within the bound ceilings. In case of a few products such as primary products, processed products and edible oils, India had earlier raised the tariffs (during 1999 and 2000) adequately to protect the domestic producers. In case of some other products, India has successfully revised the binding levels through negotiations. However, India can take suitable measures under WTO's Agreement on Safeguards if there is a serious injury to domestic producers due to surge in imports or if there is any such other threat. The Government has already taken a number of measures to safeguard the agriculture sector in the context of the phase-out of quantitative restriction, *i.e.*, import duties on many agro and other items have been substantially increased and import of about 131 products have been subjected to compliance of mandatory Indian quality standards as applicable to domestic goods.

India's domestic support to agriculture is well below the limit of 10 per cent of the value of agricultural produce and therefore India is not required to make any reduction in it at present. The subsidies given for PDS are basically the consumer subsidies and are exempt from WTO discipline. India's system of Minimum Support Prices (MSP) as also the provision of input subsidies to agriculture are not constrained by the Agreement. Moreover, the agricultural developmental schemes can also be continued under AoA.

Reference

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3.54 Elasticities of agricultural output with respect to its various determinants are set out in [Table 3.18](#). Elasticities have been highest, predictably, with respect to area and labour, followed by rain. The elasticity of agricultural production with respect to rain at 0.27 is found to be significant. However, the elasticities with respect to technology variables such as consumption of fertiliser and pesticides, cropping intensity, irrigation intensity and the share of area under HYV seeds to gross cropped area turn out to be very low, often statistically insignificant and hence are not reported. Inclusion of time trend taken as representative of technical progress in the estimation framework reduces the labour co-efficient apart from making it insignificant.

Table 3.18 : Estimated Elasticities of Agricultural Output

1	Variable	Elasticity
2		3
Without Time Trend		
	Area	0.8243
	Labour	0.8618
	Rain	0.2667
With Time Trend		
	Area	0.9096
	Labour	0.1844*
	Rain	0.2376

* : Not significant.

3.55 Indian agriculture calls for reforms encompassing technology upgradation, creation of infrastructure, creation of a better marketing system, revival of the rural credit delivery system, and public sector capital formation in infrastructural facilities, particularly irrigation. In the context of extending reforms to agriculture, multilateral organisation have offered several suggestions drawn from cross-country experience ([Box III.2](#)).

Box III.2 International Institutions on Reforming Agriculture

Deceleration in agricultural growth has been a common feature of the growth pattern in the Asia Pacific region in the recent years. Global agricultural growth is also projected to decelerate to 1 per cent in 2000 after exhibiting modest recovery in 1999 (at 2.3 per cent) over 1998 (1.4 per cent). The generally sluggish growth conditions reflect a number of underlying weaknesses which, along with uncertain weather conditions, have stifled the prospects of agricultural growth. The underlying weaknesses continue to persist even after the observed shift in national policies away from public production and state administration in favour of the market.

According to the World Bank, a key aspect in the increasing market orientation of agricultural policies relates to the sequencing of agricultural reforms. Ideally, reforms that increase farmers cost of production by eliminating input subsidies should not precede those that can stimulate growth by raising output prices - such as elimination of regressive price controls and export taxes. Furthermore, supply response in agriculture to reforms may not be symmetrical. An assessment based on 50 agricultural adjustment loans of the World Bank reveals that in countries where agriculture was penalised/taxed, reforms helped in raising farm output. In turn, other countries where agriculture was heavily protected, liberalisation adversely affected agricultural output growth by hastening reallocation of resources away from agriculture. Supply response in agriculture to the overall structural reform measures, however, depends upon the level of agricultural development of a country. An enabling government policy may not prove very effective in the absence of adequate agricultural infrastructure - including roads, irrigation, power, and telecommunications - appropriate technology, credit, farmer education and an assured supply of inputs at right price. Prices for inputs that do not reflect any explicit/implicit subsidy, but which are determined in a competitive market condition and also remove barriers to convergence with international prices could represent good practice in agricultural pricing policy, if not the right price. In revamping the public expenditure programmes for agriculture as part of the overall reform process, however, countries must take adequate precaution to avoid major decline in agricultural growth. Recognising the underlying weaknesses of the agricultural sector in several countries, agricultural adjustment loans generally rely on a two prong approach. The first major aspect of the approach emphasises price reforms and market liberalisation so as to ensure that domestic prices are in line with world market prices, marketing and processing systems are efficient, with better access to efficient technology and public services. The second key aspect emphasises private production in a competitive environment.

The Asian Development Bank points out that in a market-based system for agriculture, the possibility for reaping the potential higher yield would depend on the actual return on agricultural investment and the overall condition for agricultural production (Mingsarn, Santikarn and Benjavan Rerkasem, 2000). In the past years, decline in net returns on food crops has forced farmers to explore alternative farming opportunities with higher returns - including oil crops, fruits and vegetables. The market mechanism, thus, seems to have altered the cropping pattern in favour of more profitable non-food crops. Environmental degradation - the result of faulty application of technology and agricultural policy- has, however, been a subject of concern which could threaten long-run agricultural sustainability. In Asia, water resource management has been fragmented and project based. As a result, both surface water and ground water are used excessively. Crop production in fragile land has also resulted in soil erosion, salinisation, water logging and desertification. Inappropriate technology has often been used to avoid/postpone reforms that may be economically and socially desirable but politically impracticable. While encouraging adoption of any technology for the agricultural sector, therefore, due care must be taken to improve field-level knowledge, better crop management, and proper communication between farmers and research and development (R&D)

officials.

The OECD stresses the importance of the response of the labour market in agriculture to the overall process of structural reforms, particularly to sustain the improved labour productivity in agriculture. Surplus labor in agriculture operates as a major impediment to attain the desired labour market adjustment. It also exerts pressures on the government to address their problems through various subsidies. More efficient farm structures under market conditions can therefore emerge only when preconditions to market efficiency could be ensured.

Keeping in view the alternative prescriptions, the future course of reforms in Indian agriculture may have to focus on the following critical areas.

- ? Agricultural yield can be increased through creating infrastructural facilities rather than by providing input subsidies. Fertiliser prices need to be streamlined further to reduce the skewed N:P:K ratio in fertiliser consumption.
- ? The tools of emerging bio-technology such as genetic engineering seem to offer significant possibilities for increasing yields. Bio-technological inputs such as bio-fertiliser and bio-pesticides are perceived to be scale neutral and can be adopted by even small farmers and provide scope for savings on use of chemical fertilisers and pesticides, apart from being eco-friendly.
- ? The practice of increasing the Minimum Support Price (MSP) may have to be re-examined as it has resulted in large procurement of foodgrains by the public sector agencies, leading to an increase in the procurement incidentals. It has also distorted the price formation process in the market.
- ? In view of the removal of quantitative restrictions under the WTO agreement, the agricultural prices will have to be aligned with the international prices to be competitive. Appropriate institutional reforms such as setting up of commodity exchanges are necessary to protect domestic producers from greater price volatility that generally characterises the international market for foodgrains and other crops.
- ? India is the second largest producer of fruits and vegetables in the world and is perceived to have comparative advantage, which needs to be reaped. Given India's diversified climatic and soil conditions, the growing demand for such items in the affluent parts of the world and the scope for developing the food processing industry explains the need for shifting the pattern of production in favour of fruits and vegetables.

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III. IMPEDIMENTS TO INDUSTRIAL GROWTH

3.56 The deceleration in economic activity in the second half of the 1990s is primarily attributed to industrial slowdown. Cyclical turns in activity have impacted on industrial output, accentuating the demand-supply imbalances. Structural factors have inhibited the growth of capacity creation/expansion in industry, eroded competitiveness and increased the vulnerability of the economy to adverse cyclical or exogenous shocks. Identified structural constraints are lack of adequate infrastructure development, low agricultural buoyancy, large fiscal imbalances and dearth of internal reforms.

3.57 Insufficient demand is regarded as the single most important factor inhibiting growth in manufacturing as well as other segments of the industrial sector. Apart from the global slowdown, the current deceleration in the manufacturing sector is ascribed to slowdown in investments, low business confidence and subdued capital market (NCAER, 2001;

Chandrasekhar, 2001; Shetty, 2001; ADB, 2001).

3.58 The growth of value added in the industrial sector in India slowed down in the 1990s after recording significant improvement in the 1980s, with similar trends at the sectoral level. The growth of the industrial sector is affected by intersectoral imbalances in the growth process. The significant deceleration in the growth rate of the mining and quarrying and electricity sectors during the 1990s affected the overall growth of industrial output. The mining and quarrying and the manufacturing sectors have also exhibited higher volatility in the growth rate during the 1990s. These fluctuations in the growth rates and imbalances across the sectors have implications for stabilising output growth at higher levels ([Table 3.19](#), [3.20](#) and Charts III.19, 20, 21, 22).

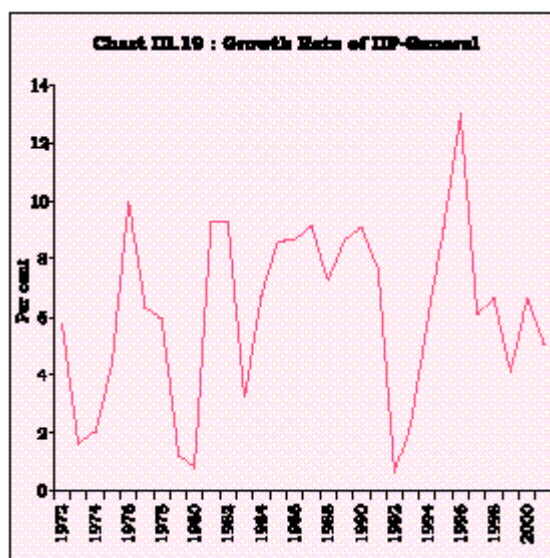
Table 3.19 : Trend Growth of Industrial Production in India

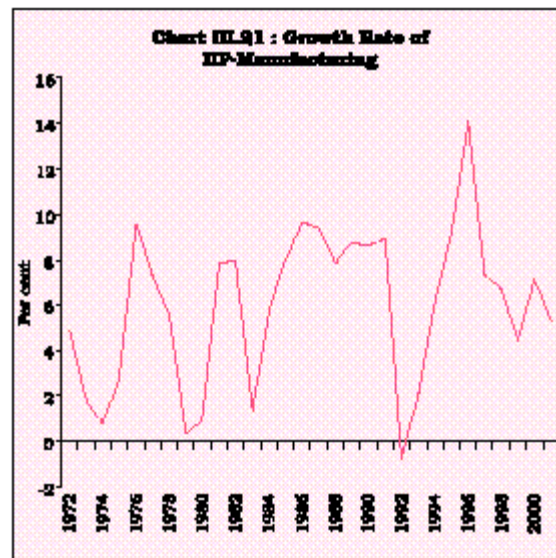
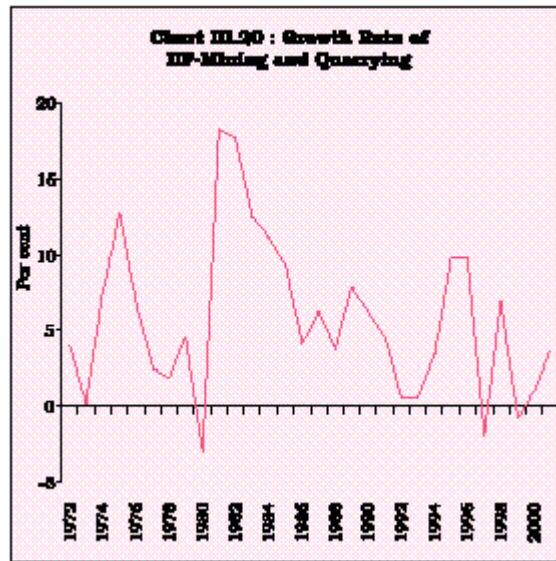
Period	(Per cent)			
	Mining and Quarrying	Manufacturing	Electricity	General
1	2	3	4	5
1970-1980	4.7	4.1	7.4	4.6
1980-1990	7.7	7.3	8.7	7.5
1990-2000	3.8	6.8	6.6	6.5

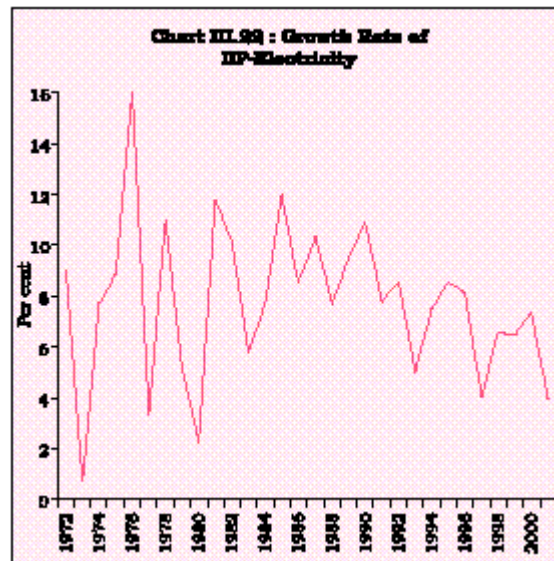
Note : The trend growth rates are derived from a semi- logarithmic function.

Table 3.20 : Coefficient of Variation of Industrial Production

Period	(Per cent)			
	Mining And Quarrying	Manufacturing	Electricity	General
1	2	3	4	5
1970-1980	110.1	85.0	67.4	72.9
1980-1990	53.0	32.3	21.2	23.7
1990-2000	125.1	62.2	21.4	55.7







3.59 In the post-liberalisation period, the cyclical fluctuations in industrial activity have been generated by the internal dynamics of the industrial sector apart from supply shocks. Evidence of cyclical behaviour of industrial production has led to the development of leading and coincident indicators of industrial activity ([Box III.3](#)).

Box III.3 Leading Indicators of Industrial Activity in India

The approach of leading indicators of economic activity has been widely used to track the phases of business cycles despite the criticism of lack of sound theoretical foundations. The leading indicator analysis of business cycles is woven around the view that economies experience cycles with "expansions occurring at about the same time in many economic activities, followed similarly by general recessions, contractions and revivals that merge into the expansion phase of the next cycle; this sequence of changes is recurrent but not periodic" (Burns and Mitchell, 1946). The framework of leading indicators provides early signals about turning points in economic activity, which is important for undertaking counter-cyclical policies.

Empirical work on the leading indicator approach originated from the National Bureau of Economic Research (NBER) in the 1930s, and subsequently numerous versions of leading indicators have been developed. The objective of constructing a composite index of leading indicators is to identify the cyclical behaviour of the reference indicator, *i.e.*, the series whose future movements are to be predicted. Reference indicators usually relate to a measure of aggregate real activity, such as aggregate output (GDP), investment and employment, *etc.* In the absence of high frequency data on aggregate measure of real activity, several studies have used industrial production as the reference series; the OECD indicator system uses the index of total industrial production as the reference series.

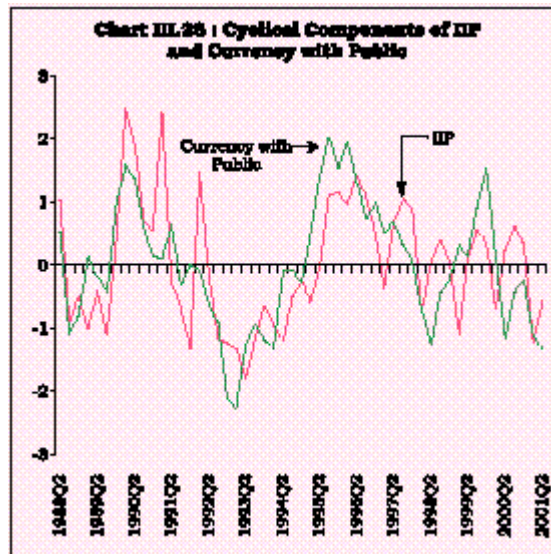
The composite index of leading indicators (CILI), being multivariate in nature, has been extensively used as it predicts cyclical turning points more effectively than any single indicator. The CILI is based on the premise that cycle of each component indicator has its unique characteristics as well as features in common with other cycles, but no single cause explains the cyclical fluctuation over a period of time in overall activity. The performance of individual indicators depends on the strength of causal relation with the reference indicator. Accordingly, the multivariate approach, as adopted for composite indicators, is necessary to combine various signals for possible causes of cyclical turning points.

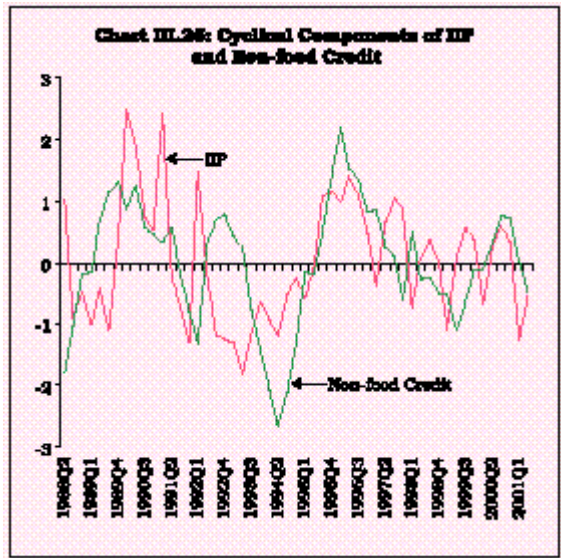
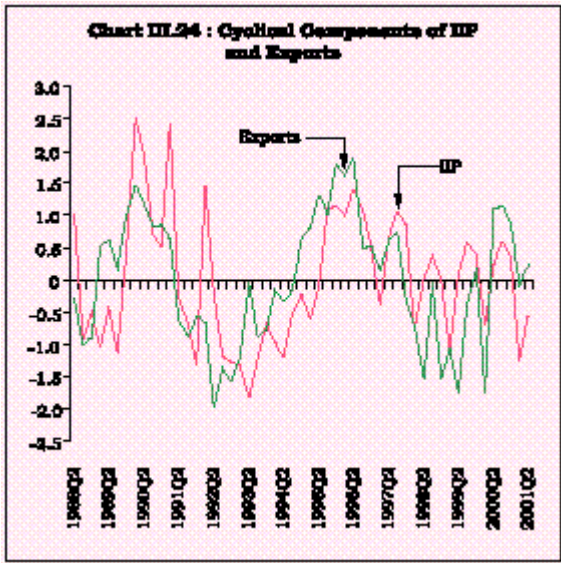
Once the cyclical behaviour of the reference series has been established, the next step is to select an economic time series whose cyclical movements typically predate those of the reference series. The leading component indicators are evaluated on the basis of their relevance, cyclical behaviour and practical considerations relating to timeliness in

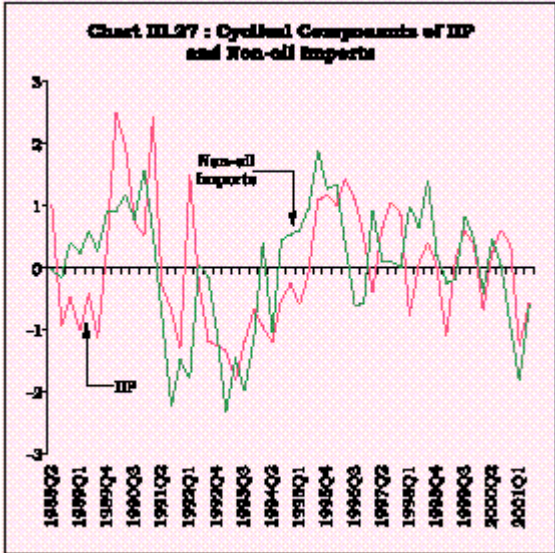
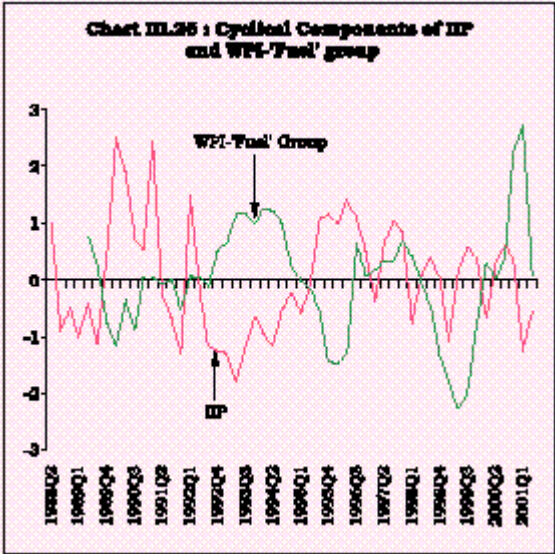
availability of high frequency information. On statistical consideration, the criterion of being leading indicators utilises the tests of peak-and-trough analysis, cross-correlation analysis, *etc.* Once a set of leading indicators has been selected, the component indicators are combined into a single composite index to reduce the risk of false signals and to provide a leading indicator with better forecasting and tracking qualities. In the empirical literature, a variety of leading indicators such as average work-week, index of overtime hours, application for unemployment compensation, new companies registered, new orders, vendor performance, construction, stock prices, money supply, change in sensitive material prices, index of consumer expectations, *etc.* have been used for constructing a multivariate index of business cycles.

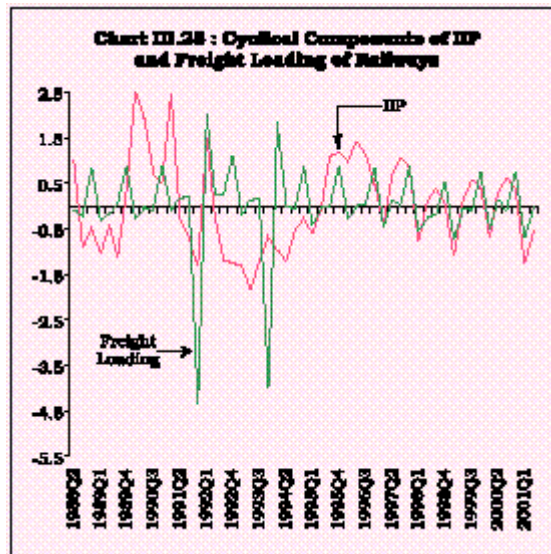
In India too, attempts have been made at building leading/coincident indicators of economic/ industrial activity in recent years using the NBER methodology for constructing diffusion and composite indices for identifying growth cycles, the ECRI approach using the Bry Boshan algorithm for coincident economic indicators and a composite leading index for the manufacturing sector as the reference indicator of economic activity.

The construction of an appropriate CILI is constrained by data limitations; many important indicators of business performance of the corporate sector are not available at monthly/quarterly frequency. Despite these data gaps, a CILI has been constructed in terms of the variables that can best explain the turning points of the business cycle. The index of industrial production (IIP) is taken as the reference indicator to represent the industrial activity in the Indian context. The component variables considered were IIP for basic goods, food stocks, deposits of scheduled commercial banks, currency demand, non-food credit, total commercial bank credit, broad money supply, short-term interest rates, stock prices, exports, non-oil imports, WPI of manufacturing, WPI of primary articles, WPI of industrial raw material, WPI of minerals, WPI of fuel, power, light and lubricants, and freight loading of railways, besides the GDP of the United States as an indicator of external economic environment. Seasonally adjusted quarterly series for the period 1988:Q2 to 2001:Q2 are passed through the Hodrick-Prescott Filter to obtain the cyclical component of each series. The lead-lag relationship between the cyclical component of the reference series *vis-à-vis* other series are identified in terms of cross-correlation matrices at various lags and Granger causality tests with varying lags. Six indicators, *viz.*, non-food credit of commercial banks, currency with the public, prices of fuel group of commodities, freight loading of the railways, exports and non-oil imports emerge as significant. Chart III.23 to Chart III.28 show the cyclical component of the IIP and each of the series. The composite index is compiled for the period using the six variables having a lead of 2-3 quarters. Since the cyclical components of the various series have varying amplitudes, each of the series is standardised taking into account its mean and standard deviation.

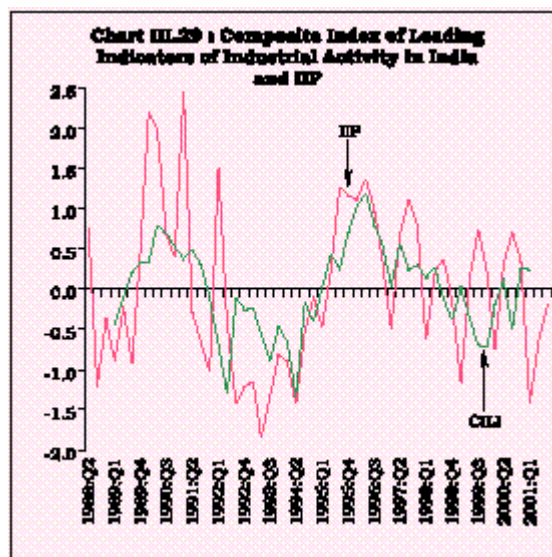








An unweighted index of these six series is compiled to forecast the turning points of industrial activity in India with implicit assumption that industrial sector is undergoing rapid changes and the production cycles may change over time. The CILI for the industrial activity leads the actual IIP by two quarters. The CILI, particularly since the early 1990s is able to capture the turning points of the IIP about two quarters in advance (Chart III.29).



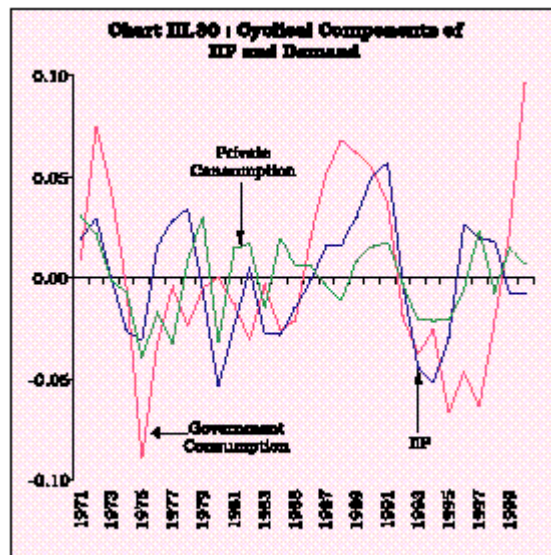
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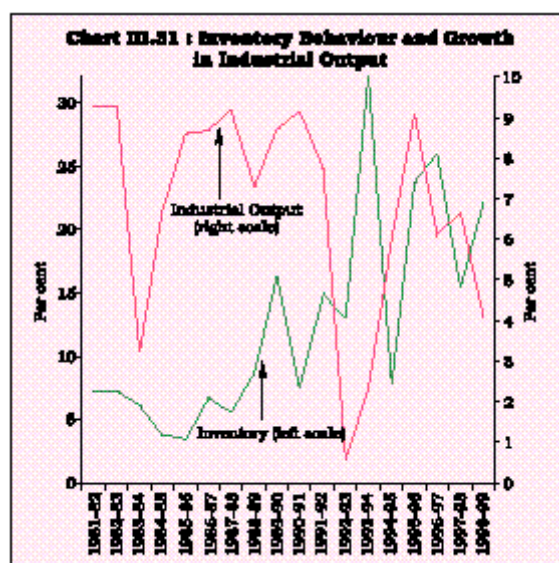
Demand Constraints in the Industrial Sector

3.60 It is essential to identify the role of the demand side factors in contributing to the declining industrial output. Of the important components of the demand for industrial goods, government consumption demand has been used in India as a counter-cyclical measure during the downturn in industrial activities, as the private consumption tends to be pro-cyclical.

3.61 A clear pattern emerges between the real private consumption expenditure and the industrial output during the 1980s and the 1990s. During the 1980s and the early 1990s, high growth in industrial output was associated with sustained growth in real private consumption demand. In contrast, during the downturn the latter half of the 1990s, real private consumption demand has decelerated. While the cyclical component of the private final consumption expenditure generally exhibits pro-cyclical movements with the industrial production, government final consumption expenditure exhibited counter-cyclical movements (Chart III.30).



3.62 An important factor explaining the fluctuations in economic activity and industrial output during the phases of business cycle is the changes in inventory holdings. The credit view on the role of inventories in explaining industrial output postulates that the impulses of a restrictive monetary policy are transmitted immediately through higher carrying cost on inventory investment, which in turn would affect the level of output through backward linkages with the industrial sector (Gertler and Gilchrist, 1994; Bernanke and Gertler, 1995). Although inventory investment may constitute a small part of the total value of output in the industrial sector, it may significantly explain the output changes. Changes in inventory holdings are found to be closely associated with cyclical turning points in economic activity in India (Darbha, 1999). On the basis of the observed trends in the inventory holdings and growth in industrial output, changes in inventory show generally pro-cyclical movement, implying that adjustment in the inventories leads the variations in industrial output (Chart III.31).



3.63 The sectoral inter-linkages between agriculture and industry provide the basis for analysing the industrial slowdown. An analysis of the inter-linkages shows that the significant improvement in industrial output in the 1980s was accompanied by an improvement in the growth rate of per capita real income in agriculture. In the 1990s, with decline in the per capita real GDP growth in agriculture to 1.3 per cent, the average industrial output growth declined to 6.0 per cent ([Table 3.21](#)).

3.64 Slow growth in agricultural output adversely impacts on the industrial production by affecting the surplus of wage goods, supply of inputs, and demand for industrial goods. On the demand side, the hypothesis of 'agricultural drag' inhibiting growth of industrial output has been a subject of considerable empirical research. It is observed that while the growth of wage goods has not been a factor constraining industrial output, the slow growth of agricultural income impacts on consumer demand for industrial goods (Ahluwalia, 1991).

Table 3.21: Per Capita Real GDP in Agriculture and Real GDP Growth in Industry

Period	(Per cent)	
	Per Capita Real GDP Growth in Agriculture	Real GDP growth in Industry
1	2	3
1970-80	-0.9	4.4
1980-90	2.5	7.4
1990-2000	1.3	6.0

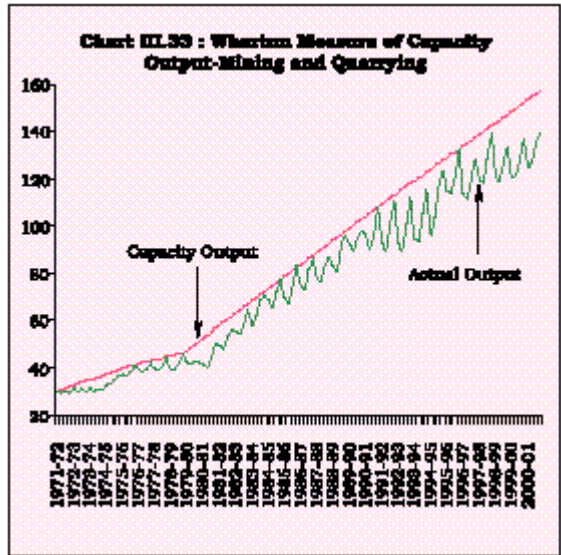
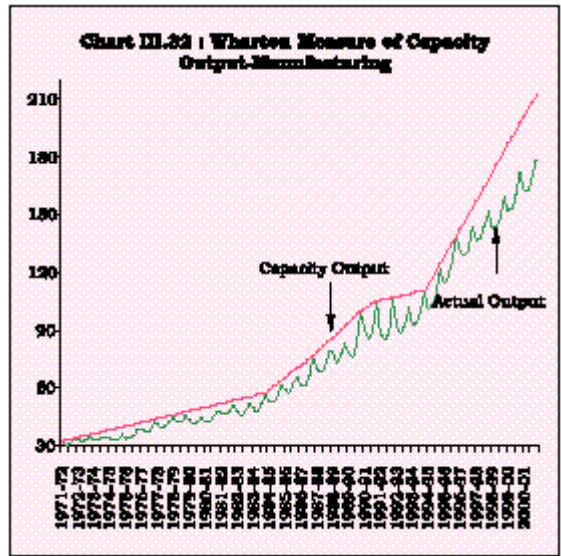
Private consumption demand is, to a large extent, determined by the levels of farm incomes. Analysis covering the post-Green Revolution period yields two agricultural factors that limited the forward thrust to industrial growth in India, *viz.*, volatility in the growth of agriculture output and low growth in the per capita agricultural income.

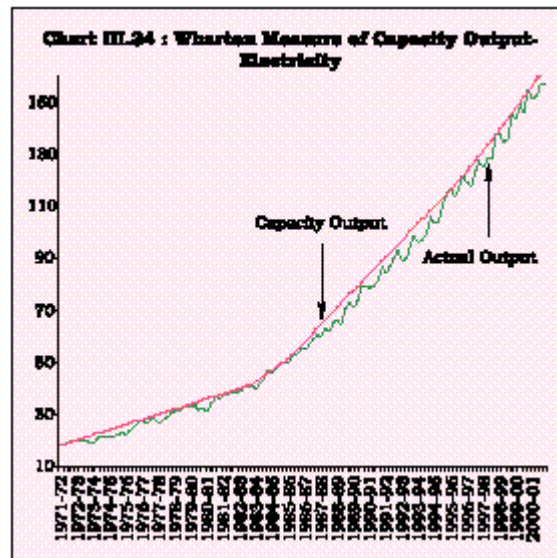
Capacity Utilisation and Output Growth

3.65 Industrial output is significantly influenced by the rate of capacity utilisation in industry. The low rate of capacity utilisation in Indian industry indicates underutilisation of factor inputs which can impose an enormous growth constraint on the economy. The declining rate of capacity utilisation also indicates the sluggish growth in demand during the downturn in economic activity, and the adjustment of supply to underlying demand conditions. The direct measurement of capacity utilisation is often constrained by the availability of information on the installed capacity in industry. The literature on capacity utilisation suggests various measures, such as, the Wharton Index of Capacity Utilisation and the Minimum Capital-Output Ratio Method (Klein and Summers, 1966). These measures and their variants have been widely used to analyse capacity utilisation in industry. In the absence of direct measures, the common traits in the behaviour of these indirect measures can provide some insights into capacity utilisation.

Wharton Index

3.66 In the Wharton Index, the capacity of a firm/industry in the short run is represented by the maximum sustainable level of production under normal working conditions when the firm is operating its existing capital stock at its customary level of intensity. However, it is argued that the peaks so identified may not truly reflect the capacity output of the industry (Paul, 1974) and that the capacity expansion takes place in a smooth and gradual manner which may not be true (Phillips, 1963). Despite some limitations, the method has been widely used to assess the capacity utilisation in industrial sector. Under this method, seasonally adjusted monthly values of indices of output are averaged into quarterly data which are used for identifying peaks as indicators of capacity output. The estimates based on the Wharton Index for the Indian manufacturing sector for the period 1971 to 2001 indicate that there has been an improvement in capacity utilisation in the manufacturing industries as a group during the 1980s. Capacity utilisation, however, showed deterioration in the 1990s, except for some brief spells. The electricity sector, unlike the manufacturing sector, witnessed an improvement during the 1990s over the 1980s and 1970s, mainly attributed to rising demand. The capacity utilisation in the mining and quarrying sector, however, witnessed deterioration over the decades with rising gaps in the 1990s. The impact of slackening demand in the recent years resulted in lower capacity utilisation (Chart III.32 to III.34).





Minimum Capital-Output Ratio Measure

3.67 As per this method, developed by the National Industrial Conference Board of the USA, a benchmark year is selected on the basis of lowest capital-output ratio (in real terms). The output corresponding to the lowest capital-output ratio is taken as the capacity output. The measure of capacity utilisation is obtained by deflating real fixed capital stock by the minimum capital-output ratio.

Table 3.22 : Capacity Utilisation (CU) in Industry : Minimum Capital-Output Measure (C/O)

Period	Manufacturing		Mining and Quarrying		Electricity	
	C/O	CU (Per cent)	C/O	CU (Per cent)	C/O	CU (Per cent)
1	2	3	4	5	6	7
1970-71 to 1974-75	2.8	98.6	1.4	95.0	11.8	80.7
1975-76 to 1979-80	2.9	94.8	1.9	69.9	11.5	82.5
1980-81 to 1984-85	3.2	84.8	2.6	50.6	12.3	77.3
1985-86 to 1989-90	3.1	88.1	3.4	38.0	11.6	81.9
1990-91 to 1994-95	3.0	90.6	3.3	38.7	10.7	88.6
1995-96 to 1999-2000	3.7	75.7	3.2	41.0	9.9	96.6

The estimates of capacity utilisation in the manufacturing sector in India for the period 1970-71 to 1999- 2000 indicate that some improvement in the capacity utilisation occurred towards the late 1980s and the first half of 1990s, *i.e.*, during the period associated with acceleration in the industrial growth rate. The mining and quarrying sector recorded significant decline in capacity utilisation. In the electricity sector, capacity utilisation rose steadily up to the 1990s. These sectoral imbalances in the capacity utilisation have implications for the overall industrial growth (Table 3.22).

3.68 In the context of developing economies, capacity utilisation is determined by both demand as well as supply side factors. Among the demand side factors, inventories in relation to sales of the firm is important. Among the supply side factors, raw material, energy, transport, credit, *etc.* are recognised (Sastry, 1980; Rangarajan, 1990; Ajit, 1993).

3.69 An empirical exercise is conducted in order to identify the proximate determinants of capacity utilisation in the manufacturing sector within a behavioural approach. Demand factors embodied in real private final consumption have a strong positive impact on capacity utilisation⁶. On the supply side, energy prices, which affect the cost of production of the industry, have a dampening effect. The dummy variable for the liberalisation period of the 1990s indicates that capacity utilisation could have declined in the post-liberalisation period, indicative of a cyclical catch-up (IMF, 2000). The actual level of capacity utilisation adjusts to the desired level fairly quickly, *i.e.* within a year (Table 3.23).

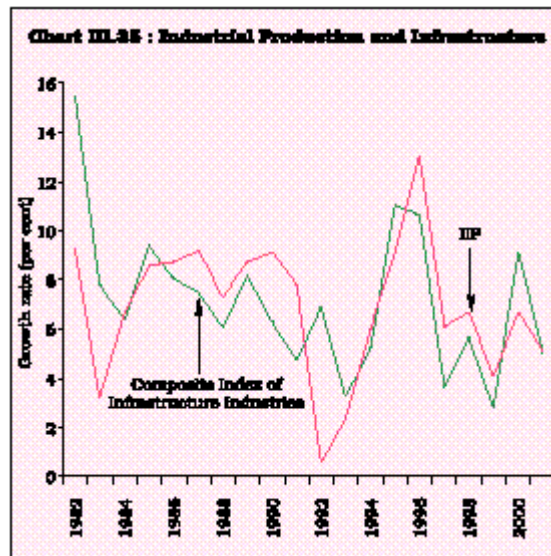
Table 3.23 : Elasticities of Capacity Utilisation in Manufacturing in India

1	Elasticities		3
	LPFCE	LWPIFUEL	
Short-run	0.583		-0.288
Long-run	1.123		-0.555
LPFCE	=log of real private final consumption expenditure		
LWPIFUEL	= log of WPI of fuel, power, light and lubricants		

Infrastructural Constraint on Growth

3.70 Among the institutional and other structural factors underlying industrial growth, infrastructure is recognised as the most important source of output growth because of its simultaneous impact on capacity creation and improvement in productivity of capital. The infrastructural sectors such as transport, power and telecommunications provide critical inputs for the manufacturing sector of the economy. The capital-intensive nature of such services requiring lumpy investment and long gestation periods, characteristics of pure public goods, underscores the role of Government in provision and management of infrastructure. As infrastructure services constitute direct inputs to production, a reduction in cost of such inputs improves the profitability of producing enterprises. Increasing availability of infrastructure facilitates the efficient use of other factors of production like labour and capital. It is argued that though higher output growth leads to higher investment in infrastructure, certain minimum investment in infrastructure is required to achieve a sustainable level of growth. Various studies have estimated the impact of infrastructure on economic growth (Aschauer, 1989; Munnell 1990a, 1990b). In the Indian context, elasticities of output with respect to various stocks of infrastructure indicate that transport and communication sectors play a dominant role in explaining the variations in gross domestic product and in other sectors (Sahoo and Saxena, 1999).

3.71 Industrial output growth in India has closely tracked the movements in the composite index of infrastructure industries during the 1980s and 1990s. This observed relationship between infrastructure growth and industrial performance in India has implications for sustaining the higher output growth and narrowing the output gap over the medium term (Chart III.35).



3.72 Empirical evidence points to a robust relationship between infrastructure investment and productivity growth in the manufacturing sector (Ahluwalia, 1991). The high growth performance of infrastructure sector during the 1980s can be attributed to a strong resurgence in the growth of infrastructure investment during the Sixth and the Seventh Plans. The public sector dominates in the power sector, water supply, railways and roads, *etc.*, while the private sector is predominantly in the transport sector, mainly road cargo transport. The India Infrastructure Report (1996) projected infrastructure investment requirement at 8.0 per cent of GDP over a medium term (Table 3.24). The requirements of funds for infrastructure are estimated to rise and an increasing proportion of gross domestic investment would have to be earmarked for financing the infrastructure.

Table 3.24 : Projected Investment Requirements for Infrastructure (Macro Estimates)

Year	(Rupees billion)			
	Gross Domestic Investment (GDI)	GDI in Infrastructure	GDI in Infrastructure as % of GDP	GDI in Infrastructure as % of total GDI
1	2	3	4	5
1990-91	1448.5	287.4	5.4	19.8
1995-96	2825.5	598.6	5.5	21.2
2000-01	4512.0	1076.0	7.0	23.8
2003-04	5938.8	1472.3	7.6	24.8
2004-05	6523.4	1639.0	7.8	25.1
2005-06	7179.5	1826.1	8.0	25.4

Note : The data for GDP, Projected GDI and GDI in infrastructure from 1995-96 onwards are at 1995-96 prices.

Source: The India Infrastructure Report (1996)

Sectoral Imbalances and Gaps in Infrastructure

3.73 Sectoral imbalances in infrastructure impose constraints on the growth of industrial output.

Juxtaposed with the slowdown in the growth of the infrastructure sector between the 1980s and 1990s, the persistence of sectoral imbalances in the infrastructure sub-sectors has simultaneously posed challenges for capacity expansion as well as utilisation of the existing capacity. The sectoral performance during the 1990s reveals that the average growth of all infrastructure industries, except for the steel sector, has remained significantly lower than in the 1980s. The decline in the overall growth of infrastructure sector in the 1990s in relation to the 1980s emanated mainly from a decline in growth of electricity, coal and petroleum. The stylised facts highlight the importance of the energy sector in sustaining higher growth of industrial output (Chart III.36, 37, 38, 39, 40).

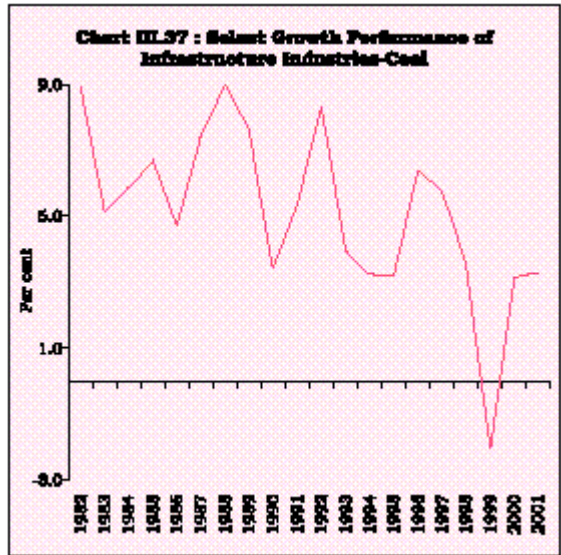
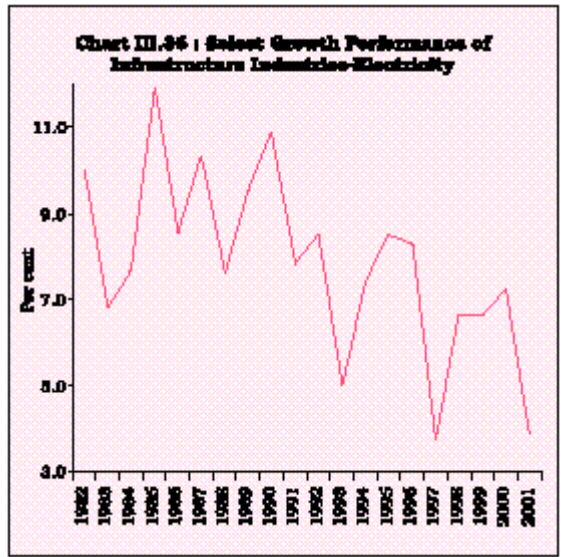


Chart III.38 : Select Growth Performance of Infrastructure Industries-Grade Petroleum and Refinery Products

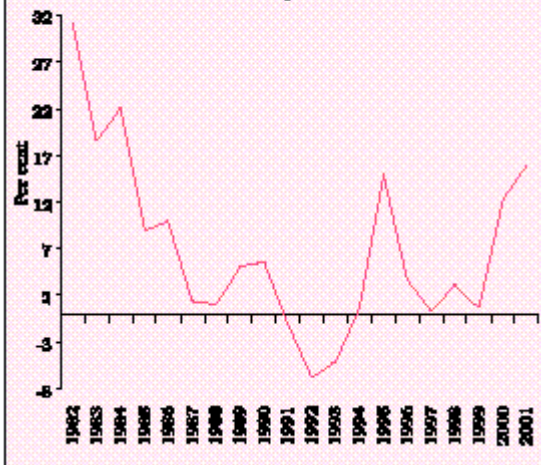
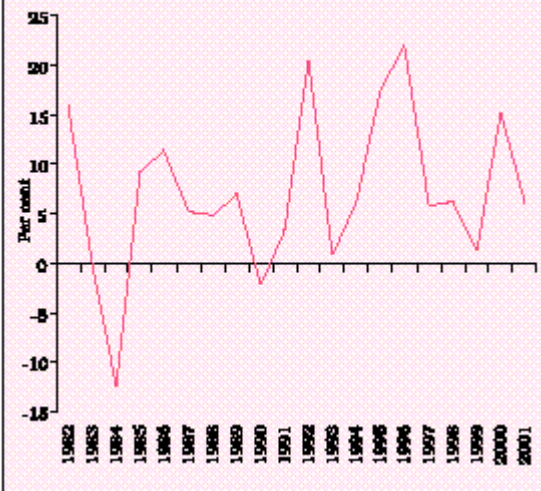
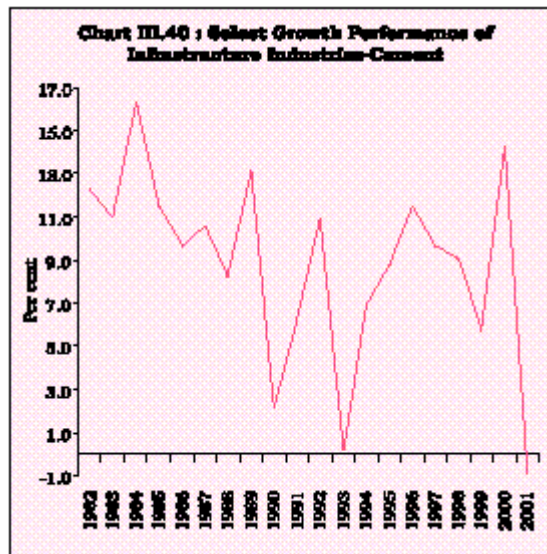


Chart III.39 : Select Growth Performance of Infrastructure Industries-Steel





3.74 Identification of sectoral infrastructure gaps assumes critical importance. The deficit in the existing availability of various infrastructure services *vis-a-vis* the potential demand provides a measure of the infrastructure gap. Among the important sub-sectors, the power sector has grown at a rate of 6.6 per cent during the 1990s as against 9.2 per cent in the 1980s. Simultaneously, the gap between demand and supply has remained significant, notwithstanding the fact that several reforms, including private participation, have been undertaken to boost growth of the power sector to fill the gap. The demand-supply gap in power widened to 11.5 per cent by 1996-97 from 7.9 per cent in 1990-91, although there was some decline thereafter. Poor performance of State Electricity Boards (SEBs), with increasing financial strain emanating from low average tariffs and high cross subsidies to agriculture and household sectors has stunted the growth of the power sector ([Table 3.25](#)).

3.75 In the telecommunications sector, the demand-supply gap has significantly narrowed from 27.9 per cent in 1991-92 to 12.2 per cent in 2000-01, reflecting the impact of reorientation of policies followed in the sector (Chart III.41). A sharp narrowing in the demand-supply imbalances in this sector notwithstanding, the extent of gap remains higher than the power sector.

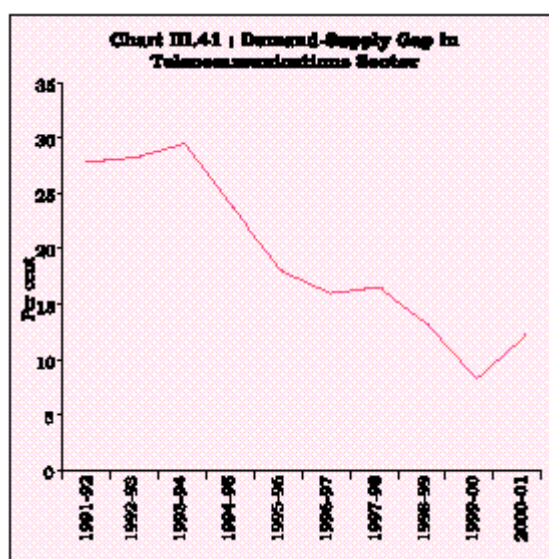


Table 3.25 : Demand-Supply Gap in the Power Sector in India

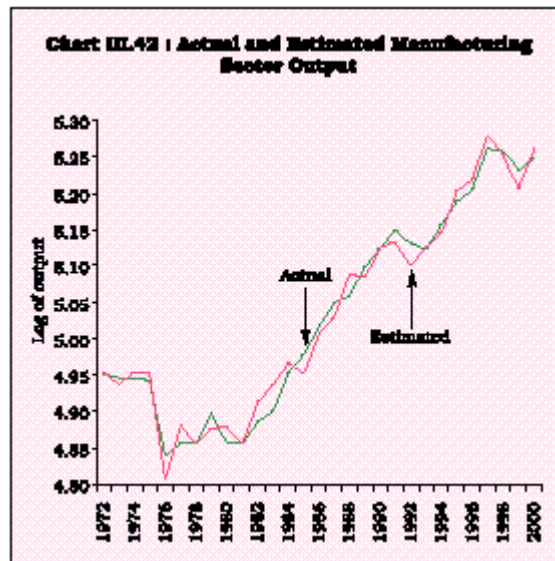
(Million units)				
Year	Requirement	Availability	Deficit	Deficit as % of Requirement
1	2	3	4	5
1990-91	2,67,632	2,46,560	21,072	7.9
1991-92	2,88,974	2,66,432	22,542	7.8
1992-93	3,05,266	2,79,824	25,442	8.3
1993-94	3,23,252	2,99,494	23,758	7.3
1994-95	3,52,260	3,27,281	24,979	7.1
1995-96	3,89,721	3,54,045	35,676	9.2
1996-97	4,13,490	3,65,900	47,590	11.5
1997-98	4,24,505	3,90,330	34,175	8.1
1998-99	4,46,584	4,20,235	26,349	5.9
1999-2000	4,80,430	4,50,594	29,836	6.2
2000-01	5,07,213	4,67,401	39,812	7.8

Source: Annual Reports, Ministry of Power, Government of India, various issues.

Although entry of the private sector has led to some increase in service expansion, the rollout of services has not begun as quickly as expected. The existing gaps in the telecom sector have implications for the technical efficiency and productivity growth in the industrial sector.

3.76 The role of public capital in infrastructure in explaining the growth in productivity and output is well recognised. Keeping in view the stylised facts on the performance of infrastructure and demand-supply mismatches, the role of public capital in mitigating these gaps needs some assessment. With a view to exploring the role of public capital in infrastructure in explaining the output growth, a logarithmic form of the Cobb-Douglas production function for the manufacturing sector is estimated with public capital stock as an additional argument (Chart III.42). The public capital in infrastructure emerges as the most dominant factor in explaining output growth in the manufacturing sector with a positive elasticity of 0.76. These estimates highlight the role of public infrastructure investment in sustaining higher output growth in the

long term.



The Sources of Industrial Growth

3.77 The growth process of the industrial sector during the decade of the 1990s has underscored the need for identifying the sources of growth for achieving higher output growth over the medium term. The classical growth theories recognised the role of physical capital accumulation as a determinant of growth. The Harrod-Domar model of growth emphasised the influences of physical capital and savings in creating effective demand as well as productive capacity in explaining the growth process. The role of productivity in the growth process was recognised by Solow (1957) in a growth accounting framework. Evolution of the endogenous growth theory towards the end of the 1980s drew attention to the role of continuous advances in human skills and technology along with factor accumulation to off-set the dampening effect of diminishing returns in sustaining the growth process.

3.78 Factor productivity as a source of industrial growth and trade competitiveness of nations has been well recognised. The total factor productivity (TFP) growth, on an average, accounted for nearly 50 per cent of the output growth for a group of developed countries, whereas the contribution of the same in the case of developing countries was only 31 per cent (Chenery, Robinson and Syrquin, 1986). This was, to a large extent, on account of a much faster growth of factor inputs in developing economies than in the developed economies (Pack, 1988). More recent empirical studies on sources of output growth in developing countries suggest that about 60-70 per cent of per capita growth is explained by capital accumulation, while human capital accounts for 10-20 per cent and the remaining on account of improvement in the total factor productivity (IMF, 2000). Notwithstanding varying evidence, some empirical work on the contribution of factor productivity to output growth in the East Asian economies reveals that the TFP accounted for about 50-55 per cent of the output growth. These diverse findings lead to a broad inference that the growth experience is country specific. It emerges, however, that while capital accumulation is a critical factor for achieving rapid growth, other factors are also important.

3.79 In the Indian manufacturing sector, the analysis of the sources of growth between 1959-60 to 1985-86 indicates that overall long-term annual growth of 5.3 per cent in value added in the manufacturing sector was associated with rapid growth of capital (8 per cent), moderate growth of employment (3 per cent) and negative growth in TFP at 0.4 per cent (Ahluwalia, 1991). These findings suggest that till the mid-1980s, the entire growth was led mainly by the capital accumulation and the contribution of productivity growth was negligible, reflecting the low efficiency of factor use. A synoptic view of the studies conducted on the Indian manufacturing sector indicates that even though an increasing trend in labour productivity has been witnessed in case of most of the industry groups, the level of labour productivity in India is abysmally low and its convergence to international standards seems to be a difficult proposition in the near future (Table 3.26).

3.80 In these studies, factor productivity growth obtained through the single deflation approach is lower than the double deflation approach, implying that the relative prices of inputs and output have increased over time⁷. Firm level panel evidence, however, indicates a strong evidence of a decline in productivity growth rates in the 1990s as compared with the 1980s. Productivity growth of firms in the manufacturing sector could have been adversely affected by the poor performance of the efficiency component in productivity (NCAER, 2001). For small-scale industries, there is a decline in labour productivity growth during the 1990s (1990-96) to 3.7 per cent from 6.2 per cent in the 1980s and a decline in capital productivity growth to -1.6 per cent from 2.6 per cent during the same period (SIDBI, 2000).

Table 3.26 : Trends in Factor Productivity in the Manufacturing Sector in India- Alternative Estimates

Study	Period Covered	(Per cent per annum)	
		TFPG (Single Deflation Method)	TFPG(Double Deflation Method)
1	2	3	4
Brahmananda (1982)	1950-51 to 1980-81	-0.2	
Ahluwalia (1985)	1959-60 to 1979-80	-0.6	
Ahluwalia (1991)	1959-60 to 1985-86	-0.4	
Balakrishnan and Pushpangadan (1994)	1970-71 to 1988-89	0.5	3.1
Majumdar (1996)	1950-51 to 1992-93	1.7*	
Rao, M.J. (1996)	1973-74 to 1992-93	1.3@	2.2
Pradhan and Barik (1998)	1963-64 to 1992-93	0.6	
Trivedi <i>et al</i> (2000)	1973-74 to 1997-98	1.95	3.7
NCAER (2001)	1980-81 to 1996-97	-0.05 to 0.04#	

* The estimates are reported only for the sub-period 1973-74 to 1992-93, out of the total period of the study spanning 1950-51 to 1992-93.

@ Growth rate of TFP is obtained indirectly from the estimates of TPG.

Represent different econometric estimates of TFPG based on the firm level panel data set.

3.81 In the context of the growing degree of openness of the economy, the level and growth rates of productivity of labour and capital have to be compared with some benchmark levels. Comparative levels of value added per person in manufacturing in 1987 revealed that for India, the ratio was only 7.2 per cent of that of the United States and 10.3 per cent of that of the West Germany (Ark, 1996). This indicates that the level of productivity in India is relatively low and would require considerable improvement to achieve convergence to the international levels.

3.82 Sources of productivity growth in India could broadly comprise infrastructure, reorientation in the trade and industrial policies, foreign direct investment along with technology transfers, reforms in the labour market to impart necessary flexibility and supply response, changes in exit procedures through appropriate legislation on industrial sickness, the Companies Act and industrial disputes and bankruptcy laws. The supply side response would depend upon raising investment in infrastructure, hastening of disinvestment process and restructuring of public enterprises.

Technological Progress and Industrial Growth

3.83 Productivity growth is the combined effect of pure technical progress as well as the improvement in the overall efficiency of factor use. Technological change involves an improvement in technology, knowledge and work efficiency. Technological progress is recognised as the key to maintaining productivity growth, and the driving force behind economic growth (Solow, 1957).

3.84 Attempts have been made in recent years to examine the role of technology expenditure on growth of productivity and output. Empirical findings support the view that science and technology play a critical role in the growth process of major industrialised countries (Sveikauskas, 1983). The hypothesis that research and development (R&D) fosters productivity growth through advances in technology has also gained support at the empirical level (Scherer, 1983). While explaining the differences in growth rates of labour productivity in the industrialised countries, it is found that technological development in the form of the growth of R&D expenditures and technology gap explain the growth rate of labour productivity in the industrial countries (Rensman and Kuper, 2000). In the case of newly industrialised countries, rapid growth in productivity and output is found to be the outcome of the ability to acquire advanced technology (Rothwell and Zegveld, 1985). These findings have important implications for the developing countries aiming for higher productivity growth since technological progress is based mainly on the import of technology.

3.85 Given that the Indian firms do not spend much on R&D, import of capital goods and machinery has had a significant impact on corporate performance. Capital deepening (*i.e.*, rise in capital-output ratio) was not found to be favouring the performance of larger firms, implying that up to a certain point, capital deepening might help growth and profits, beyond that further increases in the capital-sales ratio prove counterproductive to growth and profits (Siddharthan, 1992). These empirical findings, though relate to the pre-liberalisation period, lend support to the role of technological progress in enhancing productivity and growth. In the context of the technology gap in Indian industry during the 1980s, the per firm expenditure on technology imports revealed a steady rise, while the R&D expenditure continued to remain meagre (Swaminathan, 1993).

3.86 The impact of the reform process on technological improvement can be evaluated by comparing these indicators to the outcome of the 1990s. In the case of public limited companies in India, the ratio of R&D expenditure to their total output was as low as 0.08 per cent in 1985-86, increasing to 0.31 per cent in 1990-91 and remaining almost at that level in 1999-2000. This reflects considerably low level of R&D expenditure in the production process as compared with

industrialised countries. One of the factors for inadequate growth in R&D expenditure during the post-liberalisation period is the liberalisation of technology import and foreign investment policy ([Table 3.27](#)).

3.87 The sectoral break up of R&D expenditure suggests that the maximum investments are recorded in chemical and pharmaceutical groups, followed by engineering, motor vehicles, transport and information technology. The R&D expenditure on electricity generation and supply witnessed sharp decline during the 1990s. The low level of R&D expenditure in the Indian industry may have implications for productivity growth, competitiveness and export performance; however, the unfavourable impact can be, to a certain extent, mitigated through technology imports and foreign collaboration.

Table 3.27 : Research and Development Expenditure in Public Limited Companies

Industry	(Per cent of total output)			
	1985-86	1990-91	1995-96	1999-2000
1	2	3	4	5
Aggregate	0.08	0.31	0.28	0.29
1. Tea, Sugar, Jute	0.02	0.09	0.1	0.04
2. Cotton Textile & Rayon	0.01	0.05	0.13	0.08
3. Engineering, Motor vehicles, Transport <i>etc.</i>	0.11	0.38	0.31	0.31
4. Chemicals & Pharmaceuticals <i>etc.</i>	0.08	0.33	0.39	0.39
5. Cement	0.04	0.16	0.11	0.12
6. Rubber and Paper Products	0.05	0.2	0.2	0.23
7. Electricity Generation and Supply	—	0.53	0.07	0.01
8. Information & Technology	—	—	—	0.28

Source: Selected Financial Statistics of Public Limited Companies, RBI

3.88 An important feature of technological progress in India since 1991 has been the growth in foreign collaborations. The Indian experience shows that FDI has increasingly moved into priority areas such as power generation, oil refining, telecommunications, electronics and food processing, *i.e.*, the sectors where domestic investment is inadequate. The trends in FDI inflow reflect an increasing trend in the 1990s; however, FDI inflows to India continue to remain marginal when compared with the aggregate flow to the emerging economies and the gap between FDI approvals and actual inflows continues to remain wide ([Table 3.28](#)).

Table 3.28 : Number of Foreign Collaboration Approvals and FDI

Year	No. of Foreign Collaboration approvals	FDI in India (US \$ Million)	FDI to All Developing Countries (US \$ Million)	FDI to India as % of FDI to all Developing Countries
1	2	3	4	5
1981	389	92	12293	0.7
1986	957	118	9482	1.2
1991	950	74	35494	0.2
1992	1520	277	47130	0.6
1993	1476	550	66574	0.8
1994	1854	973	90036	1.1
1995	2337	2144	106990	2.0
1996	-	2426	131451	1.8
1997	-	3577	172571	2.1

1998	-	2635	176764	1.5
1999	-	2169	185408	1.2
2000	-	-	178004	-

Source : Reserve Bank of India and Global Development Finance, World Bank.

3.89 There is no empirical evidence of complementarity between technology import and domestic technological efforts and export performance of FDI firms (Subrahmanian, *et al*,1996). Accordingly, strategic interventions by using the country's comparative advantage in R&D and other inputs are considered necessary to strengthen linkages between multi-national corporations and Indian firms for domestic technological progress, and non-equity forms of tie-ups can be used for acquiring advanced technologies with greater scope for local adaptations, improvements and innovations.

3.90 Apart from the state of technology, efficiency improvements, which are endogenous to the firm, are critical in achieving outward shifts of the production frontier. The mean technical efficiency of Indian firms taken together seems to have declined in the 1990s as compared with the pre-reform period, particularly in the manufacturing sector (NCAER, 2001).

3.91 Cyclical variations in activity superimposed upon a persistent slowdown, underutilisation of capacity in various industries and the tightening of structural impediments have combined to produce a drag on industrial growth. A higher level of output growth can be sustained only by considerable improvements in the existing levels of infrastructure, particularly telecommunication and power. FDI can be an important conduit for technology transfer in India, although it currently operates only at the margin. In the case of public enterprises, productivity improvement would essentially require setting a clear path for restructuring and privatisation. The institutional environment in which the public sector operates would require significant reforms. A conducive environment for industrial growth hinges upon the rationalisation of labour legislations, changes in exit procedures through appropriate legislation relating to industrial sickness, and modifications in the Companies Act and industrial disputes and bankruptcy laws to impart necessary flexibility and supply response in the labour market. These measures would reduce the implicit cost of labour in production process.

IV. SERVICES IN THE INDIAN GROWTH PROCESS

3.92 The phenomenal expansion of services world-wide led to services being regarded as an engine of the growth and even as a necessary concomitant of economic growth. In development economics, seminal works on phases of growth (Fisher, 1935; Clark, 1940; Rostow, 1960; Kuznets, 1971) suggest that development is a three-stage process. The dominance of the services sector in the growth process is usually associated with the third stage of growth. In this context, the ascendancy of services even in developing countries has been regarded as a mutation of growth. During the 1980s and 1990s, services accounted for a share of close to or above 70 per cent of GDP in industrialised countries and about 50 per cent in developing countries. In India, services accounted for 38.6 per cent of the GDP in the 1980s and 44.3 per cent in the 1990s.

The Stylised Evidence

3.93 The growth of services sector has imparted resilience to the economy, particularly in times

of adverse agricultural shocks as also during cyclical downturns in industry. The share of services sector has been steadily increasing, with a fairly rapid growth in the 1990s (Table 3.29 and Chart III.43).

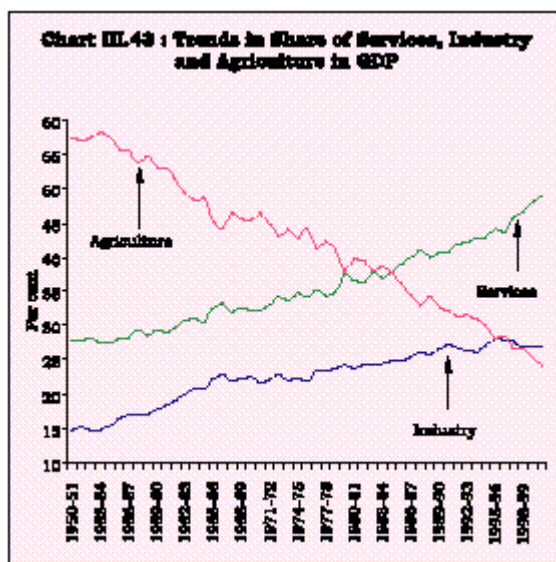


Table 3.29 : Sector-wise Average Shares, Growth Rates and Contribution to GDP Growth

Period	(Per cent)								
	Services			Industry#			Agriculture		
	Share in GDP	Growth Rate	Contribution to GDP Growth	Share in GDP	Growth Rate	Contribution to GDP Growth	Share in GDP	Growth Rate	Contribution to GDP Growth
1	2	3	4	5	6	7	8	9	10
1950-51 to 1959-60*	28.2	4.1	32.2	16.0	5.7	25.3	56.0	2.3	42.5
1960-61 to 1969-70	31.4	4.9	38.1	21.1	6.5	32.9	47.8	2.5	29.2
1970-71 to 1979-80	34.4	4.5	52.7	22.8	3.7	28.7	42.8	1.3	18.6
1980-81 to 1989-90	38.6	6.6	43.6	25.0	6.8	28.9	36.4	4.4	27.5
1990-91 to 2000-01	44.3	7.6	57.6	27.1	5.9	27.6	28.6	2.9	14.8

Inclusive of construction

* 9 year data for growth and weighted contribution since data for 1949-50 are not available.

