IMPACT AND POLICY RESPONSES IN INDIA: REAL SECTOR

6.1   This chapter analyses the impact of the global crisis on the real sector of the economy through trade and capital flow channels. The widespread nature of the crisis was evident from the decline in growth rates of real GDP across the spectrum of developed, developing and emerging market economies. As many as 130 countries witnessed a decline of GDP growth in 2008 over 2007 and as many as 166 countries in 2009 over 2008 (World Economic Outlook, IMF, April 2010). The significance of the trade channel during the recent crisis was evident in world trade growth decelerating from 7.3 per cent in 2007 to 2.8 per cent in 2008 and eventually to a negative of 10.7 per cent in 2009.

6.2   Like other EMEs, the early impact of the sub-prime crisis on the real sector of the Indian economy was rather muted as the crisis initially was restricted to turmoil in international financial markets. Following the failure of Lehman Brothers in September 2008, there was a sudden change in the external environment which impacted India adversely through the trade, finance and confidence channels, in line with other EMEs. With the crisis in the advanced economies turning more synchronised globally, the impact became severe in terms of shrinking trade and capital flow reversals during the second half of 2008-09. During this phase, the global financial shocks intensified and graduated into unprecedented worldwide economic slowdown and impacted trade, followed by real sector activities. Against the above backdrop, an assessment of the transmission of the global crisis through the trade and capital flows channels to the real sector as also the ultimate impact on saving, investment and growth has been undertaken in this chapter.

6.3   This chapter is organised as follows. A perspective is given on various channels of transmission of global shock to the real sector in Section I. In Section II, the analysis of the impact emanating from the trade channel is given in detail, while an analysis of the spillovers traversing through the financial channel is given in Section III. The impact of the decline in trade and capital flows reversal on saving, investment and growth is covered in Section IV. Section V contains the concluding observations.

I.   TRANSMISSION OF GLOBAL SHOCK TO THE REAL SECTOR

Shift in Composition of Aggregate Demand in India

6.4   Until the global crisis, the Indian economy exhibited remarkable resilience to various adverse external developments, despite the increasing openness of the economy since the 1990s. There were several reasons for this resilience. First, domestic demand played a dominant role in the growth process (Table 6.1). Second, domestic demand was led by private consumption during the first four decades of the independence. Third, a large part of investment demand was supported by domestic savings. Fourth, the services sector, led

Table 6.1: Shift in the Composition of Aggregate Demand in India
(Percentage to GDP at 1999-2000 prices)

	Private Consumption	Government Consumption	Investment	Exports	Imports
1	2	3	4	5	6
1950s	89.0	5.6	12.5	6.1	7.5
1960s	82.9	7.8	16.9	4.0	5.7
1970s	77.6	9.8	19.4	5.7	5.0
1980s	75.9	11.6	20.2	6.5	7.1
1990s	67.6	11.7	23.3	9.3	10.3
2000s	60.7	11.0	29.9	17.6	19.2
2007-08	58.5	10.3	38.2	21.6	26.2
2008-09	59.5	11.5	34.9	24.5	30.7
2009-10 (RE)	58.0	11.6	34.7	19.3	23.8

Source: Central Statistical Organisation, Government of India.

by domestic demand, contributed to the stability of overall economic growth. Fifth, in the financial sector, the banking sector accounted for a major share of the financial intermediation process which did not have significant exposure to international financial markets.

6.5   Unlike the episode of the late 1990s, the recent global crisis led to a change in perspective on the Indian economy. Global developments became important for the economy due to the significant increase in trade and finance openness (Subbarao, 2009; Reddy, 2007 and 2008). The share of exports and imports in the aggregate demand in India has risen sharply during the current decade compared to the 1980s and 1990s; on the other hand, the share of private consumption has fallen during the same period (Table 6.1). As a result of the compositional shift in aggregate demand, the Indian economy has become more vulnerable to external shocks compared to the earlier period. This is clearly visible in the decline in the growth rate of the Indian economy as the recent global crisis gathered momentum with widespread impact across sectors. The growth rate of the Indian economy moderated sharply to 6.7 per cent in 2008-09, declining by 3.0 percentage points from the peak in 2006-07. At the same time, there was also significant moderation in the growth rates of private consumption and investment activities.

Tenability of Decoupling Hypothesis

6.6   Decoupling of an economy entails significant decline in its business cycle synchronisation with that of other countries, meaning that its business cycle moves independent of the business cycle of another economy/group. During the recent global crisis, policymakers and researchers across the globe were debating in the initial phase whether emerging markets economies including India have decoupled from advanced economies. However, as the global financial crisis accentuated and graduated into a full-scale economic slowdown encompassing almost all countries including EMEs, this debate seems to have settled against the decoupling of emerging market economies.

6.7   It has been argued that the decoupling hypothesis runs against the idea that globalisation enhances trade linkages and international financial integration, allowing for a stronger transmission of country-specific shocks across countries and hence, stronger business cycle co-movements (Walti, 2009). Kose, Otrok and Prasad (2008) also mention that greater openness to trade and financial flows should make economies more sensitive to external shocks and increase co-movements in response to global shocks by widening the channels for these shocks to spill over across countries[1]. In contrast, the proponents of the decoupling hypothesis hold that emerging market economies have become increasingly less vulnerable to developments in advanced economies on account of strengthening domestic policy frameworks and achieving stronger domestic demand growth, leading to lower business cycle co-movements with advanced economies.

6.8   Walti (2009) investigated empirically the degree of business cycle synchronisation between emerging market economies and four aggregate groups – all advanced economies, the G7, the United States and the European Union – with annual data from 1980 to 2007. It was concluded that decoupling is largely a myth as business cycle synchronisation has generally not declined over time and certainly not during recent years and, thus, emerging markets have not decoupled from advance economies[2]. Similarly, Rose (2009)

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[1] They found that the global factor has become less important for macroeconomic fluctuations in both industrial economies and EMEs during the globalisation period (1985-2005) relative to the pre-globalisation period (1960-1984) and, in contrast, the importance of group-specific factors has increased markedly.

[2] The results do not imply that business cycle synchronicity will remain at its current level permanently, or that synchronicity will necessarily rise further in the future. The synchronicity is not expected to decline as long as the ongoing global recession continues, given the existing evidence showing that business cycles become more synchronised in such time periods (Walti, 2009).
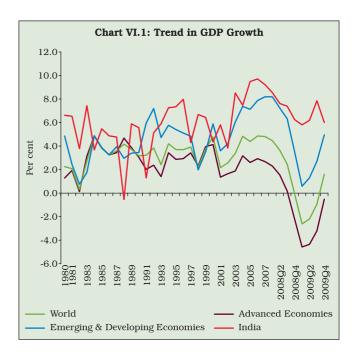
investigated the degree of cross-country synchronisation of business cycles in 64 countries taking annual data from 1974 through 2007 and found that countries across the world seem to be moving more closely over time and not less. It was also argued that the evidence presented as indicative of a divergence in economic performance, referred to as decoupling, is not definitive (Kohn, 2008).

6.9 The increased global integration has rendered the Indian economy's growth movements more correlated with growth movements in the world economy particularly during 2001-2008 compared to the 1980s and 1990s (Table 6.2). It is noteworthy that a large part of increased association between growth in India and world has emanated from emerging and developing economies as reflected by the substantial increase in the correlation compared with advanced economies.

6.10 The increased synchronisation of the Indian economy with the rest of the world was also discernible during the recent global economic slowdown wherein India's growth also decelerated following the global trend despite having unimpaired banking and financial systems unlike some advanced and emerging market economies (Chart VI.1). This intuitively reveals that, in the current context, the decoupling hypothesis may not

Chart VI.1: Trend in GDP Growth

be tenable in the case of India and other emerging market economies.