Due to rounding off, sectoral data may not add up to 100.

Source : National Accounts Statistics, CSO.

3.94 The weighted contribution of the services sector to GDP growth has been rising since the 1960s except during the 1980s when industry and agriculture recorded substantial acceleration, which led to erosion in their contribution to GDP growth. However, a resurgence of services in the 1990s with a growth of 7.6 per cent enabled services sector to contribute 57.6 per cent to GDP growth.

3.95 A notable feature of the structural transformation of the services sector has been the growth of skill intensive and high value added sectors, *i.e.*, software, communication and financial services. The rapid growth of services can be attributed, *inter alia*, to the advent of information technology (IT) and the knowledge economy. This has enhanced the growth of the high productivity segment of the services sector as well as a variety of service activities involving low productivity activities catering to a large mass of people. The phenomenal growth of low skilled

service activities has occurred due to reduced opportunities in the manufacturing sector, particularly in the unorganised sectors.

3.96 Trade, hotels, restaurants and transport and communication are the major segments in terms of their share within the services sector; however, their share in the value added in the services sector has remained constant at around 49 per cent during the 1970s and 1980s, before marginally declining in 1990s. The share of finance, insurance, real estate and business services witnessed significant improvement during the 1990s on account of the rapid pace of financial development (Chart III.44 and [Table 3.30](#)). The buoyancy in the services sector output is concentrated in the new economy sectors such as computer software and financial and business services. In the national income accounts, the contribution of the software industry in the real GDP is estimated at 0.78 per cent in 1999-2000. If raw materials in this sector are accounted for, contribution of the software sector (net of inputs) to GDP stands at about 1 per cent as per the estimates of the NASSCOM and the CMIE.

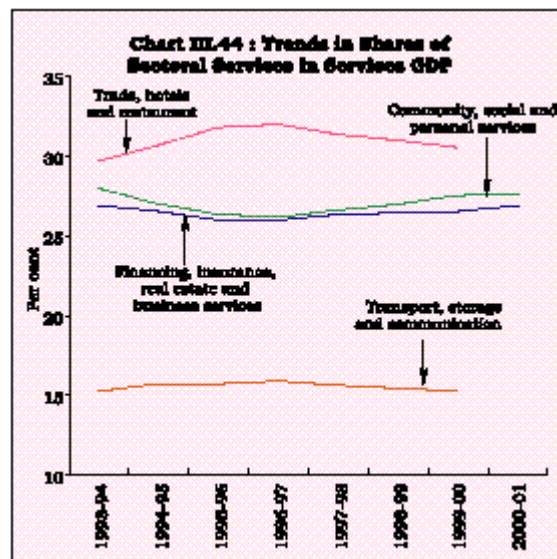


Table 3.30 : Average Share of Sub-sectors in Services Value-added (at constant prices)

Period	(Per cent)		
	Trade, Hotels, Transport and Communication	Finance, Insurance, Real estate and Business services	Social and Personal services
1	2	3	4
1950-51 to 1959-60	44.3	23.0	32.8
1960-61 to 1969-70	48.2	19.5	32.3
1970-71 to 1979-80	49.1	18.4	32.5
1980-81 to 1989-90	48.7	20.4	30.9
1990-91 to 2000-01	46.3	26.1	27.1

3.97 Some of the activities in the services sector are multidimensional, being part of industry as well as services, such as information technology and construction. Service statistics in most

countries including India provide information on value-addition of various activities of business services, hotels, trade, financial services, *etc.* For an empirical analysis, sub-sectors including trade, transport and communication, financing, insurance, real estate and business services can be categorised as producer services with hotels and restaurants and other services as consumer services. Government services comprise public administration and defence services. During 1999-2000, producer services accounted for about 70 per cent of the total services followed by consumer services (17 per cent) and government services (13 per cent). The high share of producer services reflects the strong inter-linkages between services and goods producing sectors of the economy.

Income Elasticity of Demand for Services

3.98 A rising share of services in GDP is regarded as an outcome of higher income elasticity of demand for services. The empirical studies have shown that the income elasticity of demand for services could be greater than or equal to unity (Gemmell, 1982; Summers, 1985; Bergstrand, 1991; Falvey and Gemmell, 1991). Income elasticity of demand for services increases with rising income which favours the fulfillment of more sophisticated desires. During the development process, distribution of GDP and employment register sectoral shifts. Such shifts may occur on account of the hierarchy of needs, distinguished into basic needs for food and shelter and needs for other material and non-material goods including services (Maslow, 1970). According to this view, income elasticity of demand depends on per capita income and differs across various sectors.

3.99 The empirical estimates of price and income elasticity for various categories of services in India are summarised in [Table 3.31⁸](#). It is important to mention that the actual behaviour of the services sector in real GDP depends on the relative strength of the coefficients of income and price elasticity.

Table 3.31: Income and Price Elasticities for the Services Sector

Sector	Income Elasticity	Price Elasticity
1	2	3
Services	1.20 *	-0.68 *
1. Producer Services	1.22 *	-0.78 *
2. Consumer Services	1.00 *	-0.10
3. Government Services	1.41 *	-1.05 *

* Statistically significant at 1 per cent.

3.100 The income elasticity of demand is greater than unity and price elasticity is negative and significant for the total services, producer services and government services. In other words, demand for overall services rises with increase in per capita GDP and decreases with increase in prices of services. The higher income elasticity of demand in the case of producer services underscores its forward linkages. This is corroborated by the emergence of producer services comprising advertising, publicity, marketing and other IT-related activities in the recent period as important service industries in India. Therefore, producer services can be regarded as a major source of economic growth. Similarly, public administration, social services, rural extension services and defence sectors which together comprise government services, have a high income elasticity of demand. In the case of consumer services, the income elasticity is almost equal to unity and price responsiveness is not detected. It indicates that demand for consumer services

increases in same proportion to change in real per capita income and is price insensitive. In order to check for robustness of the empirical findings, the hypothesis of constant share of services in GDP is tested⁹. The results indicate that the share of overall services responds by 0.34 per cent to a unit change in per capita real GDP while producer and government services respond by 0.41 per cent and 0.27 per cent, respectively. On the other hand, in the case of consumer services, with a unit income elasticity and insignificant price elasticity, its share is found to increase by a marginal 0.08 per cent. However, the results need to be interpreted with caution as the coefficient of determination, *i.e.* adjusted R², is quite low in the case of consumer services ([Table 3.32](#)).

Table 3.32 : Service Share Regression Coefficients

1	Coefficient	Adjusted R ²	D.W.
	2	3	4
Services	0.34	0.92	1.55
1. Producer Services	0.41	0.94	1.38
2. Consumer Services	0.08	0.22	1.11
3. Government Services	0.27	0.43	0.48

Note : All the coefficients are significant at 1 per cent .

Services, Employment and Productivity

3.101 The level of employment in services is strongly correlated with the stage of economic development; while agricultural and manufacturing activities account for a major share of employment in developing countries, services activities account for a major portion of employment in most developed countries. Various studies have explored the sources of growth in services employment (Baumol, 1967; Fuchs, 1968). Lagging productivity in the services sector is considered as the main reason behind the rising share of service employment in total employment even though share of services in real GDP remains constant, implying the existence of Baumol's cost disease (Baumol, 1967).

3.102 In India, the services sector accounted for 18.1 per cent of the total employment during 1965-66, going up to 23.5 per cent in 1999-2000. Generally a substantial increase in the share of services in employment in most countries could imply a growth of low productive, low income, informal sector (Bhaduri, 1996). However, the increase in earnings per worker in the services sector compared with the industry could mean that at least part of the increase in employment in the services sector is in the formal, perhaps public sector, or in the new IT-related industries with higher use of capital per worker ([Table 3.33](#)).

Table 3.33 : Share of Services Sector in Total Employment

Period	Employment in Services Sector (in crore)	Total Employ- ment (in crore)	Share of Services in total Employ- ment (%)
1	2	3	4
1965-66	3.97	21.93	18.1
1970-71	4.82	24.09	20.0
1980-81	5.71	30.24	18.9
1990-91	8.70	35.68	24.4
1999-2000	10.29	43.81	23.5

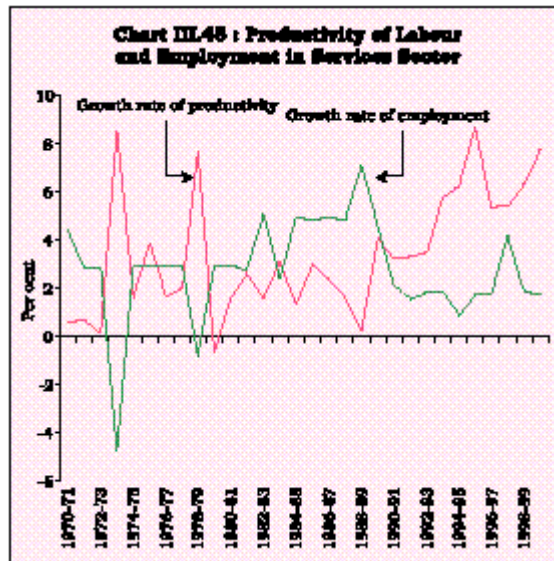
Source: National Sample Survey Organisation (various rounds) and Visaria, 1996.

3.103 In order to focus upon the differences in growth rate of employment and gross value added in services sector since 1970-71, a difference of means test is employed with the following null hypotheses: (i) there is no difference in the growth rate of employment in services sector and growth rate of gross value added in services sector; (ii) there is no difference between labour productivity growth and employment growth in services sector. Labour productivity is defined as value added in services sector divided by total labour in services sector ([Table 3.34](#)).

Table 3.34 : Difference of Means Test for Differences in Growth Rates

Period	Null Hypothesis	Mean difference	Finding at 1% level of significance
1	2	3	4
i) 1970-71 to 1999-2000	No difference between the growth rates of Employment and gross value added in services sector	-3.5	Null hypothesis Rejected
ii) 1970-71 to 1999-2000	No difference between the growth rates of labour productivity and employment in services sector	0.7	Null hypothesis Accepted
a) 1970-71 to 1979-80	No difference between the growth rates of labour productivity and employment in services sector	0.7	Null hypothesis Accepted
b) 1980-81 to 1989-90	No difference between the growth rates of labour productivity and employment in services sector	-2.2	Null hypothesis Rejected
c) 1990-91 to 1999-2000	No difference between the growth rates of labour productivity and employment in services sector	3.6	Null hypothesis Rejected

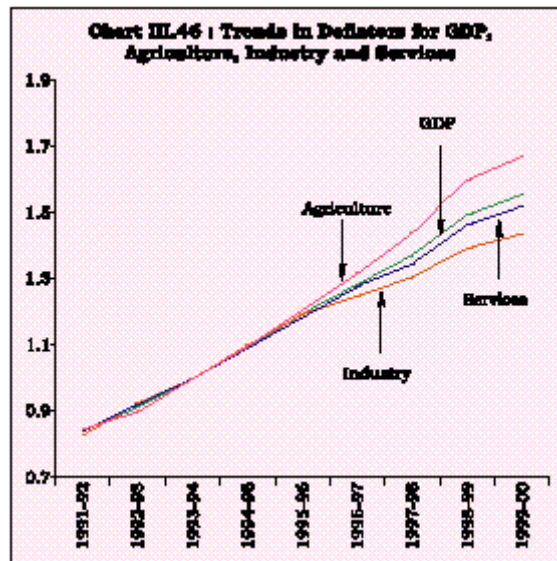
3.104 The results show that hypothesis (i) can be rejected, *i.e.*, growth rates of employment and value added in services sector are statistically different from each other during 1970-71 to 1999 - 2000. As the mean difference is negative, the value added growth in services sector is, on an average, higher than employment growth in services sector, which confirms the finding of other studies that services sector has undergone a less than proportionate increase in employment in relation to output (Mitra, 1988; Bhattacharya and Mitra, 1990). The second hypothesis about the differences in productivity and employment growth in services has been tested decade-wise. Growth in services productivity for the whole period of 1970-2000 is observed to be higher but not statistically significant. The growth rate of productivity in services sector has been higher during the 1990s as the mean difference is found to be positive and statistically significant. Thus, unlike many other countries, growth of average productivity of labour in India has remained higher than employment growth in services sector during the post-reform period. The empirical findings are supported by the declining capital-output ratio in the services sector which can be interpreted as efficient use of capital by skilled labour and low contribution of services to total employment in contrast to its high contribution to overall GDP. This points towards a growth in total factor productivity in services (Chart III.45).



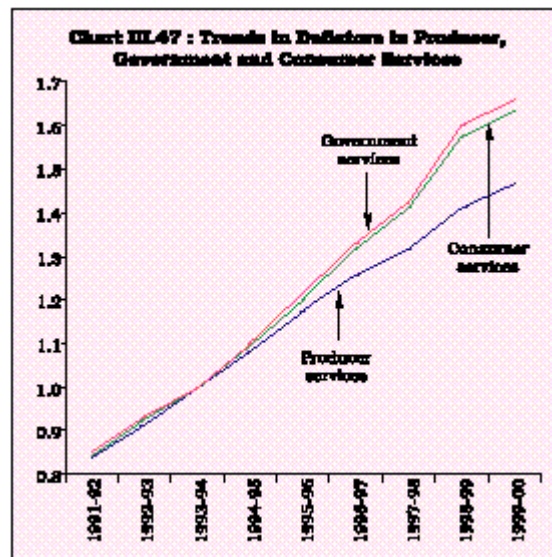
Terms-of-Trade

3.105 The services sector is not covered in the construction of Wholesale Price Index (WPI), leaving a major portion of economic activities outside the measurement of headline inflation. Therefore, the inter-sectoral terms-of-trade can only be studied with the help of sectoral deflators. However, such deflators have their inherent limitations, as they are available with low frequency.

3.106 There are divergent views on intersectoral terms-of-trade; nevertheless, the trend in sectoral deflators shows that terms-of-trade have remained in favour of agriculture *vis-a-vis* industry or services all through the 1990s. Thus, the gap between the sectoral deflators has been widening in favour of agriculture at the cost of services and industry. On the other hand, a comparison between services and industry shows that terms-of-trade have remained in favour of services (Chart III.46).

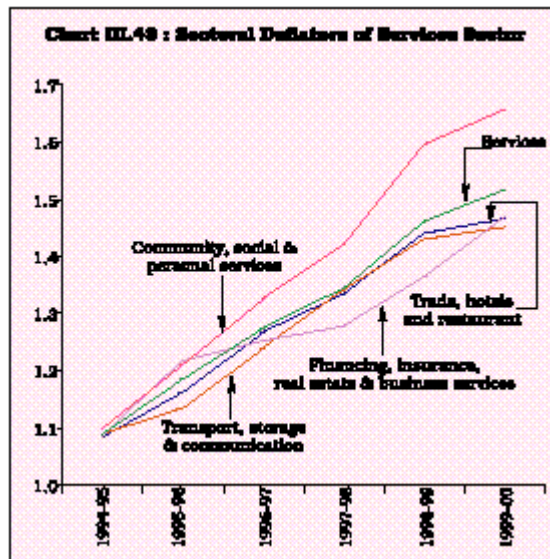


3.107 Within the services sector, the terms-of-trade have remained in favour of government services, closely followed by consumer services. The gap in the deflators between producer services, on the one hand, and consumer and government services on the other, has been widening since 1993-94. This is possibly due to the fact that for government services, which include public administration and defence, the behaviour of the deflator depends largely on government policies. The recent pay hike following the fifth pay commission's recommendation might have contributed to a relatively high deflator (Chart III.47).



3.108 The terms-of-trade have remained in favour of community, social and administration services since 1995-96 while the deflator of financing, insurance and business services is moving upward at a faster rate since 1998-99. Deflators of other two sub-sectors (transport, storage and communications and trade, hotels and restaurants) have been moving in close proximity of each other (Chart III.48). The behaviour of inter-sectoral and intra-sectoral terms-of-trade in services would have a bearing on India's position *vis-à-vis* the evolving multilateral framework for

international trade in services ([Box III.4](#)).



Box III.4
WTO and Services

The growing role of international services and their implications have come to be recognised in the General Agreement on Trade in Services (GATS) of the World Trade Organisation (WTO). The WTO rules on services trade, as embodied in the GATS and negotiated in the Uruguay Round, are the first ever set of multilateral, legally enforceable rules covering international trade in services. Like the agreements on goods, GATS operates on three levels: the main text containing general principles and obligations; annexes dealing with rules for specific sectors; and individual countries' specific commitments to provide access to their markets. Unlike in goods, GATS has a fourth special element: lists showing where countries are temporarily not applying the 'most favoured nation' (MFN) principle of non-discrimination. The temporary withdrawals of MFN treatment are also an integral part of GATS. A WTO council on services oversees the operation of the agreement. Under the framework of GATS Article, it covers all internationally traded services and the MFN clause applies to all services except the one-off temporary exemptions. It deals with foreign competition although the negotiations and commitments made can have a bearing on dismantling of domestic monopolies. The definition of what constitutes trade in services is currently a subject of multilateral negotiations.

India falls in the category of developing countries that show relatively strong position in earnings from labour and travel, with negative positions in trade in goods and most of other service categories excluding IT related services. During 2000-01, there was a surplus amounting to US\$ 294 million and US \$ 135 million on account of travel and insurance, respectively, in India's Balance of Payments while the deficit on merchandise account amounted to US \$ 14,370 million.

The advocates who favoured inclusion of services in the Uruguay Round negotiations argued that free trade in goods is insufficient. On the other hand, many of the developed nations have opined that only those sectors (*e.g.*, banking, insurance and telecommunication) in which they enjoy a comparative advantage, should be brought under the purview of GATS. It is generally felt that India should strive for a liberalised deal in the case of professional services in general and software services in particular in which she has a comparative advantage. On the other hand, there is a need to tread cautiously in respect of some services sub-sectors like banking and insurance. Liberalisation in financial services sector could be introduced in a phased manner with some regulations, as unbridled liberalisation may affect the financial stability. However, keeping with its commitment to multilateral agreement on services, India has recently raised the limit for banking licenses in respect of foreign banks from 8 to 12 in the Financial Services Agreement. In addition to this, as a part of unilateral liberalisation, India has opened up its insurance sector and other financial services including financial consultancy for foreign investment with some limit on market

access. Thus, India's interest in the ongoing GATS negotiations is uniquely placed, given her comparative advantage in the professional services and her concerns for a well calibrated and cautious liberalisation of financial services.

The recently concluded Ministerial Conference of the WTO at Doha recognised the work already initiated since early 2000 under Article XIX of GATS and many countries have submitted proposals on a wide range of sectors and other issues as well as on movement of natural persons. Among the different modes of services supply, India is most interested in movement of natural persons and has also submitted a proposal at the WTO Council for trade in services. However, other modes, viz., commercial presence, cross border supply and consumption abroad are also important for making the Indian service sector a major player in emerging international scenario.

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Sustainability of Services Sector Growth

3.109 Besides its direct contribution to GDP, services sector can be a source of productivity for other sectors and can thereby facilitate expansion in other sectors of the economy. In India, it is the services sector which has kept the GDP growth around 6.0 per cent in the 1990s when industry and agriculture sectors did not perform relatively well. The coefficient of variation of sectoral growth rates, used as a proxy for output variability, is found to be low for services as compared with other sectors ([Table 3.35](#)).

Table 3.35: Coefficient of Variation of Sectoral Growth Rates

Period	(Per cent)		
	Agriculture	Industry	Services
1	2	3	4
1970-71 to 1979-80	623.0	100.0	33.3
1980-81 to 1989-90	138.6	30.9	19.7
1990-91 to 1999-2000	125.0	58.7	26.3

3.110 As real per capita GDP grows, demand for services increases more than proportionately and this, in turn, reinforces GDP growth itself. Within the services sector, demand for producer and government services, which constitute mainly intermediate consumption, have strong multipliers impacting on real GDP. On the other hand, the demand for consumer services, which can be considered as final consumption, does not increase proportionately with the increase in real GDP. Therefore, producer and government services seem to be more important as future source of growth. Besides, there is now a general consensus on the vast potential in some segments of services sector for yielding increasing returns, particularly IT related and software services even though their shares are currently small. There has been a gradual shift towards use of IT both in the public sector and the private sector, particularly in education, medical services and exports. Accordingly, the Task Force on Human Resource Development in Information Technology set up by the Central Government has recommended government intervention in promotional activities like distributive services, financial services, business services, administration services, entertainment services and personal services which, in turn, would provide the much needed demand push for IT development from domestic sources. The growth of such dynamic service activities, which are intensive users of communication and information technology, will generate employment opportunities on a rising scale. Already, banking and

insurance sectors have started synergising with IT.

3.111 The financial services sector, with its significant share in services could turn out to be an influential source of growth. Export of services which, at present, contributes approximately 26.7 per cent of total exports can give a major boost to overall economic growth. With information technology-led global progress, trends are likely to be in favour of a major expansion of the world trade in services, particularly communication, financial services, computer and information services, technology transfers and different business services. India, with its large and expanding knowledge base, can explore the opportunities (Raipuria, 2001). The labour productivity in software is twice the ratio of India's manufacturing and 1.3 times that of the US (Arora and Athreye, 2001). The potential of its high capacity to generate wealth, foreign exchange and employment has been recognised at all levels. The global IT industry offers Indian companies unique opportunities in four broad areas: value-added IT services, software products, IT enabled services and e-business (Unni and Rani, 2000). As per NASSCOM projections, India's software and IT services sector is set to grow at a rate of 30 to 35 per cent during 2001-02. The IT industry is slated for a target revenue of US \$ 87 billion by 2008 with a 7.5 per cent contribution to the GDP.

3.112 The process of economic growth has itself led to the emergence and expansion of new services such as advertising, publicity, marketing, *etc.* These sub-sectors provide essential service inputs to other sectors in the economy, thereby developing strong linkages with the rest of economy. Various studies have examined the expansionary potential of services sector in non-services industries and found strong forward linkages, as 50 per cent of the industries in the economy are found to be directly or indirectly service intensive (Dutta, 1989; Bhowmik, 2000).

3.113 Efficient delivery of services increases the productivity of both labour and capital in the economy as a whole. In general, services sector appears to be highly growth inducing with positive externalities for other sectors, making services a catalytic agent of growth. It needs to be recognised that the services sector in itself is not homogenous. Therefore, the expansion of these sectors needs to be calibrated and integrated simultaneously into the overall growth process to impart an element of sustainability.

V. REGIONAL DIMENSION OF ECONOMIC GROWTH IN INDIA

3.114 The regional dimensions of growth of the Indian economy are assuming increasing relevance in the context of the progressive diffusion of structural reforms at the sub-national level. The quality of growth is getting increasingly assessed in terms of durable improvement in the regional growth profiles in which the interface between public policies for accelerating development and standards of living is the greatest. Moreover, regional patterns of growth provide a gauge of the quality of public policies themselves and their impact on macroeconomic welfare. The various facets of the growth experience of States in India are critical for developing an understanding of the sources of demand generation as well as changes in productivity and growth. The growth performance in the States is often the outcome of institutional and non-economic factors interacting with the initial conditions which encompass various aspects of human capital development.

3.115 Varying degrees of reform in different States have yielded wide variations in growth performance. In this context, it has been pointed out that the popular characterisation of backward States such as Bihar, Madhya Pradesh (M.P.), Rajasthan, and Uttar Pradesh (U.P.) as a homogenous group of poor performers does not hold good in terms of recent economic performance (Ahluwalia, 2000). It has also been argued that reforms have unshackled a number of States like Andhra Pradesh (A.P.), Gujarat, Karnataka, Maharashtra and Tamil Nadu (T.N.) who could achieve their true economic potential in recent years (Bajpai and Sachs, 1999). From a completely different paradigm, the faster growth in select States has been interpreted as the operation of some kind of unbalanced growth with differing rates of catching up (Chaudhuri, 2000). Three other issues are raised in the context of Indian regional development, viz., fiscal, infrastructure and human resources development (World Bank, 2000).

Regional Growth Profiles¹⁰

3.116 The State-wise profile of per capita State Domestic Product (SDP) drawn up for 15 major States (representing nearly 90 per cent of Indian population) exhibits significant variation. In 1980-81, there were only four States viz., Maharashtra, Punjab, Gujarat and Haryana whose per capita real SDPs (at 1980-81 prices) were higher than the all-India per capita real GDP (Table 3.36). The trend remained more or less similar in 1990-91. In the 1990s, this group expanded to include Tamil Nadu. Relative rankings in terms of absolute SDP need to be evaluated against a comparison of growth rates. In terms of trend growth rate, Karnataka, West Bengal, Maharashtra, Tamil Nadu, Andhra Pradesh have done well in the 1990s (Chart III.49).

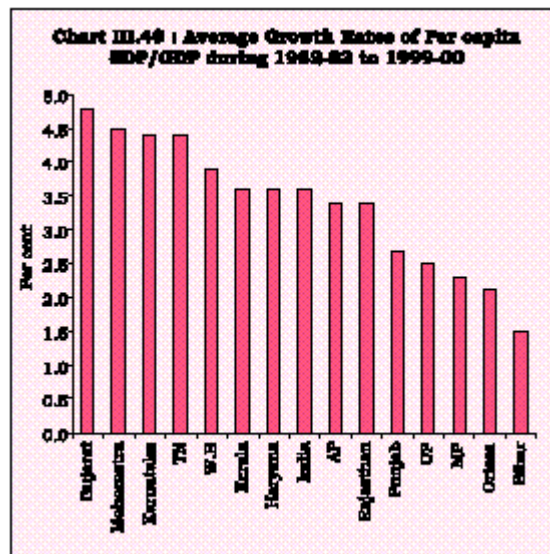


Table 3.36 : Trend Growth Rate of Per Capita SDP

States	(Per cent)		
	1980-81 = 100		1993-94 = 100
	1981-82 to 1990-91	1981-82 to 1993-94	1993-94 to 1999-2000
1	2	3	4
1 Karnataka	4.0	4.5	4.5
2 Gujarat	3.3	3.1	2.4
3 West Bengal	2.7	2.9	5.6

4	Kerala	4.3	3.7	3.5
5	Tamil Nadu	3.9	4.2	5.1
6	Orissa	3.2	3.7	5.8
7	Maharashtra	2.2	3.1	5.1
8	Andhra Pradesh	2.6	2.7	5.7
9	Punjab	3.4	3.2	3.7
10	Madhya Pradesh	2.0	2.0	4.6
11	Uttar Pradesh	4.0	3.6	2.5
12	Haryana	2.7	2.3	3.2
13	Bihar	2.4	1.7	2.0
14	Rajasthan	2.5	0.9	2.7
15	India	3.4	3.2	4.8

Notes : 1. Due to non-availability of data the average growth rates reported under column 4 for Madhya Pradesh, Gujarat, and Kerala are calculated over the period 1993-94 through 1998-99.

2. The trend growth rates are calculated from semi-logarithmic function.

Source : Directorates of Economics and Statistics of respective State Governments.

3.117 The regional growth experience of the 1990s suggests that States pursuing reforms seemed to have experienced higher growth rates in recent years with some tendency towards convergence. At the same time, the regional growth experience is indicative of some kind of unbalanced and divergent growth ([Box III.5](#)).

Regional Dimension of Select Infrastructural Indicators

3.118 The convergence literature in India highlights the role of infrastructure-related facilities in fostering growth. A critical determinant of the divergence in growth profiles among regions is the inter-state differences in infrastructural facilities. Two select indicators of infrastructural conditions, *i.e.*, electricity and transport are examined below.

Box III.5 Convergence of Economic Growth

One of the basic predictions of neo-classical or endogenous growth theory is that economies with lower capital per person tend to grow faster in per capita terms. Thus, there will be convergence of growth rates. The notion of convergence has attracted recent attention in the endogenous growth paradigm. It has been interpreted in two distinct senses. The hypothesis that poorer economies tend to grow faster than the richer ones is often referred to as the notion of absolute convergence. The empirical evidence in favour of absolute convergence from cross-country growth regressions has received mixed support. In fact, in some sample of countries the growth trajectories have been found to be quite independent of the initial conditions. This, however, could be due to the presence of heterogeneity in the sample of countries. It is in this context, the notion of conditional convergence has been proposed whereby an economy tends to grow faster, the further it is from its own steady-state value. In other words, each economy is conceived to be converging to its own steady state value, and the speed of convergence varies inversely to the distance from the steady state.

How far are the predictions on convergence valid in the Indian regional set-up? There are divergent views in this regard. While a number of studies found out that the pattern of growth of per capita SDP has followed a divergent tendency in absolute terms, controlling for internal migration and centre-state grants, there is evidence in favour of convergence among Indian states. The speed of convergence has been, however, found to be quite low with estimate of the required time for a typical Indian state to close one-half of the gap between its initial per capita income and the steady-state per capita income at 45 years!

What explains the pattern and extent of divergence among the growth profiles of Indian states, if any? Incorporation of omitted variables in the growth regression across Indian states has attracted attention in recent years. In the determination of regional steady-state level of income and ensuring conditional convergence, a number of variables have been highlighted, viz., literacy and per capita investment. In fact, it has been hypothesised that states with higher levels of income can undertake more ambitious infrastructure investment programmes, since they enjoy more fiscal revenues to pay from it. A contrary view regarding diverging tendency of per capita SDP growth is found as well. A number of reasons for such diverging trends has been cited, viz., (a) differences in private investment and public expenditure, (b) differing distribution of state Government expenditure, (c) regressivity of implicit inter-governmental transfers, (d) lack of horizontal equity in inter-governmental transfers, and (e) regional policies.

In the ultimate analysis, while much of the evidence of growth differentials among Indian states hints at some operation of conditional convergence, the determination of steady-state growth rate for a State is by itself a serious policy question. Thus, any explanation for convergence of (or its lack) growth across Indian States needs to be sought in the interplay of all these control variables, perhaps along with the institutional set-up prevalent in the region.

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Power Supply

3.119 Electricity occupies a critical role in infrastructure. Various factors determine the demand and supply of this crucial input. The level of industrialisation, urbanisation, user cost and tariff structure, presence of subsidies, all could play a significant role in the determination of demand; on the other hand, technological and institutional arrangements are the crucial factors influencing supply. The electricity sector in various States suffer from endemic problems - unviable State Electricity Boards (SEBs), transmission losses and distortive subsidy structure. The relationship between the power situation and the regional growth in the 1990s reveals that there has been a general improvement in the power supply position in all the States in terms of deficit (*i.e.*, requirement *less* availability as a percentage of requirement). In fact, two States viz., Orissa and West Bengal have managed to transform their power position from deficit to surplus ([Table 3.37](#)).

3.120 The existence of surplus power is, however, no indication of well being in the electricity sector. Out of the five States with deficits higher than the all-India average, three States, viz., Karnataka, Gujarat, and Maharashtra were high growth States in the 1990s.

Table 3.37 : State-wise Power Supply Position

(in MUs)

State	1991-92	2000-01
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	Requirement	Availability	Deficit (%)	Requirement	Availability	Deficit (%)	
1	2	3	4	5	6	7	
1	Orissa	8065	7499	7.0	11710	12070	-3.1
2	West Bengal	11140	10140	9.0	18787	18958	-0.9
3	Punjab	17238	16177	6.2	27670	26923	2.7
4	Haryana	10326	10123	2.0	17275	16793	2.8
5	Rajasthan	13220	13030	1.4	25080	24178	3.6
6	Kerala	7440	7197	3.3	13564	12670	6.6
7	Bihar	7415	5215	29.7	9208	8563	7.0
8	Tamil Nadu	23210	22086	4.8	42702	39462	7.6
9	Andhra Pradesh	24015	22415	6.7	47792	44055	7.8
10	Karnataka	20350	15550	23.6	30242	27490	9.1
11	Gujarat	25505	24417	4.3	53038	47877	9.7
12	Maharashtra	42070	40166	4.5	79527	71184	10.5
13	Madhya Pradesh	21115	19942	5.6	39644	34747	12.4
14	Uttar Pradesh	31540	28280	10.3	46295	39556	14.6
15	All India	288974	266432	7.8	507213	467401	7.8

Note : MU = Million Unit, Minus sign indicates surplus

Source : Ministry of Planning and Programme Implementation.

In terms of availability of power, Maharashtra, Uttar Pradesh (U.P.), Gujarat, Andhra Pradesh (A.P.), and Tamil Nadu were leaders in 1990-91; in 2000-01, the front runners in terms of availability were Maharashtra, Gujarat, A.P., U.P., and Tamil Nadu. Excepting U.P, all other States are clearly the high growth states of the 1990s. This indicates that high growth is closely associated with demand- induced expansion in productive capacity. As the limits of capacity expansion are approached in the absence of significant technology and institutional reform, the power sector could emerge as a binding constraint on growth.

Roadways

3.121 Another aspect of infrastructure is the mode of transport. For the purpose of analysis, two distinct transport indicators have been taken into consideration, viz., roadways and railways as proxy for State-wise availability of transport infrastructure. In terms of the share of roads of a particular state in the all-India total, a number of States like Maharashtra, Tamil Nadu, M.P, Orissa experienced a rise in their shares, relative to their positions in 1981 ([Table 3.38](#)).

3.122 The only State that crosses the ten per cent mark in this context is Maharashtra. Again a close association is discernible between shares in all-India roads and the growth record of industrial States in the 1990s. In terms of surfaced roads, taking the all-India average of 56.5 per cent as a benchmark, States like, Haryana, Gujarat, Punjab, Maharashtra, Karnataka, Tamil Nadu, Rajasthan, Andhra Pradesh and Uttar Pradesh are found to be above the benchmark. By association, this list highlights the importance of infrastructure for growth.

Railways

3.123 In the case of railways, however, the distribution is explained in terms of geographical location as well as size of the State. Uttar Pradesh (undivided) accounted for the highest proportion of all-India railway routes, followed by Madhya Pradesh, Gujarat, Bihar and Andhra Pradesh ([Table 3.39](#)).

Table 3.38 : State-wise Roadways Development

State	Percentage Distribution of Total Roads			Intra-state share of Surfaced Roads		
	1981	1991	1997	1981	1991	1997
1	2	3	5	6	7	8
1 Haryana	1.5	1.3	1.1	86.2	91.2	90.7
2 Gujarat	3.9	5.1	3.7	69.9	87.5	87.3
3 Punjab	3.1	2.7	2.6	76.9	78.1	81.5
4 Maharashtra	11.9	11.0	14.7	46.0	70.6	75.1
5 Karnataka	7.4	6.5	5.8	58.4	65.0	69.0
6 Tamil Nadu	8.2	9.7	8.4	76.5	15.6	68.0
7 Rajasthan	4.5	6.1	4.9	52.9	50.9	63.1
8 Andhra Pradesh	8.0	7.4	7.2	48.2	53.4	61.6
9 Uttar Pradesh	9.9	9.9	10.4	46.8	52.0	58.1
10 West Bengal	3.8	3.1	3.1	44.6	47.1	56.4
11 Madhya Pradesh	7.1	6.9	8.1	50.6	54.7	44.3
12 Bihar	5.6	4.2	3.6	34.3	36.1	37.3
13 Orissa	8.1	9.7	10.7	13.8	9.7	33.1
14 Kerala	7.0	6.7	5.9	22.4	27.8	31.1
15 All India	100.0	100.0	100.0	46.0	51.8	56.5

Source: Transport Research Wing, Ministry of Surface Transport, Government of India.

Table 3.39 : Distribution of Railway Routes in Major States

State	Per cent			
	1980-81	1990-91	1995-96	1999-2000
1	2	3	4	5
1. Andhra Pradesh	7.7	8.1	8.0	8.1
2. Assam	3.6	4.0	3.9	3.8
3. Bihar	8.8	8.5	8.4	8.4
4. Gujarat	9.2	8.5	8.5	8.5
5. Haryana	2.4	2.4	2.3	2.5
6. Karnataka	4.9	4.9	5.0	6.3
7. Kerala	1.5	1.6	1.7	1.7
8. Madhya Pradesh	9.4	9.4	9.5	9.4
9. Maharashtra	8.7	8.7	8.7	8.6
10. Orissa	3.2	3.2	3.5	3.7
11. Punjab	3.5	3.5	3.4	3.3
12. Rajasthan	9.2	9.3	9.4	9.4
13. Tamil Nadu	6.4	6.4	6.4	6.7
14. Uttar Pradesh	14.5	14.3	14.2	14.2
15. West Bengal	6.1	6.1	6.1	5.9

Source: Ministry of Railways, Government of India.

Select Social Dimensions of Regional Development

3.124 Apart from infrastructure, human capital and various social indicators play a crucial role in fostering growth. The State-profile of literacy, as an indicator of State-level human capital, along with urbanisation is discussed below.

Literacy

3.125 As various empirical studies show, disparities in knowledge operate analogously with factors of production to determine divergences in growth profiles among regions. A number of stylised facts emerge from the trends of literacy between 1991 and 2001 in eighteen select Indian states ([Table 3.40](#)).

3.126 First, all States have experienced an upward secular movement in literacy rates during the 1990s. Considering the fact that the 1990s were also characterised by a higher per capita GDP for all the States (in levels), a higher income has been accompanied by an improvement in the knowledge base. This is indicative of the symbiotic relationship between knowledge and growth. Secondly, the ranking of the States between the 1991 and 2001 remained more or less unaltered, indicating the uniformity in this regard.

Table 3.40 : Literacy Rate in Indian States

		(Per cent)		
State	2001 Census	1991 Census	Changes in the Literacy Rates during 1991-2001	
1	2	3	4	
1	Kerala	90.92	89.81	1.11
2	Maharashtra	77.27	64.87	12.39
3	Tamil Nadu	73.47	62.66	10.81
4	Uttaranchal	72.28	57.75	14.53
5	Gujarat	69.97	61.29	8.68
6	Punjab	69.95	58.51	11.45
7	West Bengal	69.22	57.70	11.52
8	Haryana	68.59	55.85	12.74
9	Karnataka	67.04	56.04	11.00
10	Chhatisgarh	65.18	42.91	22.27
11	Madhya Pradesh	64.11	44.67	19.41
12	Orissa	63.61	49.09	14.52
13	Andhra Pradesh	61.11	44.09	17.02
14	Rajasthan	61.03	38.55	22.48
15	Uttar Pradesh	57.36	40.71	16.65
16	Jharkhand	54.13	41.39	12.74
17	Bihar	47.53	37.49	10.04
18	India	65.38	51.63	13.75

Source: *Provisional Population Totals: India*, Census of India 2001.

3.127 Finally, the States with literacy rates higher than the all-India average are also those with higher growth rate of per capita SDP during the 1990s *vis-a-vis* the 1980s. The correspondence between the rankings on account of literacy and per capita SDP growth is not one-to-one. Kerala ranked third in terms of per capita SDP growth during 1991-92 through 1999-2000 and it is the first as per literacy standards in India. This close association between literacy and growth is perhaps indicative of the role of human capital in fostering growth.

Urbanisation

3.128 In the tradition of the stages of growth theories, urbanisation is symptomatic of economic

development. An urban centre's primary function is to act as a service centre for the hinterland around it. Though urban development need not be always synonymous with economic growth, spatial distribution of growth is linked with the emergence of a formal manufacturing sector.

3.129 Interestingly, most of the States, either with higher per capita SDP growth than the all-India average, or those experiencing a rise in per capita growth rate during the 1990s *visa-vis* the 1980s are also the States with higher than all-India average urbanisation as per the 2001 census. There are, however, some exceptions like Punjab and Haryana with quite a high degree of urbanisation but which are placed relatively low in the growth ladder in the 1990s. Kerala, despite its high growth performance is somewhat low in terms of the percentage of urban population ([Table 3.41](#)).

Table 3.41 : Percentage of Urban Population of the Indian States in 2001

		(Per cent)
State		Percentage of Urban Population
1		2
1.	Tamil Nadu	43.86
2.	Maharashtra	42.40
3.	Gujarat	37.35
4.	Karnataka	33.98
5.	Punjab	33.95
6.	Haryana	29.00
7.	West Bengal	28.03
8.	India	27.78
9.	Andhra Pradesh	27.08
10.	Madhya Pradesh	26.67
11.	Kerala	25.97
12.	Uttaranchal	25.59
13.	Rajasthan	23.38
14.	Jharkhand	22.25
15.	Uttar Pradesh	20.78
16.	Chhattisgarh	20.08
17.	Orissa	14.97
18.	Bihar	10.47

Source: *Provisional Population Totals: India.* Census of India 2001.

3.130 The regional growth profile during the 1990s suggests that higher income capabilities did not get translated into higher growth trajectories for all the States. In terms of a "before-after" comparison, most of the States with higher average per capita SDP growth rate during the 1990s (such as, Karnataka, Gujarat, Tamil Nadu, Maharashtra, or Andhra Pradesh) are those which embarked on reform programmes. The rank correlations of the States as per various indicators of development are given in [Table 3.42](#).

Table 3.42 : Correlation between the Select Relative Rankings of States

	Growth	Electricity	Roads	Literacy	Urbanisation
1	2	3	4	5	6
Growth	1.00	0.22	0.18	0.57	0.48
Electricity		1.00	0.50	0.07	0.69

Roads	1.00	-0.08	0.13
Literacy		1.00	0.47
Urbanisation			1.00

Note: 'Growth' refers to improvement in Growth Rate during 1991- 92 through 1999-2000, 'Electricity' refers to availability of electricity in 2000-01, 'Roads' refers to State-wise Roads as % to All India Roads in 1997, 'Literacy' refers to Literacy Rates in 2001, 'Urbanisation' refers to Urbanisation in 2001.

3.131 All the social and infrastructural indicators exhibit a high correlation with growth of per capita SDP reflecting the fact that in the quest for growth, the role of social and physical infrastructure is crucial. Rank correlations between growth and literacy, on the one hand, and growth and urbanisation, on the other, are found to be highly positive and significant. The relationship between ranking as per infrastructural indicators and ranking as per growth, though positive and significant, turns out to be low.

3.132 The growth profile of the Indian economy has many dimensions interacting with the heterogeneous nature of the growth efforts of various States. Given the vastness and diversity of the economy, it would be difficult to expect that all States would grow at the same rate (Ahluwalia, 2000). Reforms appear to be impacting on growth differentials of the States in the 1990s. This has implications for competition among States for scarce resources for the acceleration of growth. Despite an absence of a systematic evidence on the causal relationship between reform and growth, the strength of associations in the behaviour of growth at the level of the States suggests the possibilities of "growth arbitrage" being created by reforms.

VI. CONCLUDING OBSERVATIONS

3.133 The current slowdown in the Indian economy has become a subject of intense debate. Empirically the current phase appears to represent a loss of speed rather than a halt in growth. Cyclical patterns in activity are detected but these are of limited duration and impact. The Indian economy is characterised by stable and converging cycles which could be modulated with counter cyclical policies. The impulses for growth can be generated and nurtured primarily by releasing the structural constraints, which can shift the potential growth frontier outwards. So far, private consumption has been providing the predominant contribution to aggregate demand relative to investment. Discretionary fiscal stabilisers mainly in the form of government consumption have been holding up aggregate demand over the period of the downturn.

3.134 Capital formation has been slowing down across all three sectors of the economy. The size of accelerators suggests that greater investment needs to be directed towards manufacturing so as to revitalise growth. Manufacturing slowdown is reflecting as much a demand slack as a fall in capacity utilisation and gaps in availability of infrastructure, particularly power. Structural constraint to industrial growth are more dominant than cyclical variations. Productivity changes and technological progress have been identified in the 1990s as important sources of industrial growth.

3.135 Abstracting from measurement issues, capital formation in agriculture has been declining which is a matter of concern. The lack of capital has been a primary impediment to the adoption of new technology. Given the overall resource constraint, a conscious choice between subsidies and investment is being imposed on the conduct of public policies for agriculture. Integration of

Indian agriculture with international markets would be necessary in the context of commitments to WTO, complemented by well developed domestic future markets for agricultural commodities.

3.136 The services sector has imparted resilience to the economy, particularly in times of adverse agricultural shocks as also during cyclical downturns in industry. A notable feature of the structural transformation of the services sector has been the growth of skill intensive and high value added sectors. As growth gathers momentum, the demand for these services is expected to increase more than proportionately and this, in turn, would reinforce growth itself.

3.137 Issues relating to regional growth have added a new dimension to the size and quality of the growth process. Differential growth performances in the States is reflective of the varying degree of reform penetration. In some developing economies (Brazil, China), regional reforms have taken the lead. In India, given the federal structure, there are several areas where it is the States which can initiate reforms. In this context, it is necessary to emphasise the role of States in improving the provision and quality of the two key infrastructural services which would determine the sustainability of reforms: education and health. Greater involvement of the private sector in the production and distribution of health and education services in a cost-effective manner can have beneficial externalities for the growth process. These services, which currently account for about 5 per cent of GDP, help to develop the social and distributive infrastructure. They enrich the quality of human capital and expand demand for the output of other sectors. Improvements in delivery of health and education can generate a variety of specialised occupations with potential for synergisation. Investing in these sectors will not only improve quality of human capital but can also become a source of higher productivity and growth.

$$^1 (1) \text{ GDSR} = -25.75 + 6.61 \text{ LPINC} + 0.08 \text{ RDRT} + 3.4 \text{ IR} + 0.74 \text{ AR}(1) \quad R^2 = 0.88, \text{ DW} = 1.80$$

$$(2.78)^* \quad (1.91)^* \quad (2.12)^* \quad (5.90)^*$$

$$(2) \text{ PVSR} = -25.65 + 3.66 \text{ LRPDI} + 0.05 \text{ RDRT} + 3.84 \text{ IR} + 0.53 \text{ PVSR}(-1) \quad R^2 = 0.95, \text{ Durbin's } h = 1.45$$

$$(3.9)^* \quad (3.11)^* \quad (4.06)^* \quad (4.43)^*$$

GDSR: Gross Domestic Saving Rate, LPINC : log of real per capita income (per capita GDP at factor cost at constant prices), RDRT : real deposit rate (*i.e.*, one year deposit rate less inflation rate derived from GDP deflator), IR : Intermediation Ratio, PVSR: Private Saving rate, LRPDI : log of real per capita disposable income. t- statistics are in parenthesis and * indicates significance atleast at 10 per cent level.

² Investment (Gross Capital Formation-GCF)

$$(1) \text{ GCF} = 4807 + 0.20 \text{ GDPFC} + 0.69 \text{ ? GDPFC}(-1) - 699 \text{ rl} + 12629\text{D1} + 26938\text{D2} \quad R^2 = 0.96, \text{ DW}=1.87$$

$$(14.02) \quad (3.57) \quad (-2.20) \quad (2.95) \quad (2.18)$$

$$(2) \text{ GCFa} = 4018 + 0.04 \text{ ? GDPFC}(-1) + 0.18 \text{ Ips} \quad R^2 = 0.66, \text{ DW}=1.14$$

$$(2.0) \quad (3.0)$$

$$(3) \text{ GCFm} = -19261 + 0.61 \text{ ? GDPFC}(-1) - 811 \text{ rl} + 2.2 \text{ Ips} \quad R^2 = 0.76, \text{ DW}=1.82$$

$$(2.4) \quad (-2.4) \quad (4.7)$$

$$(4) \text{ GCFs} = -3889 + 0.22 \text{ ? GDPFC}(-1) - 304 \text{ rl} + 1.41 \text{ Ips} \quad R^2 = 0.84, \text{ DW}=1.96$$

$$(2.6) \quad (-2.02) \quad (6.54)$$

GDPFC: GDP at factor cost, rl : real bank lending rate, D1: dummy for the 1980s, D2 : dummy for 1993-96, GCFa, GCFm and GCFs are private investments in agriculture, manufacturing and services, respectively, Ips : Public investment in services. All the t-statistics (presented in parentheses) are significant atleast at 10 per cent level.

$$^3 \quad (1) \quad PFCE = 108913 + 0.60GDPFC + 0.8877 AR(1) \quad R^2 = 0.999; DW=2.07$$

$$\quad \quad \quad (23.32)^* \quad \quad (9.4)^*$$

$$(2) \quad GFCE = -9541.66 + 0.14GDPFC + 0.7834 AR(1) \quad R^2 = 0.988; DW=1.21$$

$$\quad \quad \quad (14.2)^* \quad \quad (5.3)^*$$

PFCE : Private Final Consumption Expenditure, GDPFC: GDP at factor cost, GFCE : Government Final Consumption Expenditure. Figures in brackets represent t-statistics and * indicates significance atleast at 10 per cent level.

⁴ Finance Minister's Address to Parliament Consultative Committee, November 6, 2001.

⁵ Illustratively, in case a small farmer takes credit from a large farmer and is subsequently forced to sell his agricultural product at much lower price than post-harvest prices, he is said to be affected adversely by factor-product market inter-linkage. In case the borrowing farmer is forced to work on the creditor's land at critical period like sowing, then the exploitation is in terms of adverse factor - factor market inter-linkage.

$$^6 \quad LCU = - 1.785 + 0.583 LPFCE - 0.288 LWPIFUEL + 0.481LCU\{t-1\} - 0.064 DUM91$$

$$\quad \quad \quad (2.97) \quad \quad (-3.13) \quad \quad (3.70) \quad \quad (-4.32)$$

Where LCU: log of capacity utilisation index, LPFCE: log of real private final consumption expenditure, LWPIFUEL: log of WPI of fuel, power, light and lubricants, DUM91: dummy variable for post-1991 period. Figures in brackets are t-statistics. The coefficients are significant at 1 per cent level.

⁷ The conversion of nominal value added into the real value added is done either with single deflation or double deflation method. In the case of single deflation method both nominal output and nominal material inputs are deflated by output price index, while under double deflation method, the nominal output is deflated by output price index and nominal material input is deflated by input price index.

⁸ $\text{Log (RGDPs)} = a + a_1 \text{Log (RGDP)} + a_2 \text{Log (PDEFs / PDEFgdp)}$
 RGDPs = Real GDP of Services Sector as a proxy for expenditure on services,
 RGDP = real GDP,
 PDEFs = Price Deflator in Services Sector and
 PDEFgdp = Price Deflator of overall GDP

⁹ $\text{Log (S)} = b + b_1 \text{Log (RPCGDP)}$
 S = Share of services/ sub sectors in real GDP RPCGDP = Real Per Capita GDP

¹⁰ There is no uniform series of real SDP over the period under consideration. While the real SDP from 1981-92 through 1993-94 are available with 1980-81 as the base, the data from 1993-94 through 1999-2000 are available with 1993-94 as the base. Hence, growth rates from 1981-82 through 1993-94 are calculated over the SDP numbers with 1980-81 base, while the same from 1994-95 through 1999-2000 are calculated over the SDP series with 1993-94 base.

IV The Role of Fiscal Policy in Reinvigorating Growth

Fiscal Policy and Economic Growth

The Indian Experience

Fiscal Policy, Economic Stability and Growth: an Empirical Framework

Limits of Fiscal Policy for Growth

Some Unpleasant Fiscal Arithmetic

Concluding Observations

4.1 The current phase of activity in the Indian economy has brought to the fore a revival of the debate on the role of fiscal policy in stimulating growth. A resurgence of the case for fiscal activism is driven by the argument that fiscal correction through cut back in government investment during the 1990s has contributed to the current deceleration. In this view, the country's debt is moderate by international standards and of internal variety; therefore, substantial increase in government expenditure on investment, especially in agriculture and infrastructure sectors is advocated through deployment of surfeit liquidity and/or monetisation of fiscal deficits (Patnaik, 2001; Rakshit, 2000; Shetty, 2001). The other, more moderate, view recognises the role of fiscal policy in inducing growth but stresses the costs of fiscal deficits. Although the present stream of public financing cannot be sustained any longer, the State will be failing in its duty if it absolves of its responsibility by binding itself to inflexible fiscal rules that can be obeyed only at the cost of much needed public investment (Bagchi, 2001). Moreover, it is argued that the short-term impact of increasing deficit financing on prices and the balance of payments needs to be given due consideration while formulating fiscal measures for long-term growth (Chelliah, 2001). At the other end of the spectrum, considerable scepticism is expressed regarding the efficacy of expansionary fiscal policy at the current juncture (Acharya, 2001). In this context, both the size and quality of fiscal adjustment assume critical importance (Reddy, 2001). The Report of the Economic Advisory Council (EAC, 2001) stresses that high fiscal deficits, by raising real interest rates, crowd out private investment, especially in the context of the government borrowing being predominantly used to finance revenue deficits. The EAC believes that the existing level of public debt is 'too high ... and clearly unsustainable'. In a similar vein, the IMF observes that India's fiscal sustainability remains a serious concern with large deficits crowding out private investment and constraining the scope for the monetary authorities to ease interest rates. Achievement of stronger growth would, *inter alia*, require prompt and credible progress in reducing the fiscal deficit (IMF, 2000). Despite a significant improvement in a number of areas, notably the external sector, the external credit ratings have been downgraded, attributed largely to the fiscal position.

4.2 Against this background, the Chapter addresses the key questions in the debate: Can fiscal policy stimulate the revival and how? What are the downside risks associated with expansionary fiscal policy in terms of macroeconomic instability and future growth? Section I discusses the role of fiscal policy in economic growth, drawing upon theoretical developments and cross-country experience. Section II situates the current debate in the context of the inter-temporal evolution of Indian public finances. An empirical verification of the role of fiscal policy in stimulating growth in India is undertaken in Section III covering issues relating to cyclical and structural influences of the fiscal stance, particularly in the context of the

stabilisation function, crowding-in/out associated with public spending and the growth-enhancing potential associated with government capital expenditures. The sustainability of public debt is examined in Section IV. In view of the arguments expressed in favour of pump-priming *via* monetisation of the fiscal deficit, Section V deals with the 'unpleasant monetarist arithmetic' (UMA) hypothesis, its empirical verification in the Indian context focusing on the search for an optimal combination of money and bond financing of the deficit. Concluding observations are contained in Section VI.

I. FISCAL POLICY AND ECONOMIC GROWTH

The Dominant Paradigm

4.3 The role of fiscal policy in influencing economic growth has been widely debated in the literature. The size of the fiscal deficit, despite a strong opposing view, is widely believed to be a key indicator of the overall stance of fiscal policy. On the impact of fiscal deficits on growth, alternative approaches can be identified. In the tradition of the neoclassical school, fiscal deficits increase aggregate consumption in the economy which leads to a reduction in national savings resulting in higher real interest rates (in a closed economy) and this, in turn, depresses investment and overall economic activity. In an open economy, higher fiscal deficits are reflected in higher capital flows and a real appreciation leading to lower net exports and again, a reduction in overall activity. In either case, a fiscal deficit crowds out investment/net exports and hence, brings about reduction in overall activity. The decline in current investment and build-up of external debt has adverse implications for future output.

4.4 An implicit assumption in the neoclassical approach is that the economy is operating at full employment. In conditions of less than full employment, the Keynesian approach argues that fiscal deficits would not lead to any crowding out. Given sticky wages/ prices, shifts in aggregate demand induced by changes in government spending and taxes affect the utilisation of the economy's factors of production, increasing domestic output. An expansionary fiscal policy according to the Keynesian approach is, therefore, conducive to growth just as overheating of the economy would warrant fiscal tightening. The impact of the fiscal policy on growth would depend upon the existing level of slack in the economy.

4.5 In contrast to the neoclassical and the Keynesian approaches, the Ricardian approach argues that fiscal deficits would be neutral as 'immortal' economic agents internalise variations in government expenditures. These rational agents adjust their consumption/ saving one-to-one in relation to movements in fiscal deficits thereby fully offsetting fiscal policy. With overall savings remaining unchanged, fiscal deficits do not have any impact on economic activity in the Ricardian approach. As empirical support in favour of the Ricardian view is rather weak (Ball and Mankiw, 1995; Elmendorf and Mankiw, 1998), the two major competing theories are the neoclassical and Keynesian approaches.

4.6 Since the late 1980s, developments in endogenous growth theory suggest that economic growth is an endogenous outcome of the system and not the result of forces - like exogenous technical change - that impinge from outside (Romer, 1994). Since growth is endogenous, public policy can influence its magnitude and the role of government in economic development

acquires significance. Public capital or public investment in areas like infrastructure, human capital, and science and technology exerts a positive influence on output. Similarly, government activities in protection of property rights and the taxation of economic activity influence growth in an endogenous manner. Thus, unlike the neoclassical growth theory, the endogenous view of growth stresses that fiscal policy can affect long-run growth performance (Tanzi and Zee, 1997).

4.7 Empirical studies on the influence of fiscal policy on growth can be generally grouped into studies testing for the effect of (i) government spending, (ii) taxation and (iii) budget balance on growth. In the first category, several studies have found a negative impact of government spending on output growth rates, lending support to the notion that smaller government sectors are associated with faster growth rates (Landau, 1983, 1986; Grier and Tullock, 1989; Barro, 1991). On the other hand, empirical exercises on the effects of government spending which distinguish between government consumption and government capital accumulation suggest that government capital stock has a positive impact on productivity growth and that government spending had a positive and highly significant impact on output growth rates (Ram, 1986 and Aschauer, 1989). At the same time, the empirical support in favour of the view that capital expenditures increase growth has been debated as the classification of government expenditures into consumption and investment can quickly become problematic. Hence, a more useful classification divides public expenditure into productive (growth-inducing) and unproductive (growth-retarding) (Tanzi and Zee, 1997). Cross-country examination of the relationship between growth and composition of public expenditure produces results that question the conventional wisdom. An increase in current expenditure has positive and statistically significant growth effects while a negative relationship is detected between the capital component of public expenditure and per capita growth (Deverajan, Swaroop and Zou, 1996). The results suggest that productive expenditures, when used in excess, turn unproductive and that several components of current expenditure, such as operations and maintenance, may have higher rates of return than capital expenditure. The focus on capital expenditures by developing country governments has the implication that they may have been misallocating public expenditures in favour of capital expenditures at the expense of current expenditure, losing out in terms of growth in that process.

4.8 In the second category, the near consensus of empirical evidence suggests a negative impact of taxation on output growth (Koester and Kormendi, 1988; Skinner, 1988; Dowrick, 1992; Engen and Skinner, 1992). Even a balanced-budget increase in government spending and taxation is observed to decrease long-term growth rates. This has triggered interest in the role of fiscal policy in inducing business cycles. An erratic time pattern in taxes or tax randomness could increase the intensity of the business cycle. Government spending on education financed by income taxes may spur economic growth, but it may also increase the intensity of cyclical fluctuations. Although these studies suggest a negative impact of taxation on growth, the relationship is not robust and sensitive to model specification, particularly with respect to the list of non-tax variables (like public expenditures and other budget policies) that are controlled (Easterly and Rebelo, 1993). On the whole, as Tanzi and Zee (*op cit*) note, the empirical evidence on the relationship between taxation and growth is much weaker than suggested by theory.

4.9 Studies on the impact of the budgetary gap have, as in the case of taxation and expenditure, found mixed effects. While a negative and significant correlation between the

budget deficits and growth has been found, the correlation has not been found to be robust (Easterly and Rebelo, 1993 and Levine and Renelt, 1992). Another aspect generally examined in the context of budget deficits is the long-run inflationary potential of expansionary fiscal policy. Inflation emanating from monetisation of fiscal deficits may lead to greater uncertainty about future inflation and hence have an adverse effect on growth. In a cross-sectional analysis over the period 1970-99 for 23 emerging economies, IMF (2001) indicates robust evidence of a positive long-run relationship between the size of fiscal deficits and inflation. A (permanent) reduction in the fiscal deficit by 1 percentage point of GDP is associated with a drop of 2-6 percentage points in inflation, depending upon the level of private sector's holding of money.

Fiscal Adjustment: Cross Country Experience

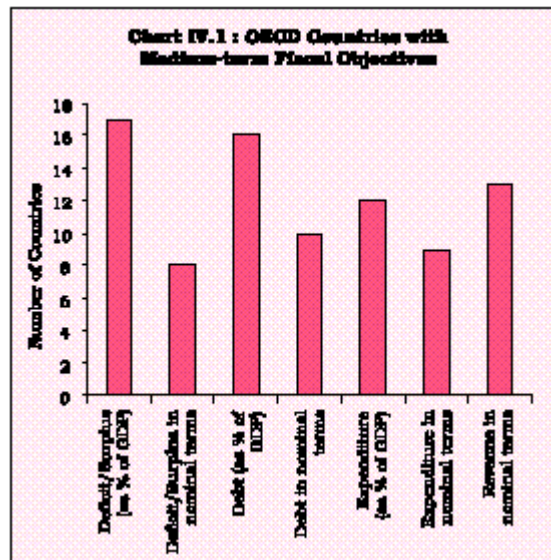
4.10 In the 1980s and 1990s, the primacy accorded to government spending has undergone a paradigm shift with many countries preferring a more limited role of government as part of restructuring of the fiscal system. In particular, a number of advanced economies have attained sizable fiscal surpluses for the first time in nearly half a century. The OECD area, for instance, achieved a fiscal surplus in 2000 for the first time after 1969 (Atkinson and Noord, 2001). Moreover, a distinct pattern is visible in the fiscal correction of the 1990s *vis-à-vis* the 1980s. The fiscal adjustment in the 1990s was achieved by expenditure reductions rather than tax increases; expenditures have been curtailed by cuts in transfer spending and in the public sector wage bill in an urgent effort to address high levels of public debt (IMF, 2001). Unlike in the 1980s, revenue growth since 1993 has made a relatively small contribution to the fiscal adjustment. On an average, general government expenditure in the advanced economies (excluding Japan) declined by close to 6 per cent of GDP during 1993-2000, with the sharpest reduction in the Northern European countries (10.5 per cent of GDP). The bulk of adjustment has fallen on expenditure categories that contributed to the earlier long upward trend in expenditure, *viz.*, wages and salaries, current transfers and interest payments ([Table 4.1](#)). The limited contribution of revenue increases during the 1990s reflected a wave of tax reforms in the industrial countries directed towards reduction in marginal tax rates on personal and corporate income in recognition of distortionary effects of high taxation, but tax exemptions, reliefs and credits were drastically curtailed to offset revenue losses. The value added tax (VAT) became an increasingly important source of indirect tax revenues. An important aspect that might have contributed to the reduced role of tax revenues could be the increasing globalisation as competitive pressures may have constrained government's ability and willingness to raise taxes.

Table 4.1 : Fiscal Adjustment in OECD Countries - Role of General Government Outlays

Item/Year	(As per cent to GDP)			
	1965	1980	1995	2000
1	2	3	4	5
Total Outlays	26.9	35.5	39.4	36.5
<i>Of which:</i>				
Income Transfers	6.5	10.7	13.2	12.8
Subsidies	0.8	1.4	0.9	0.8
Interest Payments	1.4	3.1	5.0	3.8
Consumption	14.6	17.0	16.6	15.7
Net Capital Outlays	3.5	3.3	3.8	3.4

Source: Atkinson and Noord (2001).

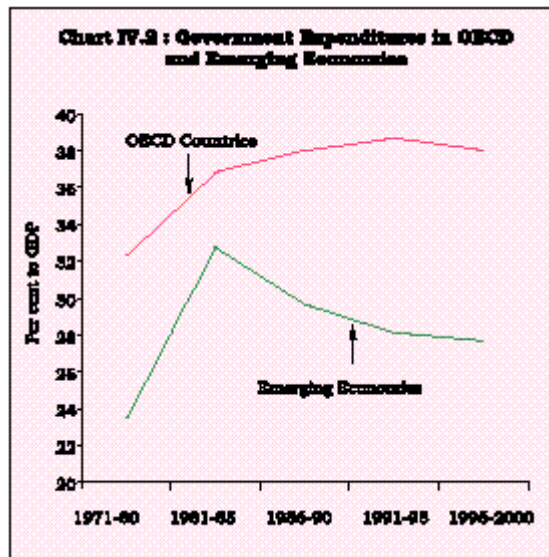
4.11 Another noteworthy feature of the fiscal adjustment in the 1990s has been efforts at strengthening fiscal frameworks: mechanisms to strengthen budgetary procedures and to enhance budget flexibility while strengthening expenditure control (Chart IV.1). The Maastricht Treaty and the subsequent Stability and Growth Pact in the euro area, the operation of a golden rule - borrowing only to finance capital spending - since 1997 in the UK and the Fiscal Responsibility Act of 1994 in New Zealand are a few landmarks of this evolution. An important aspect of the fiscal frameworks has been the focus on transparency. Based upon these frameworks, the IMF developed 'Code of Good Practices on Fiscal Transparency - Declaration of Principles' in 1998. The Code provides a benchmark for assessing fiscal transparency and as such represents a standard of fiscal transparency to which all countries should aspire (IMF, 2001). At the same time, reconsideration of the role of government has led to an expanded role for markets in the provision of hitherto exclusively public services, including contracting out of government services, liberalising public procurement, introducing user charges and using vouchers in the distribution of merit goods and services.