6.11 The decoupling hypothesis in the case of India has been investigated by estimating synchronisation of its growth in GDP and trade with other countries. It has been found that India was not decoupled from the unfolding financial crisis and recession/ slowdown in the USA and other advanced economies as is evident from its very high degree of business cycle synchronisation in income growth with the world economy, advanced economies and emerging & developing economies during recent periods, ranging from the first quarter of 2005 to the second quarter of 2009 (Chart VI.2). The findings of Walti (2009) also reveal that India has not decoupled with respect to any of the four aggregate groups of advanced economie*s, viz*., all advanced economies, the G-7, the United States and the European Union[3] .

6.12 Further, the decoupling of the Indian economy from advanced economies and emerging market economies has been explored estimating the evolving bilateral business cycle

Table 6.2: Correlation between Growth of India and the World Economy

Period	World Economy	Advanced Economies	Emerging & Developing Economies
1	2	3	4
1980s	0.43	0.52	-0.02
	(1.4)	(1.7)	(-0.1)
1990s	0.59	0.60	0.51
	(2.1)	(2.1)	(1.7)
2001-2008	0.92	0.71	0.96
	(5.8)	(2.5)	(8.4)

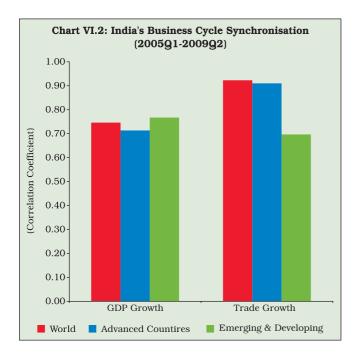**Note:** Figures in parentheses indicates t-statistics.
Source: World Economic Outlook, IMF.

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[3] Overall, none of the emerging markets in the Asia region can be said to have decoupled from advanced economies; for each country, there is always at least one group of advanced economies with respect to which synchronicity has not declined.

Chart VI.2: India's Business Cycle Synchronisation (2005Q1-2009Q2)

Table 6.4: India's Business Cycle Synchronisation (Household Consumption) with Advanced and Emerging Market Economies (EMEs)

Country	1996Q2-2009Q2	1996Q2-2000Q4	2001Q1-2005Q4	2006Q1-2009Q2
1	2	3	4	5
Argentina	0.0	-1.0	0.4	-0.8
Canada	-0.2	0.0	0.0	0.1
France	-0.6	0.7	-0.3	-0.8
Germany	-0.2	0.4	-0.2	-0.4
Indonesia	-0.3	0.3	-0.4	-0.4
Italy	0.1	-0.2	0.3	0.4
Japan	0.0	-0.3	0.0	-0.7
Korea	-0.1	0.2	0.0	0.6
Malaysia	-0.3	0.0	-0.1	-0.5
Russia	-0.4	0.5	0.3	-0.8
United Kingdom	-0.2	-0.1	-0.2	0.1
USA	-0.1	-0.3	0.2	0.5

synchronisation over the periods with quarterly GDP and consumption data from the second quarter of 1996 to the first quarter of 2009. It is found that business cycle synchronisation (in terms of GDP) of the Indian economy with most of the advanced and emerging market economies has increased over time, in particular during recent periods (2006Q1-2009Q2) (Table 6.3).

Table 6.3 : India's Business Cycle Synchronisation (GDP Growth) with Advanced and Emerging Market Economies (EMEs)

Country	1996Q2-2009Q2	1996Q2-2000Q4	2001Q1-2005Q4	2006Q1-2009Q2
1	2	3	4	5
Argentina	0.6	0.4	0.4	0.8
Canada	0.4	0.1	0.0	0.8
France	0.4	0.0	0.2	0.9
Germany	0.5	-0.1	0.2	0.7
Indonesia	-0.2	-0.6	0.2	0.1
Italy	0.3	-0.5	0.2	0.9
Japan	0.3	-0.5	0.0	0.8
Korea	0.0	-0.4	-0.4	0.6
Malaysia	0.0	-0.4	-0.4	0.7
Russia	0.0	-0.4	0.2	0.8
United Kingdom	0.6	0.2	0.3	0.9
USA	0.4	0.4	0.2	0.3

6.13   On the contrary, the movement in business cycle synchronisation of India in terms of consumption with advanced and emerging economies remained mixed as it has increased over time with some countries, particularly the advanced economies, while declined with others (Table 6.4).

6.14   The degree of co-movements of business cycles of different sectors of an economy with other countries may vary primarily depending on their extent of external openness and exposure through various indirect channels. India's industrial sector has been increasingly exposed to the world economy with rising merchandise trade and capital from international financial markets. Therefore, an attempt has been made to analyse the co-movement of industrial cycles with advanced economies in the wake of contagion emanating from the recent global financial crisis and consequent economic slowdown. The results show that industrial cyclical synchronisation of India with advanced countries, which had fallen sharply from 1995-2000 to 2001-2005 except for Germany, improved substantially in recent periods (2006-2009)[4]. During recent periods, India's industrial cycle synchronisation was the highest with

[4]   The monthly index of industrial production (IIP) in respect of India and other advanced economies was taken from the IMF from 1995 to 2009 (June) and seasonally adjusted using the US Census Bureau's X12 ARIMA procedure. Then, data was detrended with the usual Hodrick-Prescott filter and correlation coefficients between de-trended IIP between India and advanced economies were estimated.
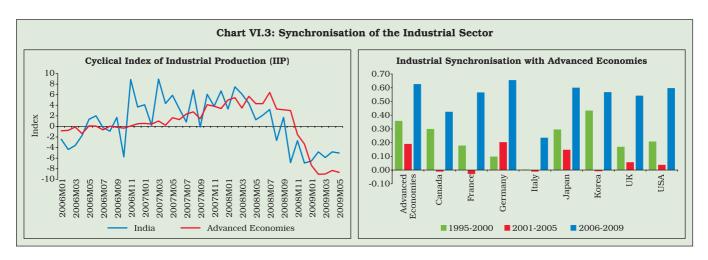
Germany, followed by Italy and the US. Another noteworthy feature is the significant increase in industrial synchronisation in recent periods (2006-2009) with major advanced countries (Chart VI.3). Thus, the strengthening of synchronisation with advanced countries made it difficult for India's industrial sector to remain unaffected from the spillover effects of the global financial crisis and economic slowdown.

Financial Crisis and Potential Output

6.15   Besides directly affecting potential output through dampening demand and drying up of funding, a financial crisis can also have an impact through indirect effects as crises usually trigger policy responses to counter the damaging effects emanating from the economic downturn (Reinhart and Rogoff, 2009). Such policy responses target the increase in investment in infrastructure in order to boost potential output; at the same time, they may introduce distortions or encourage excessive risk-taking. Temporary fiscal measures can lead to permanent increases in the size of government expenditure and in debt levels, which in turn will have negative effects on growth (Afonso and Furceri, 2008). Eventually, the nature and design of policy responses would decide the outcome of the potential output during crisis periods and subsequently. Hoj *et al.* (2006) mention that financial crises can also foster the implementation of structural reforms that can, in turn, enhance potential output by moderating political opposition to reforms.

6.16   Using the potential output based on the Hodrick-Prescott method, it is observed that the global shocks seem to have marginally impacted India's trend output growth from the pre-crisis trajectory. It should, however, be emphasised that some of the slowdown in the potential output growth in India was on account of the cyclical slowdown which had already set in before the global crisis started affecting the economy. While in the short run the output path may be impacted by the drop in productivity growth, over the longer horizon, the capital-to-labour ratio and employment growth would determine the loss in potential output. Thus, if an economy witnesses a decline in output relative to its previous trend over the medium term, it could be a decline in potential output but may also represent a persistent decline in aggregate demand.

6.17   It is argued that long-run employment loss may be attributed to the response of labour, capital and factor productivity to the financial crisis (IMF, 2009). If the shocks are significant enough to cause structural unemployment, given the institutional rigidities in the labour markets it may take longer to reach the pre-crisis level of employment, which may drag down productivity in the economy over the medium-term. Second, the crisis may slow down credit expansion and, hence, investment rate through various conduits, such as tighter credit standards, higher borrowing costs, and an adverse impact of asset prices on corporates' balance sheets through reduction in collaterals. Third,

Chart VI.3: Synchronisation of the Industrial Sector

productivity levels may fall due to loss of speed of innovations and reduction in research and development as companies attempt to restructure due to the impact of the crisis. Although it is difficult to quantify the above factors, the impact of the external shocks on investment rate in India may not be as adverse as in the advanced economies (Box VI.1).

Box VI.1
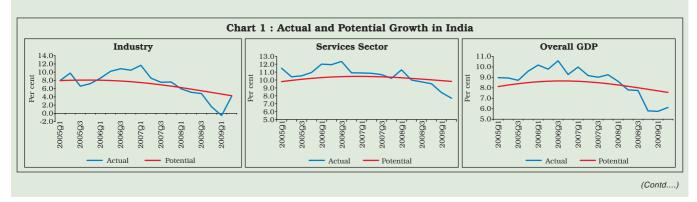**Loss of Potential Growth in India *vis-à-vis* Emerging Market Economies (EMEs)**

Potential output is generally the optimal level of output that can be achieved within natural and institutional constraints without putting pressure on inflation. Potential output has also been called the "natural gross domestic product" and, if the economy is at its potential, the unemployment rate equals the NAIRU or the natural rate of unemployment. The financial crisis often tends to affect the output of an economy through lowering financial intermediation, consumption and investments, and adversely affecting business sentiments; the extent of damage, however, depends on the severity and duration of the crisis. A recent empirical study on OECD countries over the period 1960 to 2007 by Furceri and Mourougane (2009) concludes that financial crises are estimated to lower potential output by around 1.5 to 2.4 per cent on an average. Similarly, Cerra and Saxena (2008) studied the output behaviour in 190 countries and found large and persistent actual output losses associated with financial crises, with output falling by 7.5 per cent relative to trend over a period of 10 years in the event of a banking crisis. If output loss is temporary, prompt and corrective policy initiatives are able to repair the damage and bring the output to the previous trajectory over a shorter span. On the other hand, in case output loss tends to be permanent, *i.e.,* potential output has a structural break and has shifted to a lower trajectory, policymakers have to strive very hard and it might take longer than expected to shift back to the previous trajectory.

During the recent global crisis, the level of financial intermediation decelerated significantly in India, both in terms of bank credit and dent in equity markets. Second, the unemployment rate also went up, especially in export-oriented sectors, although official estimates are not available. Third, merchandise exports contracted at a rapid pace, possibly rendering a significant part of their capital stock and labour force idle if export-oriented enterprising units failed to shift their focus on domestic markets. Hence, in light of the above, it would be worthwhile to estimate the loss of output growth, temporary or permanent (potential), in the case of India *vis-à-vis* other emerging market economies.

Although, there are various methodologies to estimate potential output, obtaining a reliable measure is fraught with difficulty and, hence, the issue of appropriateness remains unsettled. Nonetheless, the Hodrick-Prescott (HP) filter has been used for deriving a long term "trend" growth using annual as well as quarterly data to assess the loss of output growth during the current crisis. The shift in potential output growth, if any, should be construed preliminary and any inferences from the same need to be made with caveats.

The quarterly estimates of the potential growth based on the HP filter methodology shows that loss in growth, which started from the second quarter of 2008, *albeit* marginal, followed through the subsequent quarters with around 2.0 percentage points in Q4 of 2008 and Q1 of 2009 and 1.4 percentage points during Q2 of 2009. The trends in potential growth suggest that actual growth in industry has almost caught up with the potential level in Q2 of 2009, indicating a temporary loss of growth. In contrast, loss of growth in the services sector continued to widen. Nevertheless, as mentioned above, these results are preliminary and, therefore, should be used with great caution. Since services contribute about 60 per cent to the GDP, the potential growth in GDP seems to be following the trend in the services sector (Chart 1).

Chart 1 : Actual and Potential Growth in India

(Contd....)

(...Concld.)

The potential growth in India as well as in some of the emerging market economies (EMEs) was also estimated using the HP filter with annual data from 1980 to 2008. Most of the EMEs including India have experienced loss in actual growth when compared with potential growth during 2008, whereas these countries witnessed gains in actual growth in recent years (Table 1). Russia had the highest growth loss followed by China, Argentina, India, Philippines, and Malaysia during 2008.

Table 1: Growth Gap in India vis-à-vis EMEs
(Actual minus Potential)

Country	2001-2005	2006	2007	2008
Argentina	-1.2	2.0	1.1	-1.6
Brazil	-0.4	-0.2	1.1	0.1
China	-0.2	1.2	2.3	-1.9
India	-0.5	1.7	0.8	-1.5
Indonesia	0.7	0.2	0.5	-0.2
Malaysia	-0.4	0.5	1.0	-0.8
Philippines	-0.3	-0.1	1.5	-1.3
Russia	-0.1	-0.1	0.0	-2.8

References:

1. Cerra, V. and S.C. Saxena. 2008. "Growth Dynamics: The Myth of Economic Recovery". *American Economic Review*, 98: 439-457.

2. Furceri, D. and Annabelle Mourougane. 2009. "The Effect of Financial Crises on Potential Output: New Empirical Evidence from OECD Countries". *OECD Economic Department Working Paper* 699.

6.18 The shift in the composition of aggregate demand towards exports during the current decade has made the Indian economy more susceptible to global developments. Again, India's bilateral synchronisation along with business cycle synchronisation with three groups, *viz*., world economy, advanced, and emerging & developing countries, conclusively reflects the strengthening of the co-movement of India's business cycle with the rest of the world and, hence, the decoupling hypothesis is not found to be tenable during the recent global financial crisis. Further, during this crisis, several economies including India suffered loss of potential growth. In the next section, the impact of trade channels on the Indian economy is discussed.

II. IMPACT ON INDIA THROUGH TRADE CHANNEL

Impact through Exports

World Income and Exports

6.19 The outlook for international trade was strongly affected during the crisis and world trade performance weakened considerably from the last quarter of 2008. The rising trend witnessed in the growth of world trade was reversed during the crisis and it fell sharply and traversed to the negative zone from the fourth quarter of 2008. Advanced economies led this sharp deterioration in the initial period; however, the emerging and developing economies also caught the downswing (Table 6.5).

6.20 The contracting external demand from advanced economies on account of falling disposable income and heightened uncertainty spilled over to emerging markets and developing countries, concomitantly manifested in the declining international trade of these countries. India's merchandise trade was also impacted by the falling consumption, particularly in advanced countries, and the slump in trade credit following tightening of international credit market conditions in the aftermath of the collapse of Lehman Brothers in mid-September 2008. The cyclical co-movements between growth in India's exports and external demand (GDP in world and advanced economies) were highly synchronised during the current global crisis (Chart VI.4). This shows that during normal times, other factors besides world income also play a pivotal role in driving the growth in exports, while the impact stemming from world GDP becomes overriding during a crisis.