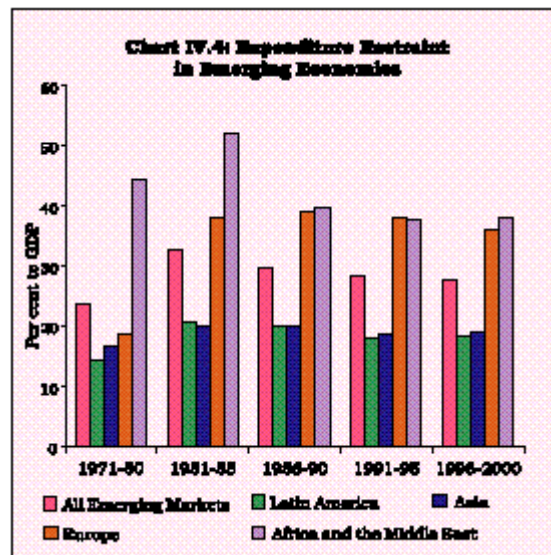
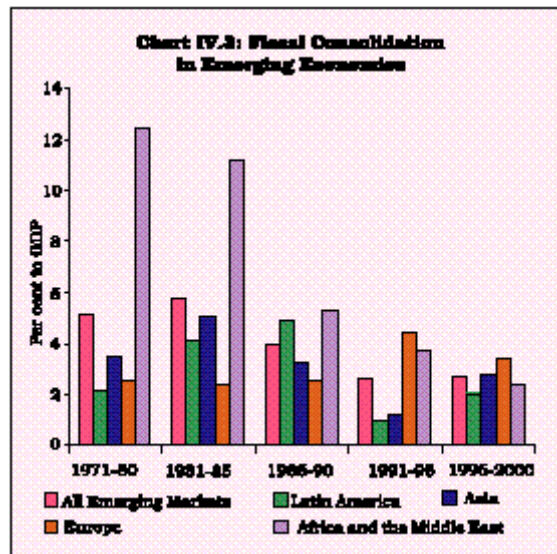
4.12 An important issue that emerges from the experience of the 1990s is whether fiscal consolidation achieved would be sustained in the future. In particular, the response of fiscal policy in the event of a future slowdown is uncertain since the current fiscal consolidation and institutional measures to support such fiscal adjustment are yet to face a cyclical downturn. In this regard, one of the important determinants of the likelihood of the success of fiscal adjustment is the composition of fiscal adjustment. In particular, fiscal adjustments that rely primarily on spending cuts in transfers and the government wage bill have a better chance of success than those relying primarily on tax increases and cuts in public investment (Alesina and Perotti, 1997). Based on this view, the recent fiscal strengthening appears to be durable as it has been achieved on the basis of expenditure reductions rather than revenue gains (IMF, 2001). On the other hand, after a relatively long episode of fiscal rigour, pent-up demand for public goods and services may result in more calls for increased government spending. With relatively strong fiscal positions, these calls may be met without a sufficiently careful assessment of the trade-off between alternatives or without a sufficient evaluation of the possible consequences of spending

choices (Atkinson and Noord, 2001).

4.13 As in the case of industrial economies, significant fiscal consolidation has also been witnessed in emerging economies since the 1980s. The fiscal deficit/GDP ratio for emerging market economies, as a group, which had increased from 5.1 per cent during the 1970s to 5.7 per cent during the first half of the 1980s, more than halved to 2.7 per cent of GDP during 1996-2000 (IMF, 2001). Although the expenditure-GDP ratio in emerging market economies has been substantially lower than in the OECD countries (Chart IV.2), the fiscal adjustment in the emerging economies, as in the OECD countries, has been based on expenditure reduction.



4.14 The adjustments in expenditures in emerging countries as a group have been more drastic than in the OECD countries with the expenditure-GDP ratio declining from 33 per cent in 1981-85 to 28 per cent in 1996-2000. With fiscal deficits in Asia already low, the improved outcome for the emerging economies was the result of efforts to contain the deficits in Africa/Middle Eastern and Latin American regions (IMF, 2001) (Charts IV.3 and IV.4) .



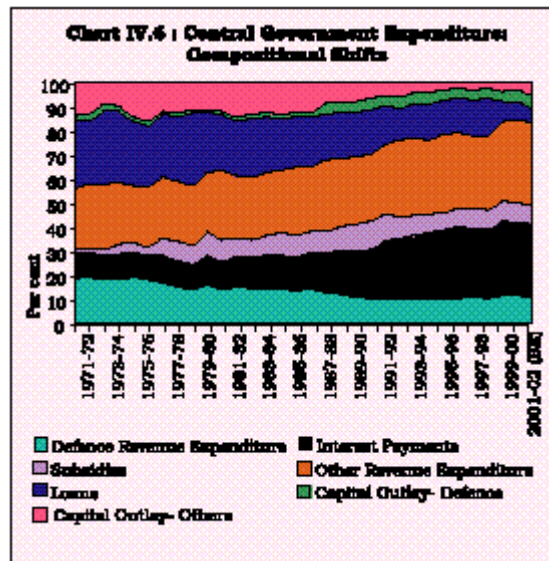
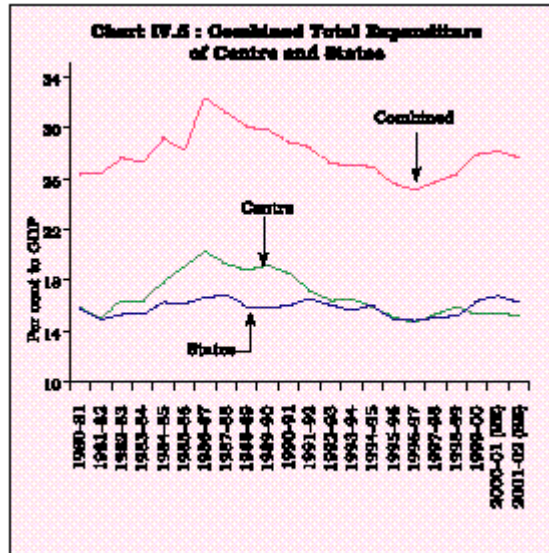
II. THE INDIAN EXPERIENCE

Stylised Facts

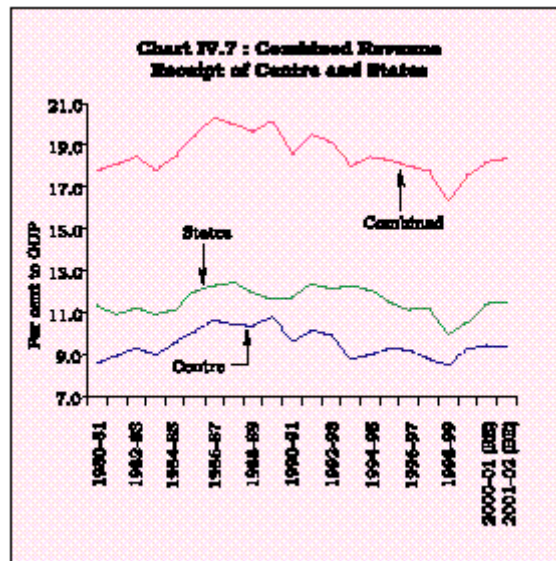
4.15 The debate on the role of deficit financing in development has raged since the 1950s. In the early years, it was argued that in a situation of supply constraints, the role of government expenditure in boosting national income through deficit financing is limited (Rao, 1952). Subsequently, the advocacy of deficit financing intensified. It is only in recent years that the poor performance of public sector units, difficulties in financing of public sector deficits, and implications for macroeconomic stability and growth have prompted a reconsideration of the role of fiscal policy in the growth process.

4.16 The 1970s was a period of moderate growth in public expenditure in line with revenue

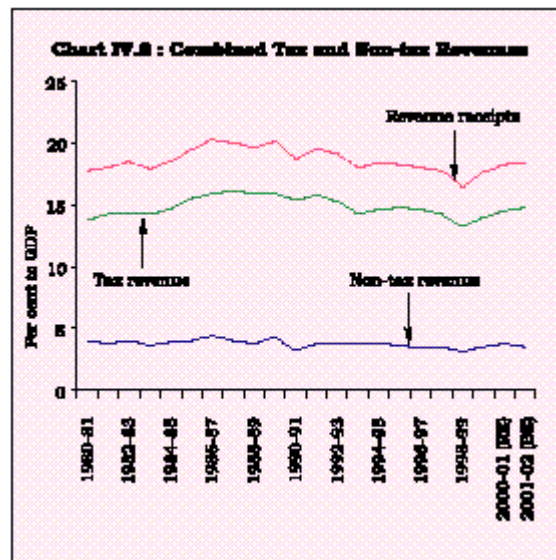
flows. During the 1980s, there was explosive growth, both in public expenditure and revenue, necessitating heavy borrowing requirements. The government expenditures, as a proportion to GDP, expanded from 26 per cent at the beginning of the 1980s to 30 per cent by the close of the decade (Chart IV.5). This was largely the outcome of rising interest payments (Chart IV.6).

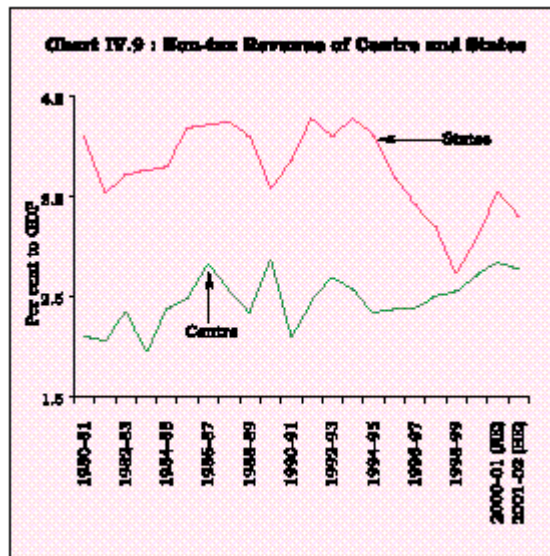


4.17 Over time and particularly since the 1980s, a distinct development has been the inability of revenues to keep pace with the expenditures. While total expenditure/GDP ratio increased by almost four percentage points during the 1980s, revenue receipts increased by only two percentage points over the decade (Chart IV.7).

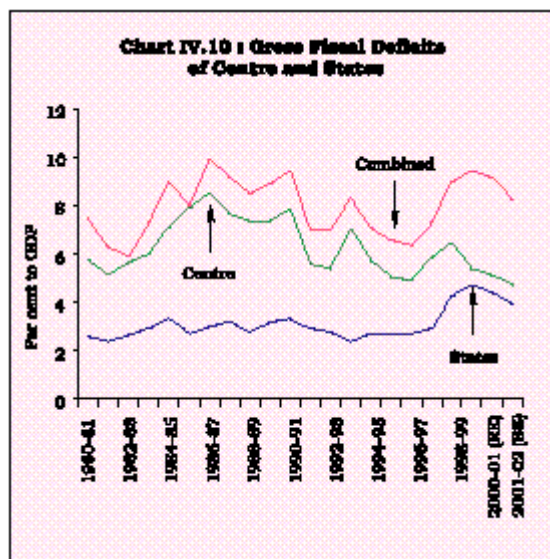


4.18 The sluggishness in revenues was mainly on account of non-tax revenues. While combined tax revenues-GDP ratio increased by more than 2 percentage points over the 1980s, the ratio of non-tax revenues to GDP did not show any improvement over the same period (Charts IV.8 and IV.9).

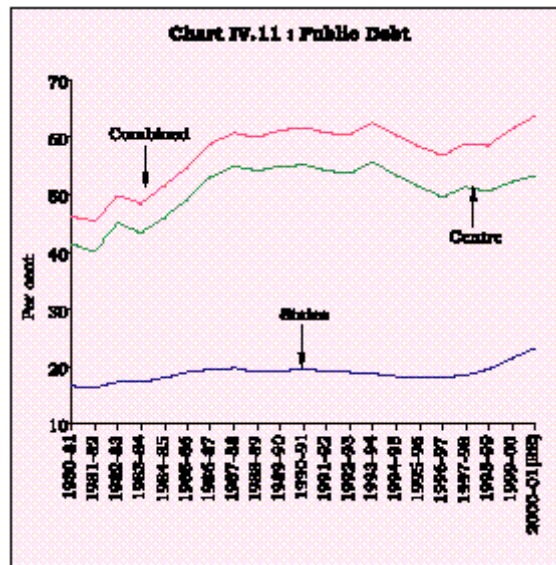




4.19 This widened the resource gap and the resultant growing borrowing requirements led to an accumulation of public debt. The growth rate of borrowing requirement (GFD) of the Government sector increased from around 17 per cent in the 1970s to 21 per cent in the 1980s. The fiscal deficit, as a result, escalated sharply and reached 9.4 per cent of GDP in 1990-91 (Chart IV.10) with a significant recourse to financing from small saving instruments.

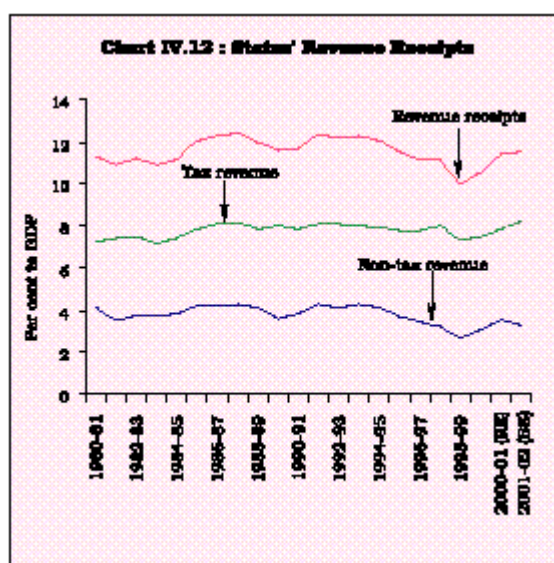


4.20 The continued fiscal imbalances have been reflected in growing public debt with the combined debt/GDP ratio of Central and State Government reaching 61 per cent of GDP by end 1980s (Chart IV.11). Systematic empirical evidence suggests that the high public debt spilled over to the external sector in the form of a deteriorating current account balance (Rangarajan and Mohanty, 1997).

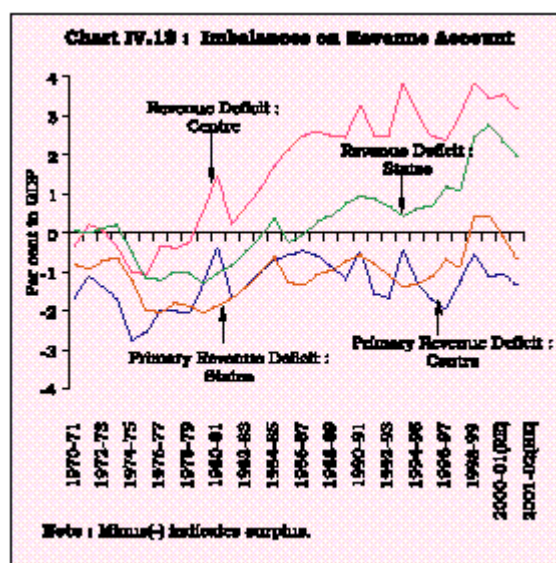


4.21 The crisis of 1990-91 and comprehensive economic reforms launched in its aftermath were underpinned by fiscal adjustment and consolidation, improvement in fiscal-monetary coordination, elimination of automatic monetisation of fiscal deficit, introduction of market-determined interest rates and reform in taxation and investment policies. The revenue receipts (as a proportion of GDP) declined in the aftermath of tax rationalisation. Some decline in tax revenue ratios in the short-run was expected due to downward revision in tax rates but this should have been at least partly made up by the removal of many exemptions and through improvements in tax administration (Chelliah, 2001). The structural transformation in the economy also impacted upon the tax revenue flows. Although the service sector contributes about 50 per cent to the GDP and has been growing at a relatively fast rate, it largely remains outside the purview of taxation.

4.22 There are structural weaknesses in the States' tax system (Chart IV.12). The sales tax, the principal source of tax revenue for the States, is not adequately progressive operationally. Secondly, a potential area for revenue generation, *viz.*, agricultural sector, which comes under the purview of States, remains unexploited. Thirdly, competitive tax rate setting among States has affected the overall tax buoyancy of State taxes.



4.23 A major weakness of government finances has been the inability to curtail revenue expenditures. Although the revenue deficit-GDP ratio declined through the first half of the 1990s in the immediate aftermath of fiscal adjustment, the ratio increased over the second half of the decade and was, in fact, higher than at the beginning of the previous decade (Chart IV.13).



4.24 The structural character acquired by revenue imbalances during the 1990s has been a critical factor underlying the rigidity of fiscal imbalances and explains as to why fiscal correction has not been durable during the 1990s (Table 4.2). Thus, the combined fiscal deficit at the end of the decade was the same as at the beginning at around nine per cent of the GDP. The reduction in the fiscal deficit at the Centre which has also followed a *zig-zag* path has been off-set by a rise in the fiscal deficit of the States (Rangarajan, 2001).

Table 4.2: Fiscal Performance: Combined Government Sector

Item	1971-80	1981-90	1991-2000
------	---------	---------	-----------

	A	B *	A	B	A	B
1	2	3	4	5	6	7
Revenue	15.9	16.2	19.0	16.1	18.2	13.5
T a x	12.6	15.8	15.0	16.0	14.6	13.6
Non-Tax	3.4	17.9	4.0	16.7	3.6	13.5
Total Expenditure	23.0	15.3	28.8	16.5	26.9	14.2
Revenue	15.0	15.9	20.6	18.2	22.4	15.1
Capital	7.9	14.4	8.2	13.0	4.5	10.3
Combined GFD	4.7	16.5	8.0	20.6	7.7	16.8
Outstanding Debt	44.7	10.8	53.7	18.2	60.6	15.0
Domestic	34.5	12.8	47.0	19.4	56.3	15.6
External	10.2	5.4	6.7	11.0	4.3	7.6

A : Percentage to GDP.

B : Average Growth Rate.

* Data pertain to 1972-80.

Expenditure Performance

4.25 Countries undertaking fiscal stabilisation attempt to offset increases in interest payments and other transfer obligations by winding back public investment. In periods of restrictive fiscal policies and fiscal consolidation, capital expenditures are the first to be reduced and often drastically, given that they are the least rigid components of expenditures (Roubini and Sachs, 1989). As these expenditures, especially those meant for basic infrastructure, are not adequately compensated by the private investment, this may ultimately result in adverse implications for output growth. In India, current expenditures are assuming a larger proportion of government expenditure, mainly driven by consumption expenditures and transfer payments *viz.*, interest payments and subsidies. On the other hand, social sector expenditure comprising mainly, education, medical facilities, public health, family welfare and sanitation showed a steady deterioration, particularly in the 1990s. The deterioration in the allocations under social sector is sharper in the Centre than in States. Another adverse consequence of the deterioration in revenue/GDP ratio has been the discretionary cut back in public investment in productive sectors raising the issue of the quality of fiscal adjustment and this may have been an important factor underlying the resurfacing of fiscal pressures over the second half of the decade.

State Finances

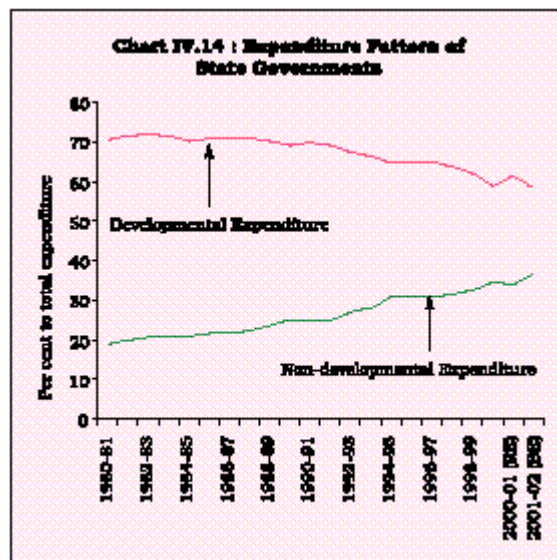
4.26 Assignment of functions and sources of finances among different tiers of government is crucial for the efficient organisation of any federal fiscal system. To enhance welfare gains, the lower level jurisdictions would have to provide all public services of a non-national character and thereby promote growth. According to the decentralisation theorem (Oates, 1972), so long as there are no scale economies, the sub-Central provision of public services results in welfare gains. The gains will be greater, the larger the variation in the preferences for public services. Therefore, progressive and mobile tax base should be assigned primarily to the Central Government, and the sub-Central units should raise revenues mainly through user charges, benefit taxes and taxes on relatively less mobile base (Musgrave, 1983).

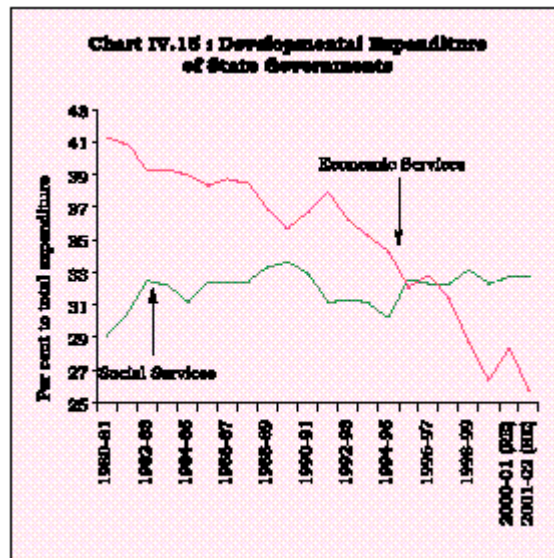
4.27 The Indian constitution provides for demarcation of functional responsibilities and finances between the Centre and the States. The provision of public services has been largely entrusted to the States. These mainly relate to law and order, public health, sanitation, water supply and

agriculture. The States have to concurrently take certain functions in areas such as education, infrastructure. Their share in combined expenditure (Centre and States) on social services is about 85 per cent, while in the case of economic services, it is about 60 per cent. Thus, the States have the primary responsibility to undertake tasks pertaining to developing social and economic infrastructure. However, their ability to undertake such developmental functions is critically determined by their financial position.

4.28 The fiscal position of the State Governments has been under stress since the mid-1980s. The stress stems from the inadequacy of receipts in meeting the growing expenditure requirements. The low and declining buoyancies in both tax and non-tax receipts, constraints on internal resource mobilisation due to losses incurred by State public sector undertakings, electricity boards and decelerating resource transfers from the Centre have resulted in rising fiscal deficit of the State Governments with an accompanying surge in the outstanding stock of debt.

4.29 Reflecting the fiscal stress, the expenditure for developmental activities, which are directly related to growth, has suffered; on the other hand, expenditure on non-developmental purposes, largely committed, has witnessed a steady rise (Chart IV.14). A rigid distinction between developmental and non-developmental expenditure with regard to their contribution to growth is somewhat difficult since certain non-developmental expenditure items such as expenditure on administrative services also exercise some influence, although of an indirect nature, on economic development. Within the developmental expenditure, the relative importance of social services has increased even though its share in total expenditure has been broadly stable (Chart IV.15). This outcome is due to a steady decline in the share of expenditure on economic services in total expenditure of States.





4.30 The crucial issue, therefore, is to bring about improvement in the State finances with a view to restructuring the expenditure in favour of developmental expenditure in order to enable a higher growth. Fiscal adjustments based predominantly on expenditure reduction, particularly when government expenditure in India are already substantially lower than that in the OECD countries, may involve welfare losses and could also have adverse implications for the growth process. As against this, the fiscal strategy based on revenue maximisation would provide the necessary flexibility to alter the pattern of expenditure so as to ensure productive utilisation of resources. A major challenge for the States in the medium-term is to raise the tax-GDP ratio, which has declined over the years. In addition, the States would need to enhance non-tax revenues, especially through cost recovery in respect of commercial services to ensure appropriate rate of return on their investment. During the 1990s, the cost recovery from social services in the form of revenue receipts has been 0.1 per cent of GDP as against the public expenditure of 5 per cent of GDP in providing these services. Tax-revenues can be raised through broadening the tax base, taxing untapped / under-tapped sources, rationalizing tax rates, introducing uniform value added tax, taxing agricultural income and raising efficiency in tax collections.

Fiscal Options from the Current Debate

4.31 It is in this milieu of the deterioration seen in public finances that the debate on role of fiscal policy in revitalising growth has reached a crossroad with one view arguing for expansionary fiscal policy and the other highlighting the costs of higher fiscal deficits. Large fiscal deficits are not regarded as being inimical to growth as long as the government borrowing finances investment expenditures. On the whole, it is believed that it would be counterproductive to insist that fiscal deficit should be brought down to zero or drastically low levels. It is also argued that current imbalances in public finances lie not so much in the overall fiscal deficit but more in the composition of government expenditure (cutback in public investment, inadequate expenditure on education and health) and modes of financing (reliance on high cost borrowing instruments). Substantial increase in government expenditure on investment, especially in agriculture and infrastructure facilities, roll-back of public consumption expenditure to the level obtained in the

early 1980s, reduction in subsidies that affect current rather than the future production and income distribution, and enhancement in social sector expenditure in general and primary education and health services in particular are advocated. On the financing side, a greater reliance on monetisation is suggested: as against the actual ratio of less than one per cent during 1996-2000, a monetised deficit of 2.5 per cent of GDP is considered a safe limit (Rakshit, 2000).

4.32 In the context of contractionary features inherent in public policies, there is a call for a decisive expansionary public policy - a 'concentrated approach' or 'imbalanced growth' strategy *a la* Hirschman - with additional expenditure of Rs.15,000-16,000 crore per annum over the next five years, distributed over four key infrastructure sectors. Towards this objective, deployment of surfeit liquidity in the financial system in a supply-leading strategy outside the budgetary programmes is recommended (Shetty, 2001).

4.33 An important issue of debate has been the crowding-in/out aspect of public investment on private investment; crowding-out is essentially a short-run phenomenon while crowding-in could take place in the medium-term, when, and if, the additional productive public investment yields results. Borrowings should be utilised only to finance capital expenditure. Given the household financial savings, the overall fiscal deficit - termed 'stable growth deficit' - of the government sector, as a whole, should be pegged at 6 per cent of GDP with the revenue deficit being gradually phased out (Chelliah, 2001).

4.34 Given the serious concerns expressed on the fiscal position in the country, an important institutional step envisaged in this direction is the Fiscal Responsibility and Budget Management Bill (FRBM), 2000. The FRBM approaches the issues of inter-generational equity in fiscal management and long-term macro-economic stability by envisaging complete elimination of revenue deficit by March 2006, generation of sufficient revenue surplus in the subsequent periods and reduction of the fiscal deficit-GDP ratio to 2 per cent by the Central Government by end-March 2006. The Bill also envisages a reduction in total liabilities (including external debt at current exchange rates) of the Centre to no more than 50 per cent of GDP by March 2011. In a similar vein, the Eleventh Finance Commission (GoI, 2000) stresses the need to completely eliminate the revenue deficit, generate primary surplus and reduce the fiscal deficit-GDP ratio of the State Governments to 2.5 per cent by the year 2004-05. While FRBM is an important step towards reforming the Indian public finances, concerns have been expressed about inflexibility to pursue counter-cyclical fiscal policy. The proposal of the FRBM to reduce the fiscal deficit to low levels may be counter productive as it may fail to sustain high rates of economic growth (Bagchi, 2001).

4.35 Such fiscal frameworks with legislative backing have been enacted in a number of countries in the recent years (Table 4.3) and the recent fiscal consolidation in the OECD countries is attributed partly to such frameworks (IMF, 2001).

Table 4.3 : Fiscal Targets and Frameworks

Deficit Measure	Level of Government	Targets for India		Selected International Frameworks
		FRBM Target (As per cent to GDP)	EFC Target (As per cent to GDP)	
1	2	3	4	5

Fiscal Deficit	Centre	2.0	4.5	EU: Medium-term objective close to balance or in surplus with a ceiling of 3.0 per cent in cyclical downturns. United Kingdom (UK): Borrowing only to finance investment (golden rule). Argentina: Fiscal Balance by 2005.
	States		2.5	
	Combined		6.5	
Revenue Deficit	Centre	0	1.0	
	States		0.0	
	Combined		1.0	
Total liabilities	Centre	<50	48	EU: 60 per cent of GDP. UK: 40 per cent of GDP.
	States			
	Combined		55	

FRBM: Fiscal Responsibility and Budget Management Bill.

EFC: Eleventh Finance Commission.

EU: European Union.

Two contrasting views on the ability of these frameworks to improve public finances are found in the literature. The 'institutional irrelevance view' holds that such fiscal frameworks may not succeed as the budget rules can be circumvented by modifying accounting practices and changing the nominal timing or other classification of taxes and expenditure, *i.e.*, the rules-based systems may be by-passed through creative accounting (Reischauer, 1990; Auerbach, 1994 and IMF, 2001). The 'public choice view' stresses that fiscal institutions place important constraints on the behaviour of political actors. Given the relatively short period and limited number of countries with such regimes, the empirical success of such regimes remains to be tested. Nonetheless, the limited evidence suggests that such institutions improve the fiscal outcome and hence, the fiscal institutions do matter (Gramlich, 1990; von Hagen and Harden, 1995 and Poterba, 1997).

III. FISCAL POLICY, ECONOMIC STABILITY AND GROWTH: AN EMPIRICAL FRAMEWORK

Cyclical and Structural Fiscal Deficits

4.36 In this section, the case for an expansionary fiscal policy in the context of the current downturn is examined within the framework of a small, testable model of the fiscal dynamics in India. It needs to be recognised that not only does the fiscal stance affect output, but the variability of output - imbalances between aggregate demand and aggregate supply - can also feedback on to the realised fiscal deficit. Given this simultaneity, an important question is to examine the design of fiscal policy to see whether fiscal policy automatically smoothens the business cycle or discretionary interventions are required. This aspect is usually examined by decomposing the actual fiscal deficit into a structural component (unresponsive to cycles in the economy) and a cyclical component (responsive to cycles).

4.37 As the economy slows down, revenues of the government, at unchanged tax rates, are expected to decline while its expenditure - say, on anti-poverty schemes, unemployment benefits - would increase. Thus, the cyclical component of the fiscal balance is expected to turn negative as the economy slows and *vice versa*. With the structural balance unchanged, the actual fiscal

deficit would widen in the event of a slowdown. In such a case, the behaviour of the cyclical fiscal deficit is stabilising and the fiscal policy has an automatic stabiliser. If the cyclical component is strong, this obviates the need for a discretionary fiscal policy. The cyclical balance, though, need not work always in this fashion; its operation may be pro-cyclical and aggravate the swing in economic activity. In an extreme case, the cyclical component may be absent if private sector savings behave in a Ricardian manner, *i.e.*, households step up savings in reaction to deteriorating fiscal balances. Such private sector savings reactions are expected to be more likely if the public debt is already high and private sector expects tax increases in the future. Under these circumstances, the in-built stabiliser part of fiscal policy would be ineffective. Accordingly, in the 1990s, the governments have increasingly supplemented/counteracted the cyclical component with discretionary policy changes (IMF, 2001) - for instance, reduction in tax rates or increased public spending or a combination of both to boost aggregate demand - to strengthen the growth impulses.

4.38 For OECD countries, automatic stabilisers have generally reduced cyclical volatility in the 1990s (Noord, 2000). However, since some of these countries had to undertake fiscal consolidation to improve public finances to meet the Maastricht criteria, the governments were forced to take discretionary actions that have reduced, or even offset, the effect of automatic stabilisers. By avoiding the hysteresis effects that may arise due to sharp economic fluctuations, fiscal stabilisers are conducive to long-run growth. In the Indian context, estimates have shown that structural deficit is quite predominant; the cyclical component, on the other hand, though present, is not significant (RBI, 1999; Pattnaik *et al*, 1999).

4.39 The first testable hypothesis is, therefore, to check for an automatic stabilising cyclical component in fiscal policy in India and its size. Following Giorno *et al* (1995) and Noord (2000), the cyclical and structural fiscal deficits are calculated by estimating structural revenues and structural expenditures, *i.e.*, revenues and expenditures that would have prevailed had the actual output been at its potential level. The cyclical component of the fiscal deficit is then derived as the difference between the structural components of government revenues and expenditures from their actual levels¹. Interest payments, given their contractual nature, are assumed to be impervious to cyclical movements in output. Moreover, the methodology assumes that the elasticity of revenues and expenditures is same across cyclical and trend (potential) output.

4.40 The first step in this process is, therefore, to estimate elasticities of revenues and non-interest expenditure of the government - both Centre and States separately as well as combined - with respect to actual output. The estimates indicate that elasticity of receipts of the combined government sector at 1.07 is fractionally higher than that of 1.06 for non-interest expenditures, indicating the operation of automatic fiscal stabiliser. Based on these elasticity estimates, the cyclical and structural components of fiscal deficits are presented in [Table 4.4](#).

4.41 The estimates confirm the predominance of the structural deficit. The cyclical component, as in previous studies, is not large in magnitude. Over the period, 1981-2001, the cyclical fiscal balance has ranged between a deficit of 0.12 per cent of GDP and a surplus of 0.21 per cent of GDP as against the actual deficit of around 8.0 per cent of GDP (Chart IV.16). Given the small size of the automatic stabiliser, counter-cyclical measures would have to depend upon discretionary fiscal actions.

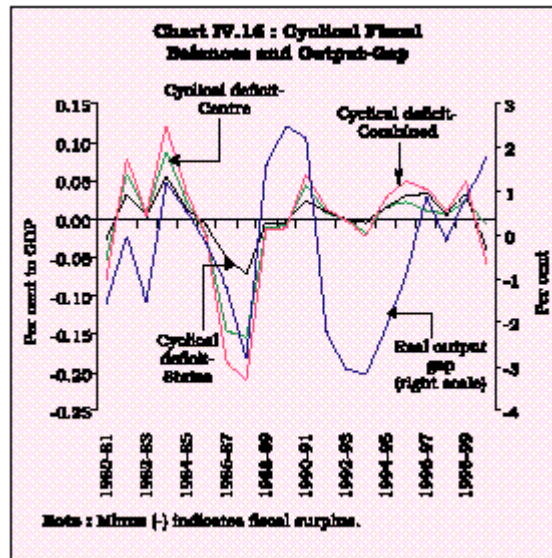


Table 4.4: Structural and Cyclical Fiscal Deficits

(As per cent to GDP)

Year	Centre			States			Combined		
	SD	CD	AD	SD	CD	AD	SD	CD	AD
1	2	3	4	5	6	7	8	9	10
1980-81	5.83	-0.05	5.77	2.61	-0.03	2.58	7.58	-0.08	7.50
1981-82	5.08	0.06	5.14	2.38	0.03	2.41	6.21	0.08	6.29
1982-83	5.64	0.01	5.64	2.65	0.00	2.65	5.90	0.01	5.90
1983-84	5.85	0.09	5.94	2.84	0.05	2.90	7.16	0.12	7.28
1984-85	7.07	0.02	7.09	3.33	0.01	3.34	8.93	0.03	8.97
1985-86	7.88	-0.02	7.86	2.71	-0.01	2.71	8.00	-0.02	7.98
1986-87	8.61	-0.15	8.46	3.03	-0.05	2.98	10.08	-0.19	9.89
1987-88	7.79	-0.15	7.63	3.24	-0.07	3.17	9.36	-0.21	9.15
1988-89	7.35	-0.01	7.33	2.77	-0.01	2.77	8.53	-0.01	8.51
1989-90	7.34	-0.01	7.33	3.18	-0.01	3.17	8.88	-0.01	8.87
1990-91	7.80	0.04	7.85	3.28	0.02	3.30	9.36	0.06	9.42
1991-92	5.55	0.01	5.56	2.89	0.01	2.89	7.01	0.01	7.02
1992-93	5.37	0.00	5.37	2.79	0.00	2.79	7.00	-0.01	7.00
1993-94	7.03	-0.02	7.01	2.40	-0.01	2.40	8.28	-0.02	8.26
1994-95	5.68	0.02	5.70	2.72	0.01	2.73	7.05	0.03	7.07
1995-96	5.05	0.02	5.07	2.62	0.03	2.65	6.49	0.05	6.54
1996-97	4.87	0.01	4.88	2.69	0.03	2.72	6.34	0.04	6.38
1997-98	5.83	0.01	5.84	2.90	0.01	2.90	7.26	0.01	7.27
1998-99	6.42	0.02	6.45	4.19	0.03	4.22	8.88	0.05	8.93
1999-2000	5.36	-0.01	5.35	4.71	-0.04	4.67	9.50	-0.06	9.44
2000-2001	5.14	-0.01	5.13	4.44	-0.08	4.36	9.28	-0.14	9.14

CD : Cyclical Deficit

SD : Structural Deficit

AD : Actual Deficit.

Note: (-) indicates surplus.

Crowding-In/Out Aspect of Government Activity

4.42 Once the case for an expansionary fiscal policy is admitted, the issue that arises is its impact on the rest of the economy or more precisely, whether or not the higher government expenditure

crowds in private consumption and investment. For counter-cyclical discretionary fiscal actions to be effective, the reaction of the private sector should not negate the demand impulse stemming from the fiscal impulse. A number of studies that have estimated private sector behaviour in India suggest that crowding-out/ in effect of public investment is sector-specific. Public investment exerts a short-run crowding-out but establishes long-run complementarity with private investment (Sundarrajan and Thakur, 1980). In the case of total private investment, the positive effect (complementarity) almost cancels out the negative effect (crowding-out), whereas in the case of private corporate investment, the positive effect seems to dominate the negative effect (Rangarajan, 1982). Other studies indicate that while there is some complementarity in certain sectors, the evidence on the overall impact of public investment on private investment is not definitive (Krishnamurthy and Saibaba, 1982 and Bhattacharya *et al* 1994). The long-term complementarity of public and private investment was also underscored by Pillai *et al* (1997).

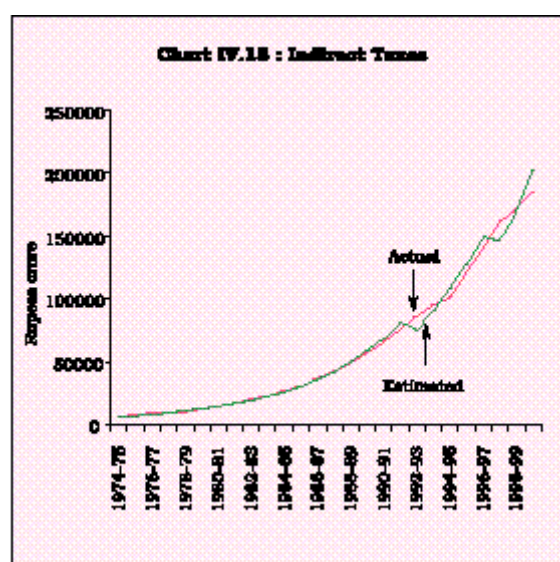
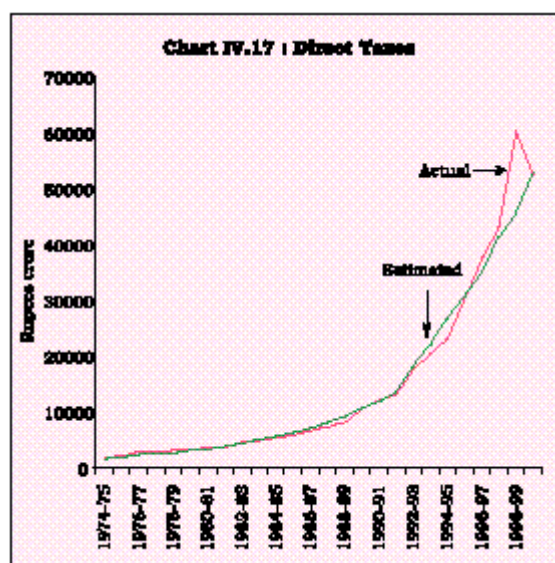
4.43 In view of the differential behaviour of different components of government activities on private sector suggested in the survey of the literature, this section undertakes a detailed assessment of the interaction between government activities and private sector behaviour. In particular, the behaviour of the direct taxes, indirect taxes, public sector consumption expenditure, public sector capital formation (manufacturing and infrastructure separately), private sector consumption and private sector investment expenditure in terms of their determinants over the period 1972-73 to 1999-2000 is studied. Moreover, in contrast to the earlier section on cyclical/ structural deficits, the model attempts to isolate the response of the government's budgetary components and private sector behaviour to cyclical and trend output. As mentioned earlier, cyclical output is measured by the imbalance between aggregate demand and aggregate supply. This requires the estimation of the behaviour of various components of aggregate demand and aggregate supply (examined in disaggregation in Chapter III), within a full scale macroeconomic model of the economy. This is undertaken in Chapter VIII. A reasonable approximation of the behaviour of cyclical output can, however, be obtained from the deviations of actual output from its underlying trend. These measures of cyclical output are highly correlated with the difference between aggregate demand and supply obtained from the macro-model in Chapter VIII. The results of the estimated equations are discussed below, followed by the results of model simulation.

Government Revenues

4.44 Direct tax revenues are positively related to the trend output with a long-run elasticity of almost unity (0.95). The cyclical output also has a positive impact, with a lag, on direct taxes, although the impact is fairly negligible (a long-run semi-elasticity of 0.02)². Indirect tax revenues exhibit a similar behaviour ([Table 4.5](#)). The elasticity of indirect tax revenues³ with trend output is estimated at 1.18. The elasticity with respect to cyclical output at 0.01 is almost negligible, as in the case of direct taxes. The lagged impact of cyclical output indicates the presence of leads in tax collections. The estimated series track the actual series fairly closely for both the tax components (Charts IV.17 and IV.18).

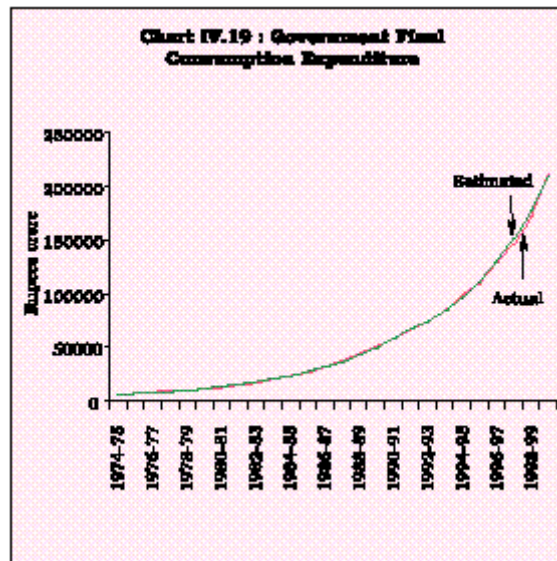
Table 4.5 : Elasticity of Major Government Revenues

Variable	Direct Taxes	Indirect Taxes
1	2	3
Trend Output	0.95	1.18



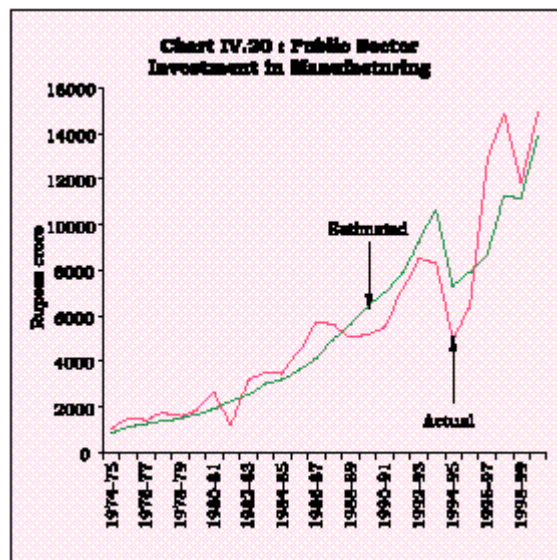
Government Consumption Expenditure

4.45 On the expenditure side, government final consumption expenditure turns out to be impervious to cyclical output⁴. The elasticity of government final consumption expenditure with respect to trend output is estimated at 1.14, *i.e.*, a 10 per cent increase in trend output leads to an almost 11 per cent rise in consumption expenditures. The high elasticity highlights the inability of the government to restrict its consumption expenditures and has been an important factor underlying the weakness in public finances. The estimated series mirrors the actual expenditures closely (Chart IV.19).



Public Sector Investment in Manufacturing Sector

4.46 Investment plays an important role in increasing the productive capacity of the economy. Public investment occurs both in manufacturing and infrastructural sectors. Public investment in manufacturing is strongly influenced by trend output with an elasticity of almost unity⁵. It also responds to business cycles in a pro-cyclical manner although the magnitude is negligible (Chart IV.20).



Public Sector Investment in Infrastructure Sector

4.47 As regards public sector capital formation in infrastructure, it increases in line with trend output with an elasticity of 0.53⁶ (Table 4.6). The lower elasticity of infrastructural investment appears to be the outcome of the substantial increases in government consumption expenditures (more than unit elasticity as estimates of the consumption behaviour indicated) leaving relatively

less resources for investment (Chart IV.21).

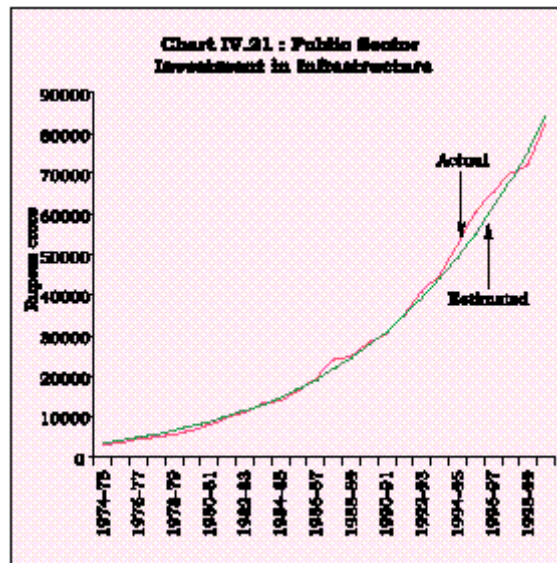


Table 4.6: Elasticity of Major Government Expenditures

Elasticity with respect to	Government Final Consumption Expenditure	Public Sector Investment in Manufacturing	Public Sector Investment in Infrastructure
1	2	3	4
Trend Output	1.14	0.96	0.53
Cyclical Output	—	0.04	—

Private Sector Consumption Behaviour

4.48 Turning to private sector consumption behaviour, the immediate response of private sector consumption to output changes is pro-cyclical. The impact of cyclical output, however, is negligible with the estimated semi-elasticity being 0.01, *i.e.*, a 10 per cent increase in cyclical output increases private consumption by only 0.1 per cent. Direct taxes have an expected negative impact on private consumption with short-run and long-run elasticities of 0.1 and 0.2. The estimated elasticity indicates that a 10 per cent reduction in direct taxes will increase private consumption by almost 1 per cent in the same year and by 2 per cent over time. Government (non-interest) transfer payments and government consumption expenditures have positive contemporaneous effects on private consumption, although the effect of the latter is not significant. Both these components, however, crowd out private sector consumption with a lag⁷. An increase of 10 per cent in government non-interest transfer payments increases private consumption by around 0.8 per cent in the current year and reduces it by 0.6 per cent in the subsequent year (Table 4.7). In response to an increase of 10 per cent in government consumption expenditure, private consumption declines by 2.5 per cent, with a lag, indicating Ricardian behaviour by economic agents, *i.e.*, individuals increase their savings in expectations of higher taxes in the future. Overall, the estimates suggest that government consumption

activities do not have a lasting effect on private consumption. The estimated series tracks the actual private sector consumption movements quite closely (Chart IV.22).

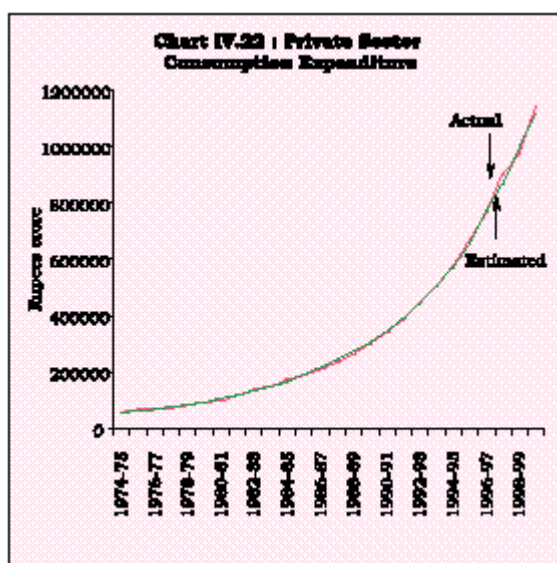


Table 4.7 : Elasticity of Private Consumption

Variable	1	2
Cyclical Output		0.02
Direct Taxes		-0.16
Transfer Payments		0.19
Government Final Consumption Lagged		-0.58

Private Sector Investment Behaviour

4.49 Private sector investment behaviour responds significantly to trend output⁸. The estimated elasticity of 0.9 indicates that an increase of 10 per cent in trend output induces almost a similar order of increase in private investment. Business cycles do not appear to exercise any significant impact suggesting that investment, particularly fixed investment decisions are based on long-horizons, impervious to cyclical fluctuations. Public sector investment in manufacturing has a negative effect on private investment, *i.e.*, government manufacturing investment crowds out private investment. An increase of 10 per cent in government manufacturing reduces private investment by more than one per cent with a one-year lag. This finding supports the view that public investment in manufacturing utilises scarce physical and financial resources that would otherwise have been available to the private sector and that the output of this sector may also be competing with that of the private sector.

4.50 On the other hand, government investment in infrastructure has a positive impact on private investment with a 10 per cent rise in the former inducing an increase of 3 per cent in the latter. The crowding-in of private investment suggests that the public sector infrastructure investment may be increasing the productivity of the capital in the economy which, by raising domestic output attracts higher private investment. Moreover, the comparison of the estimates reveals that

the crowding-in effect of infrastructure investment is stronger than the crowding-out effect of manufacturing suggesting that government investment could be concentrated in infrastructure activities. While the government investment *per se* induces private investment, it may at the same time enlarge the fiscal deficit which, in turn, could have an adverse influence on private investment. The estimates indicate such a negative and significant effect with elasticity of (change in) fiscal deficit at 0.3, *i.e.*, an increase of 10 per cent in the fiscal deficit could reduce private investment by almost three per cent (Table 4.8). Estimated and actual private investment are set out in Chart IV.23.

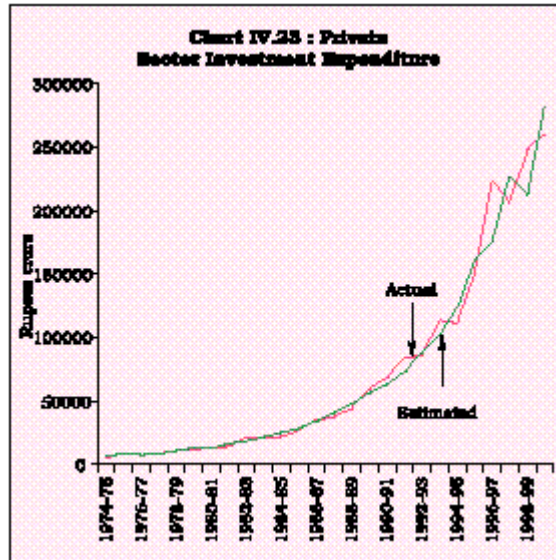


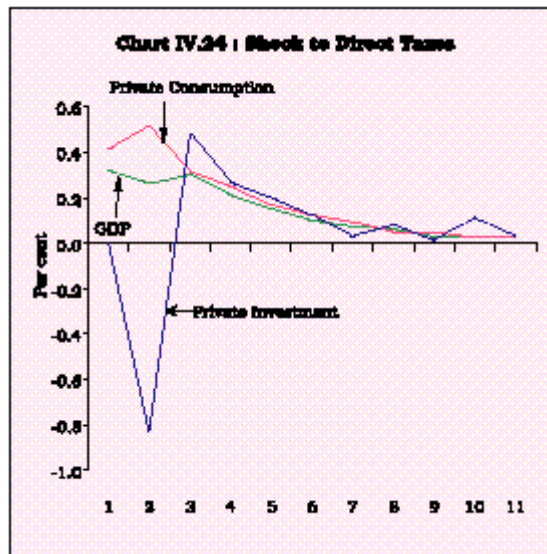
Table 4.8 : Elasticity of Private Investment

Variable	
1	2
Public Investment in Manufacturing	-0.12
Public Investment in Infrastructure	0.32
Fiscal Deficit	-0.30

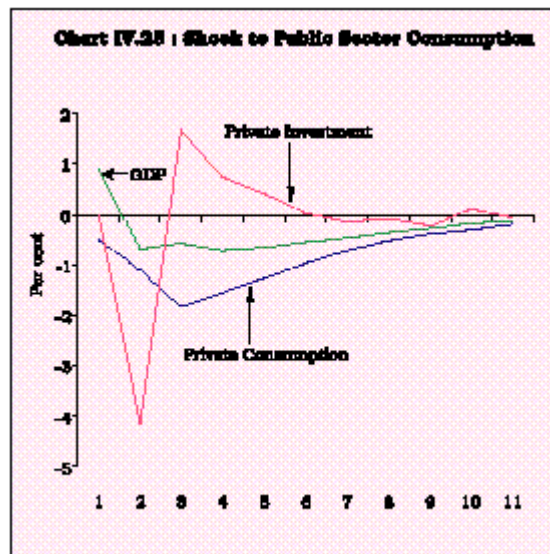
Model Simulation

4.51 The model was simulated to see the implications of pump-priming the economy through alternative instruments at the disposal of the government. In particular, shocks of 10 per cent each were given to direct taxes, government final consumption expenditure, public sector investment in infrastructure and public sector investment in manufacturing.

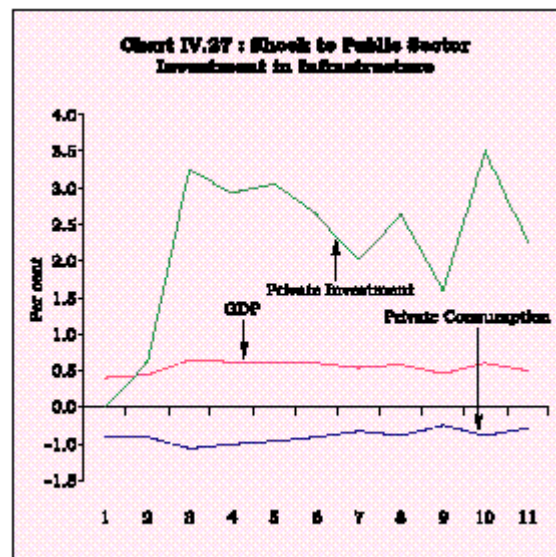
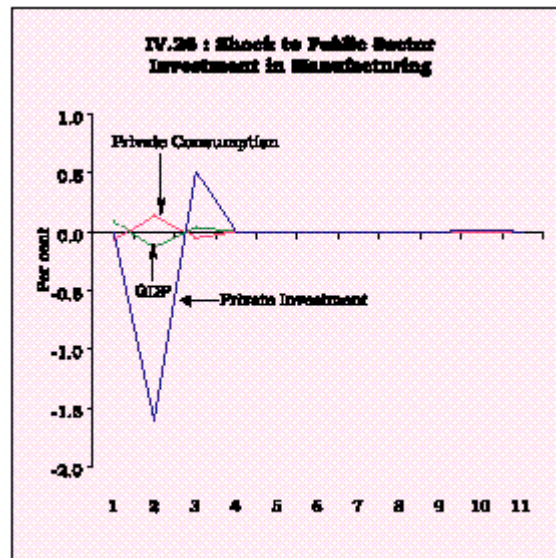
4.52 A reduction of 10 per cent in direct taxes increases private consumption by 0.4 per cent in the same period and by another 0.5 per cent in the next year with the impact dampening over time. Private investment declines by 0.8 per cent, with a lag, as reduction in taxes enlarges the fiscal deficit, depressing the private investment. The reduction in private investment partially offsets the boost to consumption. Nominal output rises by 0.3 per cent in the year of the shock and the impact weakens over time (Chart IV.24).



4.53 A 10 per cent increase in government final consumption expenditure leads to a contemporaneous increase of one per cent in output. It leads to a decline of around 4 per cent in private investment with a lag as the higher government consumption expenditure feeds into an increase in the fiscal deficit. Private consumption is also crowded out. The initial output increase is offset by subsequent declines (Chart IV.25).



4.54 As regards shocks to government investment, the results display a differential behaviour: while private investment is 'crowded-in' in case of public sector's infrastructure investment, the manufacturing investment crowds out the private investment. The enlarged fiscal deficit dampens the positive effect on private investment in both cases. On a net basis, infrastructure investment still has a crowding-in effect. Finally, the impact of infrastructure investment shock on output growth remains positive in the case of manufacturing investment; in the case of manufacturing investment, output gains turn negative (Charts IV.26 and IV.27).



4.55 In brief, the results show that raising public sector consumption to boost aggregate demand in the economy crowd-out both private consumption and investment with no long-lasting impact on output. Infrastructure investment by public sector crowds in private investment. Pump-priming *via* public investment in manufacturing has a negative impact on private investment. The results stress the need for a restructuring of the composition of government expenditure in favour of investment in infrastructure while ensuring that (i) the fiscal deficit is unchanged or even reduced; and (ii) such investment is contingent upon enforced financial discipline emphasising cost recovery and productivity gains.

IV. LIMITS OF FISCAL POLICY FOR GROWTH

Fiscal Sustainability

4.56 An important objection against the pump-priming variety of fiscal activism, at the present

uncture, is the concern about sustainability of the present state of public finances. The declining trend in the debt/GDP ratio witnessed in the early 1990s has reversed since 1997-98 with the debt of state governments exhibiting an inertia (Chart IV.11). With the interest rate on government securities becoming market-related, the weighted average cost of government securities rose to a peak of 13.8 per cent in 1995-96 before moderating to 11.0 per cent in 2000-01. Furthermore, interest rates on public account liabilities, which include small savings and provident funds, grew significantly. With a view to smoothening the inter-temporal maturity pattern and to reduce the interest cost and in the context of reduced investor appetite for longer-bonds, the market borrowings of the government were placed at the shorter- and medium-end of the market during the 1990s. As a result, securities with short- and medium term maturity (under 5 years) as a proportion of total outstanding dated securities rose sharply from 9 per cent at end-March 1991 to 35 per cent at end-March 2001 with consequent bunching of securities for redemption and frequent roll-over of such short-term issues. Besides the explicit debt, there has been a rise in contingent liabilities in the form of guarantees extended by the Government.

Guarantees are emerging as the alternative fiscal instrument to meet fund requirements of state level bodies. At present, outstanding guarantee obligations given by the Central and State government together account for around 11 per cent of GDP. The secular increase in combined public debt has, therefore, brought serious concerns about the sustainability of the existing fiscal policies.

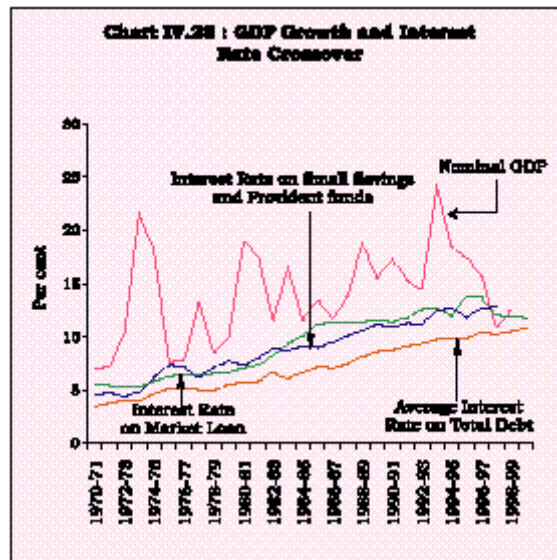
Debt Dynamics

4.57 Debt may be considered sustainable if the debt/output ratio does not grow to explosive proportions. A necessary condition for stability is the Domar's Debt Stability Equation: $b(r-g) - z = 0$, where b is debt/GDP ratio, r is real interest rate on government debt, g is real output growth and z is primary deficit/GDP ratio. The Domar stability condition holds if g exceeds r ; debt-GDP ratio is likely to be stable provided primary balance is either zero or positive (not very large if it is negative). With r higher than g , debt-GDP ratio would be rising if primary balance is either zero or negative. Thus, even if growth in output exceeds the real interest rate, a large initial primary deficit may lead to rise in debt/GDP ratio. In other words, the condition ' r is less than or equal to g ' would also require that the initial debt stock equal the present discounted value of primary surpluses in the future (Lahiri and Kannan, 2001; Blanchard, 1980).

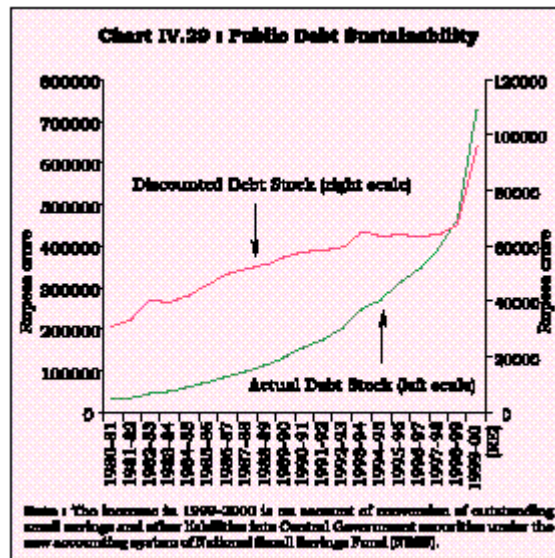
4.58 An important distinction in this context is between stability and sustainability with the former being a necessary but not a sufficient condition for sustainability. The latter includes the condition of instability and also depends upon the willingness of the public to hold the debt in future periods. Therefore, any assessment of debt sustainability requires analysis of ownership pattern, market structure and investor preferences. For instance, retail investors are less speculative and tend to buy and hold securities till maturity. Institutional investors, on the other hand, actively trade in debt and tend to reduce or increase their holdings depending upon the current/ expected movements in the market conditions. Thus, a higher debt/GDP ratio with higher proportion of individual investor holdings is more stable than a lower debt/GDP ratio with higher proportion of institutional holdings.

4.59 A number of studies have empirically tested sustainability of public debt in India. Amongst

the earlier studies on the issue, Seshan (1987) found that internal debt of the government was unsustainable. Alternative scenarios for financing of the government deficit showed that monetary financing of deficit would lead to a vicious circle: higher deficits need higher monetary financing resulting in more inflation and higher deficit (Rangarajan, Basu and Jadhav, 1989). Domar stability holds in terms of the average interest rate; however, when GDP growth rate is compared with call money rate and commercial bank lending rate, debt is not sustainable (Jha, 1999). The appropriateness of a risky rate like a commercial bank lending rate instead of a risk-free rate to judge the Domar condition for the government sector, however, is not clear. On the basis of a cross-over of average interest rate and interest rate on small savings and provident funds over the GDP growth rate in 1997-98 and the forecast that redemption yield on government bonds would touch 16.5 per cent in 2003, Rajaraman and Mukhopadhyay (1999) suggested a debt trap situation. In contrast to these studies, Khundrakpam (1998) and Moorthy *et al* (2000) found the Indian public debt to be sustainable in terms of Domar's stability equation (Chart IV.28).



4.60 An alternative approach to sustainability is adopted in this section in the tradition of Buiter and Patel (1992) and Ray (1996) based on intertemporal budget constraint to assess the long-run solvency of debt over the period 1980-2000. The method involves discounting the nominal stock of government debt with an appropriate interest rate and assessing the stationarity of the resultant discounted series. Total internal liabilities of the Central Government include market loans as well as small savings and provident funds. Since interest rates on the latter component is not market related, these liabilities were segregated from total internal liabilities of the government. The series on remaining liabilities was discounted with the weighted average coupon rate of dated government securities and tested for stationarity (Chart IV.29). Unit root tests show that discounted series remains non-stationary which implies that government debt continues to be unsustainable⁹. These results are in consonance with the findings of Buiter and Patel (1992) and Ray (1996) although they contradict the results emanating from the static Domar condition.



V. SOME UNPLEASANT FISCAL ARITHMETIC

4.61 The recent call for an expansionary fiscal policy has taken the form of an argument for pump-priming by monetising the fiscal deficit. It has been argued that financing does not matter and money financing may even ease the tax constraint. This argument revisits the unpleasant monetarist arithmetic (UMA) proposition (Sargent and Wallace, 1981) which analysed the build-up of public debt and its inflationary implications in the context of a conflict between the monetary and fiscal authorities. In particular, with real interest rates higher than real growth rate and with tight monetary policy but profligate fiscal policy, it was argued that bond financing is more inflationary than money financing. Given the stream of future primary (non-interest) fiscal deficits, the reliance on bond-financing continues to raise the public debt over time in an explosive manner. This cannot go on forever since the demand for bonds places an upper limit on bonds that would be held by the public. At some point, the public debt-GDP would outstrip the ratio of total wealth to income and bond-financing is no longer feasible. The monetary authority would then be forced to provide seigniorage revenues to finance not only the future government primary deficits but also has to service the existing public debt, forcing the creation of additional high-powered money, culminating in additional inflation. The implication of the Sargent-Wallace argument, therefore, is that fighting current inflation through tight monetary policy works only temporarily; eventually, it leads to higher inflation. In other words, an increase in primary fiscal deficits, at some time, requires a permanent increase in the inflation rate to ensure that the government's inter-temporal budget constraint is satisfied. Sargent and Wallace also argued that if economic agents have rational expectations, 'a tight monetary policy today leads to higher inflation not only eventually but starting today; tighter money today lacks even a temporary ability to fight inflation'.

4.62 The applicability of the UMA depends crucially on the condition that real interest rates increase as the government debt increases and they are higher than the real growth rate. Darby (1984) argued that real interest rates need not increase with higher debt if the economic agents are Ricardian, *i.e.*, if the individuals are concerned about future generations, the higher current

period debt will be offset by higher private savings. The relevant interest rate indicator is not before-tax real rate but after-tax real rate. Moreover, even the assumption of pre-tax real interest rates being higher than growth rates is not supported by empirical evidence. For most of the post-World War II data, for instance, the real interest rate has been below the growth rate in both the US and Canada (Bhattacharya and Haslag, 1999). On the other hand, the empirical evidence suggests that the Sargent-Wallace assumption of real interest rates greater than real growth rates may be realistic for European countries (Winckler, Hochreiter and Brandner, 1998). This is the outcome of increased worldwide capital mobility that equalises real interest rates globally at a high level although real GDP growth rates have been rather lower in Europe.

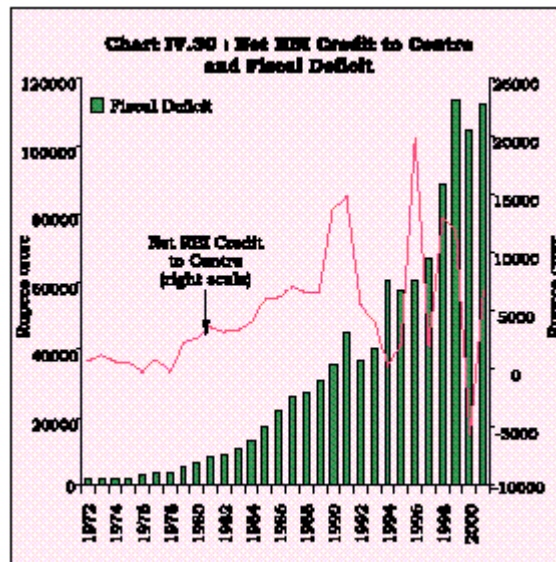
4.63 It was, however, pointed out that the empirical evidence of real interest rates being lower than the real growth rate, based on historical episodes, is flawed and does not resolve the issue since such real interest rates reflect the monetary and fiscal policies followed during that historical period (Miller and Sargent, 1984). The critical issue is whether the real interest rate would remain unchanged in the context of a change in future fiscal and monetary policies. Miller and Sargent believed that real interest rates may not remain constant and, accordingly, the average difference between the real growth rate and real interest rate cannot be expected to remain the same after a change in monetary and fiscal policies in the face of higher fiscal deficits.

4.64 More recently, it has been argued that, even if the condition 'real interest rate higher than real growth rate' does not hold, the Sargent-Wallace argument against bond financing and its inflationary potential may still be valid. The modified outcome arises if the basic Sargent-Wallace model containing two assets, money and government bonds, is extended to include an additional competing asset that has a store of value - an asset like equities representing claims on investment projects - with a real return higher than the economy's growth rate. Furthermore, if the economic agents invest in such investment projects (equities) not directly but through banks acting as intermediaries and the banks are mandated to hold a fraction of their deposits as cash reserves, then any increase in bond financing by the government must be accompanied by decline in bank deposits. The reduction in bank deposits, in turn, lowers bank's cash reserve requirements, *i.e.*, crowds out money holdings, reducing the seigniorage tax base. For an unchanged reserve money growth, the loss in revenue from the fall in the seigniorage tax base exceeds the gains from bond sales. In order to bridge the revenue gap, the government would be forced to step up the base money growth that, over time, results in higher inflation. The inflationary outcome arises in the extended model even when the real interest rate on government debt is lower than the economy's growth rate as long as a competing asset with real return higher than that on government debt exists. In other words, the condition 'real interest rate (on government debt) higher than the growth rate' is not a necessary condition for the Sargent-Wallace condition. In fact, the Sargent-Wallace condition may still hold even if the return on equities is initially lower than the economy's growth rate if the increased bond financing crowds-out private investment, raising the real return on investment projects and inducing a commensurate rise in government borrowing costs, higher interest payments, more bond financing, and further crowding out of private investment initiating a vicious circle (Bhattacharya, Guzman and Smith, 1998 and Bhattacharya and Haslag, 1999).

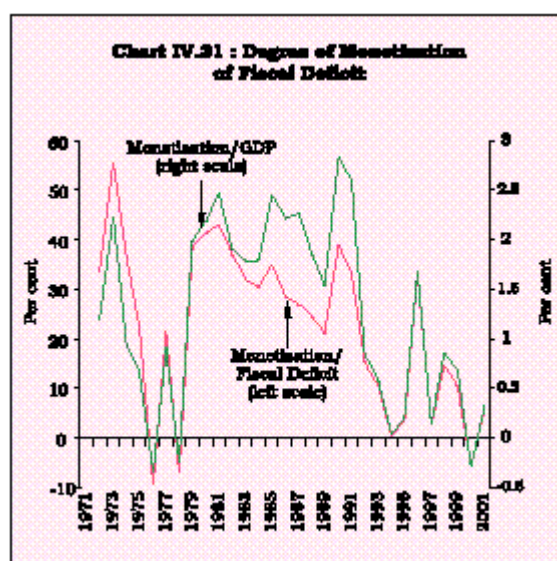
4.65 An implicit assumption in the Sargent-Wallace model as well as the extended model is that

fiscal policy dominates the monetary policy; this, however, may not be the case as the fiscal authority may have to yield since the latter may not have the purchasing power to carry out its planned spending (McCallum, 1999). Empirical evidence for Ireland and, to some extent, Italy suggests that it is the fiscal policy that adjusts to monetary policy rather than the other way round. A similar qualitative conclusion, based on trends in default risk (low) and inflation risk premia (declining) of public debt, has been documented for European countries (Winckler *et al, op cit*). The evidence in favour of fiscal policy adjustment appears plausible in the current era of increasing central bank independence.

4.66 A critical issue, therefore, is the financing of the deficit by the monetary authority and the implications for growth and inflation. In the Indian context, with the widening of fiscal deficits during the 1980s, a large part of the financing burden was borne by the Reserve Bank. The net RBI credit to Government increased at an annual average of almost Rs. 6000 crore during the 1980s, around 7-times its annual average during the 1970s (Chart IV.30).



4.67 As a result, the ratio of net RBI credit to the gross fiscal deficit which had averaged 26 per cent during the 1970s increased to 32 per cent during the 1980s. During the 1990s, it fell, averaging 12 per cent, reflecting policy efforts to reduce the reliance on the Reserve Bank. Similarly, the ratio of the Centre’s monetised deficit to GDP almost doubled during the 1980s to 2.1 per cent from 1.1 per cent during the 1970s before moderating to 0.7 per cent during the 1990s (Chart IV.31).



4.68 Alongside the growing market orientation of monetary policy, the net RBI credit to Government is increasingly reflecting, besides credit extended to Government, the impact of the Reserve Bank's open market operations (OMO) including liquidity adjustment facility (LAF), *etc.* involving change in ownership of debt owned by Government without any bearing on the primary financing of the fiscal deficit. A more relevant measure of monetisation is the Reserve Bank's primary support to the government's borrowing programme (including primary placements/ devolvement of Government securities, rupee coins, ways and means advances (WMA) netted for changes in cash balances) which accounted for 31 per cent of GFD in 2000-01 as against 6 per cent based on net RBI credit to GFD ([Table 4.9](#)).

Table 4.9 : Net RBI Credit and RBI Primary Support

Year	Fiscal Deficit (GFD) of the Centre	Net RBI Credit to Centre during the year (NRBIC)	RBI's Primary Support to Government Borrowings (RBIPS)	Monetisation	
				Based on NRBIC measure	Based on RBIPS measure
<i>As per cent of Fiscal Deficit</i>					
<i>Rupees Crore</i>					
1	2	3	4	5	6
1998-99	1,13,349	11,799	39,041	10.4	34.4
1999-2000	1,04,717	-5,587	25,682	-5.3	24.5
2000-01	1,11,972	6,705	34,943	6.0	31.2

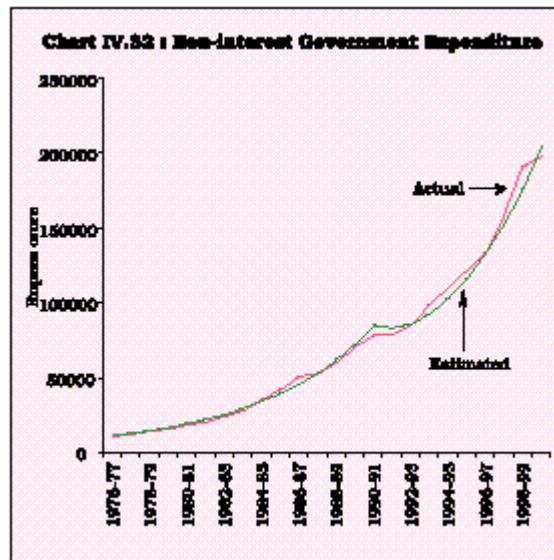
Source : RBI (2001)

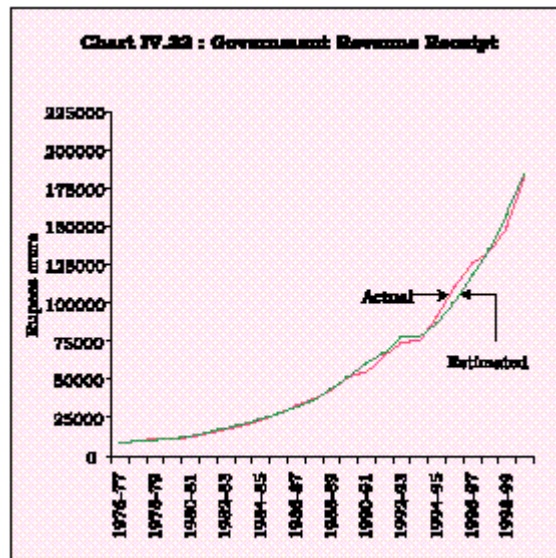
4.69 Based upon these developments and drawing upon the UMA, an important opinion in India is that the degree of monetisation of fiscal deficits in India in the 1990s has been on the lower side (Rakshit, 2000; Venkitaramanan 1995). The strict applicability of the UMA, in the Indian context, is in doubt given that real interest rates on government debt have been lower than that the economy's growth rate. Revisiting Moorthy *et al* (2000), it is observed that bond financing *vis-a-vis* money financing may increase real interest rates but it is still beneficial as it reduces inflation and, hence, increases long-run welfare. Moreover, the study also found that private

capital formation has surged since liberalisation, contradicting the view that bond-financing crowds out private investment. The relationship between fiscal deficits and their financing pattern was analysed to find the optimal degree of monetisation of fiscal deficit for the Union Budget, 2001-02 by Rao (2000). The results indicated that the optimal monetisation for the year 2001-02 is about 40 per cent of the budgeted fiscal deficit.

4.70 Against this background, this section undertakes an empirical exercise to assess the inflationary impact of monetary-fiscal dynamics through a small model with the specific objective of examining optimal monetisation in the Indian context. For this purpose, the price dynamics are at the core of the model as government receipts and non-interest expenditures may respond asymmetrically to inflation on account of the Tanzi-Olivera effect (Olivera, 1967; Aghevli and Khan, 1978 and Tanzi, 1988). At the same time, movements in interest rates determine the government's interest burden. The model, therefore, also estimates the behaviour of interest rates and inflation in terms of their determinants. The model has been estimated over the period 1971-72 to 1999-2000.

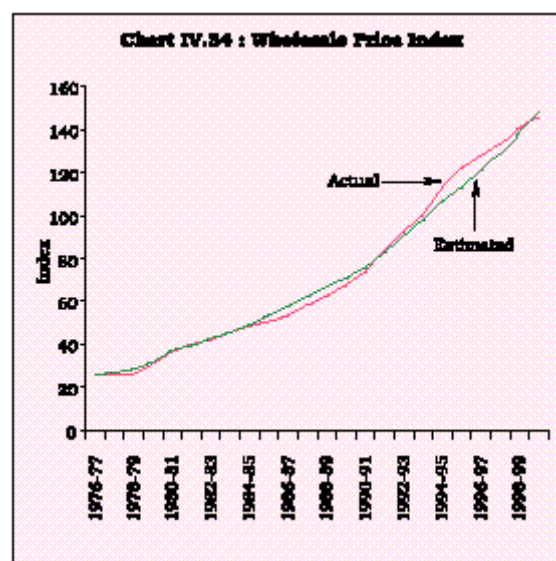
4.71 Revenue receipts and non-interest Government expenditures of the Central Government increase with real output as well as prices¹⁰. The estimated equations track the actual receipts and expenditures fairly well (Charts IV.32 and IV.33). The crucial issue for the present exercise is the response to inflation. In the short-run, the elasticity of government (non-interest) expenditure with respect to prices is 0.35 while that of revenue receipts is higher at 0.47. Inflation, therefore, improves the primary fiscal balance in the short-run. However, the long-run estimates of elasticities present a different picture. The long-run elasticity of (non-interest) expenditure with respect to prices is estimated at 1.06 while that of revenue receipts is estimated to be lower at 0.81. Thus, inflation has an adverse impact on public finances in the long-run, widening the primary fiscal balance.





4.72 The money supply influences both interest rate and prices. The interest rates are estimated from the inverted real money demand equation¹¹ and the estimates show that increased money supply initially reduces the interest rate (the liquidity effect) but increases the interest rate in the next period as inflationary expectations build up. A current period increase of one per cent in real money leads to a decline of 18 basis points in the nominal interest rate in the current period and an increase of 11 basis points in the next period interest rate.

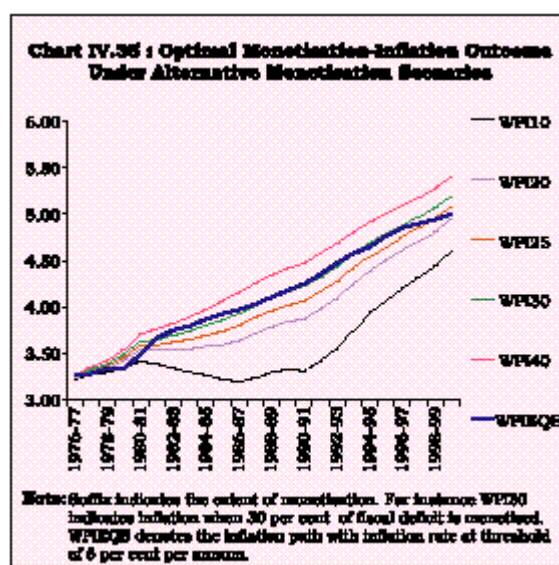
4.73 As regards the prices-money supply relationship, the estimates indicate that the short-run elasticity of price with respect to money (M_3) is 0.3, i.e., an increase of 10 per cent in money supply increases prices by 3 per cent in the same period. Over time, the inflationary process builds up, with the long-run estimated elasticity almost unity, i.e., a 10 per cent increase in money supply leads to an increase in inflation of equal magnitude¹². The estimated equation mimics the actual price behaviour closely (Chart IV.34).



Model Simulation

4.74 In the model, the variations in the degree of monetisation are reflected in changes in net RBI credit to Government (DRBIC), in turn, impacting on reserve money and through the money multiplier on the money supply. The increase in the money supply, following higher monetisation, increases inflation, widening the primary fiscal balance. On the other hand, the liquidity effect of higher money supply reduces the government's interest outgo, partly offset by an increase in the next period. An additional channel in the model influences the interest outgo on account of compositional shifts in ownership of government debt due to increased monetisation. The proportion of government debt held by the monetary authority increases while that held by the public declines. As a result, while interest payments to the debt held by the public fall, those to the monetary authority increase; the latter is reflected in higher net income of the central bank and finds a way back to the fiscal authority in the form of higher dividends. The overall impact of the compositional shift in favour of central bank would be a reduction in net interest burden of the government.

4.75 The model was simulated and alternative scenarios of monetisation of the fiscal deficit were analysed and the inflationary outcome was examined. The results show that an increase in monetisation results in higher inflation. The concept of optimal level of monetisation has been operationalised in this section as the level of monetisation that keeps the inflation rate close to its threshold. This estimate of the threshold inflation for India is 5 per cent (see Chapter V). The empirical exercise, therefore, attempted to identify the degree of monetisation that keeps the inflation rate close to 5 per cent. The simulations suggest that optimal degree of monetisation has been varying over time, with monetisation of more than 40 per cent as well as less than 10 per cent being clearly sub-optimal. The former leads to inflation above the threshold while the latter leads to inflation lower than the threshold. The optimal degree of monetisation appears to have been around 30 per cent for most of the period, with a decline in the second half of the 1990s. At present, the optimal monetisation appears to be in the range of 20-25 per cent of fiscal deficit (Chart IV.35). The decline in the optimal level of monetisation may be reflecting structural changes in the economy and policy efforts to widen and deepen the financial markets to enable the absorption of government debt.



VI. CONCLUDING OBSERVATIONS

4.76 Against the backdrop of the current deceleration, this Chapter examined the role of fiscal policy in reviving growth. The decomposition of fiscal deficits into structural and cyclical components revealed that the fiscal deficits in India have been predominantly structural; the cyclical component has been almost negligible, suggesting that discretionary policy has an important role to play in cyclical swings. In this context, the dynamics between government spending and private sector behaviour show that raising public sector consumption to boost aggregate demand in the economy crowds out private consumption. The alternative of raising public sector capital expenditure in manufacturing also crowds out private investment. It is only the public sector capital expenditure in infrastructure sectors that crowds in private investment, a result consistent with endogenous growth theory. At the same time, the enlarged fiscal deficit financing crowds out private investment. The results, therefore, suggest the need for a restructuring of the composition of government expenditure while containing fiscal deficit for the beneficial effect of government's infrastructure investment to be realised.

4.77 On the size of public debt, the results indicate that the public debt continues to exhibit signs of unsustainability. The empirical examination of the issue of appropriate level of monetisation of fiscal deficits indicate that the optimal degree of monetisation appears to be in the range of 20-25 per cent.

¹ Let Y and Y* denote actual and potential output; and, let T and G denote revenues and non-interest expenditures, then, the cyclical balance (CB) is estimated as: $CB = (T/Y)[1-(Y^*/Y)^a] - (G/Y)[1-(Y^*/Y)^b]$, where, a and b are estimates of elasticities of tax revenues and non-interest expenditures with respect to actual output.

² $\text{Log DT} = -1.58 + 0.53 \text{Log YP} + 0.01 \text{YC}(-1) + 0.44 \text{Log DT}(-1) + 0.16 \text{D2}$
 (-3.1) (4.2) (2.4) (3.4) (2.8)

$R^2 = 0.996$, Durbin's h = -0.4,

where, DT is direct taxes, YP is trend (nominal) output, YC is cyclical output (in per cent), D2 is dummy for

the 1990s.

$$^3 \text{ Log IT} = -4.2 + 1.18 \text{ Log YP} + 0.006 \text{ YC}(-1) - 0.25 \text{ D2} - 0.22 \text{ D3}$$

$$\quad \quad \quad (-20.2) \quad (67.2) \quad \quad \quad (1.8) \quad \quad \quad (-5.9) \quad \quad \quad (-5.1)$$

$R^2 = 0.998$, D-W Statistic = 1.6

where, IT is indirect taxes and D2 and D3 are dummies for the 1990s

$$^4 \text{ Log GFC} = -1.36 + 0.42 \text{ Log YP} + 0.63 \text{ Log GFC}(-1) - 0.07 \text{ D2}$$

$$\quad \quad \quad (-2.8) \quad (2.8) \quad \quad \quad (4.5) \quad \quad \quad (-2.7)$$

$R^2 = 0.999$, Durbin's h = 1.6,

where, GFC is government final consumption expenditure.

$$^5 \text{ Log CMF} = -3.56 + 0.96 \text{ Log YP} + 0.04 \text{ YC}(-1) - 0.58 \text{ D1}$$

$$\quad \quad \quad (-4.6) \quad (15.0) \quad \quad \quad (2.3) \quad \quad \quad (-3.4)$$

$R^2 = 0.93$, D-W Statistic = 1.6,

where, CMF is public sector investment in manufacturing.

$$^6 \text{ Log CINF} = 4.35 + 0.53 \text{ Log YP}$$

$$\quad \quad \quad (1.6) \quad (3.0)$$

$R^2 = 0.997$, D-W Statistic = 2.2,

where, CINF is public sector investment in infrastructure.

$$^7 \text{ Log CPVT} = -0.33 + 0.66 \text{ Log YP} + 0.01 \text{ YC} - 0.01 \text{ YC}(-1) - 0.07 \text{ Log DT} + 0.08 \text{ Log TRA} - 0.06 \text{ Log TRA}(-1) + 0.04 \text{ Log GFC}$$

$$\quad \quad \quad (-0.8) \quad (4.7) \quad \quad \quad (12.2) \quad \quad \quad (-3.8) \quad \quad \quad (-1.7) \quad \quad \quad (2.3) \quad \quad \quad (-1.7) \quad \quad \quad (0.4)$$

$$\quad \quad \quad - 0.25 \text{ Log GFC}(-1) + 0.57 \text{ Log CPVT}(-1) - 0.03 \text{ DUM} 97$$

$$\quad \quad \quad (-2.4) \quad \quad \quad (3.8) \quad \quad \quad (1.9)$$

$R^2 = 0.999$. Durbin's h = 1.2

where, CPVT is private consumption expenditure, TRA is non-interest transfer payment, GFC is government final consumption expenditure and DUM97 is dummy for 1997-98.

$$^8 \text{ Log IPVT} = -3.4 + 0.94 \text{ Log YP} - 0.12 \text{ Log CMF}(-1) + 0.32 \text{ Log CINF}(-1) - 0.30 \text{ LogFD}(-1) + 0.24 \text{ DUM}75$$

$$\quad \quad \quad (-8.1) \quad (7.6) \quad \quad \quad (-2.3) \quad \quad \quad (2.5) \quad \quad \quad (-2.6) \quad \quad \quad (3.0)$$

$R^2 = 0.997$, D-W Statistic = 2.2,

where, IPVT is private investment, FD is fiscal deficit and DUM75 is dummy for 1975-76.

⁹ The ADF test-statistic at -2.37 was significant at 1 percent.

$$^{10} \text{ Log GE} = -3.53 + 0.43 \text{ Log GDP} + 0.35 \text{ Log WPI} + 0.67 \text{ Log GE}(-1) - 0.16 \text{ Dummy}9299$$

$$\quad \quad \quad (-1.6) \quad (1.9) \quad \quad \quad (2.3) \quad \quad \quad (6.7) \quad \quad \quad (-2.8)$$

$R^2 = .997$ Durbin's h = -1.3

where, GE is Non-interest government expenditure, GDP is real GDP, WPI is Wholesale price index.

$$\text{ Log TX} = -8.7 + 0.97 \text{ Log GDP} + 0.47 \text{ Log WPI} + 0.42 \text{ Log TX}(-1) - 0.14 \text{ Dummy}9499$$

$$\quad \quad \quad (-3.8) \quad (4.2) \quad \quad \quad (4.0) \quad \quad \quad (3.8) \quad \quad \quad (-3.6)$$

$R^2 = .998$ Durbin's h = -0.3,

where, TX is government revenues.

¹¹

$$\text{ LOG RM}_3 = -7.71 - 0.055 \text{ R} + 0.60 \text{ LOG RM}_3(-1) + 0.84 \text{ GDP}$$

$$\quad \quad \quad (-4.8) \quad (-2.1) \quad (8.7) \quad \quad \quad (5.3)$$

$R^2 = 0.997$ Durbin's h = 1.2

where, RM_3 is real broad money supply, R is interest rate.

$$^{12} \text{ LOG WPI} = 3.57 + 0.27 \text{ LOG M}_3 - 0.42 \text{ LOG GDP} + 0.72 \text{ LOG WPI}(-1) + 0.14 \text{ DUM}75 + 0.07 \text{ DUM}82$$

$$\quad \quad \quad (3.0) \quad (5.0) \quad \quad \quad (-3.5) \quad \quad \quad (9.2) \quad \quad \quad (6.5) \quad \quad \quad (2.4)$$

$R^2 = 0.998$ Durbin's h = 0.5,

where, M_3 is nominal broad money, DUM75 and DUM82 are dummies for 1973-75 and 1981-82.

V Growth, Inflation and The Conduct of Monetary Policy

Monetary Policy and Growth

Transmission of Monetary Policy to Growth

The Credit Channel

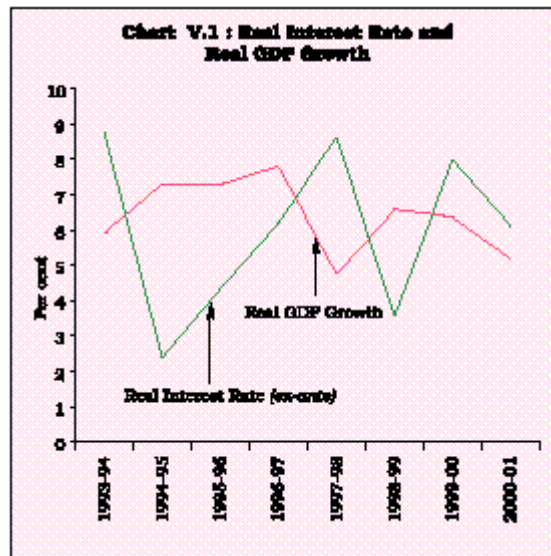
The Constraints on Growth-Oriented Monetary Policy

Concluding Observations

Introduction

5.1 The conduct of monetary policy has been engaging considerable attention in the context of the current slowdown in the Indian economy. From financial markets and industry, the case for easy monetary policy has been expressed in terms of lower interest rates. With the upturn remaining elusive, an intellectual advocacy for monetary activism *via* monetisation of the fiscal deficit has been gaining ground. It is argued that neither credit nor commodity markets in India are supply-constrained and monetisation of the fiscal deficit does not cause inflationary pressures when the economy is demand-constrained (Patnaik, 2001). It is also pointed out that maximising seigniorage revenues may, in fact, be optimal in a situation where the budget constraint is hard (Rakshit, 2000). The revival of the call for monetary activism in India *via* the fiscal deficit is not new; indeed, it characterised the debate in the mid-1990s on some unpleasant monetarist arithmetic (Venkitaramanan, 1995) and why gentlemen prefer bonds (Moorthy, 1995). Against the welling tide of arguments for monetary easing, it is important to take note of a near solitary view that interest rate reductions in India have gone too far and it is necessary to recognise the country's specific vulnerabilities while formulating monetary policy response (Tarapore, 2001). The debate remains unsettled, and it is plausible that as the economy continues to be bound by the inertial dynamics of the downturn, more heat would be generated.

5.2 The argument for monetary easing is valid to the extent that monetary policy is essentially viewed as an instrument of stabilisation, working through aggregate demand to smooth oscillations of economic activity around the desired path. In accommodation of this perceived role, monetary policy in India has moved into contra-cyclical mode since 1997 with successive cuts in key interest rates and cash reserve requirements (CRR) signalling the monetary stance. Active liquidity operations have been undertaken to satisfy and stabilise the demand for bank reserves so as to ensure that growth is not constrained by the availability of credit. Reflecting this stance, nominal risk-free interest rates measured by yields on government securities are the lowest in the last two decades and real interest rates in the recent period, on an average, have been below the real growth rate of the economy (Chart V.1).



5.3 This Chapter attempts to contribute to the debate eclectically, within the limits of an empirical and country-specific framework. The structure of the Chapter is as follows: Section I addresses the unfinished debate on neutrality and the role of monetary policy in the context of growth. Section II deals with the transmission of monetary policy to growth. Section III examines the macroeconomics of credit with a view to assessing the credit channel as a conduit of transmission of monetary policy. Section IV covers the constraints on operating monetary policy for revitalising growth. It covers issues related to the time inconsistency problem associated with a growth oriented monetary policy and the institutional arrangements under which the implicit ‘inflation bias’ in growth-centric monetary policy is minimised. This is followed by concluding observations.

I. MONETARY POLICY AND GROWTH

5.4 For monetary policy to be effective in supporting the revival, it must exert a systematic influence on economic activity, *i.e.*, output, employment, real interest rates and real exchange rates. Thus, the question of what monetary policy can or cannot do in the context of the deceleration is inextricably linked to the debate on the issue of neutrality of money, *i.e.*, whether or not monetary policy has any lasting influence on the real economy. The debate itself has dominated economic thinking in the 20th century - does money matter (non-neutral) or not (neutral). The swings in the paradigm across the spectrum of the debate have been a powerful force in shaping the stance and conduct of monetary policy.

The Neutrality Debate Revisited

5.5 The classical view of a dichotomy between the real and nominal worlds, and thereby, of monetary policy being neutral, was co-terminus with the view of the economy as self-correcting, inherently prone to revert to equilibrium and full employment. Accordingly, money had no influence on real variables in the long run; changes in money supply caused a proportionate change in the price level *via* the quantity theory. The Great Depression of 1929 and the growing dominance of Keynesianism in its aftermath swung the debate in favour of non-neutrality. Policy

makers were confronted with the clear danger of the economy slipping further and further away into depression. Consequently, interventions had to be made in the form of monetary and fiscal policies to prevent and correct macroeconomic failures.

5.6 Until the 1950s, monetary policy was subordinated to fiscal policy. Expansionary fiscal policy supplemented by the discretionary financing of fiscal deficits by monetary policy, while keeping interest rates low in order to stimulate investment was the preferred combination. In the 1960s, influential work on the US economy showed that peaks and troughs of money supply changes systematically preceded the peaks and troughs of economic activity, leading up to the premise that monetary policy has powerful effects on real variables in the short run (Friedman and Schwartz, 1963). Accordingly, the debate produced a transient synthesis during the 1960s and the 1970s within the dominance of the Keynesian paradigm. Money began to matter and central banks began to employ monetary policy to reduce fluctuations in real variables. Several developed countries including the USA, Canada and Britain pursued expansionary monetary policies and experienced healthy increases in output and reduction in unemployment rates (Handa, 2000).

5.7 Although the period 1940-71 was characterised by fixed exchange rates under the Bretton Woods par value system, most countries sought to have some discretion in the conduct of monetary policy. Many countries, both developed and developing, established exchange controls and revenue was extracted through financial repression and seigniorage. The fiscal domination of monetary policy set up an inconsistency with the exchange rate objective, and when the USA suspended the convertibility of the US dollar in 1971-73, the end of an era was in sight. Monetary policy had lost its nominal anchor. The massive oil price hike of 1973 stepped up global inflation and worsened the situation. Inflation in the industrial countries rose from low levels in the 1950s and the 1960s to double digit levels. At the same time, unemployment rates remained persistently high; the phenomenon of 'stagflation' was incompatible with the standard Keynesian analysis and the latter's abandonment in the design of policy frameworks seemed imminent.

5.8 The stagflation of the 1970s fuelled scepticism about the beneficial effects of expansionary monetary policy. The counterrevolution was led by Milton Friedman, the keeper of the 'living tradition' of the classical faith (Colander, 1986). Persistent inflation was found to be largely or solely the result of excessive monetary growth. Augmenting the Phillips curve with expectations showed that the trade-off between unemployment (growth) and inflation could possibly exist in the short run; in the long run, however, there was no trade-off. Furthermore, it was argued that long and variable lags in the operation of monetary policy can destabilise the impact of counter-cyclical monetary policy and accordingly the desired short-run impact was virtually unpredictable. Indeed, short-run discretionary monetary policy was rendered dangerous by forecast errors - expansionary monetary policy to fight a downturn can take effect when the economy is booming. All this led to the advocacy for resisting the temptation to exploit the possible short-run trade-off and to set up a rigid rule fixing the growth rate of money stock to the trend growth rate of output. Backed by the predictive model of the Federal Reserve Bank of St. Louis (1968), money began to matter in influencing output and employment, although its potentially destabilising effects were emphasised and long-run neutrality regained prominence in shaping the contours of monetary policy.

5.9 The first half of the 1970s was thus characterised by a considerable amount of uncertainty regarding the conduct of monetary policy. 'Policy ineffectiveness' raised questions regarding the ability of policy makers to 'fine tune' the economy. The operational design of monetary policy was marked by an increasing recourse to credit rationing. The introduction of floating exchange rates, however, did not provide the independence for monetary policy to pursue domestic objectives. External viability remained as a dominant concern of monetary policy right through the 1980s.

5.10 In the second half of the 1970s and up to the mid-1980s, monetary targeting became the *raison d'être* of the conduct of monetary policy. Empirical investigation turned out systematic evidence of stability in the money demand function (or the LM curve) which strengthened the case for using monetary aggregates as the intermediate target since changes in money supply could be traced to predictable changes in prices, interest rates and income. Money supply rules were also seen as a means of securing freedom for monetary policy from fiscal domination by eschewing discretionary actions. Germany, Switzerland and the USA were amongst the first to adopt monetary targets in the operating framework of monetary policy in 1975, followed by Canada in 1976, and France and Australia in 1977 (Argy et al, 1989). Beginning in 1978 and well into the 1980s, many developing countries also adopted various formulations of the money rule.

5.11 During this period, the institutional setting for monetary policy, however, underwent radical changes. Globalisation and financial sector reforms and the explosion of financial innovations had a fundamental impact on the stability of the money demand function, both in the parametric and in the predictive senses. As a consequence, there was a breakdown in the observed relationship between monetary aggregates, the inflation rate and the real activity. In part, this reflected the operation of Goodhart's law: any observed statistical regularity will tend to collapse once pressure is placed on it for control purpose. Incorporating rational expectations and market clearing into macro-economic analysis produced theoretical conclusions which questioned Keynesian and 'synthesis' propositions (Muth, 1961; Phelps, 1967; Lucas, 1972). Under these conditions, discretionary policies, both fiscal and monetary, are ineffective in influencing real variables as people anticipate policy changes and respond in a manner which renders policy changes sterile. This triggered a 'new classical' renewal of the classical money neutrality hypothesis although new Keynesians produced non-neutral effects of monetary policy even with rational agents on account of the existence of rigidities in the system (Box V.1). The impact of this shift in the paradigm in the debate on money neutrality brought about a fundamental revision in the conduct of monetary policy in the 1980s. In the 1980s, several countries either modified the operating framework of monetary policy to a monetary-cum-output targeting approach or abandoned monetary targeting altogether. Germany and Switzerland persevered with monetary targeting, although in a significantly modified form of the monetary rule. In view of these developments, the European Central Bank (ECB) follows two pillar-framework of monetary policy, with reference values of money supply being only one of the pillars.

Box V.1
Neutrality of Money: Theoretical Perspective

Neutrality is defined as a once-for-all change in the level of nominal money producing no real effects, *i.e.*, not

affecting real variables including real balances (like capital, output or real income, welfare, mix of consumption and investment goods, real interest rates, real exchange rates) permanently. A permanent shift or continuous changes in money supply not affecting the real variables is known as super neutrality. The so-called 'quantity theory of money' - strictly proportional (positive) relation between money and prices is viewed as a special case of neutrality. Similarly, the classical case of dichotomy - the equilibrium value of real variables are independent of both the supply of and demand for money - implies neutrality. As pointed out in the literature, money neutrality holds under the following assumptions -no money illusion, absence of inflationary expectations, full wage-price flexibility, dependence of marginal product of capital only on the capital intensity, no distributional effects of seigniorage and time independence of saving and consumption behaviour (*i.e.*, independent of the stage of the life cycle).

However, the neutrality debate has also taken a time dimension as there is more or less general agreement among the competing schools of thought regarding short-run non-neutrality and long-run neutrality. In the short run, even monetarists (Quantity Theorists) believe that money is non-neutral like Hume's argument that prices do not immediately rise proportionately with increased money and that, in the intervening period, it stimulates production. Non-neutrality holds on account of a number of reasons: redistribution of real income due to rising prices between debtors and creditors with different saving propensities (forced savings); no one to one and lagged response of individual prices (wage-price rigidities) to money growth rate; disequilibrium or under employment equilibrium state of the economy; the existence of a tax structure (income and capital gains tax) formulated in nominal terms and partial adjustment to the rate of inflation; and the inability on the part of individual to judge whether the change in price is with respect to the goods he is concerned with (in which case there is change in relative prices warranting quantity adjustment) or a change in the general price level (in which case there is no change in relative prices). Therefore, it is argued that only unanticipated monetary changes produce real effects, with predicted changes in money simply being reflected in price-level movements with no impact on output. Since short-run fluctuations in money are likely to be at least partially unpredictable, they will cause output and employment movements. Subsequent work by Mishkin (1982) and others showed that both anticipated and unanticipated money appear to influence real economic activity. Thus, the balance of opinion is in favour of short-run non-neutrality of money, of both anticipated and unanticipated nature.

Even with rational expectation, money can have real effects on the economy in the presence of rigidities or price stickiness. A distinctive feature of the 'new Keynesian' view is the notion that considerable economic rigidities can be generated even by small barriers to nominal price flexibility. Such price rigidities may arise due to the prevalence of longer-term wage contracts, the presence of imperfect competition, the costs of price adjustment (menu cost) and the persistence of co-ordination failures in the related markets.

Friedman and Schwartz's (1963) study of the relationship between money and business cycles probably still represents the most influential empirical evidence that money does matter for business cycle fluctuations. On the other hand, Tobin argued that the positive correlation between money and output that Friedman and Schwartz interpreted as providing evidence that money caused output movements, could, in fact, reflect just the opposite - output causing money. It has also been argued that correlation may arise from the endogenous response of the banking sector to economic disturbances that are not the result of monetary policy actions. More recently, based on equilibrium models with endogenous money, it has been pointed out that money should be more highly correlated with lagged output than with future output. The endogeneity problem is likely to be more severe if the monetary authority employs a short-term interest rate as its main policy instrument; in such a case, changes in money supply will be endogenous and cannot be interpreted as representing policy actions.

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Monetary Policy in Transition

5.12 In the period since the latter half of the 1980s, central banks all over the world are experimenting with a variety of operating instruments and analytics with a broad preference for indirect instruments and a market orientation of monetary policy. In recent years, particularly in the 1990s, there has been an upsurge of interest in the operational framework for monetary policy. Beginning in 1989, a number of countries have put in place institutional settings for directly achieving the primary target of monetary policy - inflation.

Essentially inflation targeting relies on the use of simple and explicit rules for monetary policy. While inflation targeting has been characterised alternatively as 'constrained discretion' and 'the interest rate analog of a money growth rule', it has opened up a number of dilemmas for practitioners of monetary policy, *i.e.*, the lack of complete integration into economic theory, the neutrality hypothesis and the relationship between growth and inflation, what to target - a precise number or a range, the trade-off between the exchange rate and inflation and the transmission channels from the instrument to the target.

5.13 The debate on the neutrality of money remains unsettled. The central opposing views have modified their positions and moved closer. Monetarists, for instance, have toned down their argument regarding the Phillips curve being vertical in the long run. Keynesians concede that if a long run trade-off exists, it is limited and the scope for long run policy activism is small. In the *interregnum*, monetary policy and its operational framework transit through a twilight zone.

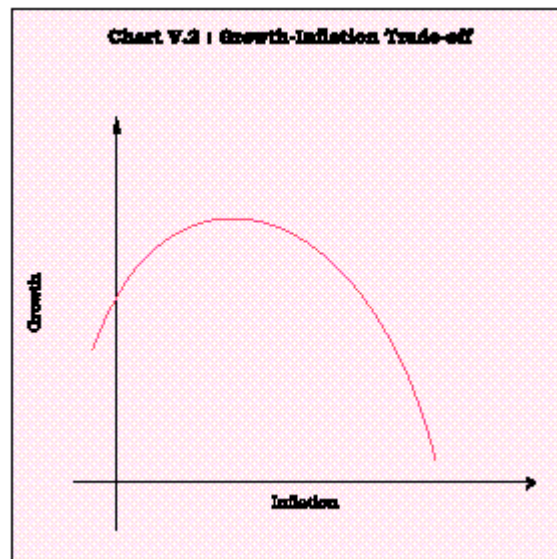
Some Practitioner Perspectives on the Debate

5.14 In the economics profession, the impact of monetary policy on output, employment and prices has always been recognised. Recent empirical research developing on the "narrative approach" of Friedman and Schwartz suggests that negative monetary shocks are followed by marked downturns in real economic activity that cannot be predicted from the past behaviour of the economy (Romer and Romer, 1989, 1994a). Furthermore, real effects of the monetary shocks are not only substantial but also long-lived (though not permanent) with the effects remaining up to 3 years. It is found that the Federal Reserve recognises quickly that recessions are underway and typically responds to downturns with prompt and large reduction in interest rates. Discretionary fiscal policy, in contrast, rarely reacts before the trough in economic activity and even then the responses are usually small reflecting inside lags (Romer and Romer, 1994 b). Monetary policy shocks have a persistent effect on output, while inflation displays an inertial response (Christiano *et al*, 2001). The Bank of England's macro-model shows that a temporary increase (increased for one year and then reversed) of interest rates by 100 basis points lowers output by around 0.20-0.35 per cent after about a year, while it reduces inflation by around 20-40 basis points after a year or so.

5.15 Growing recognition of the powerful effects of monetary policy on the real economy explains as to why societies have reposed the conduct of monetary policy with central banks/monetary authorities. In the dispensation of this responsibility, central banks have to take positions on the short run trade-off between growth and inflation; the choice is severely

conditioned by the losses of macroeconomic welfare that can result in an inappropriate position occupied in the growth-inflation curve. The conduct of discretionary monetary policy, especially since the 1970s, is centred around the choice of a rate of inflation for the national economy consistent with the choice of a rate of growth. In developing countries, the dilemma becomes sharper, especially with the conviction that there are segments in the growth-inflation curve in which some inflation is beneficial for growth. In recent years, monetary authorities have increasingly come out of the closet to reflect growth considerations, both explicitly and implicitly, in their objective functions. Even in countries which have adopted inflation targets as the goal of monetary policy, output considerations (reflected in the deviations of output from target growth) are explicitly incorporated in their monetary policy frameworks ([Table 5.1](#)). In 2000 and 2001, the process has come full circle with the Federal Reserve almost single-handedly undertaking the task of soft-landing the US economy and revitalising growth. Increasingly, monetary policy is viewed as an integral element of macroeconomic policies for growth and stability.

5.16 At the operational level, there is also a recognition that the growth-inflation curve has non-linear segments, *i.e.*, inflation at some low level has positive effects for growth by 'greasing the wheels' of the economy, but there is a point beyond which inflation can be harmful for growth (Chart V.2). Multiplicity of objectives entails assignment of degrees of importance, depending on the hierarchy of macroeconomic priorities. Consequently, the weights set for growth and inflation by the monetary authority must reflect an understanding of the functioning of the economy.



The International Evidence

5.17 A proximate starting point to the resolution of the dilemma is the identification of the threshold (optimal, tolerable) level of inflation beyond which it has negative effects on growth. Empirical investigation of the location of the threshold have proliferated in the literature since the 1970s. Early efforts were based on estimating Phillips curve type relationships with high frequency data (Fischer, 1983). Subsequently, the threshold inflation was estimated under growth

accounting frameworks. The empirical evidence produced in the second half of the 1990s suggests that there exists a significant and negative correlation between high inflation and growth. Inflation volatility is robustly and negatively correlated with growth variability at high levels of inflation. The threshold rate of inflation in industrial countries is placed in the range of 1-3 per cent (Fischer, 1996).

Table 5.1 : Objectives Pursued by Central Banks

Central Bank	Single Target	Multiple Target	Objectives
Argentina		†	Value of currency and financial system stability.
Australia		†	Price stability over the medium-term with the aim of encouraging strong and sustainable economic growth.
Canada	†		Inflation target to contribute to rising living standards.
Chile	†		Low and stable inflation contributing to welfare.
European Central Bank	†		Price stability.
Indonesia		†	Price stability and exchange rate stability.
Israel	†		Inflation target.
Japan		†	Price stability and financial stability as foundations for sound economic development.
Malaysia		†	Monetary and financial stability for growth.
Mexico		†	Maintaining stability of the purchasing power of currency, sound development of financial system and proper functioning of payment systems.
New Zealand	†		Price stability.
Pakistan		†	Economic growth and price stability.
Russia		†	Stability of the currency, development of banking system and efficient settlement system.
Singapore		†	Sustained and non-inflationary growth and sound and progressive financial services sector.
South Africa		†	Value of currency, achievement and maintenance of financial stability.
South Korea	†		Price Stability.
Thailand		†	Monetary and financial stability for achieving sustainable economic growth over the long run.
U.K.	†		Inflation target as a precondition for achieving sustainable growth and employment.
USA		†	Maximum employment, stable prices and moderate long term interest rates.

At the same time there is a strong argument against zero inflation (Akerlof *et al*, 1996). Resistance to nominal wage cuts brings with it rigidity in real wages and some inflation is necessary to allow real wages to adjust. This has been expressed as a case against price stability and inflation at 3-4 per cent has been suggested as a long run target (Krugman, 1996). Several recent studies incorporating developing countries, including India, have empirically located threshold inflation rates in the range of 8 per cent (Sarel, 1996) to 40 per cent (Bruno and Easterly, 1995). The range is relatively wide for samples including developing countries since measured productivity in the traded sectors in these countries is generally higher than in the non-traded sectors. Measuring threshold inflation in a cross-country framework runs the risk of being influenced by extreme values since samples include countries with inflation as low as 1 per cent and as high as 200 per cent and even higher. The appropriate inflation threshold, therefore, needs

to be estimated for each country separately (Rangarajan, 1997).

The Indian Evidence

5.18 In the 1970s, although there was considerable concern about inflation in the face of oil price hikes and agricultural supply shocks, there was a lack of consensus about the tolerable rate of inflation (Singh, Shetty and Venkatachalam, 1982). The reference of the Chakravarty Committee to 4 per cent as the acceptable rise in prices can be regarded as the first influential fix on the threshold rate of inflation in India. Testing for the threshold within the framework of a macroeconomic model suggested a range of 5 to 7 per cent, initially 6-7 per cent and eventually 5 to 6 per cent (Rangarajan, 1997). Employing a variety of methodologies, studies conducted in the Indian context obtain a range from 4 to 7 percent for the threshold inflation rate. The lower bound of 4 per cent may be regarded as output-neutral inflation rate with the positive effects of inflation petering off after 7 per cent. At an inflation rate of 10 per cent, inflation has adverse consequences for growth. There is not much empirical support for the trade-off between the anticipated rate of inflation and output growth although the adverse effects of inflation surprises on output growth are robustly confirmed. A recent study suggests that for inflation of up to 6.5 per cent, the growth objective of monetary policy can take precedence over the price stability objective. However, once the inflation level reaches 6.5 per cent, price stability objective should be given greater relative importance (Samantaraya and Prasad, 2001). With prolonged price stability at the global level as well as in India, the threshold can be expected to move downwards.

Estimating the Precise Threshold Inflation for India

5.19 The various empirical studies conducted for estimating the threshold inflation for India show that the results are sensitive to the methodology, the period of study and the choice of plausible factors determining growth or 'conditioning' variables. There is no consensus on the specification of the appropriate model for estimating the growth-inflation relationship, perhaps because the relationship itself is changing fairly rapidly. Accordingly, updating the estimate of the threshold inflation to take into account these underlying shifts assumes importance. Obviously, in this exercise, feasible computation takes precedence over analytical finesse. In this section, the methodology adopted by Sarel (1996) is employed to estimate the threshold inflation in India as a point estimate as opposed to the range estimates. The Sarel 'spline' technique is intuitively appealing as it specifically incorporates non-linearity in the inflation and growth relationship. It employs a search procedure to identify the structural break or 'kink' in the growth-inflation curve. This yields a unique estimate of threshold inflation. The threshold inflation in this study is estimated under a production function framework where real output is regressed on capital, labour, actual inflation rates and inflation dummies characterising alternate inflation regimes by using the Sarel methodology - which derives the threshold level corresponding to the maximum fit of the model represented by the value of the adjusted R^2 . Based on this, threshold inflation for India estimated for the period 1970-71 to 1999-2000 is 5 per cent (Chart V.3 and [Table 5.2](#)).

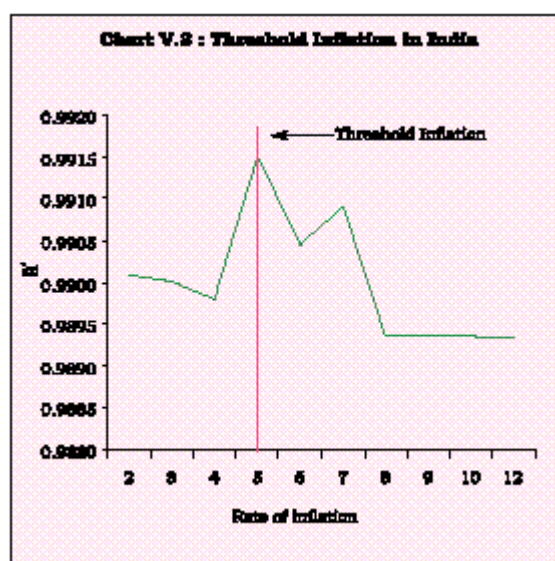


Table 5.2 : Estimated Threshold Inflation for India

Study	Year of Study	Period of Study	Estimated Threshold Inflation (per cent)
1	2	3	4
Rangarajan	1998	-	5-7
Kannan and Joshi	1998	1981-96	6.0
Vasudevan, Bhoi and Dhal	1998	1961-98	5-7
Samantaraya and Prasad	2001	1970-99	6.5
Estimate of the Chapter	2001	1970-2000	5.0

II. TRANSMISSION OF MONETARY POLICY TO GROWTH

The Role of Interest Rates

5.20 The impact of monetary policy on the economy has been viewed by some as powerful and lasting. Monetary policy impulses travel to output, employment and inflation through a number of channels. While these channels are not mutually exclusive, the relative importance of each channel may differ from one economy to another depending on a number of factors including the underlying structural characteristics, state of development of financial markets, the instruments available to monetary policy, the fiscal stance and the degree of openness. Broadly, the vehicles of monetary transmission can be classified into financial market prices (*e.g.*, interest rates, exchange rates, yields, asset prices, equity prices) or financial market quantities (money supply, credit aggregates, supply of government bonds and foreign denominated assets). The interest rate channel emerges as the dominant transmission mechanism of monetary policy. It induces movements in other asset prices to generate wealth effects, in terms of market valuations of financial assets and liabilities, like through exchange rates - higher interest rates induce an appreciation of the domestic currency which, in turn, leads to a reduction in net exports and,

hence, in aggregate demand and output. Monetary policy can also operate on aggregate demand through changes in the availability of loanable funds, *i.e.*, the credit channel. It is, however, relevant to note that 'credit channel' is not a distinct, free-standing alternative to the traditional transmission mechanism but rather as a set of factors that amplify and propagate conventional interest rate effects (Bernanke and Gertler, 1995). Nevertheless, it is fair to regard the credit channel as running alongside the interest rate channel to produce monetary effects on real activity. The credit channel is the subject of the next section.

Real Interest Rates

5.21 The real interest rate assumes critical importance in the transmission of monetary policy to growth. The real interest rate is not 'real' in the sense that, unlike nominal rates, it is not directly observed. Consequently, monetary authorities are constrained to take a 'view' on the real interest rate to ensure the efficacy of policy intervention. The classical view of the real interest rate being determined by the real forces of saving (thrift) and investment (productivity) and unaffected by nominal variables such as monetary growth or inflation does not fit well with the operational conduct of monetary policy. In the short-run, given wage and price rigidities, monetary factors can influence real interest rates and even in the long-run, variations in the rate of monetary growth can have effects on real interest rates through Tobin-Mundell portfolio effects. Similarly, the Keynesian treatment of the interest rate as being purely a monetary phenomenon determined in the money market has to be regarded as only a partial explanation of the determination of interest rates. The concept of a 'neutral rate of interest' - a rate consistent with the stock and flow equilibrium of households and firms (savers and investors) at the natural rate of growth of the economy - reconciles the two approaches within the academic debate (Allsopp and Glyn, 1999). The synthesis identifies a host of real and monetary factors - savings, investment, technology and other preference shocks, stance of fiscal policy (size of public debt coupled with the absence/presence of Ricardian equivalence), the stance of monetary policy and its interventions, credit restraints, the efficiency of the financial system, the degree of financial liberalisation - as determinants of real interest rates in a general equilibrium framework.

5.22 There is a growing recognition that there is no unique fundamental equilibrium real long-term interest rate. Empirical evidence for the US, the UK, France and Germany suggests that the real interest rates increased from 1980s onwards over the levels prevailing during the 1950s and 1960s (Chadha and Dimsdale, 1999). The low real interest rates during the 1950s and 1960s reflected the greater policy weightage assigned to output expansion. The surge in real rates from 1980s onwards reflected tighter monetary policy to contain inflation. The response of short-term nominal interest rates to inflation has improved in the recent years - in other words, variability of real interest rates has declined - reflecting greater policy focus by the monetary authorities on inflation control. Higher real interest rates since the 1980s also reflected a looser fiscal policy stance (Ford and Laxton, 1999) and an overall tendency towards deregulation of financial markets.

Real Interest Rates in India

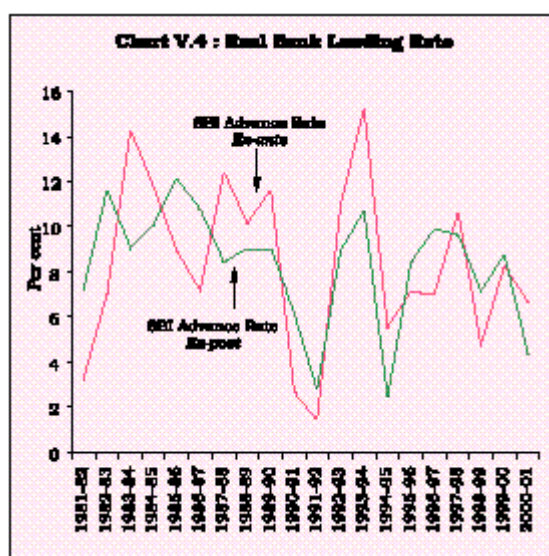
5.23 The issue of the appropriate real interest rates for India has acquired a growing focus with the shift away from a planned economy to a market-determined economy in the context of

financial sector reforms (Reddy, 1998). An important early input in this regard was the Report of the Committee to Review the Working of the Monetary System (RBI, 1985). Recognising that the depositor needs to be assured of a 'reasonably high positive real rate of interest' on savings to deter 'leakages' of financial saving in the form of gold, real estate and physical assets, it recommended a real positive interest rate of up to 3 per cent depending upon maturity, issuer and instrument: marginally positive real return on 91-day Treasury Bills, a positive real return of 2 per cent per annum for bank deposits of maturity of 5 years or more and a positive real return of 3 per cent per annum on 15-year government dated securities. There is also an influential view that the optimum real interest should be closer to the expected long-term growth rate of the economy; hence, for an economy, like India, growing at 6-8 per cent per annum, the optimum real rate would be higher than that for an economy growing at 2-3 per cent (Brahmananda, 2000).

Measuring Real Interest Rates

5.24 The principal wedge between real and nominal interest rates is inflation expectations. In practice, the real interest rate is typically measured as inflation adjusted nominal interest rates but this is an *ex-post* assessment of how inflation has eroded the returns on investment in some past period. To obtain a forward-looking *ex-ante* measure, the real interest rate may be defined as nominal interest rate less inflationary expectations. An important aspect in this context is the time horizon. Very short-term official interest rates set by government and overnight inter-bank interest rates are in a sense reflective of the real interest rates since over such horizons, prices are essentially constant (except episodes of hyperinflation).

5.25 Accordingly, the first step towards obtaining a forward-looking view of the real interest rate is to estimate inflation expectations. A variety of approaches has been employed to model inflation expectations, like collecting information on people's attitudes about the inflation outlook through surveys, observing differences in yields of nominal and indexed bonds, and drawing inferences from macroeconomic data. Inflation expectations could alternately be modelled through time-series based on econometric approaches. The real interest rate calculated by adjusting the representative nominal interest rate for inflation expectations would diverge from an *ex-post* measure depending upon the volatility of the inflation rate in the past. Movements in *ex-ante* real interest rates - nominal interest rates *less* inflationary expectations with inflationary expectations obtained from estimates of the aggregate supply curve estimated below -are reflected in Charts V.1 and V.4.



5.26 The *ex-post* real interest rates (SBI Advance Rate *less* actual inflation) have remained high in the recent period (1995-2000), averaging around 8.7 per cent as against the average real growth rate of 6.6 per cent. On the other hand, *ex-ante* real interest rates (SBI advance rate *less* inflation expectations) averaged 7.5 per cent, lower than the *ex-post* rates over the same period. Real interest rates in India imbibe some of the rigidities characterising nominal interest rates: (i) household preferences for fixed rate deposits reduces the banks' flexibility to reduce interest rates in the short-run; (ii) relatively high-level of non-performing assets coupled with high non-operating costs imparts a stickiness to banks' lending rates; (iii) persistent and large volume of market borrowing requirements of the Government; and (iv) structure of administered rates on small savings. It is in the context of (iv) that the Report of the Expert Committee to Review the System of Administered Interest Rates and Other Related Issues (Chairman : Dr. Y.V. Reddy) (RBI, 2001) recommended that the interest rates on small savings and other administered instruments of various maturities be benchmarked, with a spread of a maximum of 50 basis points and with an objective to reduce the spread over a period to the secondary market yields of various government securities of corresponding maturities. Provident funds could be offered only on a floating rate basis, while for all other small savings, an option of fixed *versus* floating rates may be provided at the time of entry.

Nominal Interest Rates

5.27 In the 1980s, with the erosion of the stability of money demand and the explanatory power of monetary aggregates on account of financial innovations, globalisation and the growing sophistication of financial markets, monetary authorities have increasingly resorted to interest rates, to the almost complete exclusion of monetary or reserve aggregates, both as sources of information for determining policy as well as operating instruments for conducting monetary policy. The main operating instrument for most central banks today is a short-term interest rate. Markets are the deepest in the short-end, allowing central banks to intervene in support of policy objectives without generating serious repercussions on market activity. Moreover, impulses from the short-end are transmitted relatively quickly across the term structure of interest rates and this makes for efficiency in intervention. The recent experience has shown that central banks have

been proactively moving target interest rates in support of output/employment and financial stability considerations, even if this has meant a temporary departure from their commitment to price stability. A contractionary monetary policy is reflected in an increase in the nominal short-term interest rate. As wages and prices take time to adjust to the interest rate change, the higher nominal interest rates translate into higher real short-term as well as long-term interest rates which dampen investment and consumption leading to a fall in aggregate demand and contraction in output. Over a period of time, as wages and commodity prices begin to adjust, aggregate demand is restored and real activity, the real interest rate and the real exchange rate return to their fundamental levels. In consensus models underlying the reactions of monetary authorities under constrained discretion, the relationships of short-term (policy) interest rates and output *via* the real interest rate have come to be regarded as almost axiomatic: raise interest rates today and, given the lags in the operation of monetary policy, output (and inflation) contracts say 8-16 months hence. The key issue in this context is the sensitivity of consumption and investment to movements in the interest rates.

5.28 In India, interest rates as an instrument of monetary policy, were activated in the 1990s. With the financial sector reforms, the monetary management has been increasingly relying upon the use of indirect instruments like interest rates and open market operations including repos. During the pre-reform period, the Bank Rate had a limited role as a monetary policy instrument. It was activated and made as a signaling and reference rate in April 1997 linking it to rates at which accommodation is provided by the Reserve Bank. Changes in the Bank Rate are also seen as an integral part of the monetary policy stance of the Reserve Bank announced from time to time and provide a direction to general level of interest rates in the system. As such, the importance of the Bank Rate which influences cost and availability of credit in the economy has increased.

5.29 Along with the Bank Rate, the open market operations of the Reserve Bank have also been actively used. With the Reserve Bank's stance to move away from the sector-specific refinance schemes, the liquidity in the system is managed increasingly through the liquidity adjustment facility (LAF), which was introduced in June 2000. The operating procedures of the LAF including auction methods and periods are being refined periodically to make it more efficient. With a strategy for a smooth transition of call money market into a pure inter-bank market, the liquidity support available from the Reserve Bank has been rationalised. As such, the repo and reverse repo rates emerging from the LAF auctions essentially reflect the market conditions of availability of liquidity in the system along with the rate at which the liquidity is available from the Reserve Bank. The LAF injects/absorbs liquidity on a day-to-day basis in a flexible manner and in the process provides a corridor for the call money and other short-term interest rates. During the last decade, deposit interest rate structure in India has been, by and large, deregulated except the savings deposits rate, which is currently prescribed by the Reserve Bank. Commercial banks have been given virtual freedom to determine their lending rates. The interest rates, particularly at the short-end of the market, are more aligned and integrated. The economic agents are currently responding to changes in the interest rates. Nevertheless, there are quite a few rigidities in the structure of interest rates.

5.30 The Report of the Working Group on Money Supply (RBI, 1998b) found a positive impact of expansionary monetary policy on output, both through reduced interest rates and increased

credit. A comparative assessment indicated that the output response operating through the interest rate channel was stronger and more persistent than that of the credit channel. Similar findings are reported from a comparison of monetary impulses transmitted through interest rate effects with that through liquidity effects for the period 1961-2000. The interest rate emerges as a significant factor explaining the variation in real activity in the 1990s as compared with a negligible impact in the 1980s (Dhal, 2000).

5.31 Thus, variations in short-term nominal interest rates by the monetary authority do have real effects in the short- and medium-term. However, the possibility of inflation bias - dynamic inconsistency - arising out of the policy discretion has provoked the search for specifying systematic, stable and predictable policy rules to guide the conduct of interest rate policy *a la* the Taylor's rule (Taylor, 1993) under which the nominal interest rates are calibrated to respond symmetrically to deviations of output from its potential growth path and inflation (expectations) from the target. Such rules or policy reaction functions, as they are euphemistically termed, reduce the inflation bias in growth oriented monetary policy (Svensson, 1999).

Operating Framework for Monetary Policy in India

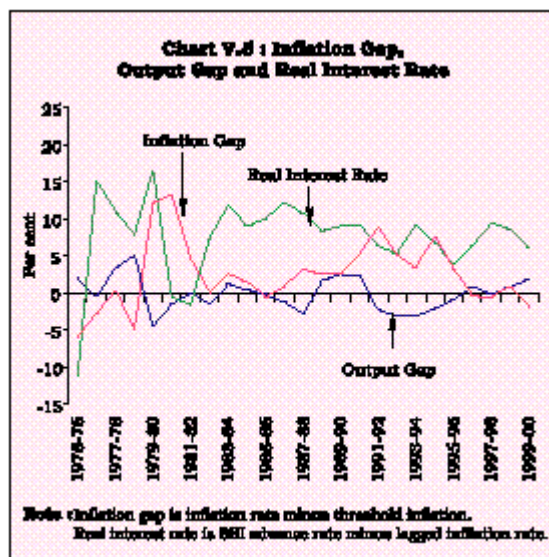
5.32 There has been a progressive erosion in the analytical underpinnings of 'monetary targeting with feedback' during the second half of the 1990s. The monetary and credit policy for 1998-99 raised questions about the explanatory power of the money demand function (RBI, 1998a). Similar sentiments were expressed regarding the predictive stability of money demand by the Third Working Group on Money Supply (RBI, 1998b). Accordingly, in the recent period, there has been an intensive quest for the analytics underlying the operational framework of current monetary policy in India and their empirical validation.

5.33 It is possible to capture the dynamics of the operational conduct of current monetary policy through a small, computable model linking the objectives and instruments of monetary policy within a simple representation of the macroeconomic processes through which monetary policy is transmitted. The model is set in the modern tradition of the 'consensus' approach which is being increasingly employed to capture the prevailing operating procedures of central banks worldwide. The 'consensus' model has the advantage of being simple, transparent and tractable. Relative to large-scale macroeconomic models, the consensus approach allows for easier evaluation of alternative policy rules. Although highly aggregative, these models have considerable theoretical content in providing stylised representation of the monetary policy transmission mechanism.

5.34 The model estimated in this Chapter draws from the empirical approach adopted in the context of examining the impact of bond financing of fiscal deficits in India (Moorthy, Singh and Dhal, 2000) and the foregoing discussion: i) monetary policy is faced with a multiplicity of objectives, although a single goal is desirable; specifically, monetary policy cannot avoid concerns about stabilising the real economy around a desired growth path even as it commits itself to price stability; ii) there exists a short run trade-off between growth and inflation and monetary authorities are constrained to take a position on the growth-inflation curve, reflecting their policy priorities; iii) money plays no explicit role in the model although the key monetarist assumption that inflation in the long run is determined by monetary policy is retained implicitly;

iv) the interest rate is treated as the principal instrument of monetary policy in consonance with monetary policy operating procedures all around the world under which monetary authorities adjust interest rates in response to economic developments. The interest rate becomes an overall index of financial conditions and all financial prices move in a stable and predictable way with changes in the policy rate (Meyer, 2001).

5.35 The first issue is the choice of objective(s) for monetary policy. The stated objectives of monetary policy in India are to 'provide sufficient credit for growth while ensuring that there is no emergence of inflationary pressures on this account' (RBI, 2001). These objectives are consistent with announced projections of growth and inflation, with projections for non-food credit performing the *ad hoc* role of an intermediate variable. The choice of these objectives inevitably involves a consideration of societal welfare, *i.e.*, deviations (of inflation and growth) from the chosen combination cause losses of macroeconomic welfare. There is considerable agreement among academics and central bankers that the appropriate loss function involves stabilising inflation around an inflation target as well as stabilising the real economy represented by the output gap (Svensson, *op cit*). The conduct of monetary policy should be directed towards minimising these welfare losses. The critical policy choice is the relative importance or weights to be assigned to deviations of output and inflation from the targets. This involves a knowledge of the structural characteristics of the economy. In terms of the model, this can be expressed through a simple three equation system specifying aggregate demand, aggregate supply and a policy rule setting out the response of the monetary policy to fluctuations in demand and supply (Chart V.5).



5.36 As in the case of fiscal policy, monetary policy operates by influencing the gap between aggregate demand and supply which, as indicated in Chapter IV, has to be estimated within the framework of a macroeconomic model (as in Chapter VIII). For operational purposes, however, a reasonable approximation of the aggregate demand-aggregate supply gap can be obtained as the difference between actual and the underlying or structural component of output. Therefore, the first building block of the model is the specification of the behaviour of aggregate demand (output gap) that depends upon its past behaviour and the real interest rate which has a negative

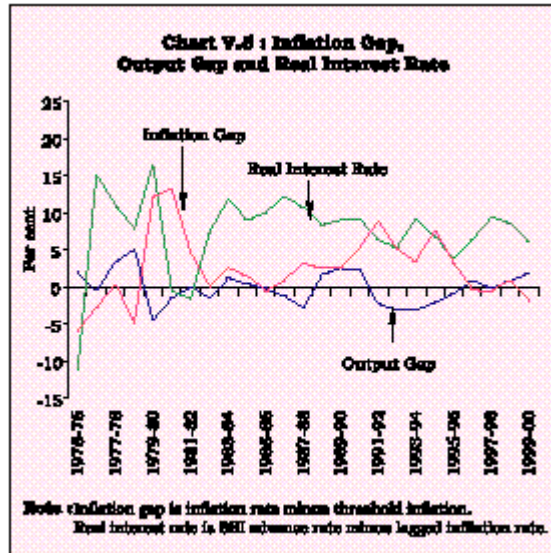
impact on demand. The real interest rate is defined in a forward-looking sense by deducting inflation expectations (proxied by lagged inflation) from the nominal interest rate represented by the SBI advance rate. In India, cyclical changes in economic activity have often been induced by supply shocks, predominant among which has been that emanating from increases in international oil prices. This is explicitly incorporated in the estimation of the aggregate demand in the model in the form of fuel price inflation. Essentially, in terms of standard economic analysis, the aggregate demand function takes the form of an expectational IS (Investment-Saving) function of the type that can be justified by dynamic optimisation analysis.