6.21 In view of India's exports being highly elastic to world income, the effect of the contracting world income was reflected in the overall decline in merchandise exports from the

Table 6.5: World Trade Performance

(Annualised growth in per cent)

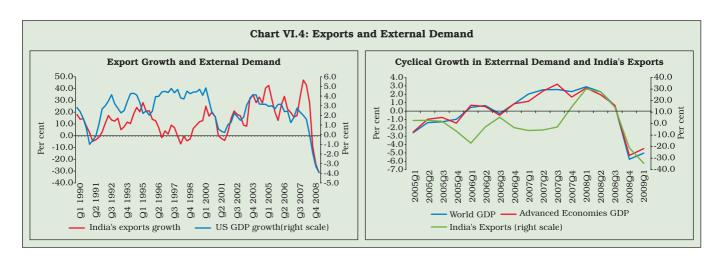|	Q1 2007	Q2 2007	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008	Q4 2008	Q1 2009	Q2 2009
1	2	3	4	5	6	7	8	9	10	11
Exports										
World	13.9	11.6	14.2	18.8	24.8	27.2	23.1	-6.3	-29.3	-30.8
Advanced Economies	13.4	10.9	13.4	16.0	19.7	22.6	16.6	-11.8	-30.2	-31.5
Emer. & Develop Eco.	15.1	12.9	15.6	24.0	34.7	35.9	34.8	3.5	-28.6	-30.0
Euro Area	16.5	12.3	13.6	16.4	18.3	24.1	15.3	-16.5	-31.1	-34.5
USA	10.8	10.7	12.2	14.2	17.1	19.0	17.1	-4.2	-22.4	-26.9
Imports										
World	14.0	13.1	14.0	19.4	23.3	25.9	23.3	-7.3	-30.6	-33.1
Advanced Economies	11.6	10.1	10.6	16.4	19.5	22.2	19.1	-11.1	-30.7	-34.6
Emer. & Develop. Eco.	16.3	14.2	14.6	17.0	18.8	22.7	14.2	-16.0	-29.7	-34.2
Euro Area	20.3	20.3	21.7	26.5	32.3	34.2	32.1	1.0	-30.5	-29.8
USA	4.1	3.7	3.2	10.3	11.4	14.2	14.3	-9.2	-29.9	-34.7

Source: IFS, November 2009, IMF.

third quarter of 2008-09. As per the export demand function estimated by Agarwala (1970), the income and price elasticity coefficients were 0.35 and -0.44, respectively. Another study by RBI (2003) found that short-term and long-term elasticity of demand for India's exports with respect to world GDP growth was at 0.8 and 1.5, respectively. Further, with the latest data, the long-term elasticity of India's exports demand was estimated at 3.7 with respect to world GDP (RBI, 2009). This confirms that with high global growth, the pull factor operating on India's exports could be sizeable. The high income elasticity of exports with respect to world income is reflected across various commodities, with their elasticity improving significantly during the reform period (1993-2008) compared with the 1980s (Table 6.6).

Export and Economic Growth

6.22   As discussed in the previous section, despite the dominant role of domestic demand in shaping the growth path, the role of trade in conditioning the growth process became increasingly important over time, which was also evident from a significant rise in the trade-GDP ratio in the recent period. The direct impact of exports on economic growth could be determined by trade openness and the acceleration in the growth of exports, which in turn could be determined by the elasticity of exports with respect to world income (Box VI.2).

Chart VI.4: Exports and External Demand

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Table 6.6: Elasticity Response of India's Commodity Exports to World Income

Commodity	1980-81 to 2007-08	1993-94 to 2007-08	1980s	Commodity	1980-81 to 2007-08	1993-94 to 2007-08	1980s
1	2	3	4	1	2	3	4
1. Food	2.7	2.0	0.8	19. Textile yarn	0.8	1.7	7.2
2. Cereals	3.9	2.6	3.1	20. Textile (non-cotton)	3.7	1.7	1.4
3. Sugar	0.7	6.7	-10.2	21. Textile materials	4.2	1.0	0.0
4. Coffee	1.1	0.3	1.1	22. Floor coverings	1.8	0.7	2.7
5. Spices	2.0	2.3	0.0	23. Non-metallic minerals	3.4	2.9	3.7
6. Oilseed cake	2.6	0.4	2.7	24. Iron & steel	7.5	3.8	1.2
7. Beverages	1.6	2.0	-2.9	25. Non-ferrous metals	7.7	7.4	5.6
8. Crude material	4.4	5.5	1.2	26. Metals	4.7	4.0	0.4
9. Raw cotton	2.5	8.4	-3.0	27. Machinery	5.3	5.2	2.4
10. Textile fibres	4.2	4.8	5.4	28. Non-electrical machinery	5.2	5.6	2.0
11. Minerals (non-POL)	3.7	3.6	3.2	29. Tele-equipment	6.6	5.5	2.6
12. Iron ore	1.4	2.8	1.6	30. Electrical machinery	5.0	5.9	2.6
13. Ores	4.4	6.0	3.1	31. Transport equipment	5.5	5.8	1.6
14. Fuel	2.2	7.5	1.5	32. Miscellaneous	2.1	2.8	3.0
15. POL	6.1	29.3	9.9	33. Apparel accessories	2.8	1.3	4.0
16. Chemicals	5.3	3.7	3.3	34. Footwear	0.9	2.7	7.6
17. Manufactures	3.3	3.1	1.4	35. Miscellaneous	5.3	4.2	2.8
18. Leather	0.8	0.6	2.8	36. General Index	3.9	3.7	1.2

6.23   Within the framework of growth accounting, the contribution of exports to economic growth was negligible during the first two decades after independence. Though it showed some improvement in the 1970s, this could not be sustained during the 1980s. During the reform

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Box VI.2
Exports and Domestic Growth Relationship: The Growth Accounting Approach

The early literature relied on the standard growth accounting approach based on national accounts to measure the contribution of exports to economic growth. According to this approach, from the demand side, the aggregate income or gross domestic product (Y) of an economy comprises domestic demand (D) and external demand such as exports (E): $Y_t = D_t + E_t$

This equation can be transformed into growth rates of Y,

D, and E: $\dfrac{\Delta Y_t}{Y_{t-1}} = \dfrac{\Delta D_t}{D_{t-1}} \dfrac{D_{t-1}}{Y_{t-1}} + \dfrac{\Delta E_t}{E_{t-1}} \dfrac{E_{t-1}}{Y_{t-1}}$

or

$g_y = g_D\, w_D + g_E W_E$ (1)

Thus, the growth rate of Y (g_y) can be estimated as the weighted average of growth rates of the domestic and external demand components, g_D and g_E. The weights W_D and W_E are the shares of domestic and external demand in the GDP in the previous year. In order to connect domestic economic growth with global economic developments, the standard export demand function in log-linear form can be used:

$lnE_t = \alpha + \beta\, lnY_t^f + \theta\, lnP_t$ (2)

where Y_t^f and P_t are world income and relative prices and the parameters β and θ are the income and price elasticity measures of exports with respect to world income and relative price (foreign price relative to domestic price), respectively. Assuming that the relative price of exports remains unchanged; the relationship between growth rates of exports and world income derives from the export demand function as

$g_E = \beta\, g_W$ (3)

Now from Equations 1 and 3, we can derive that the impact of the global economy on domestic economic growth will be a product of three factors: export elasticity, growth rate of the world economy, and share of exports in the domestic economy. In other words, for every percentage growth rate of world income, the contribution of exports to the domestic economy will be a product of elasticity of exports with respect to world income (propensity of foreigners to demand exports) and the share of exports in the domestic economy (an indicator of trade openness).

Table 6.7: Contribution of Consumption, Investment and Exports to Economic Growth

(Percentage Points)

Period	GDP	Private Consumption	Government Consumption	Investment	Exports
1	2	3	4	5	6
1950s	3.9	3.2	0.2	0.8	0.0
1960s	4.1	2.6	0.6	1.1	0.1
1970s	2.9	2.1	0.5	0.9	0.5
1980s	5.7	3.5	0.8	1.2	0.3
1990s	5.6	3.2	0.7	1.7	1.0
2000s	7.2	3.5	0.4	3.5	2.4
2003-08	9.0	4.0	0.5	5.1	2.7
2008-09	6.7	4.9	1.7	-1.5	4.2
2009-10	7.4	2.4	0.9	2.1	-3.9

Note : The difference between the growth rate of GDP at constant market price and the sum of growth of its components, consumption, Government expenditure, investment and exports is accounted for by imports expansion (contraction).