5.37 Deviations of inflation from the threshold can be studied from the supply side of the economy. The aggregate supply curve can be represented by a Phillips curve type formulation in which inflation is positively related to the output gap. The supply curve also captures the effect of inflation expectations on inflation with expectations formed in an adaptive way, *i.e.*, current inflation is determined by its past. The introduction of lagged inflation in the estimation of the supply curve produces the short-run tradeoff between inflation and growth. Food prices, another major source of supply shocks, are introduced into the supply curve reflecting the structural characteristics of the Indian economy.

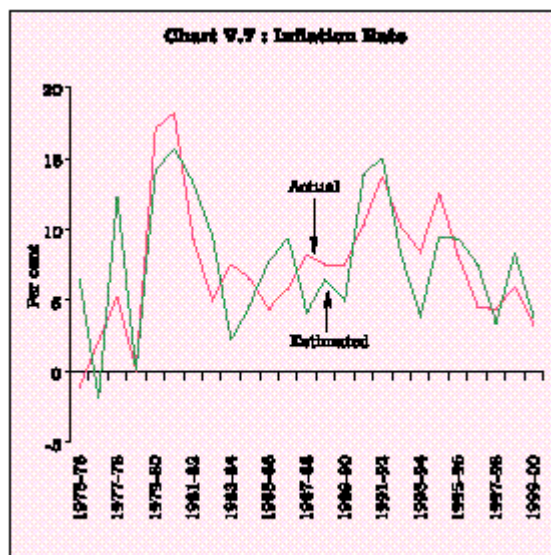
5.38 The model is closed by specifying a policy rule setting out the response of the monetary policy to deviations of the economy from the desired combination of growth and inflation chosen by the monetary authority to minimise welfare losses. In view of the country-specific situation involving the conduct of public debt management by the monetary authority and the recourse of the fisc to money financing, the fiscal deficit is explicitly introduced into the monetary policy reaction function. The policy reaction is embodied in the adjustments in the Bank Rate, the principal signaling variable as well as an anchor for interest rates on standing refinance facilities, repo rates and in general, the term structure of interest rates in India. The deployment of the Bank Rate is postulated as being symmetric in response to inflation and output deviations. An increase in the Bank Rate results in a rise of the market rate for advances, which compresses aggregate demand (or output gap) and aligns the output/inflation deviations with targets/threshold.

5.39 The statistical results of the model turn out to be reasonably robust⁴. In the aggregate demand equation, the coefficient of aggregate demand with respect to real bank lending rate is estimated at (-)0.24 in the short-run and almost (-)0.5 in the long-run. This suggests that a 100 basis point reduction in the real interest rate raises the aggregate demand and narrows the output gap by almost 25 basis points in the short-run and up to 50 basis points over time. Supply shocks embodied in the international oil price hikes have a major influence on aggregate demand, generating cyclicity in output behaviour. Adjustments of aggregate demand fluctuations to its underlying levels are fairly rapid, with almost one-half of the output gap closed within one year. This suggests that the amplitude of the cycle in the Indian economy is relatively small - upturns quickly follow downturns, vindicating the results of the spectral analysis conducted in Chapter III. The operation of monetary policy through real interest rates appears to have had a stabilising influence on aggregate demand. Simulations of the estimated equation indicate that the impact of policy measures for demand compression during the balance of payments shocks of 1990 had prolonged effects. Aggregate demand was constrained well below its potential up to 1996-97 when, following the cyclical catch-up, aggregate demand was predicted to experience a

downturn. The behaviour of actual aggregate demand indicates that the model overpredicted the downturn, mainly on account of demand stimulus emanating from the Fifth Pay Commission award and a strong rebound in agricultural growth (Chart V.6).

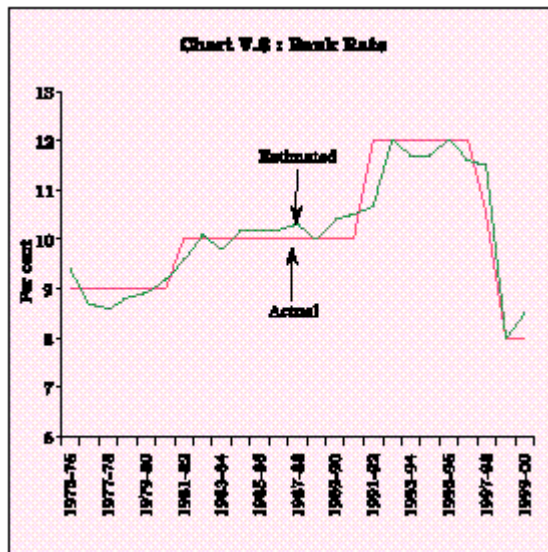


5.40 The estimates of the aggregate supply equation² indicate that the dynamic or long-run effect of aggregate demand on (changes in) inflation is about 0.5, *i.e.*, a 100 basis points increase in the aggregate demand (above its underlying) results in almost 50 basis points rise in the inflation rate. The role of food prices, a traditional channel for transmission of supply shocks to domestic inflation, is also significant; an increase of 100 basis points in foodgrains inflation rate leads to an increase of 44 basis points in the inflation rate (Chart V.7). The estimated supply equation captures the turning points fairly closely.

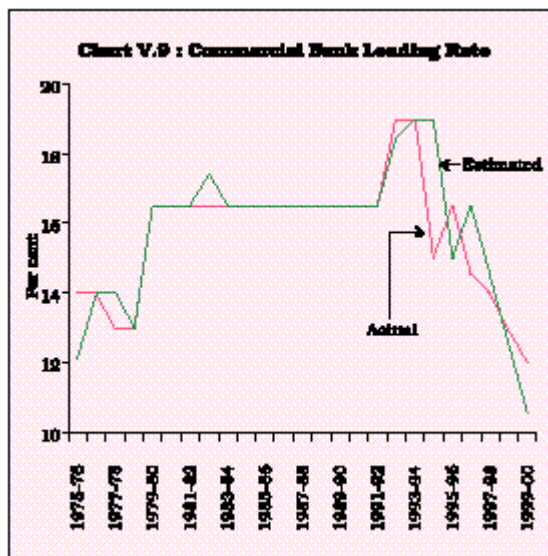


5.41 Estimates of the monetary policy reaction function satisfy *a priori* expectations of symmetrical response of the monetary policy to output and inflation movements³. An expansion

of the aggregate demand and/or rise in inflation above threshold provokes a revision in the Bank Rate in the similar direction. The estimates show that the Bank Rate is positively related to the size of the fiscal deficit (the long-run coefficient of fiscal deficit/GDP ratio is placed at 1.4) indicating that the monetary policy reaction is partly attributable to the size of the fiscal deficit which imparts a downward rigidity to the interest rates in the country. The lagged coefficient of the Bank Rate turns out to be significant suggesting a strong order of interest rate smoothing in support of financial stability, a result consistent with the empirical evidence emanating from the estimated reaction functions of other major central banks (Clarida, Gali and Gertler, 1998). The estimated and actual paths of the Bank Rate are indicated in Chart V.8.



5.42 As real interest rates employed in the model are derived from the commercial bank lending rate (SBI Advance Rate), the latter is linked through a linear relationship with the Bank Rate⁴ (Chart V.9).



5.43 In the model, a macroeconomic disturbance resulting in a demand-supply imbalance provokes a monetary policy reaction in the form of a change in the Bank Rate. The commercial bank lending rate changes in a linear and symmetric manner. As inflation expectations are inertial in the short-run, the change in nominal interest rates is reflected in real interest rates. This has a negative impact on aggregate demand and, in turn, on inflation. The monetary authority analyses the developments in aggregate demand and inflation in response to its initial interest rate move and re-calibrates, if necessary, its reaction. A negative shock to (reduction in) the Bank Rate, as discussed in Chapter VIII, produces some positive effects on the real economy in the short-run, but has adverse effects on inflation over time. In the long-run, therefore, monetary policy has to constantly rebalance the short-run output gains against the loss of welfare due to higher future inflation. This is the constraint facing growth-oriented monetary policy.

Sacrifice Ratio

5.44 Despite the recent record of low inflation the world over, the current disinflation cycle affecting both developed and developing countries has generated considerable scepticism about the primacy, and, in some cases, the single mindedness of monetary policy pursuing inflation. In recent years, there has been a proliferation of empirical work on measuring the macroeconomic costs of reduction in inflation from a certain low level. As Japan has learned, and Europe may soon find out, there is a new danger - falling prices may lock countries into a spiral of economic decline (The Economist, 1999). Given the short-run trade-off between inflation and output on account of wage and price rigidities, it stands to reason to expect a point beyond which attempts to reduce inflation would necessitate a reduction in output. In other words, a sacrifice of output is inevitable in the pursuit of inflation reduction. This loss of output, referred to in the literature as the sacrifice ratio, has encouraged the use of several alternative methodologies for their measurement, largely in the tradition of Okun. In the context of an increasing mass of developed economies having already achieved a relatively low inflation in the 1990s, the concept of sacrifice ratio, and the appropriate conduct of monetary policy, is being subjected to critical review. Of particular concern is the increasing evidence obtained from estimation of sacrifice ratios for industrial countries that aggregate supply curves tend to flatten out in an era of low inflation and structural rigidities. This may increase sacrifice ratios and lead to higher unemployment as firms would be forced to adjust, not through changes in wages which acquire an additional rigidity at low inflation rates, but through changes in employment. Thus, a tightening of monetary policy would have stronger real effects than in the past. The question, therefore, is raised as to whether "gain from reducing inflation to zero is worth the sacrifice in output and employment that would be required to achieve it".

5.45 The empirical evidence points to rising sacrifice ratios in periods of declining inflation. For 19 industrial countries for which inflation rates had fallen from 8 per cent (1965-85) to 3.5 per cent (1985-98), an increase of almost 75 per cent in the sacrifice ratios from 1.5 to 2.5 was observed (Anderson and Wascher, 1999). At the same time, the size of sacrifice ratio also depends upon the speed of adjustment with gradual disinflation leading to a higher sacrifice ratio compared to a cold turkey approach providing empirical support for rapid disinflation (Ball, 1993). The preference for speed of disinflation would critically depend upon the shape of the social welfare function. The increase in sacrifice ratios is also found to be relatively less for the

countries that had undertaken measures to increase labour market flexibility.

5.46 An important related issue is whether increased central bank independence lowers the sacrifice ratio, *i.e.*, whether there is a credibility bonus associated with independent central banks? *A priori* the public is expected to more readily believe the anti-inflationary pronouncements of an independent central bank and this, in turn, should lower output losses. Some studies, however, did not find any such credibility bonus; on the contrary, a positive and significant relationship between central bank independence and sacrifice ratio was observed. In other words, more independent central banks, on an average, pay a higher output price per percentage point of inflation to reduce the inflation rate (Fischer, 1994). The results suggest that even independent central banks have to fight hard and long to bring inflation down after an inflationary shock has struck.

5.47 Estimations of sacrifice ratios for developing countries, and particularly, for India are scanty. Nevertheless, given the current low level of inflation, concerns have been raised regarding the efficiency gains, and, more recently, on the potential output losses associated with assigning relatively higher weights in the conduct of monetary policy to reduce inflation. Accordingly, an attempt is made to estimate the sacrifice ratio for India from the aggregate supply curve (Phillips Curve) estimated as an element of the operating framework of the Indian monetary policy (presented earlier in this section). The specification of the inflation process in the aggregate supply curve follows the 'triangle model of inflation' (Gordon, 1997; Turner and Seghezza, 1999). The sacrifice ratio⁵ for India turns out to be almost 2 over the period 1975-2000, *i.e.*, in a low inflation environment, a further reduction in the inflation rate by 1 percentage point would reduce the output by 2 percentage points from its potential level.

5.48 The estimated sacrifice ratio for India is relatively lower than that of major industrial countries. Estimates of sacrifice ratios are found to be sensitive to the estimation methodology. For a sample of 19 countries, the estimated sacrifice ratio averaged 5.8 per cent based on quarterly data and 3.1 per cent based on annual data (Ball, 1993). Similarly, for OECD countries, based on single equation estimates, the average sacrifice ratio was 3.2; for most of the countries, the ratio lay in a range of 2-4, although outliers of 1.6 (Japan, Italy and the Netherlands) and 7 (Norway) were also observed (Table 5.3). System estimates yielded a common sacrifice ratio of 3.7 for 15 out of the 17 sample countries (Turner and Seghezza, 1999). Given that the threshold inflation in India is at around 5 per cent and that the average inflation has been higher than the threshold, the lower order of sacrifice ratio for India compared with the OECD countries is to be expected; however, once the inflation falls below the threshold inflation of 5 per cent, the sacrifice ratio could end up being higher.

III. THE CREDIT CHANNEL

5.49 In India, an abiding faith in the working of the credit channel of policy transmission runs through the conduct of monetary policy right from the 1950s. The tone was set out in the First Five-Year Plan document itself which envisaged "judicious credit creation somewhat in anticipation of the increase in production and the availability of genuine savings" (GoI, 1952). Right up to the 1980s, fiscal policy was accorded primacy in stepping up the investment rates and generating a 'virtuous circle' of growth through vertical inter-relationships and monetary

policy accommodated the same. The inflationary consequences of primary financing of government expenditures were tackled by curbing credit to the commercial sector and raising the cash reserve ratio (CRR) and statutory liquidity ratio (SLR) to a peak level of around 60 per cent of bank's net demand and time liabilities by 1990.

5.50 The logical evolution of the monetary policy setting in the 1970s was in the direction of credit rationing as an integral element of developmental planning. The rationing of credit evolved with food credit being given the first charge, followed by the prescribed priority sector lending, sectoral limits for credit deployment and selective credit controls. Sectoral credit targets became the proximate targets for monetary policy which was operated through allocations of non-food commercial bank credit.

Table 5.3 : Estimates of Sacrifice Ratios

Study	Methodology	Coverage and Study Period	Estimates of Sacrifice Ratio (%)
1	2	3	4
Ball (1993)	Actual developments in output and inflation	19 industrial Countries; 1960-92.	Average 5.8 per cent for quarterly data and 3.1 per cent for annual data. For annual data, the range was 0.9 (France) – 10.1 (Germany).
Anderson and Wascher (1999)	Aggregate supply curve; structural wage and price equations; actual developments in output and inflation	19 OECD countries; 1965-85 and 1985-98.	Average of 1.5 (1965-85) and 2.5 (1985-98).
Turner and Seghezza (1999)	Aggregate supply curve	21 OECD countries; 1963-97.	Average of 3.2 with a range of 1.6 (Japan, Italy and the Netherlands) – 7.0 (Norway).
Current Study	Aggregate supply curve	India; 1975-2000.	2.0

Selective credit controls were strengthened by the institution of the Credit Authorisation Scheme in 1966-88 and with the nationalisation of banks, the institutional apparatus for conducting monetary policy through the credit channel, to the virtual exclusion of other channels, was complete. Refinance was provided in order to make up for the shortfall of credit targets in relation to demand. The quantitative credit planning implied a reduced role of the interest rate as an equilibrating mechanism in the credit market. The interest rate structure was complicated and administered, rendering it inflexible and sterile as an instrument of monetary policy. The policy of setting up interest rate ceilings up to 1987-88 in situations of excess demand reinforced the rationing of bank credit in order to influence aggregate demand.

5.51 The conduct of monetary management has undergone significant changes in the 1990s in terms of objectives, framework and instruments, reflecting broadly the progressive liberalisation of the Indian economy. The Reserve Bank announced a multiple indicator approach in 1998-99, which accords the necessary flexibility to respond to changes in domestic and international economic and financial market conditions more effectively. The monetary stance of the Reserve Bank in the recent period has been to ensure that all legitimate requirements for credit are adequately met consistent with the objective of price stability. Liquidity operations are conducted with a view to ensuring that the demand for reserves is stable and adequately satisfied so that credit projections consistent with the macroeconomic objectives of growth and inflation are achieved. Simultaneously, progressive improvements in the modes of delivery of bank credit

have been pursued.

Sifting the Literature for the Credit View

5.52 The genesis of the credit view is essentially traced to a critique of the standard macroeconomic literature which treats the financial structure as irrelevant to real outcomes (Modigliani and Miller, 1958). There has, however, been a long standing alternative tradition in the literature beginning with Fisher (1933) and Keynes (1930) and upheld in more recent years by Bernanke (1983), Blinder (1987), Gertler (1988) and others which has asserted a central role of the credit market in the propagation of cyclical fluctuations. In this alternate view, deteriorating credit-market conditions - sharp increases in insolvencies and bankruptcies, rising real debt burdens, collapsing asset prices - are not passive reflections of a declining economy, but are themselves major contributors to the depression. Abandoning the classical view of the financial system just acting as a 'veil' and merely accommodating the real sector requirements, the credit view literature incorporates credit market imperfections into the standard macroeconomic models to show the crucial role of credit behaviour in explaining even "garden-variety" cyclical fluctuations (Bernanke, Gertler and Gilchrist, 1999). The two key assumptions in the credit channel are that banks cannot shield their loan portfolios from changes in monetary policy and that borrowers cannot fully insulate their real spending from changes in the availability of bank credit. Monetary policy works by affecting bank assets, *i.e.*, loans, in addition to bank liabilities, *i.e.*, deposits and the credit channel is a supplement, not an alternative, to the usual money channel (Box V.2).

Box V.2 Credit View

The "credit view" questions the asymmetry in the traditional macroeconomic models, *i.e.*, the special role of money, the bank liability, in the determination of aggregate demand of the economy while, in contrast, lumping together bank loans with other instruments in a "bond market" and suppressing the same by Walras Law (Bernanke and Blinder, 1988). The "money view" holds that financial intermediaries like banks offer no special services on the assets side and capital structures do not affect any lending/borrowing activity, while on the liability side of their balance sheet the banking system creates money by issuing demand deposits. A monetary contraction, thus, in a two asset model (money and bonds) limits deposit selling ability of banks with depositors prompted to adjust their portfolio to holding more bonds and, in absence of instantaneous price adjustment, driving the real money balances down and pushing up the real interest rates on bonds. The resultant increase in the user cost of capital reduces the interest-sensitive spending and real economic activity. On the other hand, the "credit view", arguing the existence of imperfect capital markets and information asymmetries between borrowers and lenders, relaxes the assumption of perfect substitutability of bank lending and bonds and holds that the bank lending is key in reducing the premium especially in information intensive loans for bank-dependent borrowers. The "bank lending channel", thus, holds that a contractionary monetary policy decreases bank reserves, which cannot be offset by the banks (say, by issuing certificates of deposits) thereby reducing the bank lending, investment demand and output. The credit view also proposes a "balance sheet channel" of monetary transmission arguing the additional possibility of monetary shocks affecting the net worth of firms thereby affecting lending activity of banks and other financial institutions. Thus, a contractionary monetary policy leaves less money in the hands of public which spills over as a lower demand for equity driving the net worth of firms down through lower equity prices thereby prompting the banks to check lending and inhibiting investment demand. The initial monetary policy shocks as per the traditional "interest rate channel" of the money view tend to be magnified in its impact on real economic activity through the "financial accelerator".

The "credit view" model, in a simplified sense, introduces a third asset besides money and bonds in the form of loans by dropping the assumption of perfect substitutability between bonds and credit. In a simplified framework,

the loan demand is treated as a function of lending rate, interest rate on bonds and GDP (representing the transactions demand for credit arising from working capital and liquidity considerations). Assuming that banks' desired portfolio proportions depend on rates of return on the available assets, the loan supply is treated as a function of lending rate (positive), interest rate on bonds (negative) and the required reserve ratio (negative). The introduction of the third asset necessitates a replacement of the traditional goods market equilibrium locus in the form of IS curve in the standard macroeconomic model with a commodities credit (CC) curve which would also be negatively sloped but would be susceptible to changes in monetary policy or the bank reserves as well as credit market shocks unlike the usual IS curve. Here, the monetary policy variations affects real economic activity by not only impacting the money market equilibrium locus, *i.e.*, LM curve but also the CC curve. The excess demand in the credit market on account of a decline in bank loans can be removed either through the market clearing rises in the premium on bank loans (Bernanke-Blinder, *op cit*) or through rationing of loans (Stiglitz and Weiss, 1987). Amidst the existence of credit market imperfections with problems of asymmetric information in a situation of excess demand, the credit rationing cannot be done by increasing interest rates as the latter prompts the borrowers to choose riskier projects (moral hazard) or weeds out relatively safe investments due to low profitability (adverse selection) but by augmenting rate of interest with non-rate terms. The asymmetric information leads to imperfections in financial markets and because of imperfect monitoring, raises the cost of external funds in relation to internal funds making the two imperfect substitutes for firms. Thus, even in equilibrium, the loan market may be characterised by rationing.

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5.53 Empirical examination of the credit view associates the severity of Great Depression of the early 1930s in part with financial distress associated with the deflation experienced during that period (Bernanke, 1983). Interest in the credit channel has revived in the early 1990s with the growth record in Asia and Latin America being associated with a bank credit boom and narrowing of intermediation spreads. The large devaluations and interest rate shocks of end-1994/early 1995 in Latin America and at the end of 1997-98 in Asia are attributed with having eroded the deposit base and created large non-performing loans, leading to a credit squeeze which prolonged the recession beyond the period warranted by the initial monetary tightening. As bank loans form a crucial input for provision of working capital as well as households' spending decisions in a typical emerging market economy, the bank credit squeeze led to a drop in the real GDP concentrated in non-tradeable sectors (Catao and Rodriguez, 2000). Some evidence of credit view is also found in Finland for the period 1980-1996 (Anari *et al*, 1999). Recent empirical work on the co-behaviour of limits on borrowing and the "buffer stock" have established the effects of credit market imperfections on consumption demand (Deaton, 1991) as well as investment demand *via* the impact of the balance sheet (Hubbard *et al*, 1995). The cross-country experience in developed economies as well as the developing economies suggests that given the existence of credit market imperfections as well as bank dominated credit markets, bank credit acts as a "financial accelerator" amplifying both the economic downturns as well as upswings by a far greater degree than warranted by initial monetary shocks.

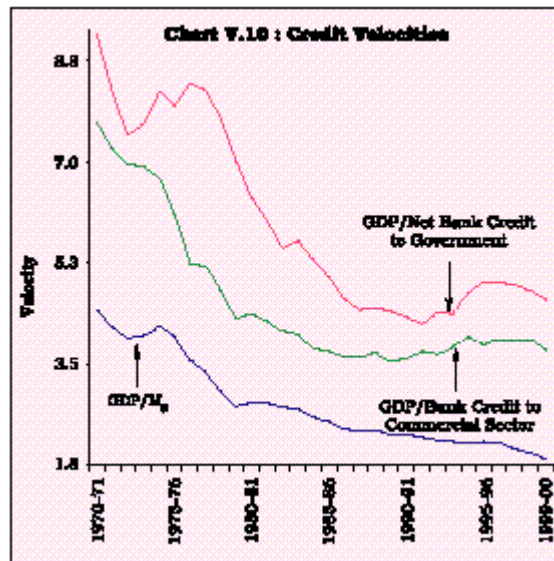
The Credit View in India

5.54 As mentioned earlier, the credit view dominated monetary economics in India. The experience of the 1970s resulted in a certain disenchantment with the credit view that was regarded as the 'ruling orthodoxy'. The restriction on operational freedom for the banks in the form of statutory pre-emptions for food procurement, exports, agriculture, small scale sector, vulnerable sections, core industries and sick industries implied that the channel of credit allocation to few pockets of the commercial sector could transmit very limited influence on the real economic variables (Vasudevan, 1978). Nevertheless, even with the advocacy for monetary targeting, full credence was given to the 'credit view' as the creation of money was viewed as simultaneously the creation of credit (RBI, 1985). While monetary expansion leads to an increase in prices, credit expansion facilitates an increase in investment and expansion in output. The issue before the policy maker is to balance the output gains of credit creation with the inflationary consequences of money creation. In the context of a macroeconomic model, it was shown that the price effect of a given expansion in money supply is higher than the output effect (Rangarajan, 1997).

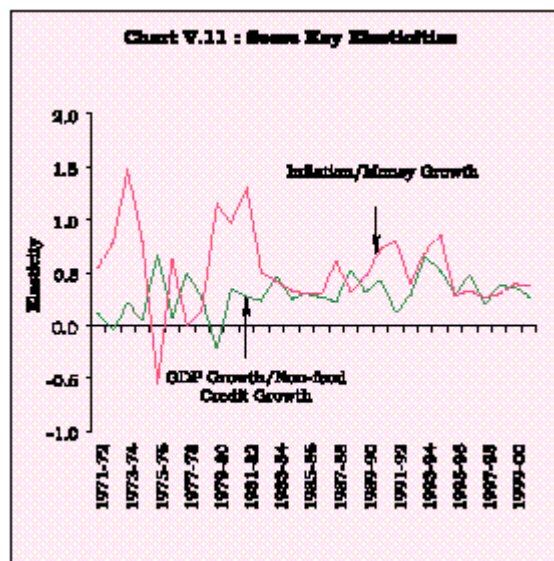
5.55 Studies conducted in the early 1990s have raised a number of interesting features of the Indian credit market. First, there appears to be a switch from a regime of credit rationing to a situation of demand constraint in the loan market in 1993-94. Second, the presence of excess liquidity in the system had failed to stimulate production. Third, the increase in commercial bank credit to the government had been far in excess of the requirement under the SLR (Rakshit, 1994). In the context of credit-supply constrained firms in the Indian industry, three major findings have been reported. First, bank credit does influence inventory accumulations. Second, the size of external finance premium depends on the financial conditions of firms and third, bank dependent small industries suffer most during the period of quantitative credit control (Mukhopadhyaya, 1998).

Stylised Facts in India

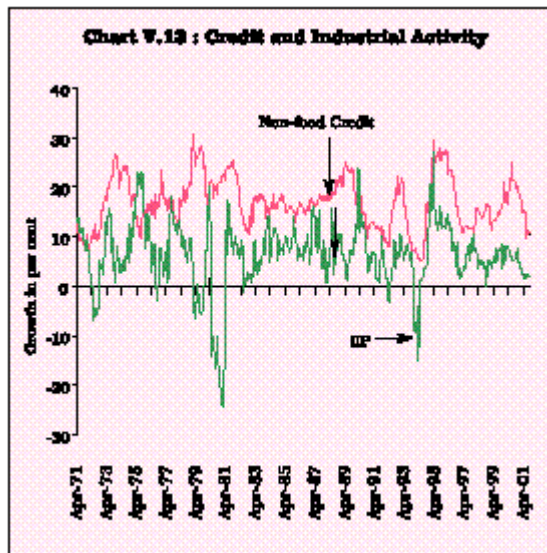
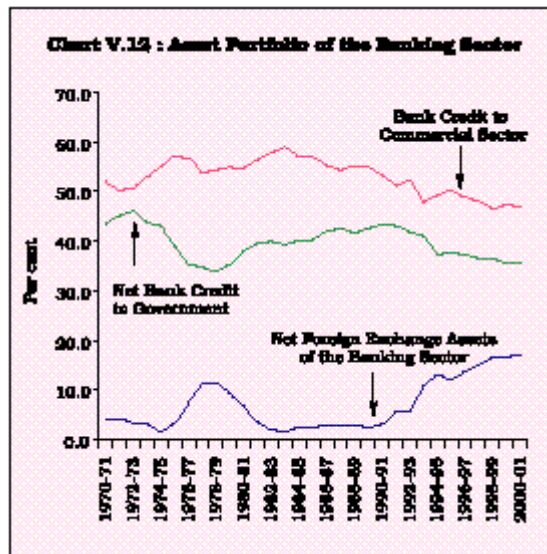
5.56 An analysis of macroeconomics of credit holds the key to an understanding of the role of monetary policy in the context of the possibilities of revitalising growth in the Indian economy for four reasons. First, the credit velocities have progressively become more stable than money velocities over the recent years. The ratio of GDP to bank credit to commercial sector, after having declined from 7.7 in 1970-71 to 3.8 in 1984-85, has remained stable thereafter around that value. The ratio of GDP to net bank credit to government decreased from 9.2 in 1970-71 to 4.6 in 1986-87 but stabilised thereafter around that value. The money (M_3) income velocity has declined from 4.4 in 1970-71 to 1.9 in 1999-2000 (Chart V.10).



5.57 Secondly, the point estimates of elasticity of income with respect to commercial sector bank credit, which were generally lower than the elasticity of inflation with respect to broad money during the 1970s, have more or less converged during the post-reform period (Chart V.11).



5.58 Thirdly, there has been growing importance of the assets side of the balance sheet of the banking system in India thereby necessitating a relaxation of the typical assumption made in the "money view" of perfect substitutability of assets of the banking system. For instance, with the progressive reduction in the statutory earmarking of resources from the banking sector for Government, there has been growing importance of allocation of resources for the commercial sector. There has also been increasing accretion to foreign assets in the banking system in the 1990s (Chart V.12). Fourthly, the Indian economy, like many other developed and developing economies, has experienced marked cycles in credit markets along with cyclical fluctuations in output (Chart V.13).



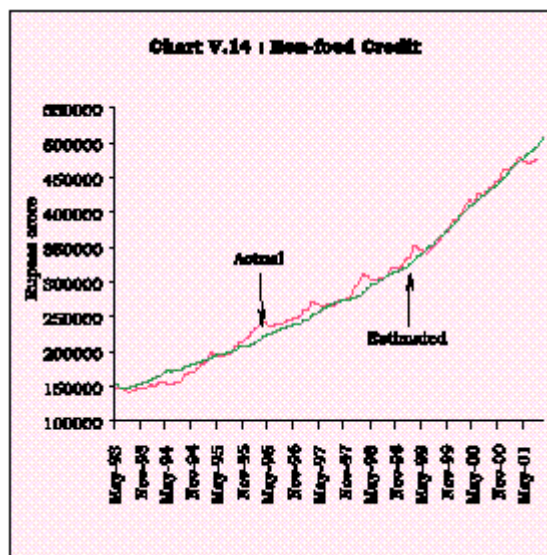
Macroeconomics of Credit: An Empirical Investigation

5.59 An empirical investigation of the non-food credit market is undertaken for the post-reform period using monthly data from May 1993 to September 2001 based on the framework of Bernanke-Blinder (*op cit*). The demand for non-food credit from the banks is largely for working capital finance. Credit demand depends on output, represented here by the index of industrial production (IIP). The dependence on output essentially tends to capture the transactions demand for credit which might arise from working capital or liquidity considerations. Generally, it is expected that a higher output would lead to an increase in the off-take in non-food credit. The other factor which normally determines the demand for non-food credit is the interest rate charged on the bank loans. It is expected that the demand for credit would be negatively related to the lending rate.

5.60 Supply of non-food bank credit is postulated to depend on the lendable resources that banks

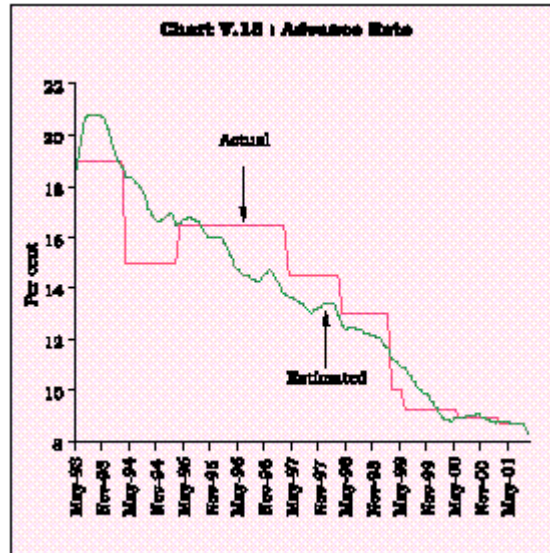
have after meeting cash reserve requirements. It is also expected to be influenced by the secondary pre-emptions by the government through the SLR. Logically, the lower the statutory pre-emptions, the higher would be the resources available for augmenting credit supply. Credit supply is also posited to be responsive to a host of financial prices, specifically the lending rate of banks, an alternate risk-free interest rate of holding government paper, say Treasury Bills⁶ and equity prices. While government bonds are a substitute for bank lending, equity prices impart balance sheet effects and work in the same direction as the lending rate on credit supply. The equity price is an important variable as the spread between the cost of external and internal finance varies inversely with the borrower's net worth - internal funds and collateralisable resources - relative to the amount required. Furthermore, an adverse shock to a borrower's net worth increases the cost of external finance and decreases the ability of the borrower to implement investment, employment, and production plans.

5.61 The empirical investigation is undertaken through a system of simultaneous credit demand and credit supply equations to avoid the 'simultaneity bias' with controls for seasonality. The results⁷ showed that the demand for non-food credit is predominantly influenced by economic activity embodied in the IIP not only contemporaneously but also by 1-month and 2-month lagged output. Credit demand is found to be inversely related to the bank lending rate with interest elasticity of 0.22, indicating a key role for interest rate policy in supplementing the credit channel in the context of revitalising growth. Output elasticities (both current as well as lagged) of credit demand are higher, in absolute terms, than the interest elasticity of credit demand. This explains the dominant influence of the current slowdown on credit demand and the tendency of the output effects to outweigh the beneficial effect of the declining interest rate conditions (Chart V.14).



5.62 On the supply side, a positive effect of the lending rate of banks on the supply of credit was obtained (a 1 per cent increase in the supply of non-food credit leads to a 0.4 per cent rise in the lending rate). The lending rate of the banks is explained very significantly by its own lagged behaviour, suggesting an inertia in lending rate movements reflecting certain structural rigidities which impart downward flexibility in the interest rate structure in India. Equity prices measured

by the BSE National Index have a positive and significant relationship with the supply of non-food credit. This indicates that push factors driving up equity markets and bank lending are similar. In the contrary situation, both the markets are adversely affected, which seems to explain the current slump in equity as well as credit markets (Chart V.15).



5.63 An analysis of the shock effects over the full-sample time span is conducted by examining difference between estimated and simulated series. In order to assess and quantify the impact of shocks on each endogenous variable, positive shocks of 1 per cent each on credit demand, interest rate on advances and index of industrial production are given (Table 5.4). Besides, the shock to the cash reserve ratio is analysed through a positive shock (increase) of 1 per cent in bank's lendable resources.

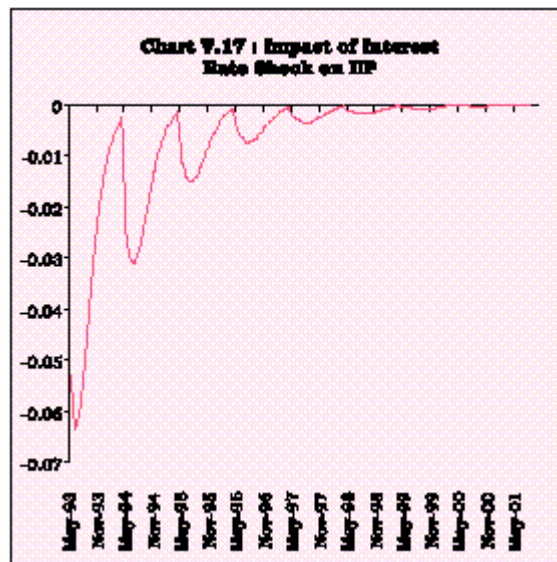
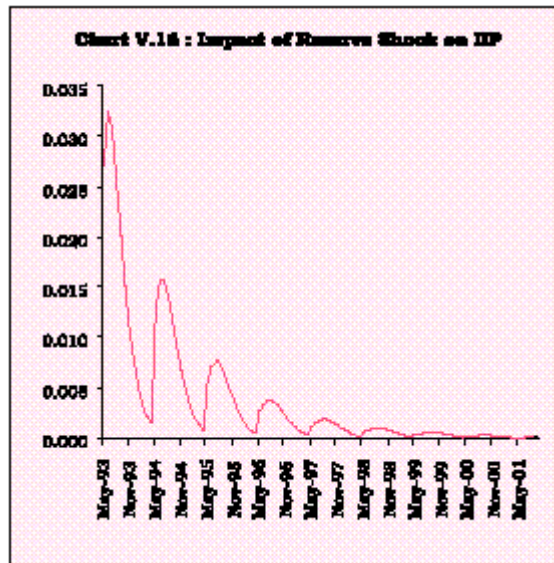
Table 5.4 : Cumulative Multiplier Effects of the Shock

Variables	Credit Demand	Advance Rate	Index of Industrial production
1	2	3	4
Credit Demand	*	0.70	0.23
Advance Rate	-1.58	*	-0.68
Index of Industrial Production	0.97	1.29	*
Banks' Lendable Resources (*)	0.80	-0.55	0.34

* : One percentage point positive shock to the variable at the commencement of the period. Sample Period is May1993 to September 2001

5.64 These results show that the direction of the changes are on expected lines. For instance, a positive shock (increase) in interest rate on advances appeared to drive down the credit demand which in turn leads to some fall in industrial production. The fall in output (being a secondary effect) is found to be of a lower order than the fall in the credit demand. A positive shock (increase) to the banks' lendable resources works out to be lower on both the demand for credit (0.80) as well as the IIP (0.34) than their impact from the interest rate shocks. The effect of the shocks is concentrated in the first three years and tapers off thereafter (Charts V.16 and Chart

V.17).



5.65 With the progressive relaxation of the interest rate regime and the removal of structural rigidities during the post-reform period, the bank lending rate appears to be emerging as an important channel of monetary transmission. The current policy stance of easing of interest rate environment is a necessary though not a sufficient condition to revitalise the growth prospects of the economy. Thus, the credit channel in India supplements and reinforces the interest rate channel rather than supplanting the latter.

IV. THE CONSTRAINTS ON GROWTH-ORIENTED MONETARY POLICY

5.66 The preference for extracting output gains suggests an inflationary bias in monetary policy and, therefore, the existence of a dynamic inconsistency. The 'bias' for economic expansion can arise from a number of factors such as knowledge of the changing characteristics of the

economy, the need to produce a consistent state-contingent policy response, political pressure on monetary policy, seigniorage revenue and the incentives provided to the monetary authority to be publicly credible.

5.67 It is increasingly recognised that when the announced inflation target is fully incorporated in the public's expectations regarding future inflation, an incentive for generating surprise inflation and, therefore, a little more output expansion opens up once inflation expectations are stabilised. Discretionary conduct of monetary policy allows the monetary authority to alter its instrument setting in favour of inflating the economy at a higher rate than announced (or what is socially desirable). Thus, announced policy objectives are not regarded as time consistent by the public which starts building in policy surprises into its expectation formation and this, in turn, renders monetary policy action sterile. Therefore, rather than discretion in monetary policy, simple and understandable policy rules have been favoured in the theoretical literature.

Proximate Solutions to Time Inconsistency

5.68 Following the seminal work on the theme (Kydland and Prescott, 1977), there has been a considerable attention in the literature on the issue of time-inconsistency of monetary policy and proximate solutions to the problem (Barro and Gordon, 1983; Rogoff, 1985; Persson and Tabellini, 1993; Nowaihi and Levine, 1994; Walsh, 1995). The resolution of the time inconsistency problem essentially involves raising the marginal cost of inflation as perceived by the central bank.

5.69 The solutions highlight the reputational constraints on central banks. Succumbing to the temptation to inflate today worsens the central bank's credibility in delivering low inflation in the future. Pursuing current expansionary monetary policy will be punished by higher inflation expectations in the future - "by punishing the central bank, the loss of reputation raises the marginal cost of inflation" (Walsh, *op.cit.*). The important issue is that the central bank must believe that it will be punished if it 'cheats', *i.e.*, the credibility of trigger strategies becomes important (Friedman, 1977). If by punishing the central bank, the private sector also punishes itself, the threat to punish may not be credible. Furthermore, if the central bank has private information about the working of the economy or if the public is unsure about the central bank's true preferences, reputational constraints in the sense of chisel-proof credibility (Nowaihi and Levine, *op cit*) are difficult to enforce.

5.70 An alternative approach to solving the time inconsistency problem has been to focus on the preferences of the central bank. Delegating the conduct of monetary policy to a 'conservative central banker' (Rogoff, 1985), *i.e.*, one with a low time preference and a higher preference for price stability relative to output considerations has formed the basis of a wider search for independence of the central bank as the solution to time inconsistency. If the central bank is independent and more conservative than society as a whole, caring less about output relative to inflation, then the public could treat its preferences as different from the elected governments. In a multi-sector economy, however, the process of appointing the conservative central banker can be subject to partisan influences (Waller, 1992). Moreover, if supply shocks to the economy are large, the government can override the central bank. The knowledge of overrides or escape clauses can affect the central bank's response (Lohmann, 1992). The unification of East and West

Germany showed that even central banks do not operate in a political vacuum. Thus, the appointment of a conservative central banker -if one can be found at all - can reduce the inflation bias but only at the cost of distorting stabilisation policy. The experience of countries with independent central banks invested with inflation objectives suggests that central bank independence is negatively correlated with inflation (Cukierman, 1992), but central bank independence does not appear to be correlated with output variance (Alesina and Summers, 1993). Therefore, it is possible that central banks with higher weights on inflation may achieve lower inflation, but they could also experience greater output variance ([Table 5.5](#)).

5.71 Another solution to the time inconsistency problem focuses on the incentives faced by the central bank. These incentives are shaped by the institutional structure in which monetary policy operates. In the tradition of Walsh (1995), these institutional arrangements can be represented by a contract between the central banker (the agent) and the Government (the principal). The central banker's tenure in office is conditional upon his performance of achieving low inflation, failure of which would lead to the repudiation of the contract of tenure. Drawing up a contract loaded with incentives for conservative behaviour can achieve the dual objective of eliminating the inflationary bias while ensuring the optimal stabilisation response from the monetary authority. If inflation itself is time varying, the contract can no longer be optimal although it can support optimal commitment by the central bank. Obviously, transparency and accountability have a critical role to play. New Zealand is characterised as having adopted the optimal contract approach. Such a solution is also preferred from the point of view of public choice theory: unless there are constitutional or institutional constraints to the contrary, a democracy contains a bias towards deficit finance; politicians do not necessarily pursue public interest but are more concerned with their personal or political agenda; central bank independence provides a solution which will ensure not only low inflation but also act as an effective institutional constraint⁸. On the other hand, it is argued that an independent central bank lacks democratic legitimacy - money is too important an issue to be left to the whims of central bankers.

Table 5.5 : Central Bank Independence (CBI) and Macroeconomic Performance

Central Bank	Index of CBI	Average Inflation (Per cent)	Variance of Inflation	Average Growth (Per cent)	Variance of Growth
1	2	3	4	5	6
New Zealand	1.0	7.6	21.9	3.0	5.4
Spain	1.5	8.5	27.8	4.2	9.4
Italy	1.75	7.3	34.3	4.0	5.7
Australia	2.0	6.4	20.8	4.0	4.6
UK	2.0	6.7	23.5	2.4	4.0
France	2.0	6.1	20.9	3.9	4.0
Belgium	2.0	4.1	10.8	3.1	4.9
Norway	2.0	6.1	11.7	4.0	2.3
Sweden	2.0	6.1	14	2.9	3.3
Denmark	2.5	6.5	11.5	3.3	6.7
Canada	2.5	4.5	12.8	4.1	4.3
Netherlands	2.5	4.2	8.4	3.4	7.0
Japan	2.5	4.9	19.6	6.7	12.3
USA	3.5	4.1	10.5	3.0	5.3
Switzerland	4.0	3.2	6.1	2.7	8.6

Germany	4.0	3.0	5.5	3.4	5.6
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Source : Alesina and Summers, 1993.

Secondly, independence may lead to frictions between the fiscal and the monetary authorities and the resulting costs of these frictions between monetary and fiscal policy may be somewhat costly for society, thus inhibiting the development process. Thirdly, there may be significant divergence in the preference pattern of independent central banks and the society at large. A strong central bank may impose its outlook on society resulting in a sub-optimal state in terms of economic welfare. Recent literature has stressed the difference between goal independence and instrument independence.

5.72 While the contracting approach allows complete flexibility in the operational conduct of monetary policy, an alternative approach focuses on restricting policy flexibility. A wide variety of rules have been proposed and analysed. Inflation targeting is currently the most discussed form of target rules. Strict targeting rules may not be desirable as they eliminate any stabilisation role for monetary policy and the real economy has to adjust to shocks. Flexible target rules bring back the trade-off between credibility and discretion.

5.73 A large body of literature has focused on the institutional design of co-ordination between monetary and fiscal policies as another set of solutions to the time inconsistency problem. The institutional setting and operational arrangements for the co-ordination of monetary and fiscal policies differ widely among countries. A host of factors play a role in shaping the framework of co-ordination like the country's history, socio-political considerations, nature of financial market development and the broad objectives set for macroeconomic policies. Country experiences show how fundamentally these factors have shaped the co-ordination arrangements as well as legal and administrative infrastructure to produce a wide diversity of second best solutions. Within the overarching responsibility for macroeconomic stability, the monetary and fiscal policies differ in terms of their transmission channels, the lags with which they operate, their instruments, the authorities which wield them and the specific targets assigned to them. The form and content of policy co-ordination has undergone significant changes over the years. Countries have been intensively working towards establishing multilateral and consensus rules for monetary fiscal co-ordination. The Maastricht treaty of the European Union is the first major initiative in this direction, under which automatic access to central bank credit by the government is formally prohibited and indirect credit is discretionary. The IMF's Code of Good Practices on the Monetary and Financial Transparency and Codes on Fiscal Transparency are recent important efforts in this area. The codes propose guidelines for clarity of roles, responsibilities and objectives of monetary and fiscal policies, open processes of policy formulation, accountability and integration and public availability of information.

Threat of Deflation

5.74 The recent Japanese experience has underscored the lower bound of monetary policy effectiveness and has brought the potential threat of deflation into focus. The monetary policy efforts to revitalise the economy have taken real interest rates in various countries to levels below their real growth rates, producing what has been termed as the deflationary gap. A situation of persistent deflation can set off a spiral of decline in activity, deflationary expectations, zero interest rates and an ineffectiveness of monetary policy - what has been

termed as the 'liquidity trap'. In such a scenario, deflation prompts consumers to postpone their current spending in expectations of fall in prices in future leading to decline in demand and further fall in prices thus generating the deflation cycle. Low or zero inflation imparts inflexibility to wages, as workers' unwillingness to accept a cut in nominal wages increases the real wage burden to the entrepreneurs, prompting them to prune the size of their work force and deepening the recession. It also makes interest rates and other financial prices rigid making the relative price signals ineffective as interest rates cannot fall below zero (negative) and hence real interest rates remain high. Moreover, deflation increases the real debt burden causing bankruptcies and bank failures.

5.75 Monetary policy authorities and the academia tend to agree that a liquidity trap is likely to bring considerable instability and real output losses. It is in this context that they advocate strategies to avoid and escape liquidity traps. It is crucial to prevent inflation and inflation expectations from falling to deflationary levels. Advance contingency plans, emergency liquidity facilities, coordinated monetary and fiscal intervention, credible and transparent inflation targets are suggested in the literature as part of the strategy to fight the deflation.

V. CONCLUDING OBSERVATIONS

5.76 In recent years, particularly in the 1990s, there has been an upsurge of interest in the operational framework of monetary policy. With the growing perception that the explanatory power of intermediate target regimes is getting eroded under the impact of globalisation and financial innovations, attention has shifted to the development of simple and flexible rules whereby monetary policy can directly achieve its objectives. Under these conditions, monetary policy operates with constrained discretion. The performance of a small, operational model for monetary policy in India suggests that under constrained discretion, monetary policy can be directed towards revitalising output growth in the short-run. The long-run inflationary consequences of current monetary policy action, however, need to be taken into account. Threshold inflation, *i.e.*, growth-maximising inflation rate is estimated at 5 per cent. There are potential output losses involved in further disinflation. Sacrifice ratio estimates suggest that, in a low inflation environment, a one percentage point reduction in inflation leads to a decline in output by 2 percentage points below its potential. The interest rate channel is rapidly emerging as the dominant transmission mechanism, supported and reinforced by the credit channel. At this juncture, more evidence needs to be accumulated and fundamental analytical issues resolved before the new analytical framework for monetary policy can be validated.

5.77 Several landmark initiatives have been recently announced to correct for the known time inconsistency in the conduct of monetary policy. The decision to divest ownership functions in commercial banking, development of finance and securities trading entities, separation of supervisory functions in regard to co-operative banks, separation of public debt management function from monetary policy, changes in the operational conduct of monetary and fiscal policies suggested by Advisory Group on Transparency in Monetary and Financial Policies (Chairman: Shri M. Narasimham) and the tabling of the Fiscal Responsibility and Budget Management Legislation mark a new phase in the evolution of monetary policy in India in the new millennium.

5.78 The conduct of the monetary policy in India would continue to involve the constant rebalancing of objectives in terms of the relative importance assigned, the selection of instruments and operating frameworks, and a search for an improved understanding of the working of the economy and the channels through which the monetary policy operates.

$$^1 \quad YGAP = 4.71 - 0.24 RLINT - 0.22 DOIL - 2.57 DUMAGRI + 0.52 YGAP(-1)$$

$$\quad \quad \quad (-3.5) \quad \quad (-4.0) \quad \quad (-3.8) \quad \quad (3.3)$$

$R^2 = 0.60$. Durbin's $h = -0.1$

Where, YGAP, RLINT, DOIL and DUMAGRI denote output gap, real bank lending rate, fuel inflation index and a dummy for agricultural output (=1 when agricultural output growth is negative), respectively.

$$^2 \quad DINFLX = 0.74 YGAP(-1) + 0.44 DDWPFOOD - 0.22 DINFLX(-2) - 0.27 DINFLX(-4)$$

$$\quad \quad \quad (1.9) \quad \quad (4.7) \quad \quad (-1.6) \quad \quad (-2.1)$$

$R^2 = 0.70$ Durbin's $h = -0.4$

where, DINFLX, YGAP and DDWPFOOD denote change in inflation rate, output gap and change in foodgrains inflation rate, respectively.

$$^3 \quad EQBNK = -1.17 + 0.09 YGAP(-1) + 0.05 TINFLX(-1) + 0.24 FDGDP(-1) + 0.83 EQBNK(-1)$$

$$\quad \quad \quad (1.5) \quad \quad (2.2) \quad \quad (2.5) \quad \quad (6.7)$$

$R^2 = 0.85$ Durbin's $h = -1.1$

Where EQBNK is Bank Rate, TINFLX is inflation rate less threshold inflation, FDGDP is public sector saving-investment deficit (as a proportion of GDP).

$$^4 \quad DSBIADV = 3.50 DUM80 + 0.94 DBNKRTE(-1)$$

$$\quad \quad \quad (3.0) \quad \quad (3.4)$$

$R^2 = 0.44$, DW = 2.3,

where DSBIADV, DUM80, DBNKRTE denote change in SBI Advance Rate, a dummy for 1979-80 and change in Bank Rate, respectively.

⁵ The sacrifice ratio is calculated as the ratio of (1-coefficients of lagged inflation)/coefficient of output gap.

⁶ The proxy of the Government bond rate could not be used due to absence of continuous data for full length of the time period of investigation.

⁷ Demand for Credit

$$\text{Ln (NFC}^d) = 3.0092 - 0.2216\text{Lnrl} + 0.3764 \text{LnIIP} + 0.3418 \text{LnIIP}(-1) + 0.2784 \text{LnIIP}(-2) + 0.4201\text{Ln NFC}(-12)$$

$$\quad \quad \quad (-5.85^*) \quad (3.93^*) \quad (3.32^*) \quad (3.06^*) \quad (7.87^*)$$

$R^2 = 0.99$ DW = 0.33

Supply of credit:

$$\text{Ln rl} = 3.9213 + 0.4143 \text{LnNFC} - 0.07872 \text{LnSLR}(\text{Dep}) - 0.0917\text{LnBSEnat} - 0.5077 \text{Ln}[\text{Dep}(1-\text{crr})] - 0.0021 \text{LnTB91} + 0.6804 \text{Lnrl}(-1)$$

$$\quad \quad \quad (1.73^*) \quad \quad (-0.70) \quad \quad (-2.45^*) \quad \quad (-2.03^*) \quad \quad (-0.56) \quad \quad (5.49^*)$$

$R^2 = 0.98$ DW = 1.69

Index of Industrial Production:

$$\text{Ln IIP} = -0.2563 + 0.2338\text{Ln NFC} + 0.4556\text{LnIIP}(-1)$$

$$\quad \quad \quad (5.58^*) \quad \quad (4.90^*)$$

$R^2 = 0.95$ DW = 2.1

where NFCd: non-food credit demand; rl: bank lending rate; IIP: index of industrial production; TB91: 91-day Treasury Bill yield; BSEnat: Bombay Stock Exchange National Index; Dep: bank deposits; crr: cash reserve ratio; SLR: statutory liquidity ratio. Bracketed figures represent t-statistics and * indicates significance at least at 10 per cent level.

⁸ These issues were covered in detail in the Second Foundation Day Lecture on "Autonomy of the Central Bank: Changing Customs in India" by Dr. Y.V. Reddy at the Indian Institute of Management at Indore on October 3, 2001.

VI External Sector And The Growth Process

Foreign Capital Versus Export-Led Growth The Debate on The Role Of Foreign Capital Cross-Country Experience on Capital Flows and Growth Capital Flows and Growth in India : The Recent Experience An Empirical Appraisal Concluding Observations

Introduction

6.1 Identifying the growth-augmenting role of external trade and foreign capital flows has assumed critical importance in India in recent years. The overall shift in the policy stance in India from export pessimism and foreign exchange conservation to one that assigns an important role to export of goods and services in the growth process has primarily been guided by the perception that an open trade regime could offer a dynamic vehicle for attaining higher economic growth. The absence of any strong and unanimous empirical evidence justifying the universal relevance of an export-led growth strategy (Giles and Williams, 2000; Rodriguez and Rodrik, 1999) as also the continued reliance on targets for sustainable current accounts has motivated greater focus on the growth augmenting capacity of foreign capital in the 1990s.

6.2 Structural reforms and external financial liberalisation measures introduced in the 1990s in India brought in their wake surges in capital flows as well as episodes of volatility associated with the capital account dictating the balance of payments outcome. Large capital inflows enabled an easing of resource constraints and an acceleration of growth in the mid-1990s. In the second half, the foreign exchange market developments as well as the rapid transmission of international sell-offs facilitated by cross border integration of equity markets *via* capital flows have provoked a reassessment of the benefits and costs of employing capital flows as a lever of growth. Throughout the 1990s, the role assigned to foreign capital in India has been guided by the considerations of financing a level of current account deficit that is sustainable and consistent with the absorptive capacity of the economy (Rangarajan, 1993; Tarapore, 1995; Reddy, 2000). In the aftermath of South-East Asian crisis, however, the need for further strengthening the capacity to withstand vulnerabilities has necessitated a shift in policy that assigns greater weightage to stability (Reddy, 2000). In view of the growing importance of capital flows in relation to trade flows in influencing the course of the exchange rate and the potentially large volatility and self-fulfilling expectations that often characterise capital flows, reserve adequacy has also emerged as an additional requirement for ensuring stable growth in the context of capital flows (Jalan, 2001). Given the trade-off between growth and instability associated with capital flows, the emphasis of the debate relating to capital flows in India has centered around sustainability, a country-specific approach to liberalisation of the capital account, a desirable composition and maturity profile of capital flows, and appropriate reserve management and exchange rate policies in the context of capital flows, with only occasional reference to the growth enhancing role of foreign capital in India.

6.3 The experience of developing countries with harnessing capital flows for growth over the

last two decades has been mixed. The actual impact of capital flows on economic growth varies widely across countries, depending on country-specific conditions and the nature of policies for external capital. Accordingly, it becomes necessary to empirically evaluate each country's experience in terms of the specific role assigned to foreign capital in the process of development. This includes an assessment, however subjective, of the negative externalities associated with capital flows. Negative externalities could emanate both during periods of surges and sudden reversals. Besides real appreciation of the exchange rate, surges in capital flows could facilitate imprudent lending and overheating associated with excessive capacity addition, which may give rise to banking crises. Sudden reversals of capital flows, particularly in cases of short-term banking flows and portfolio flows, could trigger sudden collapse of asset prices and exchange rate and thereby adversely affect growth. This Chapter undertakes an empirical assessment of the contribution of foreign capital to the growth process in India. Macro-economic analysis weighing the role of foreign capital *visa-vis* exports (of goods and services) as a growth accelerator in a developing country context is presented in Section I. Section II encapsulates the important features of the role of foreign capital by drawing on the theoretical and empirical literature on the subject. Different viewpoints on the role of alternative forms of foreign capital and the changing importance of each form of capital over time are also discussed. Cross-country experiences, primarily based on review of the specific contributions to the relevant literature are documented in Section III. A brief overview of the Indian policy framework for attracting foreign capital during the period of planned development is set out in Section IV, with specific empirical findings presented in the context of the shifts in the policy regime. Section V undertakes an empirical evaluation of the salient testable hypotheses to identify the “growth-augmenting” *versus* “growth driven” characteristics of foreign capital, the degree of complementarity between foreign capital and domestic investment, and the relative importance of alternative determinants of foreign capital to obtain an assessment of the desired level of foreign capital consistent with policy objectives in the external sector. This is followed by concluding observations.

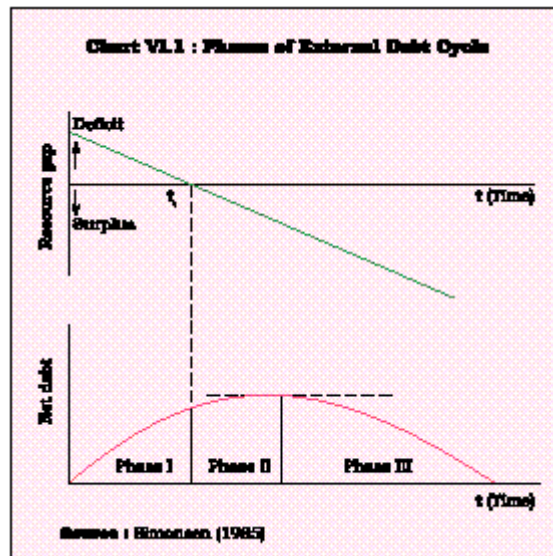
I. FOREIGN CAPITAL *VERSUS* EXPORT-LED GROWTH

6.4 The standard analysis of growth accounting in an open economy encounters an apparent contradiction between "export led growth" on the one hand, and "capital-flow induced growth" on the other, even though in reality both strategies could be operationalised simultaneously to strengthen the growth process. The apparent contradiction arises from the macro-economic identity [$Y = C + I + G + (X - M)$] which suggests that while a surplus in the external goods and services account - reflecting the result of an export-led growth strategy - could increase GDP, that would tantamount to no role for net external financing as the country must necessarily save more than it can invest, leading to net capital outflows. The underlying assumption behind this assessment is that an export-led growth strategy can stimulate growth only by generating a surplus in the external goods and services account. The actual external resource transfer process and the stages over which the importance of each form of transfer changes can explain how a developing country could simultaneously benefit from both export-led and capital-flow-induced growth strategies (Kregel, 2000).

6.5 In a developing country, the consumption level lags behind the consumption standards of advanced economies and the marginal productivity of investment is higher. A deficit in the goods and services account and the associated net capital inflows can not only enable the

economy to bridge its consumption gap but also help in achieving output convergence with the advanced economies. An export-led growth strategy could enhance the ability of a developing country to achieve this goal faster by allowing higher levels of sustainable imports. Sustainable capital inflows to finance the gap so created would be growth enhancing. In small open economies, a surplus generated in the trade (for goods and services) account could raise GDP. Residents would increase their external financial assets, acquired in exchange of real resources through the trade surplus. Financial assets, in turn, represent command over future goods and services. An open capital account in such economies helps in allowing freedom of portfolio adjustment and consumption smoothing to each resident. Small open economies, however, depend largely on external demand conditions for sustaining the export-led growth. A slowdown in external demand conditions can give rise to a large scale deceleration in domestic GDP growth in such economies. For example, Singapore's external current account exhibited large surplus in recent years (in excess of 20 per cent of GDP) indicating the role of net exports in growth. However, given its high degree of openness and sensitivity of GDP growth to global demand conditions, its GDP growth is expected to decelerate sharply from 9.9 per cent in 2000 to (-) 0.2 per cent in 2001 (IMF, 2001).

6.6 Of the three possible types of resource transfers in the external account, *viz.*, “real against real”, “financial against real” and “financial against financial”, priority is generally assigned to "real against real" form of resource transfers in the initial years of development. As a result, exports are regarded essentially as the means to pay for imports. Since the demand for certain critical real resources may exceed what could be made available domestically or what could be financed through export earnings, a bridging role emerges for financial transfers in the form of capital flows. With modest and gradually increasing recourse to "real against financial" form of transfer, a role for foreign capital is envisaged. Only over time, "financial against financial" form of transfers - representing an open capital account - can occur. Even though country-specific approaches to timing and sequencing often widely differ, three phases for debt related capital flows could be conceived (Chart VI.1). In the first phase, the country operates with a resource gap that is financed by inflows of debt capital. During this phase, debt grows faster than debt servicing. In the second phase, the country generates a positive resource balance (in the goods and services account) in the current account, but the debt servicing exceeds the positive resource balance, giving rise to further addition to debt stock. In phase three, the positive resource balance position becomes more than sufficient to finance the debt servicing obligations. As a result, residents accumulate external assets and the need for debt flows to finance the resource gap disappears (Simonsen, 1985).



6.7 India could conceptually be placed at present in phase-1 of this cycle. An export-led growth strategy - that ensures export growth to continuously exceed the interest rate on debt - would enable India to raise its per capita GDP to the threshold level beyond which generation of a surplus balance in the current account could enable the residents to accumulate foreign assets. A possible threshold level of per capita GDP for the developing countries in general could be about US \$ 1,000 (Lane and Ferretti, 2001). As regards the developed country sample, for a 10 per cent improvement in a country's output per capita, net foreign assets to GDP ratio seemed to increase by 9 percentage points. In the sample for developing countries, however, the relationship was found to be negative, or at best modestly positive. This seems to explain why a number of developing countries which are operating at below the possible threshold level of per capita GDP tend to use higher external liabilities resulting from net capital inflows as a vehicle to raise their per capita income levels. Effective use of trade as an engine of growth could help India in achieving a faster transition to the next phase of the cycle while at the same time internalising the benefits of growth impulses associated with a more open trade regime ([Box VI.1](#)). Several countries have undertaken service-oriented trade strategies to take advantage of the underlying shift in the pattern of international trade as well as the gains associated with the new engine of growth ([Box VI.2](#)).

**Box VI.1
Foreign Trade and Growth - The Indian Experience**

Perceptions on the role of foreign trade in growth have changed dramatically in the last five decades. During the 1950s and the 1960s import substitution-based industrialisation represented the dominant growth strategy pursued by several developing countries. In the 1970s, the growth experiences of individual countries led to scepticism regarding the virtues of import substitution. The resultant shift in policy stance in favour of outward-oriented trade strategies that started towards late 1970s gathered momentum in the subsequent years as a large number of cross-country studies validated the positive relationship between export growth and output growth. Some evidence demonstrating the superior growth performance of countries with export-oriented trade strategies is also available.

The theoretical arguments supporting an export-led growth strategy underscore that trade restrictions can reduce economic growth by distorting the pattern of resource allocation and by limiting the scope for innovation, technical progress and x-efficiency. Trade liberalisation, in turn, could contribute to economic growth by facilitating technology transmission, international integration of production and the associated possibility for reaping scale

economies, reduction in price distortions and increase in efficiency. In imperfectly competitive markets, increased competition through trade could bring about welfare gains by reducing the deadweight losses stemming from monopolies and oligopolies. Trade liberalisation could be highly conducive to growth as import substitution inflicts static costs on the economy by way of resource misallocation as also dynamic costs by raising the incremental capital-output ratios and by depriving access to new technology.

Table 6.1: Selected Performance Indicators of India's Foreign Trade

Years	Growth Rates (US \$ terms)		Percentage of GDP*			Export- Import Ratio	Share in World Exports
	Exports	Imports	Exports	Imports	Trade		
1	2	3	4	5	6	7	8
1970-71 to 1979-80	15.8	20.0	4.5	5.3	9.8	86.9	0.56
1980-81 to 1989-90	8.1	7.2	4.6	7.2	11.8	64.0	0.48
1990-91 to 1999-2000	8.6	9.6	7.8	9.3	17.1	84.9	0.58

* Rupee terms (At current market prices)

In a number of studies, cross-country comparisons suggest a high degree of co-movement between export-growth and output-growth even though in empirical findings there is as yet no consensus. A positive export-GDP relation in several semi-industrialised countries is attributable to the contribution of export earnings in releasing the import constraint to growth. Standard methods of Granger causality tests may give misleading results if the role of imports is not duly recognised in the analysis of the relationship between export and growth. Controlling for the growth in imports and using the measure of conditional linear feedback, a causal relationship running from export growth is obtained in about 30 countries in a sample of 126 countries.

The Indian Experience

India pursued a restrictive import control regime up to the 1970s. Several studies indicate that the major drawbacks of the excessively inward looking trade regime was that it led to an inefficient and high cost industrial structure, which also adversely affected the prospects for export growth. Selective import liberalisation measures were introduced during the late 1970s. Trade policy measures undertaken during the 1980s sought to enhance the access of domestic manufacturers to imported capital goods and raw materials that were otherwise not available indigenously. Furthermore, the domestic industry was exposed to a limited degree of competition by placing selected items of imports under the open general licensing system. These policy measures were aimed at making the domestic industry cost efficient while simultaneously improving their international competitiveness. The tariff structure continued to remain somewhat complex with relatively higher tariff rates constraining growth by raising the cost of essential growth sensitive imports. Trade policy reforms undertaken during the 1990s included sharp reduction in customs tariffs, phasing out of the quantitative and other types of trade restrictions and alignment of trade policy with the international commitments. With a clear shift in emphasis from import substitution to export promotion, direct subsidies were replaced by indirect promotional measures, and reach of export incentives was widened to cover a number of non-traditional commodities. Reflecting the liberalisation of the trade regime, both exports and imports as percentage of GDP rose during the 1990s. The average export-import ratio (an indicator of the import financing capacity of exports) improved significantly from 64 per cent in the 1980s to around 85 per cent in the 1990s (Table 6.1). Empirical studies generally find some evidence for employing trade as an engine of growth in India. Comparative static effects of trade policy reforms using a Computable General Equilibrium (CGE) Model indicate that trade policy reforms in India could lead to efficiency-enhancing inter-sectoral factor movements and also scale economies in the manufacturing sectors. Trade reforms during the 1990s placed greater emphasis on improving external competitiveness and efficiency in resource allocation. Trade liberalisation is seen to have led to increased competition, reflected in the drop in the price-marginal cost mark-ups. The corporate response has been in terms of increased mergers and acquisitions, resort to foreign technology, efforts to improve manufacturing capability by building alliances as well as through in-house initiatives, product differentiation, increased advertising expenses and adoption of export-oriented growth strategies. Evidence on improvement of productivity of the Indian industry resulting partly from trade policy reforms is also found. Although the empirical debate on the growth effects of trade policy reforms remains unsettled, strong co-movement between exports and output growth in a liberalised trade environment appears to be the general case which lends support to the need for persisting with an open trade regime.