Source: Central Statistical Organisation, Government of India.

period, the contribution of exports to economic growth increased during the 1990s and more than doubled during the 2000s (Table 6.7).

6.24   In order to further explore the relationship between exports and growth, the Granger causal analysis between GDP growth and exports growth and trade deficit to GDP ratio was undertaken based on annual data during 1950-2008. The Granger Causality results[5] provided two insights: first, the direction of causal relation between exports and GDP growth rates was from the former to the latter but not *vice versa* and, second, the direction of the causal relationship between the trade deficit ratio and economic growth was from the latter to the former, which is attributable to the role of imports demand driven by domestic economic activity. The compositional shift in the exports baskets towards technology-intensive commodities during the past few years, spurred by the prominence of exports in the Indian economy, is reflected in their increased contribution to growth.

Exports and Consumption

6.25   The direct contribution of exports to aggregate demand assumed a critical mass and has become a crucial conduit of the trade channel of transmission. Several domestic and external developments which followed the global crisis contributed to the moderation of private consumption growth (Table 6.8). Apart from the direct impact of exports on aggregate demand and growth, exports could indirectly affect growth through consumption and investment. In India, exports and private consumption demand seem to have displayed a close relationship during the recent period.

6.26   There could be a number of indirect channels through which export demand could affect consumption. First, the manufacturing sector has become export-intensive over the period. The share of manufactured exports in

Table 6.8: Some Determinants of Private Consumption in India

(per cent)

Indicators	2005-06	2006-07	2007-08	2008-09
1	2	3	4	5
(i) Private Consumption	9.0	8.2	9.8	6.8
(ii) Agriculture GDP	5.2	3.7	4.7	1.6
(iii) Loans to Households	52.1	-3.6	-2.1	-4.3
(iv) Personal Loans	40.5	26.8	12.1	10.8
Housing	38.3	24.7	11.6	7.4
Credit cards	41.3	47.7	44.2	6.1
Consumer durables	-20.9	29.3	-4.2	-7.0
(v) CPI Inflation (IW)	4.4	6.7	6.2	9.1
(vi) CPI Inflation (AL)	3.9	7.8	7.5	10.2
(vii) Stock Returns	44.2	48.3	35.0	-25.4
(viii) Remittance Inflows ($)	18.4	23.6	41.1	6.6
(ix) Travel Earnings ($)	17.8	16.2	24.4	-4.0
(x) Global Commodity Prices				
All Commodities	24.3	15.8	21.6	3.8
Food	1.1	12.7	21.8	6.4
Dubai Oil prices	46.6	14.0	27.0	6.2

[5]

Exports and Growth: Causal Relationship		
Causal relationship: Null Hypothesis	**F-statistics (probability)**	**Result**
Exports growth did not cause GDP growth	4.90 (0.01)	Reject
GDP growth did not cause Exports growth	1.21 (0.31)	Accept
Trade deficit did not cause GDP growth	0.02 (0.98)	Accept
GDP growth did not cause Trade deficit	4.19 (0.02)	Reject

manufacturing GDP in India has risen from 27.1 per cent in 1990-91 to 52.2 per cent in 2000-01 and further to 72.3 per cent in 2008-09. This significant export-orientation of manufacturing has also exposed the sector to external demand shocks. Furthermore, a large part of manufacturing exports (42 per cent) is accounted for by leather and manufactures, textile and textile products, gems and jewellery and handicrafts, which are employment-intensive, and a major part of exports in these sectors is contributed by small-scale industries (SSIs). Thus, an external demand shock has a larger impact on output and employment in such industries, which has a direct bearing on domestic consumption demand. Furthermore, there are a number of SSIs that are dependent on the supply chain of the manufacturing export firms, which are also indirectly affected by the external demand shocks.

Impact on Exports: Trend, Composition and Direction

6.27   The trade channel of the contagion that intensified in the post-September 2008 phase of

the crisis adversely impacted India's merchandise trade, with exports declining with greater intensity and more swiftly than during the recession of the early 2000s, in tandem with the steeper recession in the developed countries (Table 6.9).

6.28   An analysis of the shift in the composition of India's commodity exports reveals some interesting facts. Before the reforms, India's exports were significantly driven by exports of primary agricultural commodities and manufacturing commodities such as textiles, gems and jewellery; while the commodity composition at the global level was shifting to technology-intensive manufacturing commodities such as engineering goods and chemicals. Thus, despite the growth momentum in the 1980s, India's share in world exports declined to about 0.5 per cent.

6.29   The reforms and favourable trade policy brought a shift in the composition of India's commodity exports. Technology-intensive exports comprising engineering goods such as metals, machinery and transport equipment and chemicals, including pharmaceuticals emerged as the leading export sectors for India, signifying the

Table 6.9: India's Trade Performance

Period	Export Growth (%)			Import Growth (%)		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
1	2	3	4	5	6	7
April	31.3	63.0	-32.8	42.1	65.0	-37.2
May	23.2	50.0	-36.2	40.0	39.2	-32.7
June	16.1	58.5	-29.8	39.0	44.6	-21.8
July	18.0	52.1	-25.5	41.0	49.7	-33.2
August	17.4	40.5	-24.1	32.9	64.6	-35.9
September	16.4	26.1	-8.4	5.0	70.9	-34.0
October	47.8	-3.7	2.7	24.7	18.5	-2.7
November	29.4	-13.5	29.6	34.9	6.3	2.7
December	35.0	-8.6	19.9	28.3	-3.3	32.2
January	35.8	-13.6	18.7	58.1	-20.2	34.8
February	43.1	-21.0	31.8	43.6	-27.6	67.3
March	34.1	-25.1	54.1	37.6	-29.6	67.1
First Half	**20.4**	**48.4**	**-26.1**	**33.3**	**55.7**	**-32.5**
Second Half	**37.5**	**-14.3**	**26.1**	**37.9**	**-9.3**	**33.6**
Annual (Apr-Mar)	**28.9**	**13.7**	**-4.7**	**35.4**	**20.8**	**-8.2**

Source : Directorate General of Commercial Intelligence and Statistics (DGCI&S).

Table 6.10: Composition of India's Commodity Exports

(share in per cent)

	1987-91	1992-96	1997-2003	2004-08	2007-08	2008-09
1	2	3	4	5	6	7
1. Primary Products	24.1	21.8	19.1	16.0	16.9	13.7
(i) Agricultural & Allied Products	18.5	17.6	16.1	10.6	11.3	9.5
(ii) Ores & Minerals	2.1	2.0	1.8	3.5	5.6	4.2
2. Manufactured Goods	71.0	75.3	76.7	69.9	63.2	66.5
(i) Leather & Manufactures	7.6	6.3	4.4	2.7	2.2	1.9
(ii) Chemicals & Related Products	8.3	10.7	12.9	14.1	13.0	12.3
(iii) Engineering Goods	11.4	13.4	15.1	21.5	22.9	25.5
Manufactures of metals	*2.3*	*2.8*	*3.3*	*4.1*	*4.3*	*4.1*
Machinery Instruments	*3.6*	*2.9*	*3.5*	*4.9*	*5.6*	*5.9*
Transport equipment	*1.9*	*2.8*	*2.4*	*3.8*	*4.3*	*6.0*
Iron & steel	*0.5*	*1.9*	*2.4*	*3.9*	*3.3*	*3.2*
Electronic goods	*1.5*	*1.5*	*2.2*	*2.3*	*2.1*	*3.7*
(iv) Textiles and Textile Products	23.3	26.0	25.1	15.6	11.9	11.8
(v) Gems & Jewellery	18.4	16.7	16.9	14.6	12.1	15.1
(vi) Handicrafts	1.4	1.4	1.6	0.5	0.3	0.2
3. Petroleum Products	3.0	1.9	2.4	11.5	17.4	14.5
4. Other	1.9	1.0	1.8	2.6	2.5	5.4
Total Exports	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Directorate General of Commercial Intelligence and Statistics (DGCI&S).

rising prominence of exports in India's GDP growth (Table 6.10). Besides a shift towards technology-intensive exports, the exports of petroleum products (which showed spectacular growth) emerged as a major contributor to total exports, reflecting the impact of India becoming the sixth largest refinery in the world.

6.30   During 2008-09, the deceleration was, however, modest in the case of manufacturing goods. As a result, share of non-oil exports as well as manufacturing goods exports in total exports increased by around 8 percentage points during 2008-09 over the past year. In sum, this implies the cost competitiveness of the manufacturing sector on account of enhanced efficiency and productivity. At a more disaggregated level, the major commodities that witnessed a decline in exports during 2008-09 were handicrafts, petroleum products, ores and minerals, and agricultural and allied products. The global crisis, however, had a more pronounce impact on India's exports during 2009-10 (April-October). All sectors including

engineering, chemicals, gems and jewellery and petroleum exports witnessed a decline in export growth (Table 6.11).

6.31   The regional direction of India's exports has also experienced significant changes between 2000 and 2008. First, India's exports share in traditional markets such as the EU and North America witnessed a significant decline. Second, there was a structural shift in favour of Latin America, ASEAN, West Asia, North Africa and South Asia. In terms of growth, India's export to developing countries accounted for the largest downturn to (-0.5) per cent during 2008-09 from 33.6 per cent in 2007-08, which was mainly driven by a sharp fall in exports to China. The second largest deceleration in growth of India's exports was to OECD countries during 2008-09. The US led the deceleration in exports to OECD countries during 2008-09; nevertheless, the US continued to be the single largest contributor to India's exports (Table 6.12). The increasing share of India's trade with the above regions could be attributed to factors such as the distance and

Table 6.11: Global Crisis and India's Exports

Commodities	Amount (US$ billion)			Growth (%)			
	2006-07	2007-08	2008-09	2007-08	2008-09	April-October	
						2009-10	2008-09
1	2	3	4	5	6	7	
1. Primary Products	**19.7**	**27.6**	**25.3**	**40.0**	**-8.0**	**-22.7**	**28.5**
(i) Agricultural & Allied Products	12.7	18.4	17.5	45.3	-4.9	-25.5	36.8
(ii) Ores & Minerals	7.0	9.1	7.8	30.2	-14.5	-16.1	12.0
2. Manufactured Goods	**84.9**	**103.0**	**122.8**	**21.3**	**19.6**	**-20.9**	**39.3**
(i) Leather & Manufactures	3.0	3.5	3.6	16.1	1.5	-18.2	13.6
(ii) Chemicals & Related Products	17.3	21.2	22.6	22.3	7.1	-15.8	26.6
(iii) Engineering Goods	29.6	37.4	47.3	26.4	26.5	-28.7	51.2
Manufactures of metals	5.1	7.1	7.6	38.8	7.0	-33.7	25.3
Machinery & Instruments	6.7	9.1	11.0	35.8	19.9	-20.0	37.1
Transport equipment	4.9	7.0	11.1	41.9	58.8	-12.2	80.9
Iron & steel	5.2	5.4	5.8	4.0	6.9	-60.4	46.6
Electronic goods	2.9	3.4	6.8	17.8	102.5	-15.1	134.6
(iv) Textiles	17.4	19.4	20.0	11.8	3.0	-10.5	10.3
(v) Gems & Jewellery	16.0	19.7	27.7	23.2	42.1	-19.8	67.0
(vi) Handicrafts	0.4	0.5	0.3	16.0	-40.8	-38.2	-48.3
3. Petroleum Products	**18.6**	**28.4**	**26.8**	**52.2**	**-5.4**	**-35.8**	**-48.3**
4. Other	**3.2**	**4.0**	**7.7**	**26.4**	**148.9**	**-13.2**	**98.3**
Total Exports	**126.4**	**162.9**	**182.6**	**28.9**	**13.7**	**-23.3**	**39.4**

Source : Directorate General of Commercial Intelligence and Statistics (DGCI&S).

size of the economies as described in the Gravity Model of international trade. The Gravity Model of international trade is increasingly used to derive measures of divergence in expected volumes of trade between trading partners and their actual trade (Box VI.3).

Table 6.12: Geographical Diversification of India's Exports

(share in per cent)

Region/Country	1987-90	1990-95	1995-00	2000-05	2005-08	2007-08	2008-09
1	2	3	4	5	6	7	8
1. Advanced Economies	**57.7**	**58.1**	**56.4**	**48.4**	**40.8**	**39.5**	**37.4**
(i) EU	24.8	27.1	26.4	22.1	21.4	21.2	21.0
UK	6.0	6.4	5.9	4.8	4.3	4.1	3.6
Germany	6.4	7.2	5.5	3.9	3.3	3.1	3.5
Other EU	12.4	13.5	14.9	13.3	13.8	13.9	14.2
(ii) US	17.7	17.4	20.2	19.1	14.0	12.7	11.3
(iii) Other OECD	15.1	13.5	9.9	7.3	5.5	5.6	4.7
2. OPEC	**6.2**	**8.8**	**10.1**	**13.3**	**17.3**	**16.6**	**21.2**
(i) Saudi Arabia	1.6	1.9	1.9	1.8	2.2	2.3	2.7
(ii) UAE	2.2	4.2	5.0	6.9	10.1	9.6	13.1
(iii) Other OPEC	2.4	2.7	3.2	4.6	5.0	4.7	5.4
3. Eastern Europe	**17.5**	**8.3**	**3.6**	**2.6**	**1.3**	**1.1**	**1.1**
4. Developing Countries	**15.5**	**22.5**	**28.9**	**33.5**	**39.6**	**42.5**	**37.6**
(i) Asia	13.0	18.7	22.6	26.3	29.9	31.6	28.1
China	0.3	0.7	1.5	3.8	6.2	6.6	5.1
Hong Kong	3.4	4.4	5.9	5.2	3.9	3.9	3.6
Other Asian Countries	9.4	13.6	15.2	17.3	19.8	21.1	19.4
(ii) Africa	2.0	2.8	4.6	4.9	6.6	7.5	6.3
(iii) Latin America	0.5	1.0	1.7	2.3	3.2	3.4	3.1
5. Others	**3.1**	**2.3**	**0.9**	**2.2**	**0.9**	**0.4**	**2.7**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Directorate General of Commercial Intelligence and Statistics (DGCI&S).

Box VI.3
The Gravity Model of Foreign Trade

Borrowing from Newtonian physics, the model consists of a single equation postulating that the amount of trade between two countries depends positively on the joint size of the two trading economies and is negatively related to the distance between them. Over time, the Gravity Model of trade has been extended to incorporate a wide variety of other factors. This approach has the benefits of capturing the overall impact of a country's policy and institutional environment, including a wide variety of artificial impediments, and not just trade policy. A country is found to "under-trade" if its actual trade across trading partners is, on average, below the level predicted by the Gravity Model without explicit policy variables (IMF, 2002; Rose 2002). An analysis of developing countries' trading patterns, as per the Gravity Model, suggests the following: (i) balance of payments and trade restrictiveness remain important reasons for developing countries to trade less than industrial countries; and (ii) international vertical specialisation, which had played an important role in East Asia, is likely to become more significant for other developing countries with open trading regimes, abundant labour and flexible economies. Full liberalisation of both trade and balance of payments policies in all countries would increase trade between industrial countries (North-North trade) by about 40 per cent, North-South trade by about 63 per cent, and trade between developing countries (South-South trade) by about 94 per cent (IMF, 2002).