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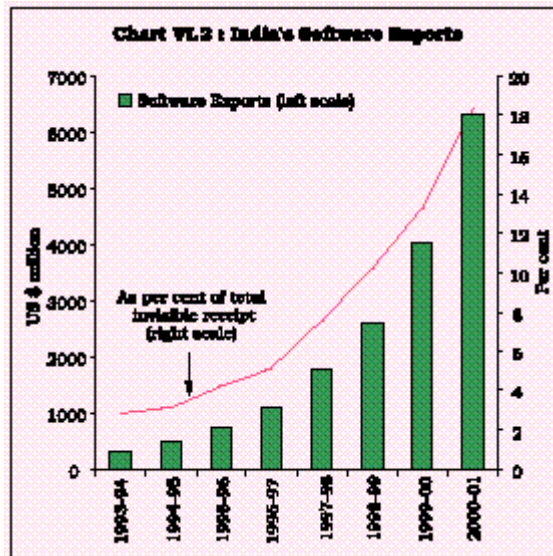
Box VI.2

Trade in Services: An Engine of Growth

Since the 1980s, an important development in international trade has been the growing trade in services. This reflects partly the increasing importance of tertiary activities the world over. A far more important factor underlying the increased importance of services in international trade has been the revolution in information technology in the 1990s which has reduced the time as well as cost of transport and communication. As a result, services, hitherto considered as non-tradable, have entered the arena of tradability. The rapid rise in the share of the services sector in the structure of national economics as well as in world trade has been particularly beneficial for the developing economies given the labour-intensive nature of most services. The 1990s have, therefore, broadened the scope for diversification in favour of trade in services. Another factor providing an impetus to internationalisation of services has been the changing character of capital flows, particularly the shift towards private capital flows in the form of foreign direct investment flows. Service activities like banking and insurance have attracted increasing FDI investment worldwide. Reflecting the IT revolution, the share of IT goods in world trade has increased from 7.5 per cent in 1990 to 11 per cent in 1999. At the same time, the rapid growth of IT production and the use of IT-related services around the world have raised concerns about cross-border propagation of business cycles.

The orderly development of international trade in services was expected to be enhanced by the adoption of the General Agreement on Trade in Services (GATS) in 1993. The barriers to international trade in services, however, remain high and opaque. These barriers emerge from the fact that a large part of the services trade involves movement of labour and capital across borders, both of which continue to confront restrictions on movement. IMF estimates indicate that gains from liberalisation of services trade would be about US \$ 1,181 billion, almost double the gains that would emanate from liberalisation of merchandise goods (US \$ 677 billion), highlighting the welfare-enhancing potential of liberal trade in services ([Table 6.2](#)).

The general paradigm shift in services trade in the 1990s also helped in the emergence of new sources of forex earnings in the services account in India's balance of payments, providing a significant source of comfort. While the period up to the 1980s was dominated by tourism earnings, the second half of the 1990s witnessed an unprecedented jump in India's earnings from newer activities like software service exports and other IT-related skill-intensive exports. Earnings from software exports have increased from negligible levels in early 1990s to US \$ 6.3 billion in 2000-01, accounting for almost one-fifth of India's gross invisible earnings (Chart VI.2).



At the same time, remittances - the single most important source of India's invisible earnings - have continued to remain strong, growing more than 6-fold from US \$ 2 billion at the start of 1990s to almost US \$ 13 billion by 2000-01, forming 2.7 per cent of GDP (Chart VI.3).

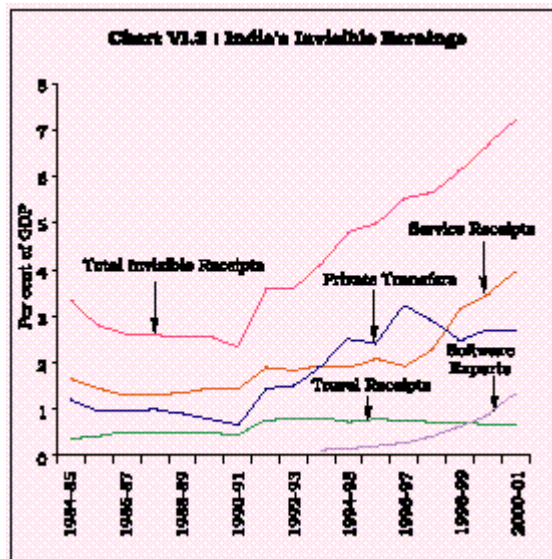


Table 6.2 : Welfare Gains from Post-Uruguay Round Trade Liberalisation

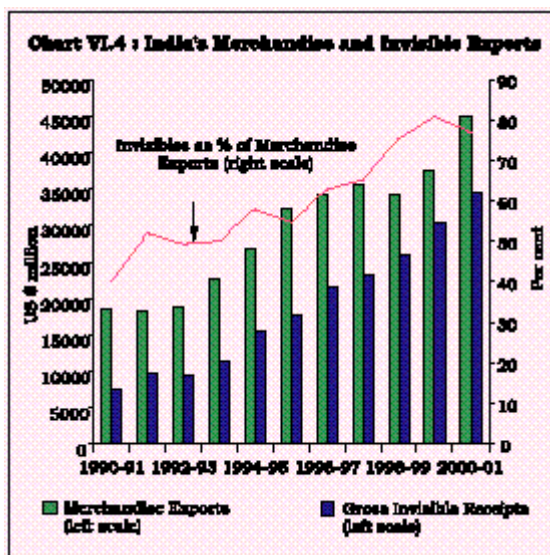
(In billions of US dollars at 1995 exchange rates and prices)

	Type of Products Liberalised				
	Agriculture	Manufacturing	All Merchandise	Services	All
1	2	3	4	5	6
Industrial Countries	7	482	489	998	1,487
Developing Countries	26	162	188	182	370
World	33	644	677	1,181	1,857

Source: IMF (2001).

The increase in software and other technology earnings and private remittances has been able to more than offset

outgoes on account of debt servicing and other services payments. The growth in gross invisible earnings has outpaced growth in merchandise exports during the 1990s, with the ratio of invisible earnings to merchandise increasing from 40 per cent in 1990-91 to almost 75 per cent in the recent years reflecting the shifting comparative advantage of India in favour of services (Chart VI.4). As a result, despite significant liberalisation of current account transactions, net invisible surplus has continued to improve during the 1990s. As against a deficit of US \$ 0.2 billion in 1990-91 that partly exacerbated the external payments imbalances during that year, the net invisible surplus has grown over time to around US \$ 12-13 billion in the recent period, imparting resilience and sustainability to current account deficits and overall balance of payments during the 1990s.



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II. THE DEBATE ON THE ROLE OF FOREIGN CAPITAL

6.8 Theoretical and empirical research on the role of foreign capital in the growth process have generally yielded conflicting results. Conventionally, the two-gap approach justifies the role of foreign capital for relaxing the two major constraints to growth (Chenery and Bruno, 1962; McKinnon, 1964). In the neo-classical framework, however, capital neither explains differences in the levels and rates of growth across countries nor can large capital flows make any significant difference to the growth rate that a country could achieve (Krugman, 1993). In the subsequent resurrection of the two-gap approach, the emphasis was generally laid on the preconditions that could make foreign capital more productive in developing countries. The important preconditions comprised presence of surplus labour and excess productive demand for foreign exchange. With the growing influence of the new growth theories in the second half of the 1980s that recognised the effects of positive externalities associated with capital accumulation on growth, the role of foreign capital in the growth process assumed renewed importance. In the endogenous growth framework, the sources of growth attributed to capital flows comprise the spillovers associated with foreign capital in the form of technology, skills,

and introduction of new products as well as the positive externalities in terms of higher efficiency of domestic financial markets, improved resource allocation and efficient financial intermediation by domestic financial institutions (de Mello and Thea, 1995; Bailliu, 2000). Since the spillovers and externalities associated with different forms of foreign capital could vary, a pecking order approach to the composition of capital flows is often pursued which helps in prioritising the capital flows based on the growth enhancing role of each form of capital (Reisen, 2001; Razin, Sadka and Yuen, 1998).

6.9 The dominant view on what drives cross-border capital flows is that marginal productivity of capital is higher in a country where capital is scarce. If marginal productivity of capital widely differed across countries, then in the presence of capital flows shortfalls in domestic saving should not constrain investment. The seminal finding that domestic saving and investment rates are highly correlated, however, indicated that the degree of capital mobility across countries may not be high (Feldstein and Horioka, 1980). The marginal productivity of capital in India was 58 times that of the United States as obtained through the standard estimation of Cobb-Douglas production functions (Lucas, 1990; Taylor, 1994). India, however, could never attract enough foreign capital to take advantage of the productivity differentials. Unlike the wide differences in estimated productivity of capital, however, real interest rates - a measure of real return received by the investors - turned out to be much less divergent across countries in reality. Capital markets could be imperfect, preventing capital flows from being driven by productivity differentials. Incremental investment would be more productive in countries with skilled workforce and well developed physical infrastructure. Thus, the presence of internal growth supportive factors appear important, not only for attracting higher private foreign capital but also for enhancing the growth inducing effects of such foreign capital (Lucas, *op cit*). The importance of internal growth supportive factors is amply demonstrated by the extremely lopsided pattern of private capital flows to the emerging markets. About 12 emerging markets account for more than 80 per cent of the total private flows to all emerging markets ([Box VI.3](#)).

Box VI.3 **Pattern of Capital Flows to Emerging Markets**

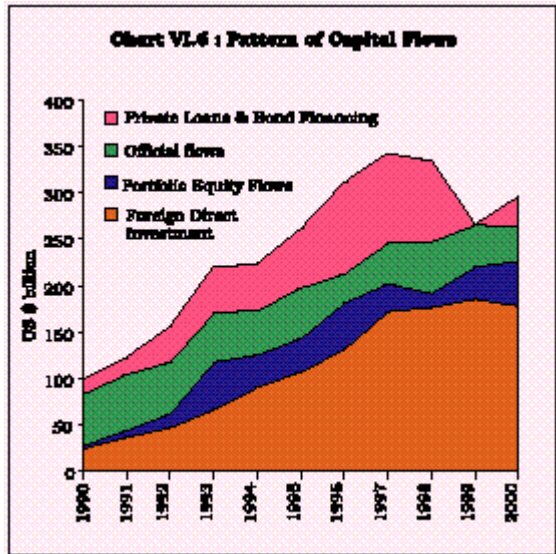
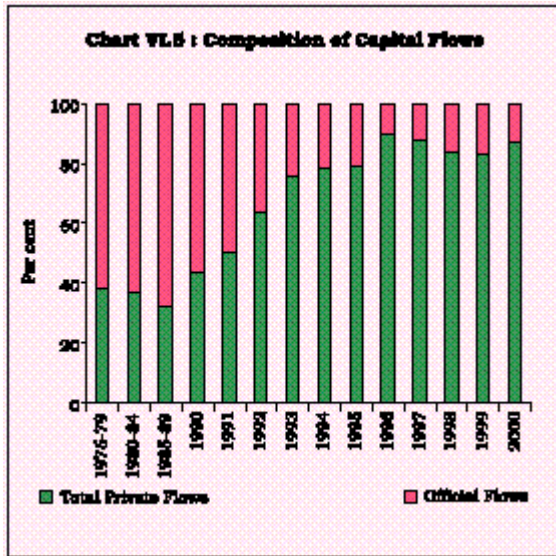
Capital flows to emerging markets over the last century have followed a boom-bust pattern, notwithstanding the large regional and compositional variations. The major boom in capital flows that started around 1870s continued till the outbreak of the First World War. This was the period of *laissez faire*, marked by significant international flows of goods, labour and capital across nations, mainly directed towards infrastructure, especially utilities and railroads. Most of the foreign investment during this period was long-term with about two-thirds in the form of portfolio flows and the remaining being in the form of direct investment. The weak communication infrastructure and information base led investors to prefer debt instruments. This is in sharp contrast to the late 20th century scenario when direct investment became extremely important, accounting for more than 50 per cent of the private capital flows in the 1990s. The boom ended with the onset of World War I. The ensuing years (1920-1931) saw a modest revival of capital flows, mostly to emerging market economies to meet their developmental goals.

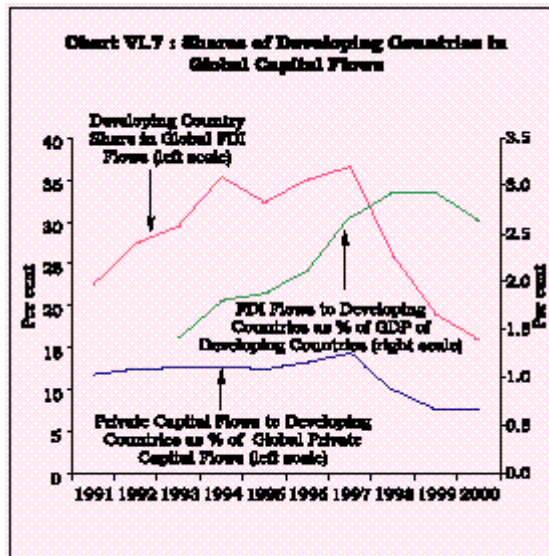
The period from 1945 to 1972 was marked by large capital flows among different industrialised countries, with capital flowing to emerging markets only at the margin. The period since 1973, however, witnessed different phases: (1) 1973-82: boom in capital flows to developing countries averaging at about \$163 billion per annum, (2) 1983-89: stagnation in capital flows at about \$103 billion per annum, (3) 1990-97: dramatic surge in capital flows, with the peak of \$ 344 billion in 1997, (4) 1997-1999: sharp deceleration in the aftermath of South East Asian crisis and (5) 2000-01: moderate recovery in 2000 but heightened uncertainty amidst global recessionary conditions and tendency for flight to safety.

1973-82 was the period of first two oil price shocks and the surge in capital flows during this phase was associated with the recycling of oil revenues. Bank loans to developing country governments, firms and banks were the main form of capital flows accounting for almost 57 per cent of total flows. Asia and Latin America received the maximum share. However, the worsening macroeconomic performance in the developing countries along with sluggishness of activity in mature markets turned the terms of trade against emerging markets. The emergence of debt servicing difficulties changed the scenario for the rest of the 1980s.

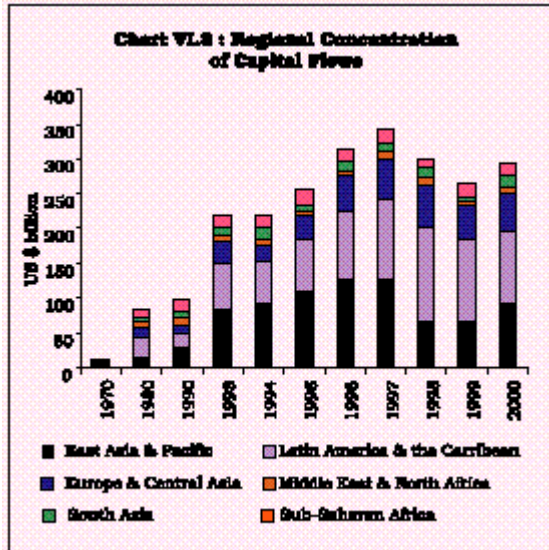
Between 1983 and 1989, capital flows to developing economies almost stagnated at around \$105-110 billion, with private sector accounting for hardly one-third of these flows. While inappropriate economic policies kept the private investors away from developing countries, the developed financial markets of the industrialised countries acted as a powerful attraction for private capital. By the end of the decade, aggregate direct investment flows into developing countries were one-eighth of the flows into developed countries (\$ 18.1 billion as against \$ 161.2 billion). Portfolio flows were rather limited (practically zero), given the underdeveloped and non-existent nature of developing country equity markets. The disadvantages of contractual foreign capital as opposed to FDI became clearly evident during the external debt crisis of the 1980s. The earlier aversion to FDI - reflected in restrictive national FDI policies stipulating ownership norms, operational restrictions *viz.*, positive, negative and restricted lists, performance requirements *viz.*, export obligation - declined over time. In the competition to attract FDI, a combination of preconditions and incentive package assumed increasing importance in the liberalisation of FDI policy.

With better economic performance and relatively open capital accounts, the 1990s saw a return of capital flows to emerging markets to the pre-1914 levels. Net capital flows to developing economies surged from \$ 80.5 billion in the late 1980s to \$ 344 billion in 1997. The composition of flows, however, altered significantly over time. In 1991-92, for the first time since 1982, private flows exceeded official finance with their share rising from 42.6 per cent in 1990 to a peak of 90.1 per cent in 1996, before dropping to 82.1 per cent in 1999 (Chart VI.5). Also, equity flows (direct and portfolio) replaced the bonds of the gold standard era and the syndicated bank loans of the 1970s (Chart VI.6), reflecting growing securitisation and increasing role of institutional investors, trade liberalisation, financial deregulation, financial innovation and the technological revolution. This also reflected a growing preference on the part of developing countries for non-debt flows. Although portfolio inflows remained important, it is foreign direct investment (FDI) that showed a six-fold jump from about \$ 35 billion in 1991 to \$185 billion in 1999. The share of FDI in developing country's GDP rose from around 0.8 per cent to 2.5 per cent over the same period (Chart VI.7). Other private flows remained volatile. Official flows fluctuated around \$ 50 billion with a significant fall in 1996 and 1997. On the recipient side, the share of private borrowers has increased dramatically from the last two decades. The private sector receives more than 65 percent of the total flows (a trend similar to the 1870-1913 period), unlike the other two period of surges (1920s and 1970s) when the share of the private sector had fallen to around 20 per cent. Asia and Latin America accounted for around 70 per cent of the total flows to emerging markets with Middle East and Sub Saharan Africa getting a minimal share (Chart VI.8). FDI occupied the dominant position for Asia while portfolio flows were more significant in Latin America.





It is generally believed that the boom in capital flows of the late 20th century can no way match the degree of integration that prevailed during the gold standard era. The current account surplus of the major creditor nations in the 20th century never exceeded 3-4 per cent of GDP, while during 1870-1913, Britain, the major lender, ran an average current account surplus of above 5 per cent of GDP. On the receiving side, the current account deficit of the borrowing countries during the late 19th century averaged 3.8 per cent, while it was around 2.3 per cent for the period 1993-97. As a percentage of the world total, foreign investment in developing economies was 45 per cent in 1914 as against only 22 per cent in 1992. Many other indicators also point towards deeper integration in the late 19th century as compared with the late 20th century (Eichengreen, 1998).



Following the financial crisis of 1997, private capital flows to emerging markets declined from a peak of \$ 344 billion in 1997 to \$ 280 billion in 1998 and further to \$ 219 billion in 1999. The fall was particularly sharp for market-based flows (bank loans, bonds and equity) owing to uncertainty and risk aversion of investors following the South East Asian crisis. FDI continued its rising trend in absolute terms, though as a share in global FDI, it fell by almost half from 36.5 per cent in 1997 to 18.9 percent in 1999 and further to 15.9 per cent in 2000 (Chart VI.7). Concessional flows rose in 1997 reflecting increase in Japanese aid in response to the East Asian crisis.

Private capital flows to developing countries saw a modest recovery in 2000 to \$ 257 billion; however, it still

remains about 15 per cent below the peak 1997 level. For the first time in over a decade, FDI showed a decline though it still continues to be the dominant component of private capital in all regions. The slowdown in FDI was maximum in Asia and Western Hemisphere reflecting slowdown in mergers and acquisitions activity in Asia and completion of large-scale privatisation projects in Latin America. In 2000, there was a modest recovery in bond financing and bank lending commitments, though concerns over credit risks in developing countries remained high, as reflected in the rise in spreads and shortening of debt maturities since the crisis. Unlike FDI, portfolio flows have shown a rising trend for the past two years reaching \$ 48 billion in 2000. However, with the growing linkages between emerging market and US market stock prices, equity flows are guided apparently less by diversification motives and remain concentrated in few countries - particularly Brazil, China, Mexico and Turkey - that received more than 80 per cent of the flows. The future scenario remains uncertain with the absence of any counter cyclical trend in capital flows to emerging markets as in the past.

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6.10 The role of relative prices and profitability of investment has been offered as an alternative explanation to the Feldstein and Horioka puzzle (Lal, 1991; Higgins, 1993; Taylor, 1994). The presence of factors such as technology and human capital can induce growth and attract capital flows to strengthen a virtuous cycle and show deviations from the Feldstein and Horioka findings. Corrected for relative prices (*i.e.*, at domestic price of capital instead of at international price), the dispersion of the marginal product of capital across countries could be small. Disincentives to capital formation in the form of high prices of capital goods could also lower growth. Cross-country experience shows that high-income countries are generally more open to capital flows and more open economies benefit from capital flows if the internal sources of growth are strong and their past growth record is satisfactory.

6.11 In the recent period, studying the growth augmenting role of various forms of foreign capital has gained prominence over the general analysis. The findings of these studies can be conveniently grouped under the classification adopted in the analysis of the balance of payments in India. This would also reflect the current ordering of capital flows by type from the point of view of the policy stance (Reddy, 1998).

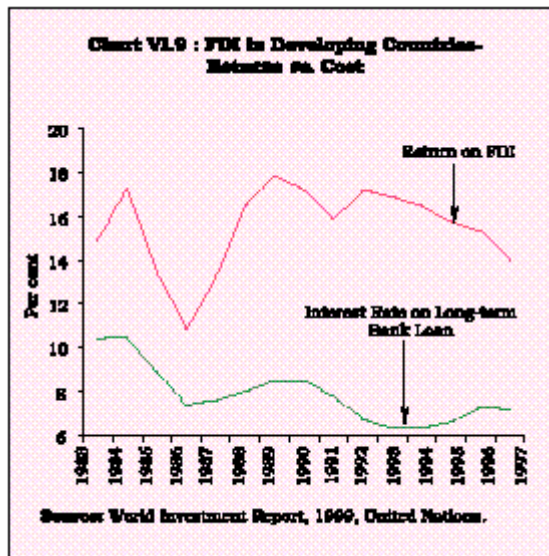
Foreign Direct Investment

6.12 Capital flows in the form of FDI have been widely believed to be an important source of growth in recent years. Since the 1970s, imperfections in goods and factor markets, presence of scale economies and government restrictions on output, trade and entry have come to be recognised as creating market structures where foreign capital in the form of FDI contributes to growth (Kindleberger, 1969; Hymer, 1976). It is eminently plausible that FDI flows might not have existed but for the presence of these imperfections. The theories of international resource allocation based upon the spatial distribution of factor endowments suggest the importance of "locational advantages" as a key driver of FDI flows while the theories of organisation point to

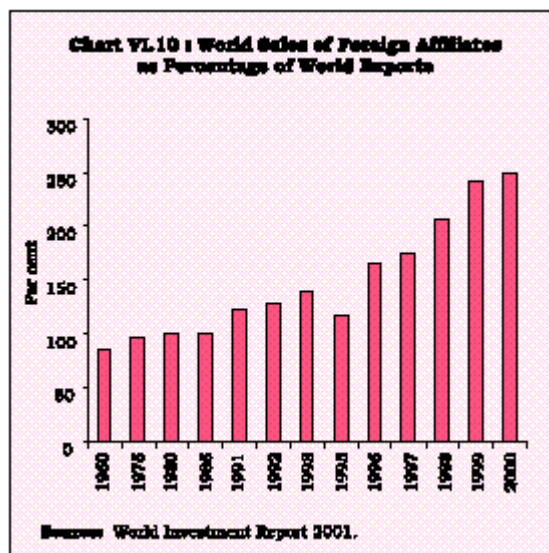
the role of “ownership advantage” and the advantage of “internalising intangible assets (like technology, brand name and marketing skills)”. Competitive policies of nations to attract FDI often work towards reducing the cost of production in a host country. Favourable tax treatment, protected domestic market and low labour costs represent the primary pull factors for FDI. Sound policies, strong and resilient financial systems and liberal exchange control norms also help in creating the congenial environment for augmented inflows under FDI.

6.13 Growth impulses originating from FDI are primarily ascribed to superior technology and greater competition that generally accompany FDI. Local firms of many developing host countries also do not invest enough on R&D to offer and sustain competition with Transnational Corporations (TNCs). Investment on R&D by TNCs in foreign affiliates is, however, found to be low, accounting for as little as 1 per cent of the total R&D investment even though TNCs are generally viewed as R&D intensive (UNCTAD, 1999). Despite the usual concerns that inappropriate technology is generally transferred to the foreign affiliates, empirical assessments suggest that technology - both public and private - that accompany FDI are complementary and inter-firm collaboration helps in augmenting growth. The public knowledge component of technology, representing blueprints and designs that can be codified in manuals and handbooks, can be transferred to the host country depending on the speed at which it is imitated and adapted by other local firms for development of local skills. The private part of the technology that is internalised by the parent, represents a key source of productivity differential across firms. In such cases also FDI may augment growth in a country if its initial technology gap is higher and openness to FDI is significant.

6.14 Whether FDI promotes competition or facilitates development of oligopolistic structures depends upon whether FDI crowds-out or crowds-in domestic investment. FDI can potentially displace domestic producers by preempting their investment opportunities. It is possible, however, that the adverse growth effect emanating from crowding-out could be more than offset by the increase in productivity resulting from advanced technology that often accompanies FDI. Whenever the technology is externalised, it may be transferred at a higher cost since it involves unbundling the package that FDI represents. FDI policies generally take into consideration the conditions that could crowd-in domestic investment. It is the attractiveness of the package that has expanded the appeal of FDI despite the fact that it could be one of the costliest forms of capital for a developing country (Chart VI.9).



6.15 Since trade is an important vehicle for growth, FDI could also contribute to growth by promoting exports. For sustaining an export-led growth strategy, it becomes important to attain dynamic shifts in comparative advantage and FDI can play a major role in imparting the desired dynamism on account of its global marketing network. When capturing the host's market to reap scale advantage becomes the principal objective of TNCs, the expected contribution to dynamic comparative advantage of the host country may not materialise. The very fact that annual sales of foreign affiliates have outpaced total volume of global annual merchandise exports in the 1990s shows the growing importance of market access through FDI in relation to exports (Chart VI.10).



Portfolio Capital

6.16 Portfolio capital has emerged as the key channel for integrating capital markets worldwide. For developing countries, the growth process in the initial phase is often characterised by self financed capital investment, which is replaced gradually by bank-intermediated debt finance and

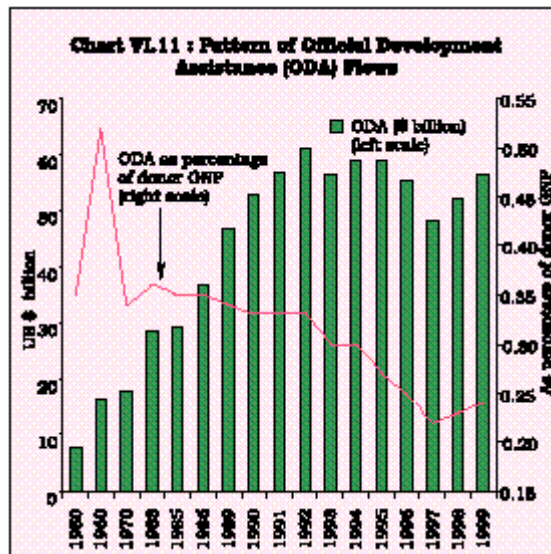
supplemented over time by both debt and equity from the capital market. Portfolio capital flows can ease the constraint on growth imposed by illiquid and small sized capital markets in the early and intermediate stages of the growth process. Countries that reduced barriers to portfolio flows exhibit significant improvements in the functioning of their stock markets (Levine and Zervos, 1995). Greater liquidity in the capital market makes it possible to take up investment projects in developing countries that require lumpy and long-term capital. Equity, unlike debt, allows a permanent access to capital (Kunt and Levine, 1995).

6.17 Surges in portfolio flows can, however, adversely affect growth. Greater liquidity and opportunities for risk diversification may reduce household saving and excess volatility in the stock market may hinder investment. The problem of market imperfection and asymmetric information amplifies the volatility resulting from sudden shifts in the pattern of portfolio flows. Portfolio flows can hinder export promotion by exerting upward pressures on the exchange rate and also sustain an import-cum investment boom to overheat the economy. Unlike FDI, for the portfolio flows there is no one-to-one relationship with real investment. When portfolio activities are entirely concentrated in the secondary market, there is no direct link with real investment in the economy. At the macro level, portfolio flows finance the current account gap when alternative forms of foreign capital prove inadequate. Otherwise, it is only by enhancing the efficiency and liquidity of capital markets that portfolio flows can propel growth.

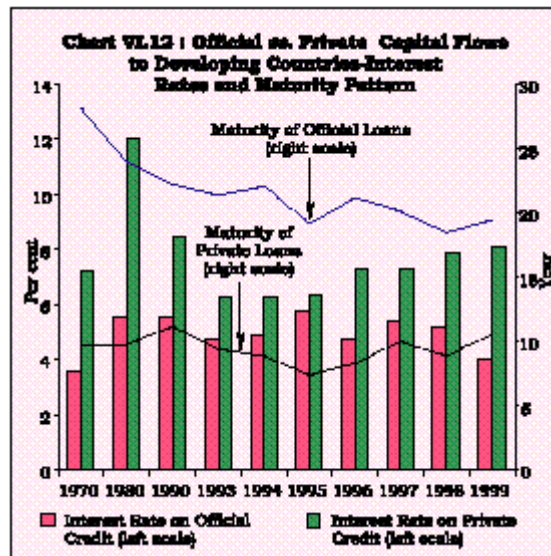
6.18 Despite the ambiguous effect of portfolio flows on growth, large portfolio flows have occurred in the 1990s. Institutionalisation of saving in the advanced economies - giving rise to preference for pooled funds held by pension funds, insurance companies, mutual funds and investment trusts - and the opportunity to diversify idiosyncratic risks in a global market for financial assets contributed to the increased cross-border flow of portfolio capital. Low correlation with equity returns on emerging market stocks during normal conditions and the associated prospect to maximise the benefit from diversification facilitated a shift in the pattern of capital flows to the emerging markets in favour of portfolio flows.

External Aid

6.19 The role of external aid in enhancing growth has waned in recent years. In several developing countries, including India, public and publicly guaranteed capital flows have been supplanted by a growing recourse to private capital flows. In some countries, the problem of negative resource transfer associated with aid has emerged as an additional balance of payments/growth constraint. Except for the poorest countries and those with very limited access to commercial capital, a general sense of aid fatigue has set in. Donors have also gradually deemphasised the role of aid in international economic relations resulting in a significant decline in aid flows as percentage of GDP of the donors since the 1960s (Chart VI.11).



6.20 External aid was initially equated with the need for resource transfer to ease the financing constraint to growth. The major contradiction that surfaced soon was that while the poorest countries had the greatest need for external aid, their capacity to absorb foreign aid was highly unsatisfactory. In the 1980s, structural reforms were seen as the key to promote growth and the earlier project-linked aid strategy was supplemented by non-project linked structural adjustment lending as an additional instrument to augment growth. Structural conditionality then emerged as a contentious issue which created scope for weakened country ownership of programmes. Despite the element of high concessionality (zero rate of interest and repayment over fifty years for certain IDA assistance), the real cost of aid appeared to be high due to conditionality and the tied nature of aid. Aid has often been employed as an instrument of foreign policy. Past experience relating to possible debt forgiveness by donors has also accentuated the problem of moral hazard on the part of recipient countries. Some empirical evidence suggests that aid can crowd- out public expenditure in certain sectors and thereby adversely affect growth. Sustained aid dependence could, in fact, weaken the internal forces of growth (Potiowski and Qayum, 1992). Lack of sound policy environment in the aid receiving countries has operated as a major factor in eroding aid effectiveness (World Bank, 1998). Despite the general dissatisfaction with aid effectiveness, factors such as lower cost and higher maturity of aid in relation to commercial loans has encouraged many developing countries to maintain their access to aid flows (Chart VI.12).

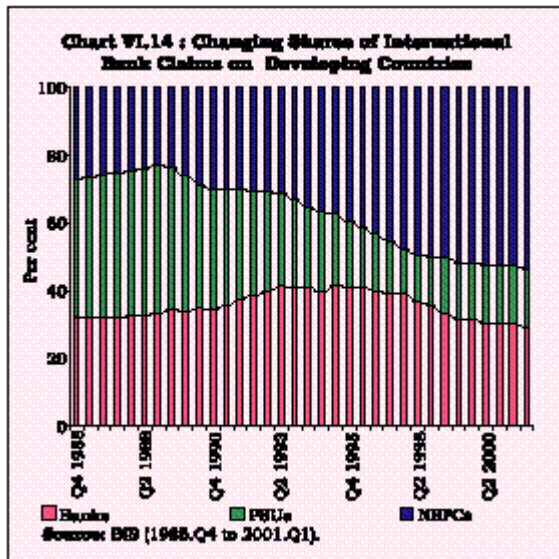
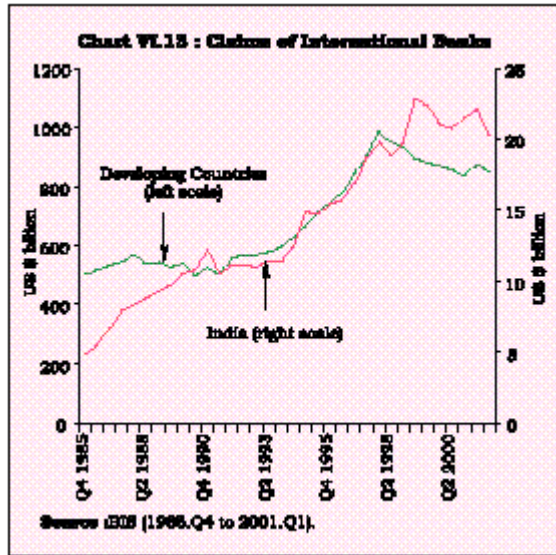


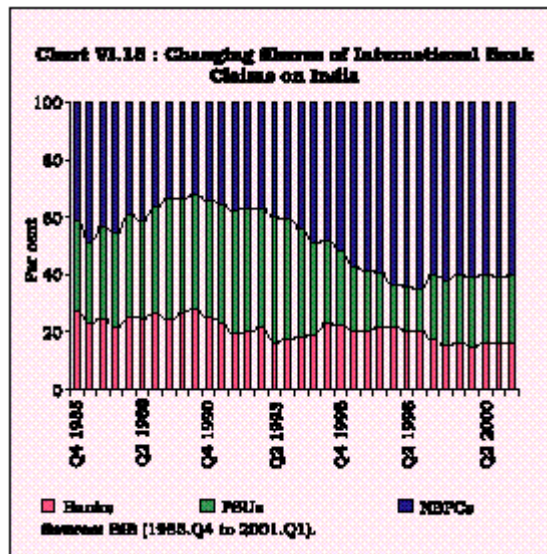
6.21 An orderly transition from aid dependence to market access for foreign capital is being pursued by several developing countries. A number of countries have successfully accessed international markets and raised adequate levels of private capital to meet the financing gap. It is also being increasingly highlighted that "more aid" policy should give way to "more trade", requiring a change in the policy stance of the donors to liberalise their extant restrictions on exports from aid-receivers so as to allow them to reap the benefits of their true competitive advantage and in that process to reduce their dependence on aid.

Commercial Debt Capital

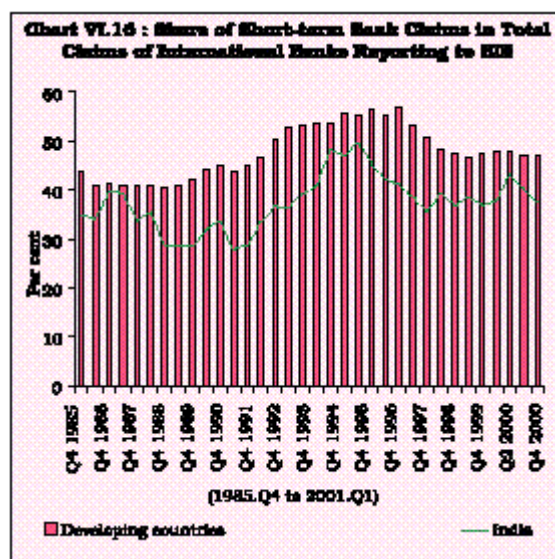
6.22 Commercial debt capital includes a whole range of sources of foreign capital where the overriding consideration is commercial, *i.e.* risk adjusted rate of return. External commercial loans could include bank loans, buyer's credit, supplier's credit, securitised instruments such as Floating Rate Notes and Fixed Rate Bonds, and commercial borrowings from the private sector window of multilateral financial institutions. The oil crisis of 1973 dramatically altered both the demand and supply conditions for commercial capital. The Organisation of Petroleum Exporting Countries (OPEC) experienced a 10 fold increase in their current account surplus in 1974 and their surplus positions remained large for the subsequent years. Oil-importing developing countries, in turn, experienced widening financing gaps. The surplus petro-dollars were recycled by the banks of the developed countries to the developing countries. Financing gaps of the oil-importing countries created and sustained the demand for the surplus international banking funds. The external debt crisis of 1982 brought about an interruption in banking capital flows to the developing world. The inadequate recognition of the vulnerabilities arising from interest rate and exchange rate risk exposures associated with foreign debt capital emerged as the key areas of concern. In the first half of the 1980s when the US dollar appreciated and international interest rates hardened significantly, debt servicing problems turned unsustainable. Many emerging economies, however, had to increase their dependence on commercial capital in the 1980s in the quest for higher growth, particularly in terms of access to critical imported capital goods and other inputs.

Cross-border bank lending - a major element of commercial borrowing - registered modest increase during the 1980s, gathering momentum in the 1990s (Chart VI.13). Structural changes were visible in the pattern of these flows reflecting the need for raising the productivity of banking capital flows by directing them to emerging markets. The most important change was in the form of large scale contraction in bank lending to public sector enterprises and a perceptible shift in favour of non-bank private corporates (NBPCs) (Charts VI.14 and VI.15).





6.23 Commercial lending by banks in the past was given for general purposes under central government guarantees. Government guarantees had reduced the role for monitoring and there was a perception that "governments cannot go bankrupt"(Aerni and Junge, 1998). In the aftermath of the debt crisis of 1982 when about 70 per cent of the private capital flows to developing countries was in the form of banking capital, it became important to address the problem of information asymmetry and the fear of non-performance of the debt contract within the legal jurisdiction of another country. Information asymmetry could be partly addressed by lending to the corporate sector through domestic banks and financial institutions. Local banks and institutions could monitor the individual borrowers better and also service small and medium clients for whom direct access to international lending could be limited and costly. Furthermore, non-performance of contracts by individual borrowers could shift the costs of opportunistic behaviour to the government and this would be reflected in reduced access to international capital for the country as a whole. These concerns underscored the relevance of monitoring of private debt by the national authorities. The fear of improper monitoring and the difficulties in collateralising cross-border loans have, however, resulted in a strong shift in the preference of lending banks for short-term loans (Chart VI.16)



6.24 In the aftermath of the East Asian crisis, it was recognised that even when banking capital to the private sector is used for raising domestic investment - not consumption - the growth enhancing capacity may be constrained by unproductive investment, addition of excess capacity and investment in sensitive sectors like real estate and stocks. Weak domestic banking systems and the nexus between banks and various influential interest groups can not only overheat the economy but also expose the economy to a large-scale loss of output and employment during a crisis. It became evident that even if banking capital does not directly flow to the public sector, credit allocation decisions of banks and financial institutions could be influenced to direct the flow of credit to favoured firms and industries at subsidised rates.

6.25 It is generally believed that the potential of banking capital in augmenting growth would be largely realised in a strong and resilient domestic financial system with effective supervision and regulation. Despite the diversification in the 1990s in favour of commercial borrowings from the market, loans from banks continue to dominate the commercial debt segment for the developing countries. At the end of March 2001, while the outstanding claims of international banks on developing countries was about US \$ 856 billion, outstanding volume of capital raised through money market instruments and bonds and notes amounted to US \$ 7.7 billion and US \$ 450.7 billion, respectively. The advantage of raising longer-term debt capital to finance projects with large gestation period, particularly in the infrastructure sector has mainly driven the shift to market. Tighter entry norms, such as meeting internationally acceptable accounting/ auditing standards, disclosure of information and formal rating requirement, however, may not encourage many small and medium firms to access international bond markets despite having identified projects with growth opportunities. At the end of March 2001, the share of government and state enterprises in the total volume of capital raised through issuance of securities in both money and capital market was about 54 per cent as against the corporate sector's share of 32 per cent and financial institution's share of 14 per cent. This indicates that the shift in the composition of bank loans away from state enterprises has been partly offset by the market in the bond segment. The objective of linking commercial debt capital to direct production/trade activities that prompted the shift in the pattern of bank loans has, therefore, not been entirely achieved.

III. CROSS-COUNTRY EXPERIENCE ON CAPITAL FLOWS AND GROWTH

6.26 Empirical assessments of the causal relationship between capital flows and growth recognise the role of several factors. The extent to which the growth augmenting potential of foreign capital could be actually realised depends on the domestic business and policy environment of the receiving country. Lessons from the cross-country experiences have particularly been viewed as important due to the lack of any clear consensus on what could be the right approach to capital flows and also the absence of sufficient empirical research to establish the net positive impact of a liberalised capital account on growth. Growth regressions with various measures of international financial openness as determinants suggest either no statistically significant relationship between the two (Kraay, 1998; Rodrik, 1998) or that such results are obtained only for countries with higher income (Edwards, 2000), better-educated labour force (Borensztein, *et al.*, 1998), and well developed banking system (Bailliu, 2000; Soto, 2000).

6.27 Simple correlation coefficients suggest that the association between capital flows and growth has strengthened in the last three decades, which in fact coincided with the growing influence of private capital flows as the principal vehicle of global integration (World Bank, 2001). The correlation coefficients rose from 0.09 in the 1970s to 0.13 in the 1980s and further to 0.28 in the 1990s. Correlation between capital flows and growth, however, reflects the effects of both capital deepening and capital productivity. The investment augmenting capacity of capital flows seems to have weakened with increasing cross-border integration of trade and finance. The earlier one-to-one association between private capital flows and domestic real investment has changed over time which is reflected in a lower order of increase in domestic real investment for every unit increase in capital flows. In view of the perceived weakening in the investment deepening effect of capital flows in the face of increasing correlation, it is possible to infer that productivity gains associated with foreign capital must have gone up in the 1990s.

6.28 A disaggregated assessment across different forms of foreign capital and across countries at different levels of development would have greater explanatory power in respect of global patterns. Empirical findings indicate that capital flows in the form of FDI and bank lending had significant and strong effects on domestic investment during 1979-95 (Bosworth and Collins, 1999). The impact of portfolio flows, however, turned out to be statistically insignificant, though positive. For the period 1972-98, the incremental impact in terms of raising both domestic investment and current account deficit was almost one-to-one in case of total capital flows. While long-term capital inflows exhibited a similar pattern, the impact of short-term flows was extremely weak. FDI flows exhibited close to one-to-one relationship, banking flows tended to raise domestic investment more than proportionately and current account deficits tended to deteriorate by more than the extent of inflows. The impact of portfolio flows on domestic investment was found to be modest and the current account position, in fact, improved. Sub-Saharan African region showed the strongest association between capital flows and investment, even more than the East Asian and the Pacific region. The association appeared to be marginal in case of Latin American and the Caribbean countries ([Table 6.3](#)).

6.29 Portfolio flows and bank lending seem to perform better in countries with sound and deep financial markets. Greater exposure to portfolio capital flows is, however, associated with

heightened volatility which may negate the growth enhancing effects of foreign capital. Controlling for the volatility effects, it is estimated that an increase in capital flows by 1 percentage point of GDP could give rise to an increase in per capita growth of 0.25 to 0.5 per cent. Countries with higher absorptive capacity benefit from foreign capital by raising investment and productivity. Human capital and infrastructure raise the absorptive capacity of a country which, in turn, helps in raising the productivity of foreign capital (World Bank , 2001).

Table 6.3: Major Findings of Recent Studies on the Relationship between Capital Flows and Growth

Author(s)	Period of study	Major findings
1	2	3
Bosworth and Collins (1999)	1978-95 (for 58 developing countries)	Every dollar increase in capital flows was associated with an increase in domestic investment of about 50 cents (Above 80 cents for FDI, close to 10 cents for portfolio flows and about 50 cents for loans).
World Bank (2001)	1972-98 (for 118 countries)	Every dollar increase in capital flows was associated with about 80 cents increase in investment (close to 90 cents for long-term capital, 25 cents for short-term capital, above 80 cents for FDI, more than one dollar for bank lending and about 50 cents for portfolio flows).
Agosin and Mayer (2000)	1970-96 (for developing countries of Africa, Asia, and Latin America)	Strong evidence of crowding-in effect of FDI for Asia (2.71), modest crowding-in effect for Africa (0.89) and crowding-out effect for Latin America (-0.14).
Bailliu (2000)	1975-95 (for 40 developing countries)	Evidence of capital flows fostering economic growth only for economies where the banking sector has reached a certain level of development.
Soto (2000)	1986-97 (for 44 developing countries)	FDI (with a lag of one year) significantly boosts per-capita income growth in the receiving country. A ten percentage point rise in FDI/GNP ratio increases the long-run steady state income level by 3 per cent and short-term per-capita income by 1 per cent.

6.30 In view of the direct one-to-one relationship between FDI and domestic investment, much of the empirical literature focuses on the growth-enhancing role of FDI. Causality tests have been employed to identify the “growth induced” *versus* “growth enhancing” aspects of FDI. On the other hand, studies on determinants of FDI help in ascertaining the importance of various determinants in attracting FDI. Other studies examine complementarities between FDI and domestic investment. Over the period 1970-96, evidence of significant crowding-in effects of FDI on domestic investment have been found for Asia and modest crowding-out effects for Latin America (Agosin and Mayer, 2000). For Africa, the link between FDI and domestic investment turns out to be one-to-one. For every incremental unit of FDI in Asia, domestic investment rose by 2.71 times that of the initial incremental FDI. Contribution of different forms of foreign capital have been evaluated using cross-section panel regressions so as to segregate best forms of foreign capital from the second best (Soto, 2000; Bailliu, 2000). In countries with better capitalised domestic banks, foreign banking capital may turn out to be growth enhancing.

6.31 Testing for the relevance of push and pull factors as determinants of capital flows using

panel regressions yield results contrary to earlier findings (Hernandez *et al*, 2001). International interest rate movements may not play a major role in pushing capital to emerging markets. The pool of foreign capital available to the emerging markets as a whole appears to be one of the important determinants, implying that the prospect of getting foreign capital for an individual country could brighten when the size of the pool itself increases. Among the set of domestic determinants, investment rate and debt-service ratio turn out to be significant. There is also a shift in the significance of some of the determinants over time; as opposed to the real appreciation in the 1970s and early 1980s, growth in domestic bank credit appears to have emerged as the more dominant internal risk factor in the 1990s. The public sector deficit did not exhibit the generally expected negative association with capital flows, being financed by sovereign issues. The more revealing finding is that capital flows may not be constrained by restrictions on capital flows (interpreted as restrictions on payments for transactions and surrender/repatriation requirement on export proceeds). Capital controls are effective in changing the composition of flows but not the volume of total capital flows. Selective use of controls to alter the composition of inflows in favour of more stable and growth supportive forms of capital could raise the overall growth of the economy.

6.32 Interest rate differential is conventionally viewed as one of the key determinants of private capital flows. As national financial systems integrate, the effect of capital flows gets reflected in convergence of asset prices. While capital flows reflect the arbitrage process, asset prices reflect the outcome of arbitrage. A study on the determinants of debt and equity flows from the US to nine Latin American and nine Asian countries suggests that country-specific factors, particularly credit rating and black market exchange rate premium, appear to significantly influence the pattern of capital flows. The US interest rate turns out to be the single most important determinant for short-term debt flows (Taylor and Sarno, 1997). Global factors seem to dominate the importance of country-specific factors in respect of debt flows whereas country specific factors were seen to be more important in attracting equity flows.

Table 6.4 : Planned and Actual Current Account Deficits in Different Plans (% of GDP)

Plan	Planned CAD	Actual CAD
1	2	3
Ist Plan (1951-56)	1.7	0.1
2 nd Plan (1956-61)	1.9	2.4
3 rd Plan (1961-66)	2.2	1.8
4 th Plan (1969-74)	0.7	0.3
5 th Plan (1974-79)	1.5	0.2
6 th Plan (1980-85)	1.4	1.6
7 th Plan (1985-90)	1.6	2.3
8 th Plan (1992-97)	1.6	1.2
9 th Plan (1997-2002)	2.1	1.0 (1997-2001)

IV. CAPITAL FLOWS AND GROWTH IN INDIA : THE RECENT EXPERIENCE

6.33 Capital flows into India have been predominantly influenced by the policy environment. Recognising the availability constraint and reflecting the emphasis on self-reliance, planned

levels of dependence on foreign capital in successive Plans were deliberately held at modest levels ([Table 6.4](#)). Economy in the recourse to foreign capital was achieved through import-substitution industrialisation in the initial years of planned development. The possibility of exports replacing foreign capital was generally not explored until the 1980s. It is only in the 1990s that elements of an export-led growth strategy became clearly evident alongside compositional shifts in the capital flows in favour of commercial debt capital in the 1980s and in favour of non-debt flows in the 1990s. The approach to liberalisation of restrictions on specific capital account transactions, however, has all along been against any "big-bang" ([Box VI.4](#)).

Box VI.4 **Role of Capital Controls in Stabilising the Growth Process**

The debate centering around the perceived benefits of an open capital account, on the one hand, and the observed advantages of selective capital controls in stabilising the growth process, on the other, has prompted national authorities to undertake capital account liberalisation at varied pace and sequencing, depending on country-specific circumstances. A review of country experiences suggests that countries impose capital controls for a variety of reasons, *i.e.*, to (a) protect infant industries - a second best solution whereby the authority introduces an off-setting distortion to correct some other pre-existing distortions that cannot be corrected otherwise; (b) increase the effectiveness of monetary policy; (c) limit exposure to risks (such as transfer risk, sovereign risk, and country risk); (d) avoid the costs of sterilisation; (e) limit the potentially destabilising effects of volatile capital flows; (f) enable monetary authorities to pursue managed exchange rate regimes; (g) reduce domestic financial system vulnerability by substituting for (absent or underdeveloped) prudential standards; (h) provide breathing space for entrenching the preconditions for an open capital account; and (i) restructure capital flows in favour of non-debt and longer maturity flows.

Capital controls, however, have certain negative implications. They may lead to inefficient allocation of resources with implications for productivity. Capital controls limit the substitutability between domestic and foreign assets and introduce a systematic wedge between domestic and foreign interest rates. Controls on outflows may depress domestic interest rates with adverse implications for domestic saving. Differential reserve requirements on banks' domestic *vis-a-vis* foreign currency liabilities are discriminatory, impairing the efficiency of monetary policy. By limiting adjustment to the quantity variable, the burden of adjustment of a shock on the investor's portfolio allocation results in increased volatility of the exchange rate/equity prices. Capital controls entail administrative costs, and render accessibility to desirable forms of foreign capital difficult and costly. Many countries have also resorted to capital controls as a soft option, preferring it to the implementation of difficult measures of financial sector reforms that would have otherwise proved beneficial in the long run. In significant measure, the resort to capital controls also reflects the gaps in the international financial architecture, which have made the resolution of capital account crises costly, inequitable and contagious.

Prior to the Asian crisis, the IMF generally discouraged imposition of capital controls. An implicit assumption in the exercise of its responsibility for international monetary and financial stability was that private sector capital markets usually do not 'get it wrong' in deciding the right amount and right composition of capital flows to a country. Accordingly, the IMF had recommended further improvements in market discipline to promote private capital flows (Goldstein and Mussa, 1993). Even as late as in October 1997, the Fund's World Economic Outlook had recommended further liberalisation of the capital account noting the linkage between 'rapid growth and large capital inflows'. Although developing countries may experience increased volatility, this should be managed without imposing capital controls with greater exchange rate flexibility to deal with such flows (IMF, October 1997). In the post South-East Asian crisis period, the IMF recognised the role of capital controls. The Fund's initial criticism of Malaysia's re-imposition of exchange and capital controls in September 1998 as an "important set-back not only to that country's recovery and potentially to its future development, but also to other emerging market economies that have suffered from heightened investor fears of similar actions elsewhere" (IMF, October 1998) has undergone a progressive transformation with an acknowledgement that "controls appear to have provided some breathing space in which to implement more fundamental reforms" (IMF, October 2001). Capital controls on short-term capital inflows by Chile to increase the potency of monetary policy also found favour with the IMF. It acknowledged the existence of "important preconditions for an orderly liberalisation of capital movements" and also recognised the

inability of the market participants to appropriately assess the risks of investing in emerging markets leading to excessive volatility in capital flows (IMF, 1998; Mussa, 2000). The IMF's current view on capital account liberalisation resembles the Indian approach. For countries with comparatively weak financial systems, maintenance of some restrictions on private capital flows (at least for some period of time) has been recognised as a desirable option.

Empirical studies find a weak positive relationship between international capital account liberalisation and growth. Potential benefits of liberalisation in the form of higher investment, technological spillovers and deeper financial markets may get offset by financial crises resulting in temporary, but large losses in output. These financial crises, associated with volatility in net capital flows, have increased during the 1990s, particularly for countries that experienced more rapid capital account liberalisation. Some evidence is available to support the view that stronger institutions increase the benefits from capital inflows; thus adequate financial regulation and supervision, by ensuring that domestic lending agencies do not undertake excessive risks, can prevent crises and output losses.

Capital controls cannot, however, be a permanent solution, nor a substitute for reforms. Further, effectiveness of controls also depends on the administrative capacity and the level of financial market development. Evidence as regards ability of capital controls to limit volatility and loss of growth is also mixed; unlike Malaysia which undertook structural reforms to strengthen the financial system, controls imposed by Russia, in the absence of adequate structural reforms, proved less effective. The IMF treats emerging market countries that have already significant involvement in international capital markets differently from both developing countries that are only partially involved in global capital markets and the poorest developing countries. The IMF, in general, recommends “a slow and gradual approach to opening the capital account” if the preconditions of effective liberalisation are not in place. It underscores the importance of the creation of conditions and institutions that can encourage foreign capital.

The Indian Approach

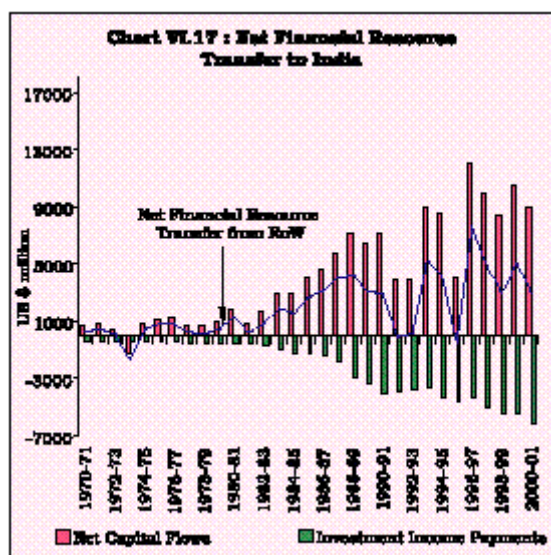
India considers liberalisation of capital account as a process and not as a single event. While relaxing capital controls, India makes a clear distinction between inflows and outflows with asymmetrical treatment between inflows (less restricted), outflows associated with inflows (free) and other outflows (more restricted). Differential restrictions are also applied to residents *vis-à-vis* non-residents and to individuals *vis-à-vis* corporates and financial institutions. A combination of direct and market-based instruments of control is used, meeting the requirements of a prudent approach to management of the capital account. The control regime also aims at ensuring a well diversified capital account including portfolio investments and at changing the composition of capital flows in favour of non-debt liabilities and a higher share of long-term debt in total debt liabilities. Thus, quantitative annual ceilings on external commercial borrowings (ECB) along with maturity and end use restrictions broadly shape the ECB policy. Foreign direct investment (FDI) is encouraged through a progressively expanding automatic route and a shrinking case-by-case route. Portfolio investments are restricted to select players, particularly approved institutional investors and the NRIs. Short-term capital gains are taxed at a higher rate than longer-term capital gains. Indian companies are also permitted to access international markets through GDRs/ADRs, subject to specified guidelines. Capital outflows (FDI) in the form of Indian joint ventures abroad are also permitted through both automatic and case-by-case routes. The Committee on Capital Account Convertibility (Chairman: Shri S.S. Tarapore) which submitted its Report in 1997 highlighted the benefits of a more open capital account but at the same time cautioned that capital account convertibility (CAC) could cause tremendous pressures on the financial system. To ensure a more stable transition to CAC, the Report recommended certain signposts and preconditions of which the three crucial ones relate to fiscal consolidation, mandated inflation target and strengthened financial system. International developments, particularly the initiatives to strengthen the international architecture for dealing with the problems arising in the capital account of a country's balance of payments, would also influence the timing and sequencing of CAC in India.

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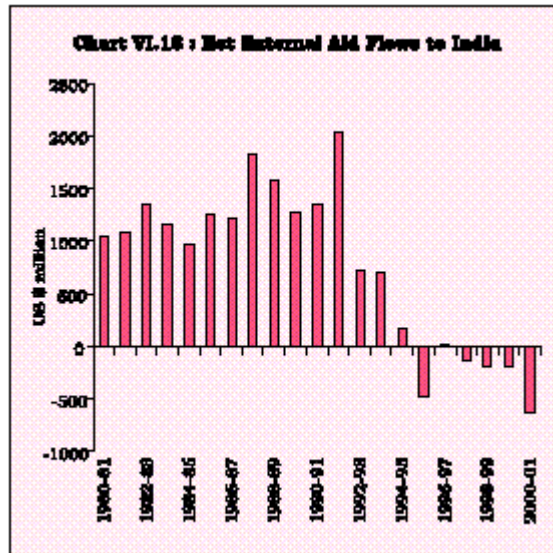
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6.34 A large part of the net capital flows to India in the capital account is being offset by the debt servicing burden. As a consequence, net resource transfers have fluctuated quite significantly in the 1990s, turning negative in 1995-96 (Chart VI.17).

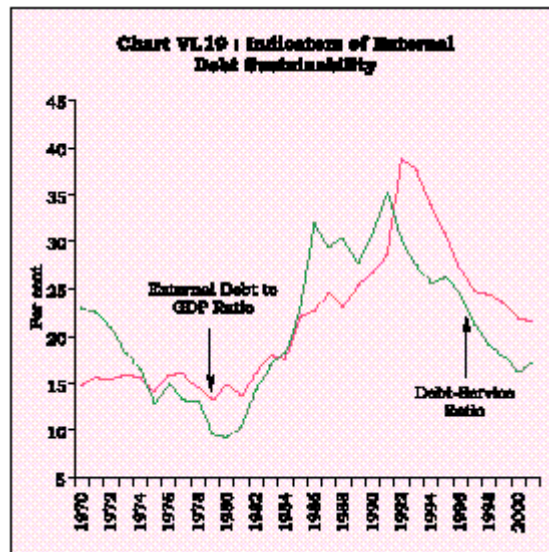


6.35 Till the early 1980s, the capital account of the balance of payments had essentially a financing function (Rangarajan, 1996). Nearly 80 per cent of the financing requirement was met through external assistance. Aid financed imports were both largely ineffectual in increasing the rate of growth and were responsible for bloating the inefficient public sector (Kamath, 1992). Due to the tied nature of bilateral aid, India had to pay 20 to 30 per cent higher prices in relation to what it could have got through international bidding (Riddell, 1987). The real resource transfer associated with aid to India, therefore, was much lower. There were occasions "when India accepted bilateral aid almost reluctantly and without enthusiasm because of the combination of low priority of the project and the inflated price of the goods" (Lipton and Toye, 1989; Jha and Swaroop, 2000). The environment for enhancing aid effectiveness has been highlighted as one of the key factors in the assessments of aid by donors, *i.e.*, "open trade, secured private property rights, the absence of corruption, respect for the rule of law, social safety nets, and sound macroeconomic and financial policies" (World Bank, 1980). The Report of the High Level Committee on Balance of Payments (1993) identified a number of factors constraining effective

aid utilisation in India and underscored the need to initiate urgent action on both reducing the overhang of unutilised aid and according priority to externally aided projects in terms of plan allocations and budgetary provisions. Net resource transfer under aid to India, however, turned negative in the second half of the 1990s. (Chart VI.18).



6.36 In the 1980s, India increased its reliance on commercial loans as external assistance increasingly fell short of the growing financing needs. The significant pressures on the balance of payments as the international oil prices more than doubled in 1979-80 and the world trade volume growth decelerated sharply during 1980-82, triggered an expansion in India's portfolio of capital inflows to include IMF facilities, greater reliance on the two deposit schemes for non-resident Indians - the Non-Resident External Rupee Accounts (NRERA) (that started in 1970) and Foreign Currency Non-Resident Account (FCNRA) (that started in 1975) - and commercial borrowings on a modest scale. A few select banks, all-India financial institutions, leading public sector undertakings and certain private corporates were allowed to raise commercial capital from the international market in the form of loans, bonds and Euronotes. Indian borrowers received finer terms in the 1980s. Spreads over LIBOR for loans to India improved gradually from about 100 basis points in the early 1980s to about 25 basis points for PSUs (50 basis points for private entities) towards end of 1980s (Joshi, 1997). Maturities were elongated from seven years to ten years during this period. Debt sustainability indicators, particularly debt/GDP ratio and debt service ratio, however, deteriorated significantly during this period (Chart VI.19).



6.37 The policy approach to ECB has undergone fundamental shifts since then with the institution of reforms and external sector consolidation in the 1990s. Ceilings are operated on commitment of ECB with sub-ceilings for short-term debt. The ceiling on annual approvals has been raised gradually. The focus of ECB policy continues to place emphasis on low borrowing cost (by specifying the spread on LIBOR or US TB rates), lengthened maturity profile (liberal norms for above 8 years of maturity), and end-use restrictions.

6.38 Given the projected need for financing infrastructure projects, 15 per cent of the total infrastructure financing may have to come from foreign sources. Since the ratio of infrastructure investment to GDP is projected to increase from 5.5 per cent in 1995-96 to about 8 per cent by 2006, with a foreign financing of about 15 per cent, foreign capital of about 1.2 per cent of GDP has to be earmarked only for the infrastructure sector to achieve a GDP growth rate of about 8 per cent ([Table 6.5](#)).

6.39 NRI deposits represent an important avenue to access foreign capital. The policy framework for NRI deposits during 1990s has offered increased options to the NRIs through different deposit schemes and by modulation of rate of return, maturities and the application of Cash Reserve Ratio (CRR). In the 1990s, FCNR(B) deposit rates have been linked to LIBOR and short-term deposits are discouraged. For NRERA, the interest rates are determined by banks themselves. The Non-Resident (Non-Repatriable) Rupee Deposit [NR(NR)RD] introduced in June 1992 is non-repatriable, although interest earned is fully repatriable under the obligation of current account convertibility subscribed to in 1994. In the 1990s, NRI deposits remained an important source of foreign capital with the outstanding balances under various schemes taken together rising from about US \$ 10 billion at the close of 1980s to US \$ 23 billion at the close of 2001. Capital flows from NRIs have occasionally taken the form of large investments in specific bonds, *i.e.*, the India Development Bond (IDB) in 1991, the Resurgent India Bond (RIB) in 1998 and India Millennium Deposits (IMD) in 2000.

Table 6.5 : Projections for External Savings

	1994-95	2000-01	2000-95	2005-06
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	Actual	Projected	Actual	Projected
1	2	3	4	5
1. Gross Domestic Investment (% of GNP)	25.2	29.4	23.3*	31.5
2. Current Account Deficit (% of GNP)	1	2.4	0.5	3
3. Current Account Deficit (US \$ million)	3014	10586	2579	19814
4. Net Capital Account Surplus (US \$ million)	7771	18760	9023	27311
5. Reserve Level (US \$ million)	20233	47660	42281	87259

Source: India Infrastructure Report- Policy Imperatives for Growth and Welfare, GoI, 1996.

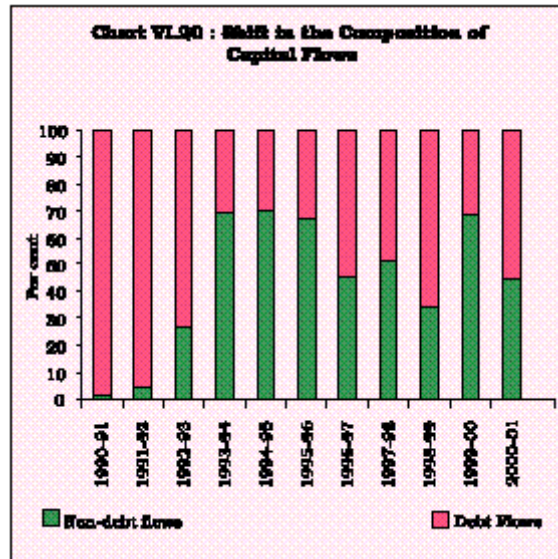
* : 1999-2000 (QE)

6.40 The need for supplementing debt capital with non-debt capital with a clear prioritisation in favour of the latter has characterised the government policy framework for capital flows in the 1990s. The High-Level Committee on Balance of Payments recommended the need for achieving this compositional shift. A major shift in the policy stance occurred in 1991-92 with the liberalisation of norms for foreign direct and portfolio investment in India (Suma and Kapur, 2001).

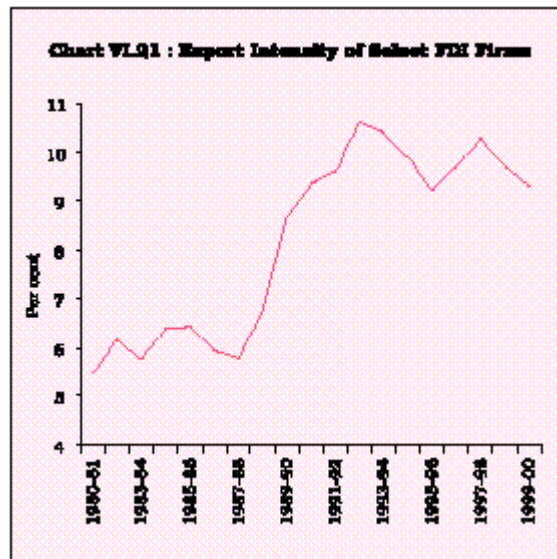
6.41 The liberalisation process started with automatic approval up to 51 per cent for investment in select areas. Subsequently, the areas covered under the automatic route and the limits of investment were raised gradually culminating in permission for 100 per cent participation in certain areas (particularly oil refining, telecommunications, and manufacturing activities in Special Economic Zones). The requirement of balancing the dividend payments with export earnings which was earlier limited to a short list of 22 consumer goods items was completely withdrawn. Limit for FDI in projects relating to electricity generation, transmission and distribution has been removed. FDI in non-bank financial activities and insurance is also permitted. Restrictions on portfolio investment through purchase of both traded primary and secondary market Indian securities are also liberalised. As opposed to the earlier restriction permitting Non-Resident Indians (NRIs)/Overseas Corporate Bodies (OCBs) to acquire up to 1 per cent (individually) and up to 5 per cent (taken together) of paid-up capital of Indian companies, the overall ceiling was initially raised to 24 per cent for Foreign Institutional Investors (FIIs)/NRIs/OCBs while allowing investment by FIIs in September 1992. Subsequently, the aggregate limit was raised gradually and presently FII investment is permitted up to the sectoral cap/statutory ceiling as prescribed for FDI investment in different sectors, provided the general body of the respective firms takes a decision to that effect. Portfolio investment in Global Depository Receipts(GDRs)/ American Depository Receipts (ADRs)/ Foreign Currency Convertible Bonds (FCCBs) floated by Indian companies in international markets is also permitted.

6.42 Foreign investment responded favourably to the liberalised policy environment and the generalised improvement in macro-economic conditions. By 1993-94, FDI and portfolio flows taken together emerged as the most important source of external finance and non-debt flows exceeded net debt flows in the form of NRI deposits, external commercial borrowings and

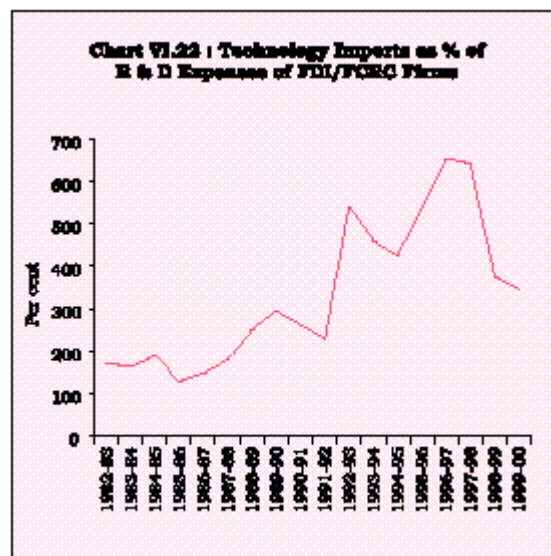
external assistance. Since then, foreign investment has remained as the most important form of external financing for India (Chart VI.20).

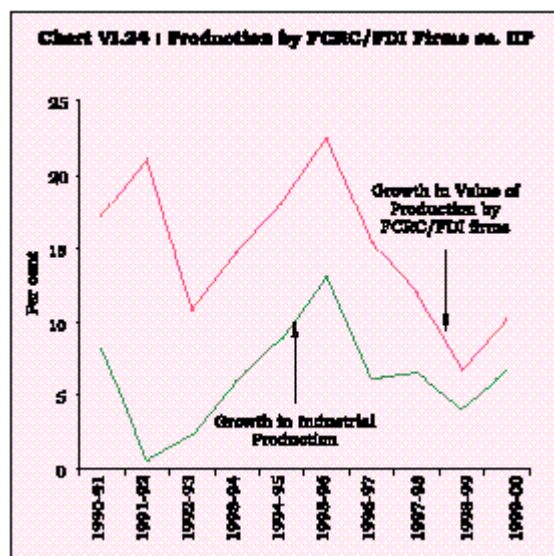
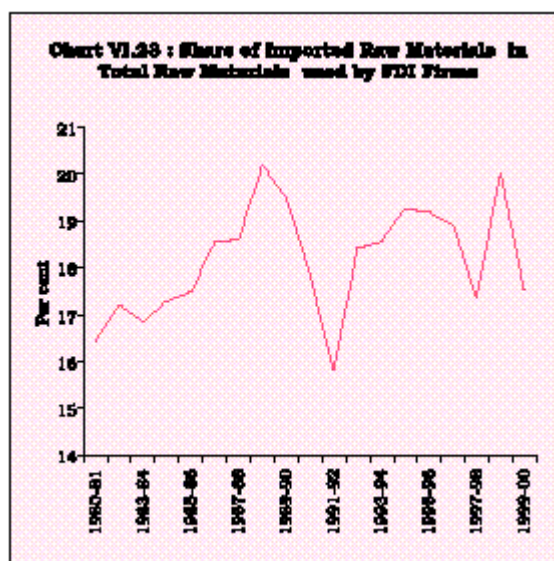


6.43 It is difficult to assess the direct contribution of these flows, particularly FDI, to the growth process. Anecdotal evidence suggests that foreign-controlled firms often use third-party exports to meet their export obligations (Athreya and Kapur, 2001). Another factor that contributes to widening the technology gap in FDI in India is the inappropriate Intellectual Property (IP) regime of India. Survey results for 100 US multinationals indicate that about 44 per cent of the firms highlighted the weak IP protection in India as a constraining factor for transfer of new technology to Indian subsidiaries. For investment in sectors like chemicals and pharmaceuticals, almost 80 per cent of the firms viewed Indian IP regime as the key constraining factor for technology transfer (Lee and Mansfield, 1996). Information collected from annual surveys of select Foreign Controlled Rupee Companies (FCRCs)/FDI companies on the export intensity of FCRC/FDI firms during the 1980s and the 1990s shows that these firms export only about 10 per cent of their domestic sales and the export-intensity has increased only modestly in the 1990s. It appears that the lure of the large size of the domestic market continues to be one of the primary factors causing FDI flows into India (Chart VI.21).



6.44 Spillover of positive externalities associated with FDI in the form of transfer of technology is also highlighted as another factor that could contribute to growth. The relationship between technology imports (comprising import of capital goods and payments for royalty and technical know-how fees) and domestic technology efforts in terms of R&D expenditure does not exhibit any complementarity (Chart VI.22). Foreign exchange spent on technology import as percentage of domestic expenses on R&D rather increased significantly in the 1990s in relation to 1980s, suggesting the use of transfer pricing mechanism to create a gap between the visible and invisible patterns of resource transfer. The share of imported raw materials in total raw materials used by FDI/ FCRC firms has, more or less, hovered around only 20 per cent (Chart VI.23). FDI firms, however, outperformed the overall growth in industrial production in the 1990s (Chart VI.24).





V. AN EMPIRICAL APPRAISAL

6.45 Testing for whether capital flows are "growth driven" or "growth augmenting" typically involves the identification of the direction of causality. Without reference to the possible existence of any structural relationship between capital flows and growth, Granger causality procedure helps in indicating as to whether the behaviour of one variable could be explained by the past behaviour of another variable. In that sense, the predictive potential of variables could be examined through such causality tests without any reference to the degree of causation or the channels through which this causation could materialise. Granger causality tests were conducted for the Indian economy for "net capital flows" (NCF), "net non-debt capital flows" (NDCF) and "net debt creating capital flows" (DCF), all expressed as ratios of GDP and real GDP growth (GDPG), over 1970-2000. The results suggest that net capital flows "Granger-cause" growth in GDP but the reverse causality does not hold statistically, implying that net capital flows may not be "growth-driven" in India. Of the two major forms of foreign capital, it is only the non-debt

creating flows that seem to Granger-cause GDP growth in India ([Table 6.6](#)).

Table 6.6: Relationship Between Capital Flows and Growth – Granger’s F Statistics

Hypothesis	F-Statistic	Accept/Reject the Hypothesis
1	2	3
GDP Growth does not Granger Cause NCF	1.75	Cannot reject
NCF does not Granger Cause GDP growth	5.19*	Reject
GDP Growth does not Granger Cause NDCF	0.13	Cannot reject
NDCF does not Granger Cause GDP growth	3.78*	Reject
GDP Growth does not Granger Cause DCF	1.07	Cannot reject
DCF does not Granger Cause GDP growth	1.63	Cannot reject

* Indicates significance at 1 per cent level.

6.46 The results of the causality tests can be verified against tests of "complementarity" between foreign capital and domestic investment as also by estimating the determinants of capital flows in India. Estimates using the test suggested by Agosin and Mayer (2000) and the World Investment Report (1999) show evidence of "crowding-in" effect of capital flows on domestic investment in India. Every dollar of capital inflow - whether in debt or non-debt form - raises domestic investment by more than one dollar, implying the presence of "crowding-in" and the resultant increase in growth ([Table 6.7](#) and Chart VI.25).

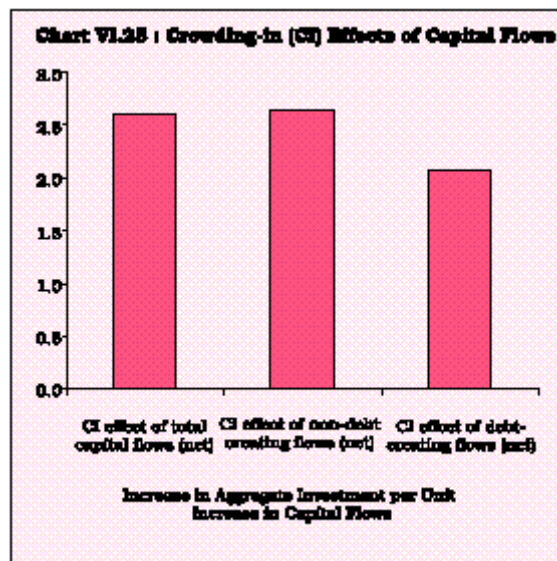


Table 6.7: Crowding-in/Crowding-out Effects of Capital Flows

Change by	Estimated CI/CO factor	Remark
1	2	3
Unit increase in NCF as percentage of GDP	2.62	Unit increase in NCF/ GDP crowds-in aggregate investment by 2.62 units
Unit increase in NDCF as percentage of GDP	2.64	Unit increase in NDCF/ GDP crowds-in aggregate investment by 2.64 units
Unit increase in DCF as percentage of GDP	2.08	Unit increase in DCF/ GDP crowds-in aggregate investment by 2.08 units

???

$$I_{1,t} = \alpha_1 + \alpha_{1,1} + F_{1,t} + \alpha_{2,1} F_{1,t-1} + \alpha_{3,1} F_{1,t-2} + \alpha_{4,1} I_{1,t-1} + \alpha_{5,1} I_{1,t-2} + \alpha_{6,1} G_{1,t-1} + \alpha_{7,1} G_{1,t-2}$$

where I = investment to GDP ratio, F = net foreign inflows as percentage of GDP, and G= growth of GDP

The ‘crowding-in (CI)’ / ‘crowding-out (CO)’ factor = $\alpha_1 + \alpha_2 + \alpha_3 / (1 - \alpha_4 - \alpha_5)$

if the factor > 1, there is evidence of ‘crowding-in’, and if the factor is < 0, there is evidence of ‘crowding-out’

6.47 In the empirical assessment of the determinants of capital flows, both push and pull factors are generally used. Push factors such as international interest rates, world GDP growth, total availability of capital flows to all emerging markets, *etc.* are beyond the control of national authorities. Therefore, identifying the pull factors assume importance. Pull factors explaining the behaviour of capital flows broadly comprise strength, vulnerability and openness variables. Real GDP growth (GDGP) can be taken as a summary measure of the strength variable while gross fiscal deficit (GFD) can represent the vulnerability variable, and trade (export and import of goods) to GDP ratio as the openness indicator (OPENNESS). Estimates of capital flows to India obtained from this formulation reasonably track the actuals and results corroborate the findings of the causality tests. Real GDP growth turns out to be statistically insignificant as a determinant of capital flows to India. Both openness and fiscal deficit are significant. The positive relationship between fiscal deficit and net capital flows suggests that level of fiscal deficit has not discouraged capital flows into India. While external aid has traditionally been a source to finance the fiscal deficit, other debt creating flows improve the resource availability in the economy, facilitating financing of the deficit through domestic market borrowing. The positive relationship, therefore, essentially reflects the financing role of foreign capital. Trade openness seems to be a major determinant of capital flows as it reflects both the requirement to finance

imports and the capacity of the country to service external liabilities through export earnings¹.

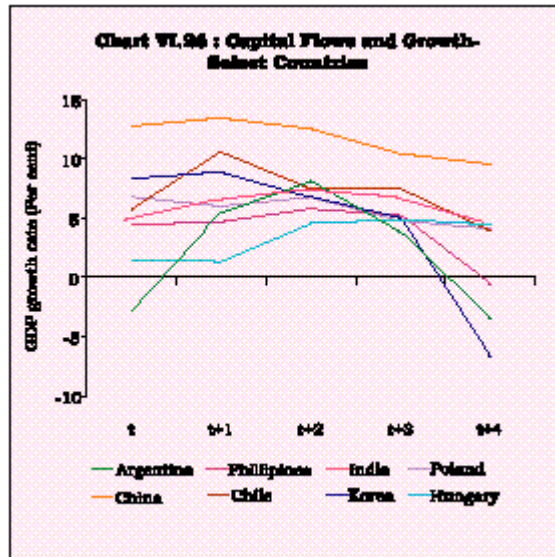
6.48 The importance of openness and GFD as determinants of capital flows differs drastically for debt and non-debt creating flows. In case of non-debt creating flows, fiscal deficit seems to discourage inflows while it encourages greater recourse to external debt flows. Given the limited financing gap in the external current account, debt creating flows in excess of the financing gap improve the availability of resources domestically, facilitating recourse to greater internal borrowing by the government to finance the fiscal deficit. Thus, while in case of non-debt inflows the fiscal deficit could be a sign of vulnerability, in case of debt-creating flows the fiscal deficit could reflect the improved availability of resources brought about by the inflows from abroad. Expectedly, greater openness appears to be congenial for attracting non-debt flows. Debt flows, however, do not exhibit any statistically significant relationship with trade openness.

6.49 The literature suggests that among the determinants of debt and non-debt capital flows, the debt-service ratio (DSR) could be an important determinant. The debt service ratio shows a positive relationship with DCF, *i.e.*, more debt flows are required to meet the higher debt servicing. The policy preference for attracting greater non-debt flows due to rising debt servicing burden explains the positive relationship with NDCF. Debt creating flows have also been regulated, particularly during periods of surges in non-debt flows, and therefore, DCF shows a negative relationship with NDCF of previous periods, indicating that debt flows are discouraged when excessive non-debt flows are received. DCF exhibits the expected positive co-movement with import-to GDP ratio, reflective of the import financing role of external debt capital. A dummy variable (DUM) capturing the three years in the last three decades when India had to approach IMF also turns out to be significant for DCF. Annual increase in foreign exchange reserves (DFOREXR) seems to have positively impacted upon NDCFs whereas nominal depreciation during the previous years (DEPR(-1)) seems to have discouraged NDCFs².

6.50 With a view to examining the direct impact of capital flows on growth, the relationship between per capita GDP and foreign capital was estimated following the specification adopted in Soto (2000) and Bailliu (2000). Estimated coefficients indicate that log of per capita GDP (LPCGDP) exhibits positive and significant relationship with both gross domestic saving (GDS) rate and net capital flows (as percentage of GDP). Non-debt creating flows exhibit the strongest positive influence on per-capita GDP and even the impact of debt-creating flows appears to be higher than domestic saving. This suggests that domestic saving cannot relax the constraint to growth arising from non-availability of certain inputs and technology. Capital flows help in softening this constraint and while complementing domestic investment financed by domestic saving also enable realisation of higher growth that would have been difficult to achieve with domestic saving only³.

6.51 The empirical tests conducted in this section indicate that capital flows seem to have contributed to raising the economic growth in India even though the role of higher growth as a pull factor remains ambiguous and needs further verification. The "growth augmenting" effects of capital flows also tend to weaken over time. Several countries have experienced one-step jumps in output growth in the aftermath of the initial surge in capital flows in many countries. In the subsequent period, capital inflows may continue to be large, but in relation to the peak growth achieved in the immediate post-surge period, their growth remains somewhat lower. In

India, the surge in capital flows that started in 1993-94 was followed by a three-year period of above seven per cent real GDP growth. In the subsequent years, the average GDP growth was almost one percentage point lower even though the capital account remained in significant surplus in all these years. An event-study analysis depicted in Chart VI.26 shows that similar growth pattern was observed in a number of emerging market economies. With ‘t’ corresponding to the period of surge in the respective countries, GDP growth improved generally in the immediate post-surge period (t+1 to t+3) but fell subsequently.



6.52 In the context of the evidences supporting the growth-augmenting role of foreign capital and the planned current account gap of 2.8 per cent of GDP during 2002-07 (CSO, 2001), an assessment of the disguised problem of scarcity of foreign capital for India in the 1990s assumes relevance. During the last decade (1992-2001), India's current account deficit as percentage of GDP averaged at about 1 per cent. Given a net capital inflow of about US \$ 79 billion during this entire period and current account financing gap of only about US \$ 36.5 billion, there was an accretion to foreign exchange reserves of about US \$ 42.5 billion (excluding valuation effects). With a CAD to GDP ratio of about 2 per cent that is viewed as sustainable, the financing gap would have been close to US \$ 75 billion. This implies that accretion to foreign exchange reserves could have been quite modest - only about US \$ 4 billion instead of the actual of US \$ 42.5 billion. In essence, there was a hidden shortfall of about US \$ 38-40 billion during this period which did not exert any pressure due to the low absorptive capacity of the economy (as reflected in a current account gap of only about 1 per cent of GDP). In other words, in the eventuality of actual gap coming close to the sustainable level, fifty per cent more foreign capital than what actually came to India would have been required to reach the present level of foreign exchange reserves.

6.53 Financing of an average CAD of about 2.8 per cent of GDP as projected in the Approach Paper to the Tenth Five-Year Plan would require a minimum of a two-fold increase in the size of annual capital flows from the present level. Assuming that CAD of 2.8 per cent of GDP is attained in each of the five years and that reserves are maintained at about the 1990s average of at least six month cover for imports, the capital inflow requirement would have to rise from the

present level of about US \$ 10 billion to US \$ 19 billion in the initial year of the Tenth Plan and further to about US \$ 26 billion by the terminal year. The underlying assumptions driving these estimates are that GDP would actually grow at the projected 8 per cent with imports also growing at least at the same rate. If the average CAD/GDP of 2.8 per cent is attained gradually over the five year period (*i.e.* at 2.2, 2.4, 2.8, 3.2 and 3.4 per cent in the five years, respectively), then the capital inflow requirement would increase to about US \$ 15 billion in the initial year of the Tenth Plan and further to about US \$ 31 billion in the terminal year. Depending on the composition of capital flows and the possibility of an average import growth in excess of 8 per cent, reserve adequacy requirement could also raise the net capital inflow requirement even further. Besides the problem of availability of foreign capital, low absorptive capacity of the economy may pose another challenge during the Tenth Plan period. If both higher capital inflows and improved absorption are attained as planned, the sustainability of the growth process would critically hinge upon the export performance during the Plan period.

VI. CONCLUDING OBSERVATIONS

6.54 Capital flows have begun to play a significant role in India's growth dynamics. Evidence of strong complementarity with domestic investment suggests that capital flows brighten the overall investment climate and stimulate domestic investment even when a part of the capital flows actually gets absorbed in the form of accretion to reserves. Growth-augmenting role of foreign capital, however, seems to have been constrained by the low levels of actual and planned absorption of foreign capital in India.

6.55 External payments imbalances of the past have largely resulted from overshooting the sustainable level of current account deficit. A successful export-led growth strategy alone can raise the sustainable limit of external resource gap for India. Hence, despite the presence of strong evidence of complementarity with domestic investment, the extent of dependence on external financing cannot be raised significantly without endangering the risk of payments difficulties. The conservative approach to sustainable level of CAD needs to be reassessed in the light of the changes brought about in the 1990s in the composition of capital flows in favour of non-debt creating liabilities. While supplementing domestic saving with foreign capital, a somewhat higher level of sustainable level of CAD may appear feasible only if it is concurrently possible to augment the absorptive capacity and export performance of the economy. Against the backdrop of the problem of disguised scarcity of capital flows to India in the 1990s, achieving a minimum of two fold increase in net capital flows from its present level would be essential to meet the Tenth Plan growth projections.

¹	NCF	=	-1.39 + 0.02 GDPG	+ 0.10 OPENNESS	+ 0.26 GFD	
			(0.54)	(3.08)*	(3.17)*	R ² = 0.52, DW = 1.70
	DCF	=	-0.62 + 0.02 GDPG	- 0.02 OPENNESS	+ 0.33 GFD	
			(0.47)	(-0.54)	(4.71)*	R ² = 0.43, DW = 1.73
	NDCF=		-0.80 + 0.006 GDPG	+ 0.11 OPENNESS	- 0.08 GFD	
			(0.33)	(7.62)*	(-2.09) **	R ² = 0.69, DW = 1.15
²	DCF	=	-1.11 + 0.05 DSR (-1)	- 1.31 DUM +	0.20 MGDP(1)	-1.02 NDCF(-1)
			(4.55)*	(-4.77)*	(3.81)*	(-4.26)*
	NDCF	=	-1.05 + 0.12 OPENNESS	- 0.12 GFD	+ 0.006 DFOREXR	+ 0.02 DSR - 0.07 DEPR (-1)
						R ² = 0.69, DW = 2.23

$$(7.78)^* \quad (-2.48)^* \quad (2.83)^* \quad (1.82)^{***} \quad (-2.19)^{**} \quad R^2 = 0.80, DW = 0.85$$

$$3 \text{ LPCGDP} = 7.65 + 0.05 \text{ GDS} + 0.09 \text{ NCF} \\ (5.79)^* \quad (3.13)^* \quad R^2 = 0.77, DW = 0.55$$

$$\text{LPCGDP} = 7.85 + 0.04 \text{ GDS} + 0.18 \text{ NDCF} + 0.07 \text{ DCF} \\ (4.43)^* \quad (3.61)^* \quad (2.41)^* \quad R^2 = 0.80, DW = 0.74$$

*, **, *** imply significance at 1%, 5% and 10% level, respectively

VII Resource Allocation And The Financial System

Finance and Efficiency

Facets of The Indian Experience

Measuring Allocative Efficiency of The Financial System

Concluding Observations

7.1 Developments in recent years, worldwide as well as in India, have brought about a fundamental revision in the approach to the role of the financial system in the development process. The near-exclusive emphasis on capital accumulation driven growth has given way to a recognition of financial efficiency gains as an 'endogenous' source of growth. The shift in the development paradigm has propelled several developing countries to undertake programmes of financial liberalisation either by unilateral efforts, or as part of structural adjustment strategies, to free their financial systems from erstwhile repression regimes. In many of these countries, this transformation has been accompanied by a dismantling of the predominant role of the state, as embodied in central planning mechanisms, and its progressive replacement by market-oriented strategies of development. An efficient financial system is now regarded as a necessary precondition for growth. In the 1980s and 1990s, the emphasis in the approach to the financial system in the growth process has shifted from channelisation of resources by directed credit to their allocation among competing uses, largely determined by market forces. In the wake of the financial crises of the 1990s, the role of the financial system in growth has been subjected to critical reassessment and considerations of financial stability have come to occupy equal place, if not higher, with allocative efficiency.¹

7.2 In India, up to the 1980s, the dominant fear of market failure provided the rationale for state intervention in the financial system's allocative role. The first eight Five-Year Plans, by and large, ignored the role of the financial system in the development process (Patra and Roy, 2000). It was realised that the Indian financial system, though extensive, had only a limited role to play in terms of allocative efficiency under a regime which prevented proper pricing (Joshi and Little, 1996). In the Ninth Five-Year Plan it was recognised that the transformation of desired saving into investment needs to be largely determined by the process of financial intermediation (GoI, 1997). The allocative role of the financial system has been highlighted in terms of the transformations performed by it - liability-asset transformation, size-transformation, maturity transformation and risk transformation - with the gains to the real sector depending on how efficiently the financial sector performs the basic function of financial intermediation (Rangarajan, 1998). Stylised evidence suggests that financial sector reforms have brought about some efficiency in the financial system (Reddy, 1998). With the diffusion and further intensification of reforms, a vision of an efficient financial system has emerged: a well-developed financial structure with multiple intermediaries operating in various segments of the financial markets with different risk profiles (Jalan, 2000 and Jalan, 2001). Urgency has come to be attached to a faster transformation of the financial sector so that it can assume its function of resource allocation on a wider and more penetrative scale than currently seen in the context of a predominantly bank-based system.

7.3 Accordingly, it is recognised that a widening and deepening of the financial market, including equity and debt, with adequate oversight is central to the process of a sustained growth

in saving and investment in the country over the longer run (GoI, 2001). On the other hand, there is no evidence to suggest that stock markets have either led to increase in the overall scale of saving and investment in the economy or have raised the productivity of investment by mere allocation of resources (Nagaraj, 1996; Singh, 1997; Singh, 1998; Nagaishi, 1999). No evidence is obtained of an improvement in the allocative efficiency of the Indian capital market during the post-liberalisation period (Guha Khasnobis and Bhaduri, 2000).

7.4 Against the backdrop of the evolution of views on the financial sector's role in the recent growth experience, this Chapter reviews the performance of the financial system in India in the context of its allocational role. In doing so, it hopes to contribute to an informed assessment of a critical aspect of the on-going financial sector reforms. The following section undertakes a survey of the literature on the relationship between finance and growth with particular emphasis on allocative efficiency. This is complemented by an analytical examination in Section II of the formative evidence on indicators of financial development and performance relating to the principal segments of the Indian financial system perceived to be invested with the allocational role, *viz.*, banks and other financial institutions, and the capital market. Section III analyses the results of several empirical tests undertaken to gauge the allocative efficiency of the Indian financial system. The final section offers pointers for the directions of future development of the financial sector in the conduct of its resource allocation function.

I. FINANCE AND EFFICIENCY

7.5 The critical test of an economic system lies in the efficiency of its allocation of resources, *i.e.*, if all resources are put to their best use so that there are no other allocations that could improve general welfare. The concept of allocative efficiency has remained an empirical constraint in the mainstream literature. In the absence of definitive measurement criteria and the existence of even conceptual ambiguities, it is worthwhile to sift through the relevant literature for specific testable hypotheses that can be assessed in Indian conditions.

7.6 In abstraction, resource allocation from financial savers to investors could be equally efficient as between the Walrasian auctioneer and the central planner; real world structural rigidities and information asymmetries, however, generate both market and state failures (Bardhan, 1990). It has also been pointed out that efficient financial markets foster efficient resource allocation by enabling investors to distinguish between investments and facilitate lenders and intermediaries in screening projects (Diamond, 1984; Boyd and Prescott, 1986). Agency theorists argue that pressures from investors encourage the management to pursue value-maximising investment patterns (Jensen, 1986).

7.7 The initial advances in development economics recognised the importance of capital accumulation but the special role of finance was ignored for the most part. The development of financial institutions was viewed from the angle of resource mobilisation and mere channeling of resources from savers to investors. In most developing countries, following planned development strategies, financial systems were largely geared to raising resources for the government at repressed rates.

7.8 By the 1970s, it was recognised that financial development has a two-pronged effect:

through enhancing the efficiency of investment (Goldsmith, 1969) and by increasing saving and hence, the scale of investment (McKinnon, 1973; Shaw, 1973). Essentially embedded in the tradition of development economics, the McKinnon-Shaw hypothesis posited that policies of administered low interest rates with a view to containing the burden of public debt led to financial repression. Controls that result in artificially low or negative real interest rates, for instance, reduced the incentive to save, which in turn, resulted in lower investment and growth. Liberalisation of these repressed credit markets could foster development since raising interest rates to their 'equilibrium' levels would lead not only to higher savings but also to a more efficient use of investible resources.

7.9 In recent years, theories of endogenous growth have underscored the criticality of efficient financial systems in economic development. The consensus now is that there is a positive two-way causal relationship between economic growth and financial development (Greenwood and Jovanovic, 1990). The process of growth fosters participation in financial markets thereby facilitating financial development, which in turn, enables selection of efficient investment projects and hence, stimulates investment and growth. Financial intermediation enhances economic growth by channeling savings into productive areas of investment, while allowing individuals to reduce the risks associated with their liquidity needs (Bencivenga and Smith, 1991; King and Levine, 1993).

7.10 The role of finance in growth has been validated by recent empirical work (Gelb, 1989; Greene and Villanueva, 1991; Gertler and Rose, 1991; De Gregario and Guidotti, 1995; Levine and Zervos, 1998). Most of these studies are based on cross-country regressions, which find that a measure of financial development, such as credit or market capitalisation, has a positive and significant effect on growth. There is evidence that financially developed economies seem to allocate their resources more efficiently (Carlin and Meyer, 1998; Beck *et al*, 2000). Developed domestic financial markets, proxied by the size of the domestic stock and credit markets relative to GDP, are found to be associated with a better allocation of capital (Wurgler, 2000). Measures of allocative efficiency of stock markets (such as stock price synchronicity) are associated as much with market size, volatility, country size, diversification of economies and the co-movement of firm-level fundamentals, as with measures of institutional development (Morck *et al*, 2000).

7.11 The debate over financial systems in recent years has also been deeply influenced by recent financial crises in the Latin American and SouthEast Asian countries. Increasingly, integrated financial markets transmit disturbances not only to markets within the economy but also internationally. Failures in one segment of the market often emit so-called "negative" externalities, which may affect all segments of the economy, including the non-financial markets. Recent studies across emerging market economies show that corporate governance variables significantly explain economic performance (Johnson *et al*, 2000). Measures of market discipline, such as minority shareholder rights, play a significant role explaining the efficiency of resource allocation (Wurgler, 2000). These findings are in line with international initiatives in crisis prevention and in establishing international financial standards and codes that provide a benchmark for measuring the performance of the financial system, essentially in terms of health and resilience.

7.12 The swiftly changing face of financial systems worldwide and the fundamental shifts in structure that have occurred since the 1970s suggest that the allocative efficiency of the financial system is a dynamic concept, diffused and embedded in overall performance -macroeconomic and financial - and this attribute must be specifically taken into account in empirical analyses of the role of financial intermediation in growth.

II. FACETS OF THE INDIAN EXPERIENCE

7.13 Financial intermediaries (banks, development financial institutions (DFIs), *etc.*) and capital markets are two generic mechanisms for mobilising and allocating resources. There is some controversy as to which mechanism allocates resources more efficiently. It is argued that market-based financial systems provide a constant valuation of the various instruments through price mechanisms, which improves the process of allocating financial resources between alternative projects competing for the same financing. On the other hand, as some critics point out, the capital market-based system may lead to a lower level of investment, particularly in assets where the returns accrue in the longer-term such as technology or intangibles, as shareholders place more emphasis on short-term performance. The argument in favour of financial intermediaries emanates from economies of scale in collecting information and containing the disadvantages of asymmetric information in less developed market conditions and in enabling diversification of savers' risks. In the Indian context, it is argued that at a fundamental level, the banking system and the stock market compete in two dimensions, *viz.*, (a) maximising the quality of their information processes and (b) minimising the transaction costs imposed upon households (Shah and Thomas, 1997).

7.14 India has, historically, followed a financial intermediation-based system where banks, DFIs and other intermediaries have played a dominant role. The share of banks in total financial assets of banks and non-bank financial intermediaries has declined over the last three decades (Janak Raj, 1999). Various indicators suggest that banks and other intermediaries continue to dominate the Indian financial system ([Table 7.1](#)).

Table 7.1: Financial Intermediaries and the Capital Market

As at end-March	Financial Assets of Scheduled Commercial Banks	(as per cent of GDP at current market prices)		
		Financial Assets of Financial Institutions	Market Capitalisation	Market Capitalisation as % of Scheduled Commercial Banks' Financial Assets
1	2	3	4	5
1981	31.0	11.6	3.8	12.2
1991	39.2	21.6	16.0	40.8
1996	41.2	23.5	47.5	115.3
2000	43.5	25.6	46.7	107.3

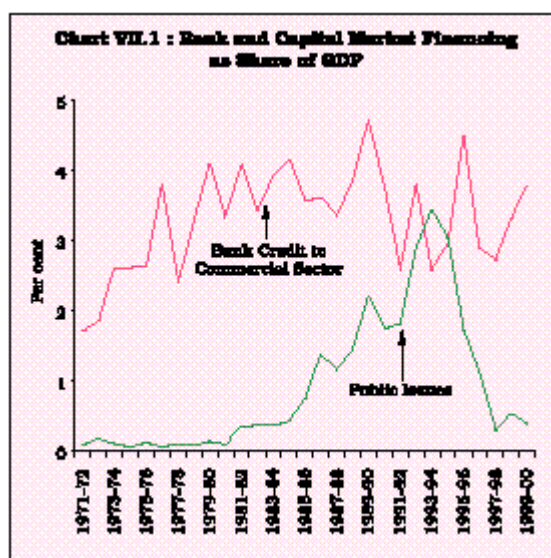
Data are provisional.

Table 7.2: Sources of Resource Mobilisation

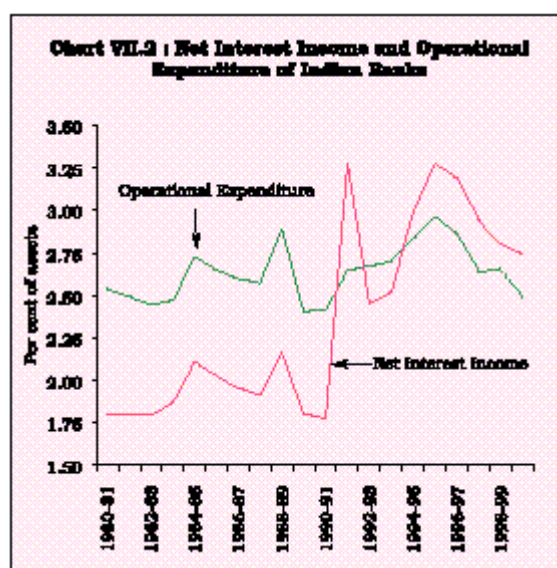
Variable	(Per cent of GDP)		
	Period		
	1971 to 2000	1971 to 1992	1992 to 2000
1	2	3	4
A.Credit by Banks	3.3	3.3	3.2
B.Credit by DFIs	0.7	0.6	1.1
C.Credit extended by Banks and DFIs (A+B)	4.0	3.9	4.3
D.Resource mobilisation from Capital Market* (Debt and Equity)	0.9	0.6	1.7

* Excluding private placements. Data are provisional.

7.15 The financing of the commercial sector also essentially continues to be bank-based, with the commercial credit off-take accounting for an average of 3.3 per cent of GDP during 1971-2000 (Table 7.2 and Chart VII.1). Besides conventional credit in recent years, banks have been increasingly investing in non-SLR instruments issued by the commercial sector, following the relaxation of portfolio restrictions.



7.16 During the 1980s, the cost of intermediation, *i.e.*, the operating expenditure as a proportion of total assets, in the Indian banking system generally hovered between 2.5 per cent and 2.8 per cent (Chart VII.2). The spread or net interest income as a proportion of assets varied between 1.8 per cent and 2.3 per cent. Both operating expenditure and net interest income followed an inverted U curve in the 1990s, peaking at 2.9 per cent and 3.3 per cent, respectively, during 1995-96. While the cost of intermediation during 1999-2000 worked out to 2.5 per cent, net interest income amounted to 2.7 per cent.



7.17 Development financial institutions (DFIs) were set up to meet the medium- and long-term requirements of industry, trade and agriculture. Advances from DFIs amounted to an average of 0.6 per cent of GDP during the 1970s and 1980s and thereafter increased sharply to 1.1 per cent during the 1990s.

7.18 The resource mobilisation through equity markets has been limited even though India has a long history of capital markets. During the 1970s and 1980s, the resources mobilised by the capital market amounted to about 0.6 per cent of GDP, partly reflecting the restrictions on public issuances. The primary markets witnessed a sharp increase in issuances during the first half of the 1990s, following the liberalisation of norms governing issues. The primary issues market later turned subdued on account of depressed capital market conditions, largely mirroring the slowdown in real activity. However, in recent years resources are increasingly being mobilised through the private placement route.

7.19 The financial ratios showed a sharp increase during 1970-2000, reflecting a deepening of the Indian financial system as a whole (Table 7.3). The financial inter-relations ratio moved up steadily from the 1950s till the 1980s reflecting the increasing role of the financial system in the process of net domestic capital formation. The finance and intermediation ratios have steadily increased throughout the entire period partly reflecting financial liberalisation.

Table 7.3: Indicators of Financial Development - Summary Statistics

Period	Finance Ratio	Financial Inter relations Ratio	New Issue Ratio	Intermediation Ratio
1	2	3	4	5
1951-52	0.01	0.11	0.18	-0.39
1970s	0.22	1.60	0.91	0.76
1980s	0.37	2.41	1.42	0.71
1990s#	0.46	2.39	1.32	0.82

1990-91 to 1995-96

- Note :
1. Finance ratio = ratio of total issues to national income.
 2. Financial inter-relations ratio = ratio of total issues to net domestic capital formation.
 3. New issue ratio = ratio of primary issues to net domestic capital formation.
 4. Intermediation = ratio of secondary issues (*i.e.*, issues by banks and other financial institutions) to primary issues.

Source: Reserve Bank of India, (2000), *Flow of Funds Accounts of the Indian Economy: 1951-52 to 1995-96*.

7.20 In respect of the financing of a sample of non-government non-financial public limited companies, the share of capital market-related instruments in total sources of funds increased sharply during the first half of the 1990s but declined during 1995-2000 (Table 7.4). On the other hand, the share of banks and other intermediaries in the total financing by the corporate sector which had declined during 1990-95, recovered somewhat in the second half of the 1990s.

Table 7.4: Financing of Non-Government Non- Financial Public Limited Companies by Financial Intermediaries *vis-a-vis* Capital Market

Category	(Percentage share in total share of funds)		
	1985-86 to 1989-90	1990-91 to 1994-95	1995-96 to 1999-2000
1	2	3	4
i) Capital Market (Debentures + Paid-up Capital)	18.2	26.0	19.0
ii) Financial Intermediaries (banks and FIs)	22.2	18.5	20.2

Source: RBI Bulletin, various issues.

7.21 The Indian financial system was highly segmented on account of interest rate controls and balance sheet restrictions which inhibited proper pricing of resources and limited allocative efficiency. Directed credit programmes to the priority sectors at subsidised rates had to be covered by charging higher rates from other borrowers, paying lower rates to depositors and limiting profits of the financing institutions. The resource mobilisation in the primary market was subject to several controls, including pricing and timing, which prevented the process of price discovery. During the early 1990s, various reforms were initiated in the Indian financial system with a view to improving allocative and operational efficiency (Box VII.1).

III. MEASURING ALLOCATIVE EFFICIENCY OF THE FINANCIAL SYSTEM

7.22 Efficiency in the financial system can be interpreted differently in terms of i) information arbitrage efficiency, *i.e.*, whether all market information is reflected in the prices, ii) fundamental valuation efficiency, *i.e.*, if the company valuations are reflected in scrip prices, iii) full insurance efficiency, *i.e.*, whether economic agents can insure against all future contingencies either by surrendering some of their own resources now or by contracting to deliver them in future, and iv) functional efficiency, *i.e.*, if saving is allocated to the most socially productive

uses (Tobin, 1984). A financial system is expected to be efficient in all the four forms. It is also possible that one form of efficiency leads to improvement in one or more of other types of efficiencies. For instance, fundamental valuation efficiency and information arbitrage efficiency could both be expected to increase the functional efficiency.

7.23 A financial system could be said to be functionally efficient if it allocates resources to the most productive uses. Although the best indicator of the contribution to economic growth of a project financed by the financial system is its economic rate of return (ERR) which measures (quantifiable) net economic benefits, this is difficult to calculate. Most studies measure allocative efficiency for the system/ industry/sector as a whole, either indirectly by estimating the contribution of a financial variable to economic growth or directly by monitoring some proxy of allocative efficiency (Box VII.2).

Box VII.1

Allocative Efficiency of Resources of the Financial System in India - Recent Measures Initiated

Banking Sector

- ? Liberalisation of interest rates, with a view to enabling proper pricing of resources. Banks are free to determine deposit rates, barring savings deposit rates and rates on a few other categories. Banks/DFIs are also free to determine most of the lending rates depending on the creditworthiness of the borrower. Interest rates in money markets are now free while prices of Government securities have become market-related.
- ? Relaxation in balance sheet restrictions in the form of statutory pre-emptions, *viz.*, reduction in reserve requirements (to 5.5 per cent of NDTL of commercial banks) and the statutory liquidity ratio (SLR) (to the statutory minimum 25 per cent of NDTL) and permission to invest in non-SLR securities. Banks are now relatively free to optimise their portfolios across financial markets.
- ? Increased competition in the banking sector by allowing entry of new private sector banks. The Government has also announced its intention to reduce its holding to 33 per cent in the nationalised banks.
- ? Improvement in the mechanism of supervision through enhancement of on-site inspection, introduction of off-site supervision, enlargement of the role of statutory external auditors and laying down of enhanced standards for corporate governance for banks.
- ? Introduction of prudential norms relating to income recognition, asset classification, provisioning and capital adequacy for banks and all other intermediaries such as urban co-operative banks, DFIs, and non-banking financial companies (NBFCs) with a view to improving balance sheet quality.
- ? Strengthening priority sector allocations in line with social and economic goals through changes in coverage and form of lending. Indirect lending by banks whereby the unfulfilled portion of priority sector lending can be deposited with NABARD and SIDBI has also been allowed.

Capital Market

- ? Repeal of various restrictions on public issues. In 1992, the Capital Issues (Control) Act, 1947 was repealed and issuers of securities, subject to their fulfilment of certain conditions, have since been allowed to raise capital from the market without requiring any consent from any authority (except for vetting of the offer documents by SEBI) either for making the issue or for pricing it. Restrictions on rights and bonus issues have also been removed. New as well as established companies are now able to price their issues according to their assessment of market conditions.
- ? Rationalisation of the process of price discovery in the primary market. As it was not easy to determine the price at which the market would clear the issue under the fixed price mechanism, parallel mechanisms of book building (in which an offer price of an Initial Public Offering (IPO) is based on investor demand) were introduced in 1995.
- ? Enhancing transparency with a view to improving the information content of stock prices through stringent disclosure norms both at the time of issuing securities and continuing disclosures under the listing agreement. Companies issuing capital are required to make sufficient disclosure including justification of the issue price

and also material disclosure about the risk factors in their offering prospectus. All listed companies are now required to publish mandated unaudited financial results on a quarterly basis, half-yearly corporate results on limited audit review, a statement on the actual utilisation of funds, actual profitability, as against projected utilisation of funds and projected profitability on a quarterly basis. To prevent price manipulation, the SEBI issued Insider Trading Regulations prohibiting insider trading in 1992. For ensuring greater market transparency, negotiated and cross deals (where both the seller and the buyer operate through the same broker), which were allowed earlier, have also been banned.

- ? Improved trading and settlement practices, including uniform settlement cycles in all exchanges, gradual introduction of rolling settlement, and banning of deferral products in the cash segment to segregate forward and cash segments. Reduction in transactions costs by enabling the investor to assess overall supply and demand through screen-based trading.
- ? Promotion of international best practices, including rolling settlement. The need for adopting such practices has been strengthened both by the introduction of foreign institutional investors (FIIs) in the capital markets in September 1992 with a view to encouraging non-debt creating flows and by permitting Indian companies to raise funds from the international capital market by way of ADRs/GDRs.
- ? Introduction of a transparent and efficient take-over code.

7.24 Indirect measures such as the growth impact of the size of the credit markets, liquidity and arbitrage efficiency (of stock markets) and asset quality (of banks and other intermediaries) are very general measures of allocative efficiency. These measures, in the context of an evolving financial system, as in India, where the norms/practices are continuously changing, are themselves dynamic. So far as direct measures are concerned, use of synchronicity tests provides an indication of the extent to which economy-wide or firm-specific factors are taken into account when resources are to be allocated. Accordingly, these tests need to be supplemented by other methods.

Box VII.2

Measures of Allocative Efficiency of Financial Systems

Measures of allocative efficiency of the financial system usually attempt to estimate either trends in a certain proxy of market efficiency (such as interest rates or synchronisation measures) or the contributions to growth by some macroeconomic variable such as bank credit that is used as a proxy for the size of the financial market.

Direct measures

Some studies use the interest rate structure as a measure of allocative efficiency (Price Waterhouse, 1988 and Catinat, Eonnai and Italianer, 1988). As efficient allocation of funds from ultimate savers to ultimate borrowers results in distribution and/or hedging of risk at the least cost, the lower is the difference between a benchmark (representing the most efficient path) and the observed interest rates, the more efficient is the system.

Some studies use cost of intermediation and net interest margin as measures of bank efficiency (Demirguc-Kunt and Levine, 1999). The cost of intermediation refers to the operational expenditure incurred by banks in the process of mobilising savings from the ultimate savers and extending loans and advances to the final borrower. It has been argued that high levels of operational costs (as a proportion of assets) reflect waste of investible resources. While many factors influence interest margins, a tighter interest margin is generally attributed to a competitive and efficient banking system.

Some other recent studies have attempted to use a number of synchronicity measures that attempt to delineate the impact of the market and the company-specific factors on equity prices, as measures of allocative efficiency of the capital market. This is based on the proposition that assuming a reasonable degree of economic diversification, allocative efficiency would be higher if investors pay greater attention to company performance rather than market-specific factors (Yu, 1998). Synchronicity measures are usually of two types. The first type compares the synchronicity of stock returns, *i.e.*, the fraction of stocks traded moving in the same direction to measure the effect of economy-wide factors. A second methodology follows Roll (1988) to test the returns generating function specified by the market model:

$$R_{it} = a_i + b_i R_{mt} + U_{it}$$

where R_{it} and R_{mt} are the rates of return of the i^{th} and the market portfolio, respectively at time t .

As the return on the market portfolio is taken as a proxy for economy-wide factors that affect all the shares on the exchange, its explanatory power (R^2) emerges as a proxy of allocative efficiency of resources by the stock market. There is evidence that stock markets in emerging market economies have a higher measure of synchronicity in terms of both measures ([Table 7.5](#)).

Table 7.5: Synchronicity Measures

Economy	Percentage of stocks moving together	R^2	Economy	Percentage of stocks moving together	R^2
1	2	3	4	5	6
Brazil	64.7	0.16	Indonesia	67.1	0.14
China	80.0	0.45	Malaysia	75.4	0.43
Germany	61.1	0.11	Poland	82.9	0.57
India	69.5	0.19	US	57.9	0.02

Source: Morck *et al* (2000).

Indirect measures

A number of studies have established that there is a close link between financial development (as measured by credit) and growth. De Gregario and Guidotti (1995) attempted to disentangle the effect of financial intermediation on the volume of savings and investment from those on the efficiency of investment for a cross-country sample of 100 economies during 1960-85 and attributed one-fourth of the impact on the volume effect. Levine and Zervos (1998) use four simple regressions with output growth, capital stock growth, productivity growth and savings as dependent variables and bank credit and turnover as a proxy of the stock market liquidity as independent variables to estimate their contributions.

Some studies have used proxies for resource allocation and tested them against macro-economic factors. Changes in the allocative efficiency following financial deregulation could be tested through changes in the variance of the expected marginal returns to capital (in some cases, marginal cost of capital) across industries before and after the event (Gupta and Lensink, 1996). Wurgler (2000) tests the determinants of the allocative efficiency of capital in a cross-country two-step process by first estimating the degree to which a particular country increases investment in its growing industries and decreases investment in its declining industries and regresses it against a summary measure of financial development (stock market capitalisation and credit outstanding to GDP). Financial market variables explain a significant portion of the variation in capital allocation quality across countries.

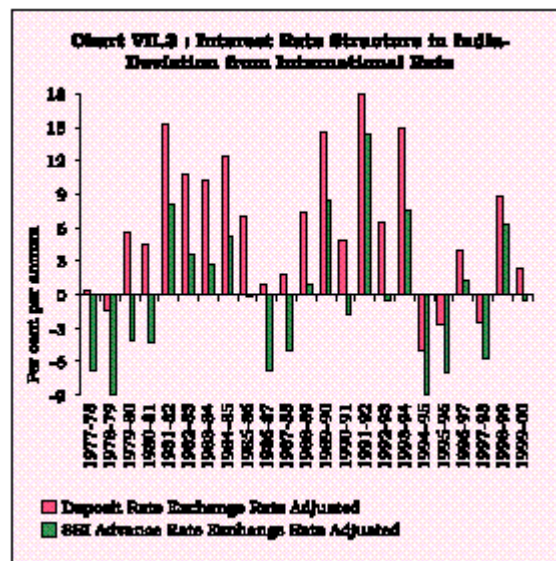
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Banking Sector

7.25 In the context of industrialised countries, studies have generally argued that the higher the efficiency of the financial system, the lower the level of the real interest rate. This, however,

may not be true for a developing country like India, given a long history of administered interest rates. Artificially low interest rates may lead to misallocation of resources by introducing a rationing of investible funds. In the context of developing countries, therefore, it is the proximity to benchmark rates rather than the low real interest rate, *per se*, which should be considered as a measure of increased efficiency. The choice of an appropriate benchmark, therefore, assumes importance in this context. Therefore, for evaluating the efficiency of the financial system in India, the London Inter-Bank Offer Rate (LIBOR) could be used as an international benchmark. The deviations from the benchmark interest rate have been particularly noticeable in the 1970s. While the deviations declined during the mid-1980s, they increased thereafter before declining noticeably from the mid-1990s (Chart VII.3). This indicates that there has generally been an increase in the efficiency of the banking system in the 1990s.



7.26 It is useful to examine facets of sectoral resource allocation in the banking system. The sectoral allocation of bank credit and indices of industrial production by sub-sectors are compared for the period 1980-2001. Since the industrial classification used by the Central Statistical Organisation (CSO) for compiling data on industrial production are not exactly similar to those used by the Reserve Bank for data on sectoral deployment of bank credit, a broad correspondence is worked out between these two sets of data so that the results derived by the empirical exercises can be viewed as only indicative (National Statistical Commission, 2001). In terms of weightage assigned by the CSO to work out the general index of industrial production (series with 1980-81 as base year), the sub-sectors covered in column 2 of [Table 7.6](#) account for more than 80 per cent of the total industrial production. The sub-sectors covered in column 1 accounted for, on an average, about 80 per cent of the total bank credit channelised towards large and medium industries.

Table 7.6 : Correspondence between Sectoral Classification of Credit(Reserve Bank of India) and of IIP (CSO)

Classification used by the Reserve Bank	Classification used by the CSO
1	2
Coal	Mining and quarrying

Iron and steel	Basic metal and alloy products
Other metals and metal products	Metal products and parts (except machinery and transport)
All engineering	Machinery and machine tools and parts and transport equipment and parts
Cotton textiles	Cotton textiles
Food products	Food products
Tobacco and tobacco products	Beverages, tobacco and tobacco products
Paper and paper products	Paper and paper products and printing industry
Rubber and rubber products	Rubber, plastic, petroleum and coal products
Chemicals, dyes, paints, <i>etc.</i>	Chemicals and chemical products
Leather and leather products	Leather, leather and fur products (except repairs)

7.27 First, correlations are calculated between sectoral output and credit for the purpose of examining the relationships between bank credit deployment and output levels for the two periods, viz., 1980-81 through 1990-91 and 1991-92 through 2000-01 (Table 7.7). All sub-sectors except 'tobacco and tobacco products' show strong and positive correlations between bank credit and industrial output during the first period. At the sectoral level, correlation coefficients in the first and second periods do not show a definite pattern. For 8 out of the 11 sub-sectors, correlation coefficients remained broadly unchanged between the two periods; for 2 sub-sectors, the correlation coefficients during the second period were sizeably larger than those during the first period and for the remaining sub-sector, it was the other way round. The correlation at the aggregate level, however, increased considerably during the second period over the first period, indicating a stronger positive impact of bank credit on the level of industrial output in the second period.

7.28 Differences in sector-wise correlation coefficients, *prima facie*, indicate that industry-specific factors remain important in deciding allocation of bank credit across different segments of Indian industry. Taking sectoral output levels as the dependent variable and bank credit as the independent variable, the estimated elasticities indicate that bank credit has a significant impact on industrial output in both the periods (Table 7.8). The only exception to this empirical regularity has been the industry group of 'tobacco and tobacco products' during 1980-91 - the result is not statistically significant.

Table 7.7: Correlation Coefficient between Bank Credit and Output: Sector-wise

Sector	1980-81 to 1990-91	1991-92 to 2000-01
1	2	3
Coal	0.686	0.849
Iron & steel	0.863	0.857
Other metals and metal products	0.923	0.872
All engineering	0.994	0.768
Cotton textiles	0.853	0.879
Food products	0.974	0.900
Tobacco and tobacco products	-0.278	0.734
Paper and paper products	0.948	0.969
Rubber and rubber products	0.899	0.802
Chemicals, dyes, paints, <i>etc.</i>	0.986	0.981
Leather and leather products	0.807	0.853
Overall	0.329	0.526

Table 7.8: Estimated Sector-wise Credit Elasticities of Output

Sector	Elasticity	
	1980-81 to 1990-91	1991-92 to 2000-01
1	2	3
Coal	0.33*	0.18*
Iron & steel	0.32*	0.34*
Other metals and metal products	0.31*	0.69*
All engineering	0.41*	1.23*
Cotton textiles	0.18*	0.30*
Food products	0.41*	0.26*
Tobacco and tobacco products	-0.06	1.13*
Paper and paper products	0.43*	0.85*
Rubber and rubber products	0.36*	0.42*
Chemicals, dyes, paints, <i>etc.</i>	0.56*	0.68*
Leather and leather products	0.39*	0.47*

Note : Elasticities are derived from a log-linear model of the form:

$\text{Log}(Y_{it}) = a + b \text{Log}(BC_{it})$, where Y= Output, BC= Bank Credit, for i= 1 to 11.

* Significant at 1 per cent.

The sectoral credit elasticity of output varied between 0.18 to 1.23. Cross-country studies suggest that different industrial segments have different demand structures for bank credit. Specific characters of the sub-sector including historical trends in corporate financing, the level of maturity, growth performance, capital intensity, *etc.*, are some of the important determinants of the demand for bank credit by the industry segment (Cetorelli and Gambera, 1999). In line with such findings, in the current exercise, the impact of bank credit on different segments is not uniform.

Table 7.9 : Estimated Credit Elasticities of Output - Results from Panel Regression

Period	Model	Elasticity	t-statistic	Hausman test
1	2	3	4	5
1980-81 to 1990-91	Random Effect	0.302	14.58*	34.18*
1991-92 to 2000-01	Random Effect	0.357	10.72*	21.10*

Note: Elasticities are derived from a log-linear model of the form:

$\text{Log}(Y_{it}) = a + b \text{Log}(BC_{it})$, where Y= output, BC= bank credit, for i= 1 to 11.

* Significant at 1 per cent.

7.29 In order to explore the relative impact of efficiency of finance in inducing output growth, panel regressions have been conducted taking sectoral output levels (in logarithmic form) as the dependent variable and bank credit (in logarithmic form) as the independent variable ([Table 7.9](#)).

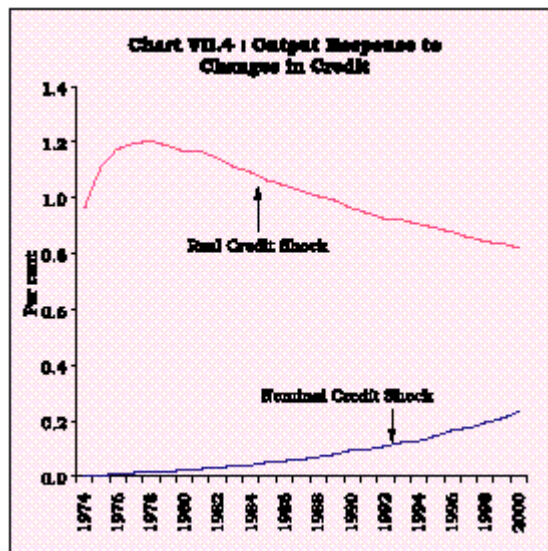
7.30 The Hausman test indicates the applicability of the random effect model as there are

industry-specific characters affecting sectoral allocation of bank credit. The panel regressions also reaffirm the positive and significant impact of bank credit on industry output. Furthermore, there had been an increase in the credit elasticity of output between the two periods. In a general sense, all the empirical results described in this section indicate that the efficiency of sectoral credit allocation in India has improved during the 1990s.

7.31 Recognising the complex interactions between financial intermediation (proxied by bank credit), sources of growth and growth, the possible impact of credit on growth could be studied in a three-equation framework, with investment, capital stock and output as endogenous variables.² First, investment is determined by credit flows and the lagged change in output. Second, the net fixed capital stock accumulation process is determined by investment. Finally, following the production function approach, output depends on net fixed capital stock and employment. The aggregate supply response to changes in credit is thus explained indirectly through the change in capital stock *via* the investment rate which could be modulated by altering the flow of credit.

In the absence of any standard empirical specification in the literature, the supply response is studied by using two different specifications of credit, *viz.*, annual changes in credit in nominal terms and in real terms. Investment responds positively to both the two alternative specifications of credit.

7.32 Given the relationships obtained through the regression equations between investment and capital stock on the one hand, and capital stock and growth, on the other, the extent of and the time path over which change in credit could influence growth has been simulated by giving one percentage point shock to the alternative credit variables (Chart VII.4). The output response appears to be relatively stronger and persistent when credit increases in real terms.



7.33 Recent studies have attempted to disentangle the scale and efficiency effects of financial intermediation on investment. The hypothesis is that if output is regressed on a set of variables such as credit (as a proxy of financial development), investment and other related variables, the

coefficient of credit in the regression with investment, reflects only the efficiency effects of financial intermediation and the coefficient of credit in the regression without investment reflects both scale and efficiency effects of financial intermediation. For the period 1974-2000, GDP is first regressed on the sizes of the financial sector (proxied by average bank credit to the commercial sector) and government (proxied by gross fiscal deficit (GFD)) and investment (proxied by gross domestic capital formation). In the second stage, the investment variable is dropped from the equation. The coefficient of credit in the first equation³ (with investment as an explanatory variable) works out to 0.8. Dropping investment from the regression⁴ increases the coefficient of credit to 1.0. Thus, the efficiency effect of the financial sector works out to about 80 per cent, while the effect on volume of investment works out to about 20 per cent, which is reasonably in line with De Gregario and Guidotti (1995).

7.34 This exercise was buttressed by a switching regression model for a sequential search of break points in the intercept and the slopes of both credit and investment during this period. The empirical estimation underwent a downward shift in the intercept during 1978, indicating a dampening of the growth cycle in general⁵. This continued to persist till 1983, when a marginal upward shift in the slope of credit is noticed, implying a somewhat increased degree of credit utilisation efficiency⁶. This efficiency effect, however, appears to fade out quickly with the slope returning to insignificance in 1985 itself. The next major and significant break in the slope of credit occurs in 1990⁷. This effect is not only pronounced but also significant indicating the improved performance of the banking system during this period. It, however, appears to peter out by the mid-1990s.

7.35 Using a time series approach, the relationship between financial intermediation (proxied by commercial credit) and allocative efficiency (proxied by the investment elasticity of output) has been explored by generating investment elasticities⁸ through a rolling regression. The results suggest that while the financial intermediation exhibits a significant and positive relationship with the investment elasticity, the coefficient of the government size is negative and significant, reflecting the constraint of fiscal dominance. Efficient intermediation and delivery of credit are expected to raise investment in more productive sectors by shifting resources from less productive sectors. Estimated relationships obtained for India⁹ validate the crucial role of a developed financial system in the growth process.

Stock Markets

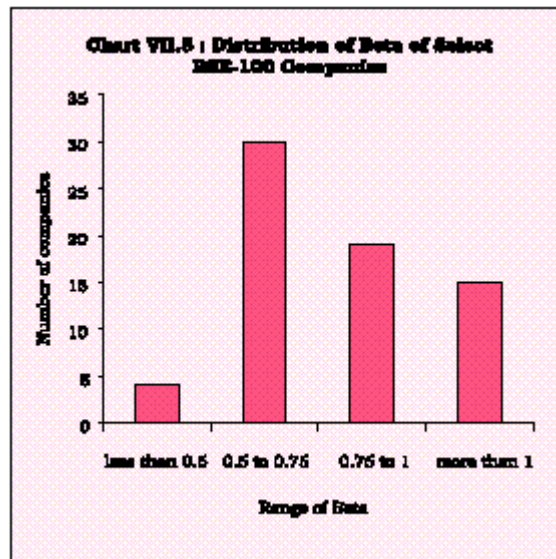
7.36 Synchronicity tests based on daily data were carried out for 68 stocks included in the BSE - 100 Index for each year from 1995-96 to 2000-01 as also for the entire period. On an average, about 70 per cent of the stocks in India move in the same direction ([Table 7.10](#)).

7.37 The percentage of stocks moving together in India is found to be more or less comparable to other emerging markets, such as, Brazil and Indonesia but lower than in China and Malaysia ([Table 7.5](#)).

7.38 The average values of R^2 for 68 select stocks in the BSE-100 Index for different periods were found to be in the range of 0.21 and 0.30, thus implying that on an average about 20 per cent of the variation in stock returns can be explained by economy-wide factors. This

performance compares poorly with developed markets but much better than many emerging markets.

7.39 The beta (b) of a stock estimates riskiness relative to the market. The b values could also be used to ascertain whether it is economy-wide or company-specific factors, which play an important role in explaining the stock returns. Of the 68 stocks, b values only in respect of 18 scrips were found to be around unity (with variations of +/- 10 per cent) (Chart VII.5). That is, risk-return perceptions are influenced by the company-specific factors as well as by the market-wide factors.



7.40 The various tests for the Indian stock markets clearly suggest that stock returns are influenced by both the company-specific and economy-wide factors. Although they compare favourably with many emerging markets, these tests show that the Indian stock market may not be allocating resources as efficiently as stock markets in advanced countries.

Table 7.10: Synchronicity Test - BSE -100 Index

Variable/ Year	Percentage of stocks moving together	(Per cent) R ²
1	2	3
1995-96	70.6	0.21
1996-97	69.8	0.29
1997-98	69.5	0.22
1998-99	70.1	0.30
1999-2000	68.5	0.22
2000-01	68.5	0.20
1995-96 to 2000-01	69.5	0.22

Note : Relates to 68 companies included in the BSE-100 Index.

Allocative Efficiency - Banking Sector and Stock Markets

7.41 In the previous two sections, the allocative efficiency of the banking sector and stock market were measured separately. In order to draw comparative inferences, there is a need to test the allocative efficiency of both the systems using common techniques which yield quantifiable results. Step-wise regressions of output on financial intermediation and the capital market and related real variables indicate that financial intermediation turns out to be significantly positive but not the capital market. This is consistent with the stylised fact that capital markets have only recently emerged as a significant source of finance in the Indian economy ([Table 7.2](#)).

Stock Markets and Growth

7.42 Apart from playing a direct role in the growth process through mobilisation of new investment and improvement in the allocative efficiency of investment, the stock market also contributes to growth indirectly through its effects on aggregate demand. The stock market impacts aggregate demand, specifically through aggregate consumption. A rise in stock prices is expected to have an effect on consumption through the wealth effect. If the response of consumption to changes in wealth emerges relatively quickly, it could explain the aggregate relationship through what can be termed a "direct" channel. If the lags are long, the aggregate relationship between stock market wealth and consumption might be termed as "indirect", which takes place when stock prices predict changes in future income, or because of some other link (Poterba and Samwick, 1995; and Poterba 2000).

7.43 There is no clear international evidence of the alternative explanations for the aggregate relationship between consumption and stock prices. Some micro-data studies applying the Capital Asset Pricing Model (CAPM) find that the spending of stockholders is more correlated with stock market returns than that of non-stockholders which supports a direct effect (Mankiw and Zeldes, 1991; Attanasio, Banks and Tanner, 1998; Vissing-Jorgensen, 1999 and Brav, Constantinides and Geczy, 1999). The balance of evidence points, however, to a small role for direct effects. The correlation between stock prices and consumer sentiment does not vary by stock ownership (Otoo, 1999 and Starr-McCluer, 2000).

7.44 In the Indian context, there is some evidence that changes in stock prices impact consumption ([Table 7.11](#)). For the period 1980 to 2000, the evidence suggests that changes in stock prices (proxied by the BSE Sensex) cause changes in private final consumption with no evidence of reverse causation.

7.45 The wealth effect, in the Indian context, is, however, limited by the relatively small stock holdings of the household sector. The percentage of household wealth held in the form of stocks crossed 10 per cent of total household savings during the period 1989-90 to 1994-95 but worked out to below 3.0 per cent during 1999-2000. Another factor limiting the consumption effect of stock market valuations is the nature of the distribution of stockholders in India across the hierarchy of wealth holders. The distribution of stock holdings in India is skewed in the favour of the wealthy, who are less sensitive to the increases in stock prices because of lower marginal propensities to consume (SEBI-NCAER, 2000).

IV. CONCLUDING OBSERVATIONS

7.46 Which system - capital market-based or financial intermediation - is more efficient in the long run in allocating financial resources? The empirical analyses set out in the previous section does not suggest the superiority of any one system or the other in the Indian context as in the cross-country experience. The two competing systems are, in fact, in continual change. This process has helped in bringing the two models closer. In countries, such as, Japan and Germany - economies where banks play a crucial role - capital markets are becoming increasingly important. This is due, in part, to the growing volume of banking activity in the capital markets. On the other hand, in the US, banks are increasingly required to play a greater role in corporate finance.