6.32   An empirical analysis is undertaken to assess how the broad direction of India's exports to emerging market economies relative to developed countries was determined by the relative price competitiveness effect and real demand conditions. The long-run elasticity of the direction of India's exports with respect to relative price was statistically significant and positive at 1.88, higher than the almost unitary elasticity coefficient with respect to relative real demand conditions[6]. However, a significant structural shift since 1991-92 in the model led to a significant moderation of the relative price effect and improvement in the relative real demand effect. The price elasticity coefficient was reduced to 0.49, while the real demand effect improved to 1.44 (Table 6.13). The contraction in India's exports since October 2008 was mainly conditioned by real demand effects emanating from the sharp fall in real activities in advanced and emerging market economies during the current global crisis.

Leading Exports by Commodities and Firms

6.33   Engineering goods exports have assumed critical proporation in merchandise exports of India during the post-reforms period (Box VI.4). The critical role of engineering and chemicals goods exports was evident during the global crisis. The exports of engineering goods maintained their growth momentum in 2008-09, with a significant acceleration in the growth of transport equipment. The exports of

Table 6.13: Relative Price and Real Demand Effects on India's Broad Direction of Exports (Long-run Co-integration Coefficients)

Dependent Variable: Direction of Exports	Explanatory Variables			
	Intercept	Relative Price	Real Demand	Structural shift
1	2	3	4	5
1. X_{em}/X_{ac}	0.66	1.88 (7.25)	1.01 (6.45)	
2. $X_{em}X_{ac}$	1.18	0.49 (1.02)	1.44 (6.95)	0.05 (2.07)
3. $X_{em}X_w$	0.42	2.17 (12.28)	1.00 (7.82)	
4. $X_{em}X_w$	0.81	1.66 (7.25)	1.26 (6.82)	0.03 (1.73)
5. $X_{ac}X_w$	-0.38	10.83 (8.00)	0.47 (1.36)	
6. X_{ac}/X_w	0.016	3.26 (1.97)	1.87 (5.37)	0.03 (2.83)

X_{em} : India's exports to emerging and developing economies (EMEs) in US dollar terms.
X_{ac} : India's exports to advanced economies in US dollar terms.
X_w : India's total exports to the world in US dollar terms.
Pem : Import price index (unit values) of EMES.
Pac : Import price index (unit value) of advanced economies.
P_w : Import price index (unit value) of world.
Q_{em} : Real demand condition of the EMES, *i.e.*, total imports of the EMEs deflated by their import price index measured in US dollars.
Q_{ac} : Real demand condition of the advanced countries, *i.e.*, their total imports deflated by their import price index measured in US dollars.
Q_w : Real demand condition of the world, *i.e.*, their total imports deflated by their import price index measured in US dollars.
Relative prices : P_{em}/P_{ac} used in Equations 1 & 2, P_{em}/P_w in Equations 3 & 4, P_{ac}/P_w used in Equations 5 & 6.
Relative demand : Q_{em}/Q_{ac} used in Equations 1 & 2, Q_{am}/Q_w in Equations 3 & 4, Q_{ac}/Q_w used in Equations 5 & 6.
Figures in parentheses are t-statistics.

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[6]   Estimate based on the co-integration model involving the natural logarithm of these variables for the period April 1980 to July 2009.

Box VI.4
India's Exports of Engineering Goods

During the reform period, India's merchandise exports witnessed a notable shift in terms of commodity composition, led by engineering goods. In an environment of increasing openness of the economy and a supportive policy framework since the early 1990s, exports of engineering goods accelerated from US$ 1.2 billion (9.5 per cent of total merchandise exports) in 1987-88 to US$ 47.3 billion in 2008-09 (25.5 per cent of total merchandise exports).The rapid growth of engineering goods exports at a trend growth rate of 27.7 per cent during 2001-02 to 2008-09 was attributable to the growing competitiveness and increasing technological sophistication of India's manufacturing exports. In 2004-05, engineering goods emerged as the largest item of manufacturing exports, surpassing exports of textiles and gems and jewellery. Within engineering goods, transport equipment emerged as the key driver of exports growth, attributable to the increasing global competitive advantage of India's automotive industry. According to the Automobile

Table : Exports of Automotive Products of Emerging Economies

(US$ billion)

Country	Machinery	Automobile
World	5,348	1,234
Brazil	42	15
China	674	29
India*	25	5
Korea	234	49
Mexico	154	46
Russia	17	4
South Africa	16	8
Thailand	74	16
Turkey	39	18

Source: World Trade Organisation.

Components Manufacturing Association of India (ACMA), the Indian auto component industry is characterised by the largest three-wheeler market, the second largest two-wheeler market, the fourth largest tractor market and the fifth largest commercial vehicle market in the world and the fourth largest passenger vehicle market in Asia. Since the mid-1990s, India's automotive industry has witnessed rapid transformation from a low-volume and fragmented sector into a highly competitive sector characterised by world-class technology, large and assured volumes and strict delivery schedules in response to the demand from global vehicle manufacturers. Several Indian companies have entered into technological collaborations and equity partnerships with world leaders in automotive components. Some global vehicle manufacturers have set up subsidiaries for components manufacturing facilities in India, taking into account the lower labour cost and the availability of a highly skilled workforce. Furthermore, India's automotive components industry is highly diversified with a capacity to produce as many as 150 different products. Notwithstanding the recent surge in engineering exports, the technology intensity of India's exports compared with emerging economies in East Asia and Latin America has the potential for substantial growth. In terms of the global positioning of the automotive industry, the share of India's exports in the global automotive market remains small (Table). During 2001-2007, India's exports of machinery and transport equipments posted a trend growth rate of 33.0 per cent compared with the global trend growth rate of the sector at 12.1 per cent. Thus, the share of India's exports of machinery and transport equipment and automotive components at the global level increased from 0.10 per cent in 2000 to 0.33 per cent by 2007. According to the ACMA, the automotive components industry has to accelerate measures towards improving quality and its competitive position in the global market.

chemicals also remained resilient in 2008-09, *albeit* with some moderation in growth. The expansion of exports in these two sectors in 2008-09 accounted for the overall expansion of India's total exports in 2008-09. In 2009-10 (April-October), the decline in engineering goods exports accounted for about a half of the decline in manufactured exports and a third of India's total exports.

6.34   The significance of the engineering goods, chemicals and textiles industries within the manufacturing sector is evident from their principal economic characteristics. According to the Annual Survey of Industries 2007-08, the engineering

goods sector accounted for about a third of aggregate investment, output, value added and employment in the manufacturing sector. Engineering goods, chemicals and textiles together accounted for more than 50 per cent of investment, output, value added and employment in the manufacturing sector (Table 6.14). Therefore, engineering goods assume a critical proportion in the growth of the manufacturing sector in India and the relative resilience displayed by the performance of engineering good exports somewhat insulated the Indian industry from the shocks stemming from sagging external demand during the crisis.