Table 7.11: Consumption and the Capital Market - Pair-wise Granger Causality Tests

Null Hypothesis	Period	F-statistic	Probability
1	2	3	4
Changes in private final consumption does not Granger-cause changes in the BSE Sensex	1980-2000	1.14211	0.34918
Changes in the BSE Sensex does not Granger-cause Changes in private final consumption	1980-2000	3.43677	0.06336

7.47 Thus, both systems could co-exist. However, for each system to work effectively there are certain necessary conditions which need to be satisfied. It is, therefore, possible that under a given set of conditions, one system may perform relatively better and is more suitable than the other. In mature markets, with a low level of innovation and, therefore, with less uncertainty, financial intermediaries offer clear advantages over capital markets (Allen, 1993). On the other hand, in emerging industries with significant financial and technological risks a financial intermediary option will be less preferable.

7.48 On balance, it is desirable to have a diversified and balanced financial system where both financial intermediaries and financial markets play important roles in imparting greater competitiveness and efficiency to the financial system. In the present context of financial liberalisation, stock markets and banks emerge as sources of corporate finance and stock market development actually tends to increase the quantity of bank loans through improved debt-equity ratios. Thus, the coexistence of both systems is socially desirable not only because it encourages competition, but also because it reduces transaction costs within the financial system, and helps improve resource allocation within the economy.

¹ Various issues relating to finance and growth with emphasis on market efficiency have been discussed in the *Report on Currency and Finance, 1999-2000*.

² (1a) $GDCF = 75765 + 0.9 \text{ ? } GDP(-1) + 2.6 \text{ ? } BCCS, R^2 = 0.91, DW = 1.68$
 (10.0) (2.8) (8.5)
 (1b) $GDCF = 25780 + 1.4 \text{ ? } GDP(-1) + 3.6 \text{ ? } RBCCS, R^2 = 0.81, DW = 1.71$
 (1.8) (3.2) (4.9)

(2) $NFCS = -15106 + 0.56 GDCF, R^2 = 0.94, DW = 1.59$

$$(3) \text{ Log GDP} = -2.5 + 1.0 \text{ Log NFCS} + 0.2 \text{ Log EMP} - 0.7 \text{ D8088}, R^2 = 0.99, DW = 2.2$$

$$\begin{matrix} (-1.6) & (10.3) \\ (-13.3) & (16.6) & (1.8) & (-8.7) \end{matrix}$$

where GDCF, GDP, NFCS are gross domestic capital formation, gross domestic product, and net fixed capital stock, at constant prices, respectively, BCCS and RBCCS nominal and real (deflated by GDP deflator) bank credit to commercial sector, EMP employment, D first difference and D the dummy for the years specified.

$$3 \quad Y = 1.5 + 0.8 \text{ Credit} + 0.2 \text{ I} - 0.03 \text{ D}, \quad R^2 = 0.99, DW = 2.2,$$

$$\begin{matrix} (2.9) & (6.5) & (1.6) & (-0.6) \end{matrix}$$

where, Y is gross domestic product at market prices, credit is average bank credit to the commercial sector, I is GDCF at market prices and D is gross fiscal deficit.

$$4 \quad Y = 1.3 + 1.0 \text{ Credit} - 0.01 \text{ D}, R^2 = 0.99, DW = 2.2$$

$$\begin{matrix} (2.4) & (15.5) & (-0.3) \end{matrix}$$

$$5 \quad Y = 4.9 - 2.9 \text{ D} + 0.1 \text{ I} + 0.3 \text{ S}_I + 0.7 \text{ Credit} + 0.01 \text{ S}_C - 0.2 \text{ FD}, \quad R^2 = 0.99, \quad D.W = 1.4$$

$$\begin{matrix} (5.2) & (-2.9) & (0.4) & (0.8) & (2.2) & (0.1) & (-2.8) \end{matrix}$$

where D is a dummy for changes in the intercept, $S_{i,c}$ are slopes of the Credit and I series, respectively.

$$6 \quad Y = 4.6 - 3.2 \text{ D} + 0.2 \text{ I} - 0.1 \text{ S}_I + 0.6 \text{ Credit} + 0.4 \text{ S}_C - 0.01 \text{ FD}, \quad R^2 = 0.99, DW = 1.1,$$

$$\begin{matrix} (9.9) & (-6.1) & (0.9) & (-0.6) & (2.6) & (1.8) & (-2.2) \end{matrix}$$

$$7 \quad Y = 3.6 - 2.9 \text{ D} + 0.5 \text{ I} - 0.3 \text{ S}_I + 0.3 \text{ Credit} + 0.5 \text{ S}_C + 0.01 \text{ FD}, \quad R^2 = 0.99, DW = 1.1$$

$$\begin{matrix} (12.1) & (-5.8) & (3.3) & (-1.2) & (1.8) & (2.2) & (0.2) \end{matrix}$$

8

$$\text{Loge}(I_t/I_{t-1}) = c + h \text{Loge}(V_t/V_{t-1}) + e_t$$

where I is gross capital formation, V value added and t year. The slope estimate, h, is an elasticity.

$$9 \quad h = -0.22 + 0.28 \text{ BCR} - 0.99 \text{ GFDR}$$

$$\begin{matrix} (-0.09) & (2.24) & (-3.63) \end{matrix}$$

$$R^2 = 0.36, DW = 1.6$$

where BCR and GFDR are the ratios of credit and GFD to GDP, respectively.

VIII A Macroeconomic Summary of The Economy

The Model

The Results

Simulating the Model for Alternative Policy Scenarios

Concluding Observations

8.1 The foregoing chapters covered a wide canvas of macroeconomic relationships underlying the growth process in India with a view to exploring the current slowdown, the scope for monetary and fiscal policy action, external levers of growth and the contribution of financial intermediation to the growth process in terms of allocative efficiency. Each chapter attempted to construct a bridge between the theory and the operational realities embodied in the functioning of the economy, both national and cross-country. In doing so, each chapter maintained its own identity in terms of approach, methodology, presentation and inference; however, a common thread runs through them all: a quest for the revitalisation of growth in the Indian economy. Accordingly, it is possible to summarise the findings of the Report into one unifying framework of accounting of the Indian economy.

8.2 This chapter, therefore, attempts to present the estimated characteristics of sectoral behaviour, inter-linkages and the underlying dynamics of the overall economy in the form of a structural macroeconomic model. The model is small in the interest of facilitating a wider understanding as well as computational feasibility. It consists of 18 behavioral equations and 23 identities representing the principal structural relationships identified in the preceding chapters. There are 26 exogenous variables including pre-determined variables in the model. It needs to be mentioned that the various other estimation exercises conducted in the earlier chapters are employed either as sub-models recursively feeding into the main model or as information variables enabling off-model consistency-check calibrations, although they may not be explicitly set out in this chapter. Moreover, certain parameters estimated in the preceding chapters may undergo some alteration when re-estimated in an integrated framework in this chapter, though the objective is not to deviate from the underlying theoretical postulates. The design of this chapter is as follows: Section I sets out the algebra underlying the construction of the model and its sectoral components accompanied by a commentary of the *a priori* expectations given by economic theory and the methodological issues confronted in actual estimation. Section II evaluates the model results in terms of the statistical criteria of robustness, and graphical depiction of the “goodness of fit” of estimated equations. Section III simulates various possible scenarios obtained by delivering 'shocks' to key instruments with a view to deriving the implications for the strength and sustainability of the growth response.

I. THE MODEL

8.3 The model has the following distinguishing features: (i) recognising that aggregate demand shocks are temporary while aggregate supply shocks are persistent, the model is constructed with specific counter-cyclical properties so as to qualify as a policy model for evaluating stabilisation policies; (ii) it is flexible and capable of incorporating the impact of future changes in technology by suitably altering the parameters of the production function which enters the model in an off-model setting; (iii) it is built around the multiplier-accelerator

principle which sets a law of motion for the macroeconomic variables; (iv) the model belongs in the modern tradition of ‘consensus models’ in which money does not explicitly find a place; competitive financial market conditions are assumed under which monetary and financial quantities clear through prices, *i.e.*, interest rates and the role of money is taken by a monetary policy reaction function specified in an endogenous setting; and (v) it is forward-looking and can accommodate future revisions in inflation threshold/targets, which are determined off-model.

Real Sector Block

8.4 A macroeconomic model focusing on growth confronts the unavoidable problem of over-identification of the key parameter, *i.e.*, GDP or Y. To resolve the problem, the analytical approach of Chapter III is adopted, *i.e.*, the growth process is conceived as a combination of cyclical and structural influences, with the former predominantly determined by forces operating on aggregate demand and the latter reflecting conditions of aggregate supply. The behaviour of aggregate supply (Y_s) can be estimated in the form of a simple production function of the Cobb-Douglas type in which output is largely determined by factor accumulation - fixed capital (K) and labour (L)- and factor productivity:

$$Y_s = A K^\alpha L^\beta \quad (1)$$

where $\alpha + \beta = 1$ only under conditions of constant returns to scale, and $1 < \alpha + \beta < 1$ under conditions of increasing returns and decreasing returns, respectively. α and β are technical parameters representing the marginal product of capital and labour, respectively. In India, as in other developing economies, constant returns to scale may not be the appropriate assumption and, therefore, the generalised production function is employed where there are no restrictions on the parameters α and β . The parameters of the production function, which is estimated outside the model, are fixed and employed essentially to set the long run trajectory of aggregate supply. In equilibrium, aggregate supply must necessarily match aggregate demand, in a *post facto* sense; however, aggregate demand is an *ex ante* phenomenon in the sense that consumption and investment decisions by economic agents are planned, and the process by which aggregate demand and aggregate supply adjust represents the underlying dynamics of growth. Since planned aggregate demand may deviate from aggregate supply before the attainment of equilibrium in the *post facto* sense, it is necessary to specify the behaviour of aggregate demand in the model. The basic economy wide identity serves as the specification *i.e.*,

$$Y_d = C + I + G + (X - M) \quad (2)$$

where Y_d is the aggregate demand, C represents consumption by the private sector, I investment by all agents in the economy, G government consumption, X exports of goods and services and M represents imports of goods and services.

8.5 As mentioned earlier, aggregate demand and aggregate supply can diverge in an *ex ante* sense. This divergence is the ‘structural output gap’ which provides a summary measure of cyclical changes in demand and thereby, of future inflationary expectations. The aggregate demand represents the behaviour of the four segments of the economy; *i.e.*, households and businesses comprising the private sector, the government, and the external sector. The behaviour

of each of the four major economic agents is modelled separately. The private sector - households and private business - affects overall demand by changing both C and I. Private consumption (real) is postulated to be a function of last year's income to capture the lags between income and spending, the real deposit interest rate (r_{drt}) and real government consumption (G) to capture crowding-out/crowding-in effects:

$$C = a + b_1 Y(1) + b_2 r_{drt} + b_3 G \quad (3)$$

8.6 Investment behaviour of the private sector could be studied in a disaggregated framework. First, total investment (real) can be broken down into its public and private components:

$$I = I_{pv} + I_p \quad (4)$$

where I_{pv} and I_p are private and public investment, respectively;

Secondly, private investment can be disaggregated under agriculture ($I_{pv,ag}$), manufacturing ($I_{pv,mnf}$), services ($I_{pv,srv}$) and others ($I_{pv,others}$), i.e.,

$$I_{pv} = I_{pv,ag} + I_{pv,mnf} + I_{pv,srv} + I_{pv,others} \quad (5)$$

8.7 In the third stage, the investment equations are modelled in the context of the accelerator principle. Investment responds to changes in income [$Y(-1)$] and also to the induced changes provoked by stabilisation policy (i.e., change in the real interest rate brought about by altering the nominal interest rate, given inflation expectations) and public expenditure which takes the form of infrastructural and producer services or $I_{p,srv}$ (approximation for fiscal policy). Inclusion of the interest rate (r) as a determinant of investment assumes importance in view of the present stance of monetary policy that emphasises “revival of investment demand through provision of adequate liquidity” and the scope for softening the interest rate stance if the evolving situation so warrants even while continuing with the stable interest rate environment (Monetary and Credit Policy, Reserve Bank of India, October 2001). The significance attached to the evolving situation in the decision regarding the interest rate also explains that the interest rate reaction function can be endogenised, even though depending on the weightage of judgement based policy action, the reliability of estimated coefficients could vary over time. Investment in agriculture is presumed to be impervious to interest rate changes given its preferential treatment in the policy framework.

$$I_{pv,ag} = c + d_1 Y(-1) + d_2 I_{p,srv} \quad (6)$$

$$I_{pv,mnf} = e + f_1 Y(-1) + f_2 r + f_3 I_{p,srv} \quad (7)$$

$$I_{pv,srv} = g + h_1 Y(-1) + h_2 r + h_3 I_{p,srv} \quad (8)$$

In the standard literature, capital stock would adjust in response to investment (adjusted for depreciation). In India, while consistent time series data on “net fixed capital stock” for the economy as a whole are available, information on investment (i.e., gross capital formation) are

available on a gross basis, warranting specific adjustments which cannot be presented in the form of an identity to link the capital stock accumulation process with investment. Gross capital formation represents a combination of fixed capital, working capital and depreciation. Thus, only a part of the gross capital formation could explain the capital stock adjustment process. Accordingly, the increment in the net fixed capital stock is modelled separately as,

$$\Delta K = h_4 \Delta K + h_5 I \quad (9)$$

The above specification would also help in examining the supply response of output to changes in investment.

Monetary Block

8.8 The response of consumption and investment behaviour to change in real interest rates offers the scope for the operation of monetary policy in order to stabilise the real sector. The real interest rate has two components, *i.e.*, the nominal interest rate (R_{lrt} , represented by the SBI advance rate) and inflation expectations (modelled in Chapter V):

$$r = R_{lrt} - \pi \quad (10)$$

8.9 The nominal lending rate is specified as a function of the Bank Rate (R_{brt}) to establish the link between the policy rate and the lending rate:

$$R_{lrt} = l + m R_{brt} \quad (11a)$$

Unlike investment in different sectors which get influenced by the lending rate (equations (6), (7) and (8)), consumption behaviour (in other words, saving behaviour) could respond to change in deposit rates (equation(3)). Assuming that the Bank rate is used as the key policy rate for anchoring the structure of interest rates in India, the deposit rate could be specified as

$$R_{drt} = l_1 + m_1 R_{brt} \quad (11b)$$

A positive and statistically significant m_1 could validate the relationship between the bank rate and deposit rates as has been presumed while specifying the equation (11b).

8.10 A critical consideration guiding the conduct of monetary policy is the anchoring of inflation expectations. Actual inflation (π) can be expressed as a combination of the estimated inflation gap (π_{gap}) and the threshold inflation (π^T) which is estimated in Chapter V. In other words,

$$\pi = \pi_{gap} + \pi^T \quad (12)$$

8.11 The behaviour of the inflation (proxied by change in the inflation rate in the model ($\Delta \pi$)) is specified to respond to the observed behaviour of the output-gap (Y_{gap} - the difference between aggregate demand (Y_d) and aggregate supply (Y_s)) summarily representing the conditions of aggregate demand, as well as supply shocks to inflation originating from the foodgrain sector (measured by foodgrains prices- π_{food}).

$$\pi_t = j + k_1 Y_{\text{gap}}(L^y) + k_2 \pi_{t-1} + k_3 \pi_t(L^p) \quad (13)$$

where L^y and L^p denote appropriate lags.

8.12 Equations 10 to 13 are specified in a manner which allows aggregate demand to respond to changes in the real lending rate. Furthermore, the monetary policy reaction function is also specified to examine the response of the Bank Rate to the behaviour of the output gap and the inflation gap. In Indian conditions, fiscal policy, in particular, the financing of the fiscal deficit has an important bearing in shaping the stance and setting of monetary policy. Accordingly, the fiscal deficit (fd) can be explicitly introduced into the monetary policy reaction function as follows:

$$R_{\text{brt}} = n_0 + n_1 Y_{\text{gap}}(L^p) + n_2 \pi_{\text{gap}} + n_3 \text{fd} \quad (14)$$

Fiscal Block

8.13 The conduct of fiscal policy in India is marked by the absence of a financing constraint. In order to capture this country-specific feature, public expenditure (G) is assumed as exogenous. This is strategic since it enables testing of the possibilities of 'pump-priming' as well as alternative combinations of government expenditure which are decided outside the model. Non-tax revenues (NTR), mainly comprising profit transfers from the monetary authority and other public sector entities, user charges, *etc.*, are also exogenous to the model.

8.14 Tax receipts (TR) comprise direct tax (DT) and indirect tax (IT) collections, *i.e.*,

$$\text{TR} = \text{DT} + \text{IT} \quad (15)$$

8.15 Both direct and indirect tax revenues are expected to be determined by aggregate income (Y) and price level (P) as a proxy for inflation tax, the latter is important for fiscal policy under a tight revenue constraint:

$$\text{DT} = p + q_1 Y + q_2 P \quad (16)$$

$$\text{IT} = r + s_1 Y + s_2 P \quad (17)$$

The price level is linked to the inflation equation (13) by

$$P = P(1) (1 + \pi) \quad (18)$$

Given the exogenous public expenditure, interest payment (IP) and estimated tax revenues, the fiscal gap (FD) is represented as

$$\text{FD} = G + \text{IP} + \text{Others} - \text{TR} - \text{NTR} \quad (19)$$

and as a proportion to nominal GDP (representing the conventional presentation of the fiscal deficit in India),

$$fd = FD / Y_n \quad (20)$$

Nominal income Y_n (*i.e.*, GDP at current market price) is obtained by reflating real income (Y -GDP at factor cost at constant prices) estimated in (2) by the GDP deflator (DFL)

$$Y_n = (Y * DFL) + \text{net indirect taxes} \quad (21)$$

and the GDP deflator is specified in a linear relationship with the wholesale price level (P), *i.e.*,

$$DFL = u + vP \quad (22)$$

Similar deflators for different components of aggregate demand have also been estimated to provide the link between respective nominal and real variables.

External Sector Block

8.16 Net exports of goods and services are conventionally regarded as an injection of external demand supplementing aggregate domestic demand. In India, the typical situation is that, given the supply constraints, some part of domestic demand is satisfied externally, *i.e.*, through imports. For countries with limited degree of external openness and continued reliance on sustainable current account targets, foreign capital inflows can meet the financing of net import demand and help in achieving other macro-economic objectives such as reserve adequacy.

8.17 Merchandise exports (quantum index of exports or x_g) are postulated to be determined by world demand conditions (represented by changes in world GDP or Y_w) and export prices in dollar terms as prevailing in India (P_{XD}) and in the rest of the world (P_{XW})(to explain the relative profitability of selling in the domestic versus the world market).

$$x_g = w_0 + w_1 Y_w + w_2 P_{XD} + w_3 P_{XW} \quad (23)$$

8.18 Import demand, represented by quantum index of imports (m_g) is expected to be determined by domestic real GDP(Y), unit value index of imports(P_{MD}) in rupees in relation to domestic price- P (to explain the relative attractiveness of domestic substitutes versus imports), and debt service ratio (DSR) which embodies the foreign exchange constraint to imports.

$$m_g = x_0 + x_1 Y + x_2 P_{MD} + x_3 P - x_4 \text{ DSR} \quad (24)$$

8.19 Assuming that prices of exports (P_{XD}) and imports are determined in the(P_{MD}) international markets and net services are exogenous, *i.e.*, outside the model, nominal values of exports, imports and the current account balance are obtained through the following transformations:

$$X_g = (x_g) * (P_{XD}) \quad (25)$$

$$M_g = (m_g) * (P_{MD}) \quad (26)$$

$$(X-M) = (X_g - M_g) + \text{net services} \quad (27)$$

8.20 Having specified the external resource balance at (27), net capital flows can also be modelled as a mirror of the external resource balance in the current account with an adjustment for changes in reserves and other transactions which are not explicitly modelled but can explain the difference between actual capital flows and (X-M) such as, change in reserves, net transfers, net income, and errors and omissions. The indirect representation of the external resource balance through capital flows draws from the analysis presented in Chapter V and the capital flow equations are entirely off-model in nature. The net capital flows (NCF) can be disaggregated into net debt creating flows (DCF) and net non-debt creating flows (NDCF) as follows:

$$\text{NCF} = \text{DCF} + \text{NDCF} \quad (28)$$

8.21 Non-debt capital flows are expected to be influenced by the behaviour of debt service ratio-DSR (higher debt service ratio may encourage forced liberalisation of policies towards non-debt), degree of openness-OPN (reflecting both the needs for foreign capital as well as the capacity to service external liabilities), change in foreign exchange reserves-DFX (indicator of confidence) and depreciation of the domestic currency-DEPR (which could reduce the return in rupees when converted into US dollars). Debt creating flows, in turn, are expected to be determined by the debt service ratio-DSR (reflecting the need for additional capital to service the debt), import intensity of GDP-MGDP (another indicator of need for foreign capital) and non-debt capital flows-NDCF (as a policy of prioritising capital flows would imply that debt flows may only be encouraged when non-debt flows appear inadequate).

$$\text{NDCF} = z_0 + z_1 \text{DSR} + z_2 \text{OPN} + z_3 \text{fd} + z_4 \text{DFX} - z_5 \text{DEPR}(-1) \quad (29)$$

$$\text{DCF} = z_6 + z_7 \text{DSR} + z_8 \text{MGDP}(-1) + z_9 \text{NDCF}(-1) \quad (30)$$

8.22 The dynamics of the model can be represented in terms of a flowchart (Box VIII.1). Annual data covering the period 1970-71 to 1999-2000 have been used for examining these dynamics. Seventeen dummy variables were also used in different equations, to approximate the effects of outliers.

II. THE RESULTS

8.23 The empirical results are reasonably robust and satisfy the usual statistical properties of significance and goodness of fit. The order condition is satisfied with respect to individual equations and there is no problem of identification. All equations are satisfactory in terms of *a priori* signs.

8.24 Estimates of the relative contribution of capital and labour to the aggregate supply of output as per the specification set out in equation (1) show that while capital stock exhibits unit elasticity with output, the elasticity in respect of labour turns out to be about 0.22. In view of the evidence supporting increasing returns to scale and the strong impact of capital accumulation on growth, raising the investment rate appears to be the critical force for strengthening the supply

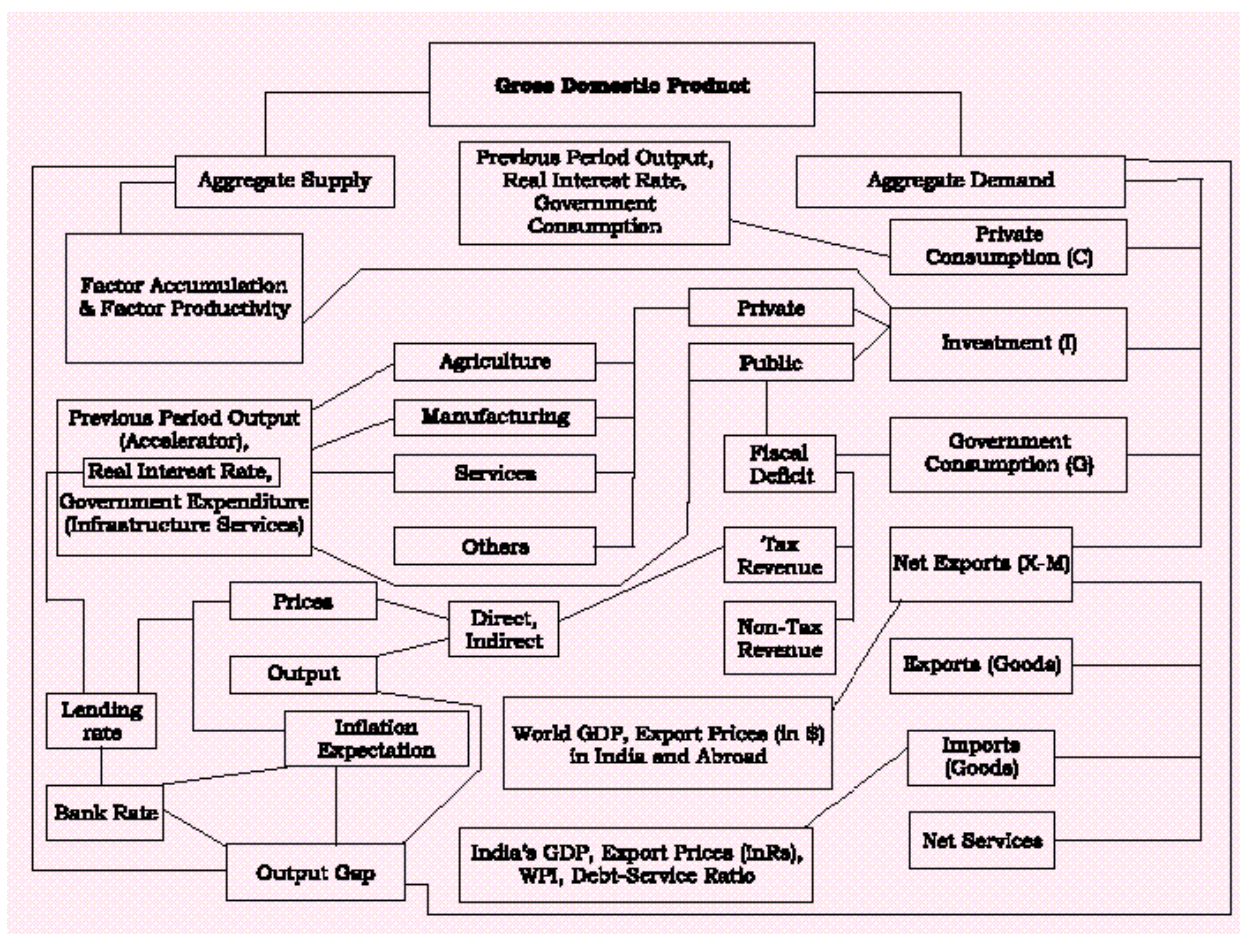
response and increasing the long-run capacity output.

8.25 As regards the relative importance of aggregate demand, private consumption demand has significant relationship with permanent income (as proxied by lagged income) and government expenditure. The real interest rate shows a negative impact on private consumption as expected, indicating the positive response of savings to real return. The partial elasticity of private consumption to government consumption indicates contemporaneous complementarity of private consumption with public consumption spending, although the inter-temporal effects would be consistent with crowding out effect.

8.26 Different components of private sector investment behaviour respond differently to changes in major determinants. Private investment in agriculture seems to be influenced by lagged aggregate output only modestly, indicating the weak operation of the accelerator. Public sector expenditure on infrastructure related services - including power - has a somewhat moderate influence on private investment in agriculture. Private investment in manufacturing sector strongly responds to public investment on infrastructure and previous period output - the latter indicating the smooth operation of the accelerator. Private investment in manufacturing shows a statistically significant negative relationship with the real interest rate. Thus, reducing the real interest rate can play a catalytic role in stimulating private investment. Financial intermediation (FIMD) has positive effect on private investment.

8.27 Public sector investment expenditure on services strongly influences private sector investment in the service sector with a relatively strong accelerator, which is, however, less effective than in case of private investment in the manufacturing sector. The real interest rate also exhibits a statistically significant and negative relationship, as in the case of investment in the manufacturing sector.

BOX VIII.1:STRUCTURE OF THE MACROECONOMIC MODEL



8.28 Direct tax revenue, as expected, is strongly influenced by both real GDP and the price level. The income effect, however, clearly dominates the price effect. In respect of indirect tax revenue, the opposite result is obtained as the price effect outweighs the income effect. This clearly signifies the effect of strong pass-through of increase in indirect tax rates to the final prices.

8.29 Changes in inflation rate seem to have responded strongly to the anticipated output gap. Changes in food prices also show the expected positive relationship with headline inflation. The negative relationship with previous period inflation suggests evidence of some correction in agents' expectations as also the effect of anti-inflationary policy stance. In the monetary policy reaction function, the Bank Rate seems to have responded more to output gap than the inflation gap, indicating a pro-active response of monetary policy in terms of stabilising the real economy. The Bank Rate setting incorporates the impact of the fiscal stance on financial market conditions. The lending rate exhibits significant relationship with Bank Rate over time, signifying the determining influence of monetary policy on the structure of interest rates in India.

8.30 Estimated income elasticities of exports and imports indicate that net external demand could be an important source for stimulating output growth in India. As per Krugman's (1989) 45-degree hypothesis, the income elasticities of demand for a country's export and imports are systematically related with a country's long-term GDP growth. Fast growing countries generally exhibit a high income elasticity for their export and a modest/low income elasticity for their

imports. Estimated income elasticities for India (over the period 1970-2000) show that the income elasticity of exports (2.03) is almost twice that of the income elasticity of imports (1.03), implying that export-led growth can ensure a faster rate of GDP growth for India than other countries having an export to import elasticity ratio of less than two. The relatively higher sensitivity of exports to fluctuations in world GDP relative to the sensitivity of imports to fluctuations in domestic output indicates that during a global recession, higher trade deficit could weaken the export-led growth process, unless the terms-of-trade and export supply conditions improve simultaneously.

8.31 Both export and import demand exhibit price sensitivity, with exports increasing when international export prices in US dollar (P_{XW}) increase in relation to the prices for Indian exports in US dollar (P_{XD}). Similarly, imports seem to increase when prices of domestically available goods (as reflected in P) increase in relation to the prices of importables (P_{MD}). While the former shows the relevance of competitive pricing to augment export growth, the latter testifies the role of relative cost advantage of import substitutes in containing the growth of imports. For enhancing both the competitive pricing of exports and domestic production of cost effective import substitutes in a policy environment that is free from any export or import bias, productivity enhancing real investment would be critical. Productivity induced output growth would reinforce the growth enhancing effects of an export-led growth strategy.

8.32 Given the role of capital flows in the growth process, an assessment of the determinants of capital flows with an emphasis on the pull factors suggest that both openness and fiscal deficit turn out to be statistically important in influencing non-debt capital flows. The fiscal deficit seems to discourage non-debt inflows while greater trade openness potentially attracts larger inflows. Higher debt service (representing greater need for foreign capital) and annual increment to the country's foreign exchange reserves (which enhances the confidence about repatriability) seem to be associated with higher inflows whereas rupee depreciation seems to discourage inflows. Debt creating flows are primarily driven by the need for financing and, therefore, exhibit statistically significant co-movement with import intensity of GDP, debt service ratio and fiscal deficit.

Estimated Equations

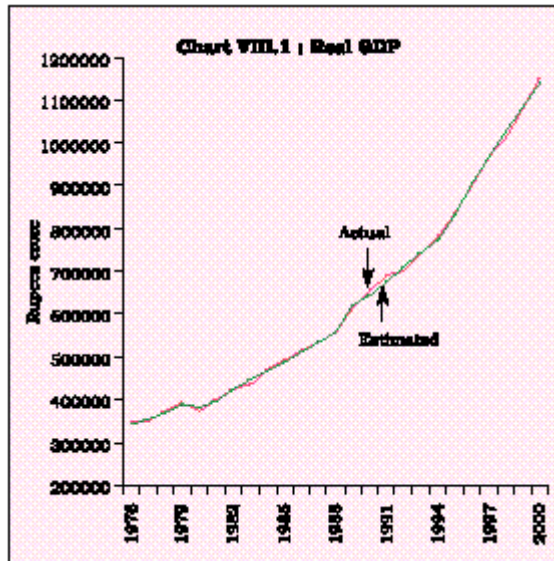
(1) Production Function (Log Linear form)

$$\text{LnY} = -2.49 + 1.02*\text{LnK} + 0.22*\text{LnL} - 0.065*\text{D80s}$$

(-13.3)
(16.6)
(1.8)
(8.7)

Adjusted $R^2 = 0.99$ DW = 2.2

Ln denotes for natural logarithm.



(3) Private Consumption

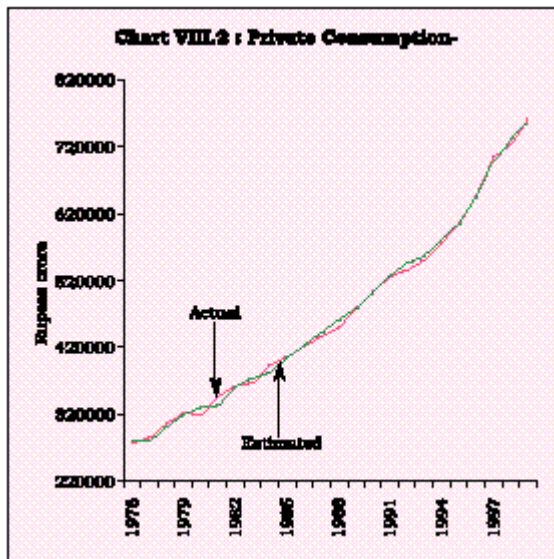
$$C = 72493 + 0.55 Y(-1) - 597 r_{drt} + 1.07 G$$

(20.86)
(13.27)
(-2.49)
(3.51)

$$+ 13066 D80s + 18066 D97,99$$

(7.23)
(3.78)

Adjusted $R^2 = 0.99$, $DW = 2.50$



(6) Private Agricultural Investment

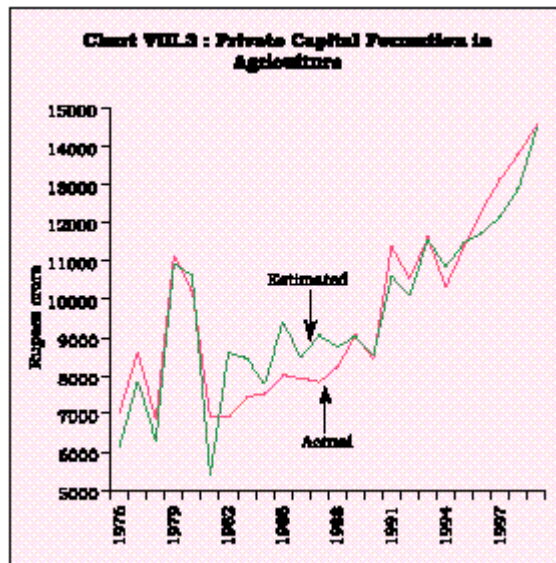
$$I_{pv,ag} = 3837 + 0.06 D Y^{(-1)} + 0.08 I_{p,srv}$$

(6.05)
(5.27)
(4.30)

$$+ 2896 AGDUM$$

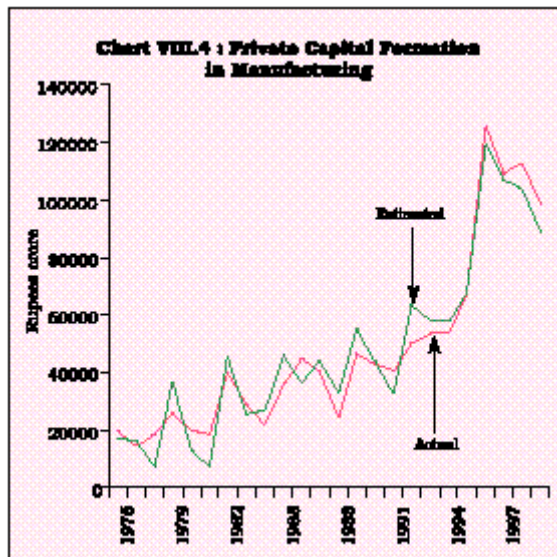
(7.36) Adjusted

$R^2 = 0.89, DW = 1.57.$



(7) Private Manufacturing Investment

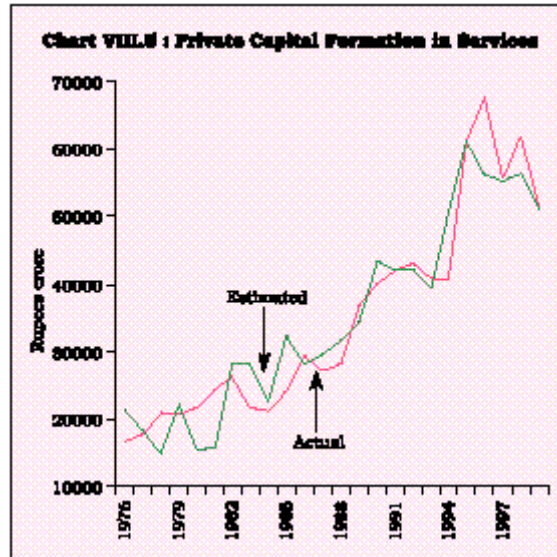
$$I_{pv,mnf} = -44952 + 0.52 Y(-1) - 728r + 1.28 I_{p,srv} \\ (-2.86) \quad (2.37) \quad (-3.37) \quad (5.69) \\ + 31571FIMD + 31832 D96 - 22908 D90 \\ (1.72) \quad (2.77) \quad (-2.75) \\ \text{Adjusted } R^2 = 0.87, DW = 1.57.$$



(8) Private Service Sector Investment

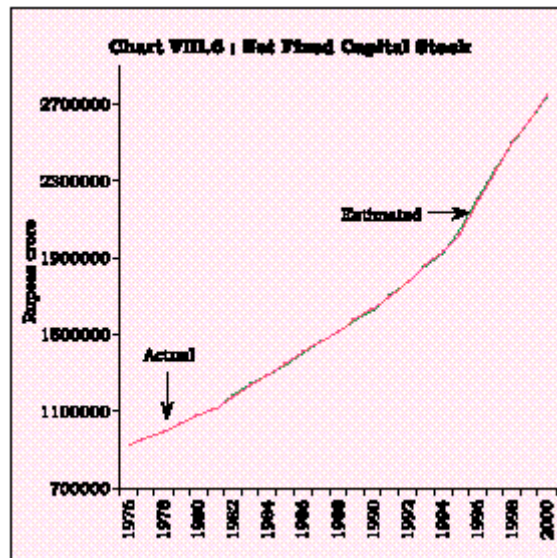
$$I_{pv,srv} = -25745 + 0.26D Y(-1) - 463r + 0.78 I_{p,srv} \\ (-4.45) \quad (3.11) \quad (-3.05) \quad (6.66)$$

+28421 FIMD
 (3.82)
 Adjusted $R^2 = 0.88$, DW = 1.98



(9) Net Fixed Capital Stock

? $K = -15106 + 0.56 I$
 (-1.6) (10.3)
 Adjusted $R^2 = 0.94$, DW = 1.60



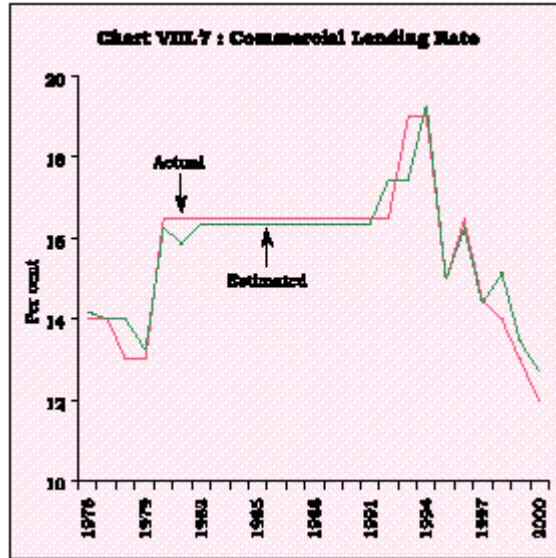
(11a) Commercial Lending Rate

$R_{lrt} = -1.14 + 0.75 R_{lrt}(-1) + 0.52 R_{brt}$
 (-1.80) (12.93) (5.05)

$$-4.30 D95 + 3.00 D76,97$$

(-7.20) (8.84)

Adjusted R2= 0.96, DW = 2.09, h = -0.28

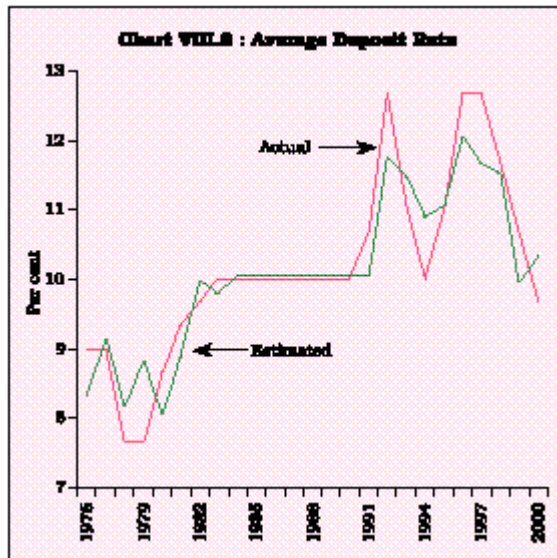


(11-b) Average Deposit Rate (Rdrt)

$$Rdrt = 4.30 + 0.59 Rbrt + 0.95 D78,93,96 + 0.80 AR (1)$$

(2.82) (4.13) (3.69) (6.28)

Adjusted R2= 0.88 DW = 1.65

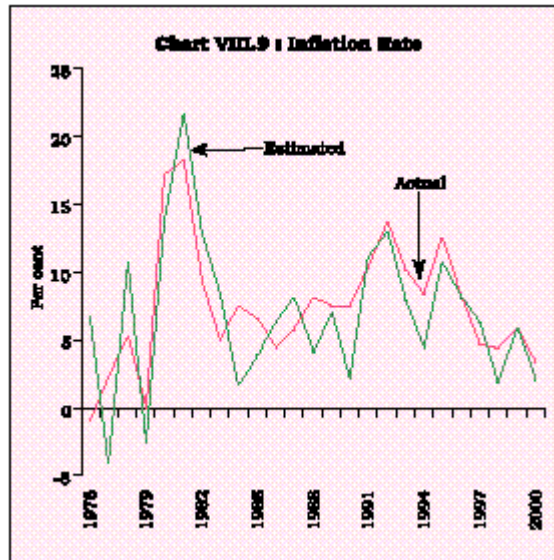


(13) Inflation Rate

$$?? = 0.57 Y_{gap} + 0.39 ??_{food} - 0.26 ?? (-2)$$

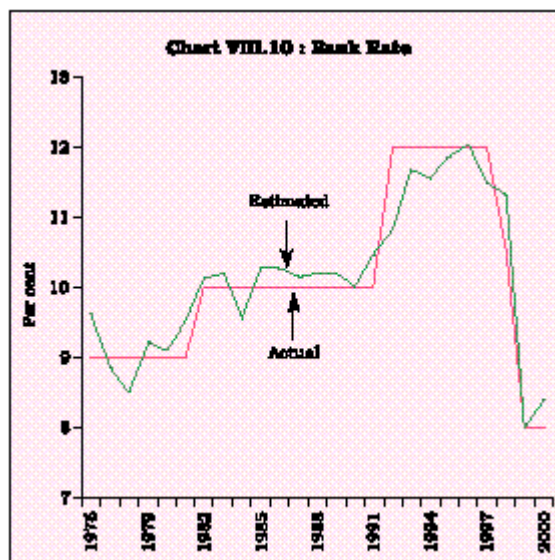
(1.93) (3.57) (-1.83)

$$\begin{aligned}
 & -0.25 Dp(-4) + 5.00 D80 - 2.18 D96 \\
 & \quad (-1.88) \quad (1.67) \quad (-2.88) \\
 & \text{Adjusted } R^2 = 0.67, \text{ DW} = 2.28
 \end{aligned}$$



(14) Monetary Policy Reaction Function

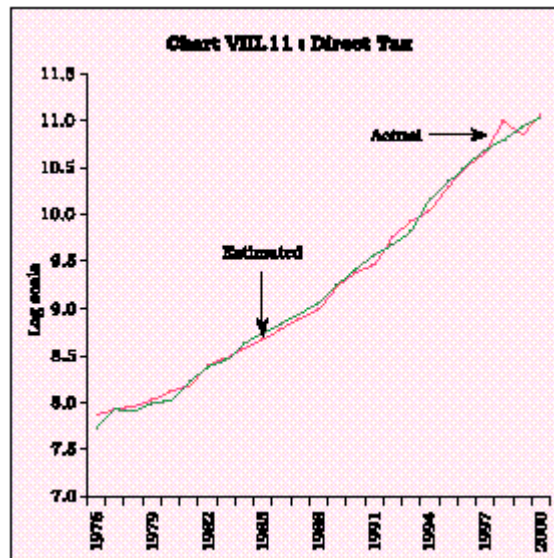
$$\begin{aligned}
 R_{brt} = & 0.81 R_{brt}(-1) + 0.06 p_{gap}(-1) + 0.18 Y_{gap}(-1) \\
 & (14.17) \quad (2.90) \quad (1.92) \\
 & + 0.06 fd - 1.50 D98 \\
 & (1.72) \quad (-3.51) \\
 & \text{Adjusted } R^2 = 0.88, \text{ DW} = 2.12, h = -0.27
 \end{aligned}$$



(16) Direct Tax

$$\begin{aligned} \ln DT = & -14.68 + 1.58 \ln Y + 0.68 \ln P + 0.17 DT_{77} \\ & (-6.5) \quad (7.8) \quad (5.9) \quad (8.3) \\ & + 0.21 DT_{9499} \\ & (3.3) \end{aligned}$$

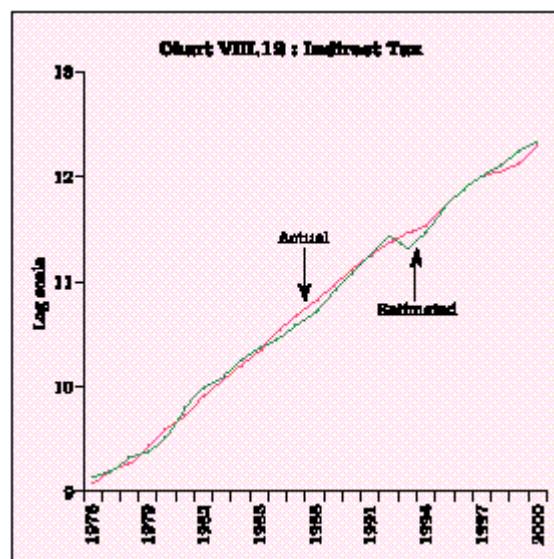
Adjusted R² = 0.99 DW = 2.0



(17) Indirect Tax

$$\begin{aligned} \ln IT = & -7.33 + 0.97 \ln Y + 1.30 \ln P - 0.16 IT_{75} \\ & (-3.4) \quad (5.0) \quad (12.7) \quad (-4.7) \\ & - 0.28 IT_{9399} \\ & (-5.5) \end{aligned}$$

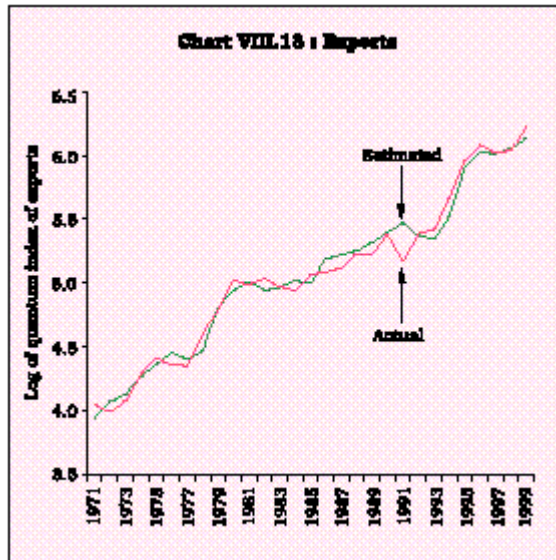
Adjusted R² = 0.99 DW = 1.5



(23) Export Demand

$$\begin{aligned} \text{Ln}x_g = & -6.68 + 2.03 \text{Ln}Y_W + 0.99 \text{Ln}P_{XW} \\ & (-2.01) \quad (3.89) \quad (3.41) \\ & -0.63 * \text{Ln}P_{XD} + 0.82 * \text{AR}(1) \\ & (-1.92) \quad (6.93) \end{aligned}$$

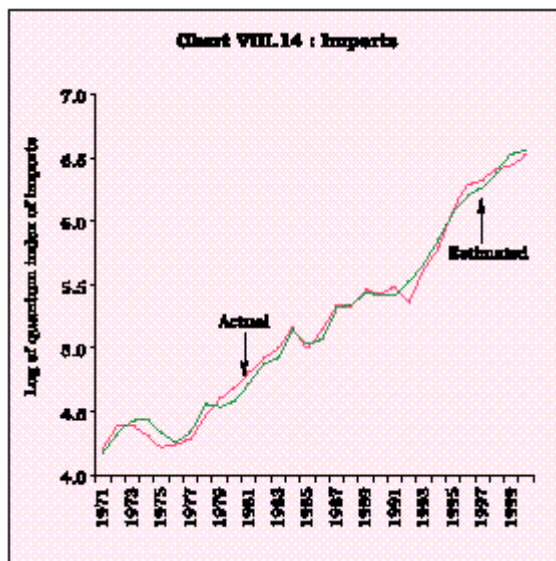
Adjusted R² = 0.98, DW = 1.84



(24) Import Demand

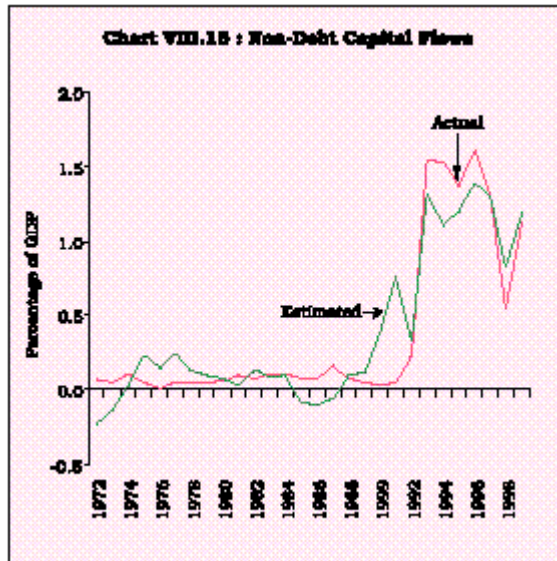
$$\begin{aligned} \text{Ln}m_g = & -9.15 + 1.02 \text{Ln}Y - 0.81 \text{Ln}P_{MD} \\ & (-3.94) \quad (4.89) \quad (-8.02) \\ & + 1.29 \text{Ln}P - 0.01 \text{DSR} \\ & (6.49) \quad (-3.92) \end{aligned}$$

Adjusted R² = 0.99, DW = 1.27



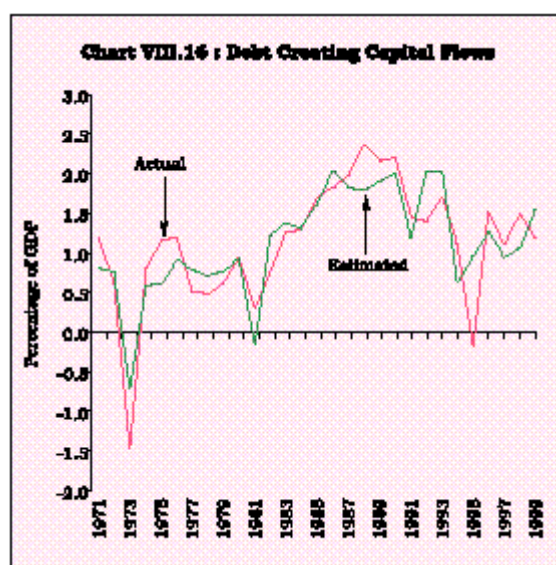
(29) Non-Debt Capital Flows

$$\begin{aligned}
 \text{NDCF} = & -1.05 + 0.02 \text{ DSR} + 0.12 \text{ OPN} - 0.12 \text{ fd} \\
 & (-4.25) \quad (1.82) \quad (7.78) \quad (-2.48) \\
 & + 0.006 \text{ DFX} - 0.07 \text{ DEPR}(-1) \\
 & (2.83) \quad (-2.19) \\
 \text{Adjusted R}^2 = & 0.80, \text{ DW}=0.85
 \end{aligned}$$



(30) Debt-Creating Capital Flows

$$\begin{aligned}
 \text{DCF} = & -1.11 + 0.02 \text{ DSR}(-1) - 1.31 \text{ DUM} \\
 & (-2.69) \quad (4.55) \quad (-4.77) \\
 & + 0.21 \text{ Y}_n(-1) - 1.02 \text{ NDCF}(-1) \\
 & (4.72) \quad (-4.26) \\
 \text{Adjusted R}^2 = & 0.67 \text{ DW}=2.23
 \end{aligned}$$



III. SIMULATING THE MODEL FOR ATERNATIVE POLICY SCENARIOS

8.33 The model is operationally evaluated by simulating it using the Gauss-Seidel algorithm. The model's predictive power is attested by the simulation error statistics, *e.g.*, Theil's 'U' statistics for some key endogenous variables ([Table 8.1](#)).

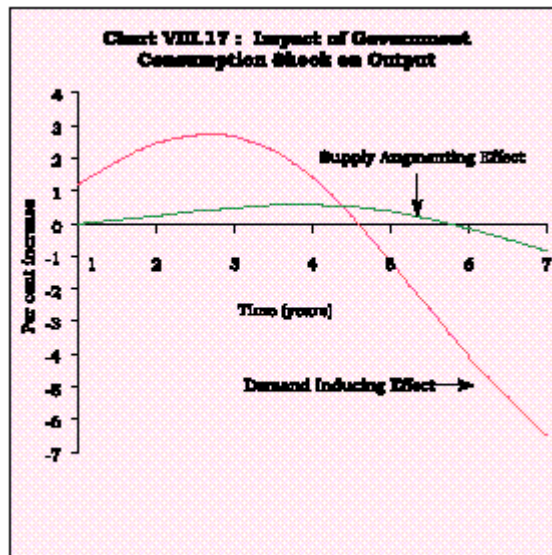
Table 8.1 : In-Sample Prediction Error Statistics

Behavioural Equations/Variables 1	Theil's U Statistics 2
1. Private Consumption	0.01
2. Private Investment in Agriculture	0.01
3. Private Investment in Manufacturing	0.10
4. Private Investment in Services	0.01
5. Capital Stock Accumulation	0.03
6. Production Function	0.01
7. Direct Taxes	0.02
8. Indirect Taxes	0.03
9. Exports	0.05
10. Imports	0.03
11. GDP Deflator	0.01
12. Inflation Rate	0.07
13. Lending Rate	0.19
14. Deposit Rate	0.31
15. Bank Rate	0.18
16. Deflator(Government Investment)	0.01
17. Deflator(Government Consumption)	0.02
18. Deflator (Net Exports)	0.06

8.34 Given the performance of the model, five scenarios are generated to evaluate (i) the impact

of fiscal stimulus through (a) a sustained increase in government consumption expenditure by 5 per cent; (b) a sustained increase in government investment expenditure in infrastructure services by 5 per cent; (c) a sustained enhancement in fiscal empowerment by reducing government consumption expenditure by 5 per cent accompanied by a matching increase in government investment expenditure in infrastructure; (ii) the impact of monetary stimulus through a one-time one percentage point reduction in the Bank Rate; (iii) the impact of external demand conditions through an increase in the world GDP by 1 per cent on a sustained basis. It needs to be recognised that each shock has a dual effect i.e., a demand inducing as well as a supply augmenting effect .

8.35 The shock to government consumption produces a demand induced expansion in output which is, however, short-lived, lasting in intensity up to 3 years before losing momentum. Output declines thereafter with the cumulative loss of output completely offsetting the initial gain from the shock. Simultaneously, the shock yields a marginal improvement in the supply response embodied in capacity output (Chart VIII.17).

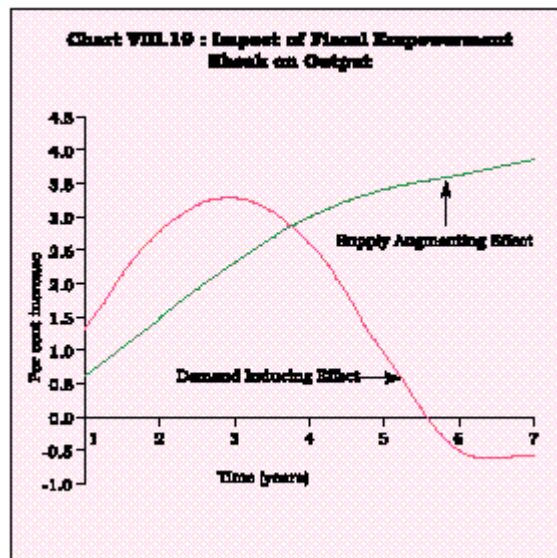
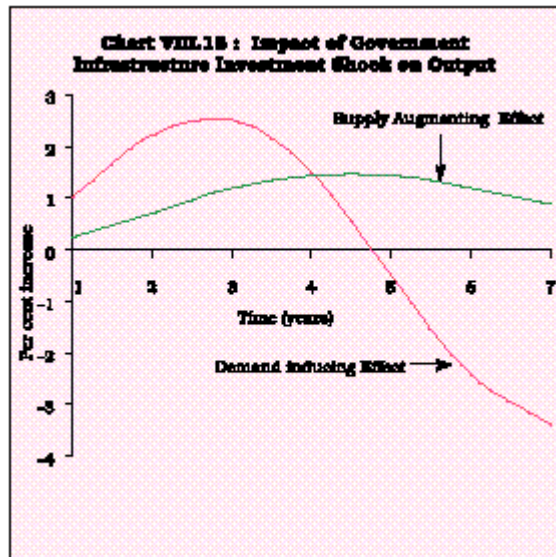


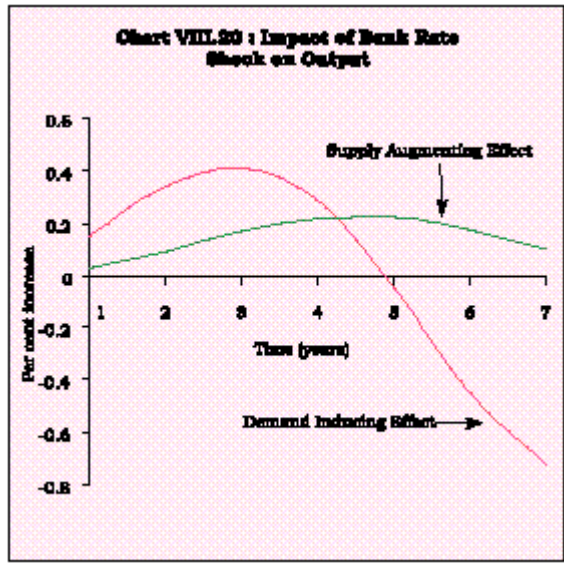
8.36 The stimulus through government investment in infrastructure has a similar effect on aggregate demand as that of government consumption, but the impact on aggregate supply is pronounced and persistent (Chart VIII.18).

8.37 Switching the shock by reducing government consumption with an offsetting increase in government investment in infrastructure has a major impact on aggregate supply, i.e., capacity output which rises in a sustained manner over the full period of the shock. Demand effects are similar to those obtained earlier, although they do not completely offset the initial stimulus, as in the case of a pure government consumption shock (Chart VIII.19).

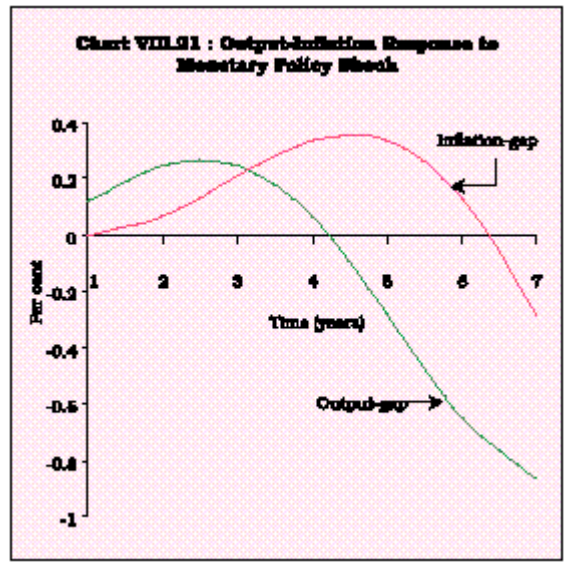
8.38 The monetary policy shock conveyed through a reduction in the Bank Rate generates a modest improvement in demand induced output which is transient and less powerful than the fiscal expansion. The impact on capacity output is lower than the impact of pure government consumption and pure government investment shocks (Chart VIII.20).

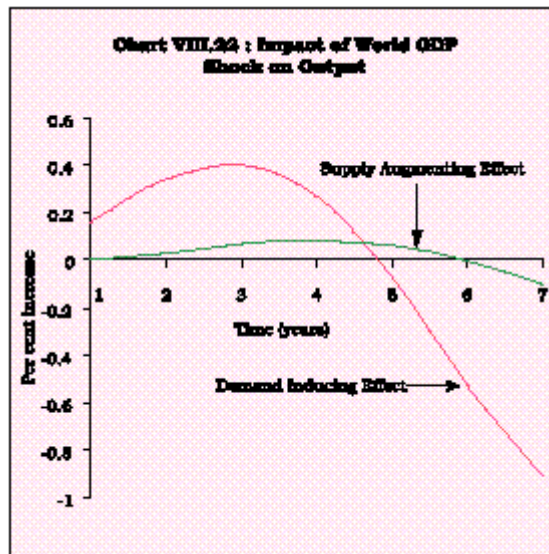
Keeping in view apparent inflation-growth tradeoff associated with any monetary policy shock the output-gap effect has been compared with the inflation-gap effect by giving a shock of one percentage point reduction in the bank rate (Chart-VIII.21). The positive output response dominates in the initial years, but over time the output response subsides while the inflation effect predominates and persists for a long period.





8.39 Finally, the external demand shock produces weak demand and supply effects, almost replicating the effects of the monetary policy shock. Thus, under the current conditions of sluggish demand, both external and internal, monetary policy and external demand have limited roles to play in the revitalisation of growth (Chart VIII.22).





IV. CONCLUDING OBSERVATIONS

8.40 The macroeconomic model presented in this chapter provides a synoptic view of an economy experiencing an adjustment of demand to the supply constraints. Aggregate demand is sensitive to interventions by stabilisation policies; however, these stimuli are short-lived, even episodic, and unable to retain potency in the absence of an upward shift in the aggregate supply curve. This requires releasing the sectoral bottlenecks inhibiting productive capacity expansion through both factor accumulation and increased productivity. In the context of the increasing returns to scale characterising the production process, this acquires importance as it can potentially be exploited to shift out the production possibility frontier so that even higher growth rates of the economy than recorded so far can become feasible.

8.41 The current deceleration in the economy has front-loaded fiscal policy, already under the stress of ongoing fiscal consolidation, with responsibilities for stabilising the economy. Yet, fiscal reform of the 1990s is being viewed as having eroded the efficacy of fiscal policy as a stabilisation instrument and this is being put to the stress by the current phase of activity. Public investment has become the 'soft target' of consolidation as in many other countries in similar process of transformation. Public investment has, however, externalities which can be reaped by private investment, particularly in infrastructure. Faced with the conflict between the compulsions of downsizing and the objective of stimulating the revival of the economy, discretionary fiscal stabilisers seem to have been used in the form of an expansion in both government consumption and investment expenditure. The results obtained here indicate that the impact of a consumption stimulus is temporary, and can reverse to dampen aggregate demand over time. It needs to be recognised, however, that even while public investment has stimulating and complementary effects for private investment, the consequent expansion in the fiscal deficit can result in financial crowding out, raising the real interest rate *via* the nominal interest rate and this, in turn, can induce a downturn in aggregate demand. Accordingly, fiscal stimuli in support of revival of growth must rely on a compositional shift in fiscal expenditures in favour of public investment in infrastructure without an unbridled expansion of the fiscal deficit.

8.42 A stimulus to aggregate demand can also be applied through expansionary monetary policy through its influence on real interest rates. Output effects are positive in the short run, losing force as the inflation effect dominates over time. There are non-linearities in the growth-inflation relationship which need to be taken note of by monetary authorities. Identifying the threshold inflation is critical for the monetary policy reaction function. The current inflation rate in India has fallen below the threshold estimated for India. The threshold itself has a shifting perspective, responsive to underlying inflation conditions. The pursuit of controlling inflation below the threshold as an objective of monetary policy has adverse output consequences. In India, sacrifice ratio-the output costs of disinflation, can go up to 2 per cent of real GDP for every one percentage reduction in inflation.

8.43 Capital flows have begun to matter in the growth process. So far, the growth-inducing properties of external capital flows have remained unexploited due to lack of absorptive capacity. A 'pecking order' in inflows is clearly in existence in India but this hierarchy seems to be policy induced. Maintaining full debt servicing and adequate reserve levels are 'feel good' factors while fiscal deficit needs to be contained to encourage augmented inflows of non-debt capital.

8.44 The Report is exploratory and its findings formative, requiring the validation of time. Identification of factors underlying the current deceleration is an empirical quest. Quantification matters from the point of view of calibrating the policy response. Revitalising growth has assumed a global urgency; the scope for discretion in national efforts is getting bounded by the inertial dynamics of the slowdown. For India, a measure of insulation from global conditions provides some discretion to seek within for country-specific solutions. In this regard, the principal impediment emerges as the inadequate response of private investment to the change in the development strategy. Catalysing private investment could be the central focus of the second generation of reforms. This may require transformation in the policy framework, including a reconsideration of the public and private incentive structure to spur and modulate the flow of investment demand. Consumption levels are, however, protected including through public intervention. Here external flows have a role to play in smoothing consumption, and preventing the deceleration in the rate of domestic saving and investment. This, in turn, has implications for external viability. The key role of exports comes to the fore. The financial sector can contribute to the revival in a supply-leading role as well as by improving the overall productivity of the economy through allocative efficiency gains. The financial sector, comprising financial institutions and markets, may well nurture the first impulses heralding the upturn.

8.45 The urgency attached in this Report to the revitalisation of growth is enmeshed in a recognition of the basic impediments to sustained development - the high incidence of unemployment and the lack of tangible gains in poverty reduction. There is a growing consensus for an agenda of reforms which directly address these fundamental obstacles to progress. Creating an environment for investing in human and physical capital, labour market and industrial reforms, removal of pricing distortions, farm policy re-orientation, legal restructuring and fiscal empowerment by rebalancing fiscal instruments will help to address the gaps in employment generation and poverty alleviation. The translation of this agenda into action would be facilitated by a favourable macroeconomic environment as an initial condition.