**Table 6.14 : Principal Characteristics of
Leading Export Industries**

(Per cent to total)

Indicators	Engineering	Chemicals	Textiles	Total
1	2	3	4	5
(i) No. of Factories	25.2	7.6	11.3	44.1
(ii) Fixed Capital	34.4	14.7	10.4	59.5
(iii) Productive Capital	34.9	15.1	9.6	59.6
(iv) Invested Capital	35.2	13.6	9.8	58.5
(v) Workers	26.8	7.5	21.6	55.8
(vi) Total Persons	27.8	8.5	20.0	56.3
(vii) Engaged				
(viii) Wages to Workers	38.2	9.2	17.4	64.9
(ix) Total Emoluments	40.3	12.2	13.4	65.9
(x) Total Input	34.5	10.3	7.3	52.0
(xi) Total Output	35.3	10.9	7.2	53.4
(xii) Depreciation	34.1	15.8	11.2	61.1
(xiii) Net value added	39.5	12.8	6.3	58.6
(xiv) Rent paid	35.0	10.7	10.6	56.3
(xv) Interest paid	33.2	13.2	13.0	59.4

Source: Annual Survey of Industries 2007-08.

6.35 In order to further ascertain the role of the trade channel in India's growth, firm-level export-orientation information was examined. The firm-level export orientation also demonstrates the growing importance of trade channels in the growth of India's manufacturing sector. An analysis of 1,500 companies from the CMIE database showed that the number of companies with exports-to-sales ratios of 20 per cent or above more than doubled between 1993-94 and 2007-08 (Table 6.15). Their

share in manufacturing exports also increased substantially during this period. This trend in firm-level export orientation was the outcome of the increasing internationalisation of Indian companies. On the back of an increased export orientation, the global shocks spilled over to firms in the manufacturing sector through declining external demand for their products from the third quarter of 2008-09.

Impact through Imports

6.36 Merchandise imports also caught the global downswings in the second half of 2008-09, offsetting some of the adverse impact of contracting exports. The growth in India's imports plunged sharply during the third quarter of 2008-09, and subsequently contracted from the last quarter of 2008-09 to 2009-10 (April-October). A massive weakening of imports was witnessed in the case of crude oil, capital goods, and gold and silver (Table 6.16).

6.37 There have been a number of subtle compositional shifts in imports within the broad aggregation during the past decade that need to be recognised. For instance, within petroleum imports, there has been a shift from petroleum products to crude oil, following the large-scale increase in refinery capacity within the country. Further, since 2001-02, India has transformed

Table 6.15: Firm-level Export Orientation

Classification	1993-94	1998-99	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1	2	3	4	5	6	7	8	9
Exports-Sales Ratio (per cent)			Distribution of the Number of Companies					
>=75	56	71	77	75	81	61	76	71
>=50	75	126	158	160	168	159	169	179
>=35	94	175	219	242	241	249	272	261
>=20	145	269	346	357	382	388	409	417
>=10	249	398	499	533	542	555	566	566
Exports-Sales Ratio (per cent)			Percentage to Total Exports of Manufacturing Sector					
>=75	12.5	15.0	13.0	12.6	11.5	10.2	10.4	13.1
>=50	15.6	24.4	28.1	26.9	24.7	24.6	22.5	51.6
>=35	23.2	34.0	36.5	40.8	38.2	42.0	68.8	61.1
>=20	34.3	50.6	68.0	68.2	74.4	73.3	76.0	77.8
>=10	62.1	70.6	84.4	82.8	85.5	84.2	83.1	83.7

Source: Prowess data for 1,497 companies, CMIE.

Table 6.16: Global Crisis and India's Imports

Commodity Group	US$ billion			Growth (%)			
	2006-07	2007-08	2008-09	2007-08	2008-09	April-October	
						2009-10	2008-09
1	2	3	4	5	6	7	8
1. Bulk Imports	**84.2**	**112.7**	**135.7**	**33.8**	**20.3**	**-35.6**	**70.6**
(i) Petroleum and Petroleum Products	56.9	79.6	91.3	39.9	14.6	-35.0	71.6
(ii) Bulk Consumption Goods	4.3	4.6	4.9	7.1	6.2	68.0	3.8
Edible Oil	2.1	2.6	3.4	21.4	34.4	54.9	12.6
(iii) Other Bulk Items	23.0	28.5	39.5	23.9	38.6	-46.2	78.5
Fertilisers	3.1	5.4	13.6	71.9	151.2	-60.4	245.0
Iron & Steel	6.4	8.7	9.4	35.2	7.8	-26.8	19.4
2. Non-Bulk Imports	**101.5**	**138.7**	**155.8**	**36.6**	**12.3**	**-22.7**	**33.7**
(i) Capital Goods	47.1	70.1	70.5	49.0	0.6	-24.1	46.2
Machinery except Electrical & Electronics	13.9	19.9	20.9	43.4	5.3	-21.9	37.5
Electronic Goods incl. Computer Software	16.9	21.1	24.4	24.6	15.7	-12.5	22.4
Transport Equipment	9.4	20.1	13.0	113.1	-35.2	-56.7	133.4
(ii) Mainly Export-Related Items	17.9	20.8	29.7	16.2	43.1	-31.1	75.6
Pearls, Precious & Semi-Precious Stones	7.5	8.0	14.4	6.5	81.1	-39.1	112.1
Chemicals, Organic & Inorganic	7.8	9.9	12.2	26.4	22.8	-25.0	56.1
(iii) Others	36.6	47.8	55.5	30.8	16.1	-16.4	8.8
Gold & Silver	14.6	17.9	18.7	22.0	4.6	-16.3	31.8
Total Imports	**185.7**	**251.4**	**291.5**	**35.4**	**15.9**	**-29.0**	**49.5**
Memo Item							
Non-Oil Imports	128.8	171.8	200.2	33.4	16.5	-25.9	40.3
Non-Oil Imports excl. Gold & Silver	114.1	153.9	181.5	34.9	17.9	-27.2	41.6

Source : Directorate General of Commercial Intelligence and Statistics (DGCI&S).

itself from a net importer of petroleum products to a net exporter of the same. Another significant development during the 1990s has been the channelising of gold imports through official routes (Table 6.17). Since 1997 when banks were allowed to import gold, the import of gold through

Table 6.17: Commodity Composition of India's Imports

(share in per cent)

Commodities	1987-91	1992-96	1997-2003	2004-08	2006-07	2007-08	2008-09
1	2	3	4	5	6	7	8
I. Bulk Imports	**38.3**	**40.9**	**37.4**	**40.3**	**45.5**	**44.8**	**47.8**
Petroleum, Crude and Products	18.6	23.9	23.7	28.4	30.8	31.6	32.9
Bulk Consumption Goods	3.7	2.7	4.2	3.0	2.3	1.8	1.6
Edible Oils	1.7	1.0	3.0	2.2	1.1	1.0	1.2
Other Bulk Items	15.9	14.3	9.5	9.0	12.4	11.3	13.2
Fertilisers	3.6	3.7	2.2	1.3	1.7	2.1	4.9
II. Non-Bulk Imports	**53.1**	**59.1**	**62.6**	**59.7**	**54.5**	**55.1**	**52.2**
Capital Goods	22.9	25.5	20.5	23.7	25.3	28.1	21.3
Export-Related Items	16.0	16.6	16.8	14.1	9.6	8.3	9.9
Pearls, Precious and Semi-Precious Stones	9.5	8.3	9.3	7.5	4.0	3.2	4.7
Organic and Inorganic Chemicals	5.4	6.7	5.9	4.8	4.2	3.9	4.2
Others	14.2	17.0	25.4	21.9	19.6	18.7	21.0
Gold and Silver			9.4	8.2	7.9	7.1	6.6
III. Total Imports/All Commodities	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Non-oil Imports	81.4	76.1	76.3	71.6	69.2	68.4	67.1
Industrial Inputs	73.5	67.3	59.2	58.0	56.3	56.4	53.1

Source: Directorate General of Commercial Intelligence and Statistics (DGCI&S).

Table 6.18: Geographical Diversification of India's Imports

(Per cent share in total)

Region/Country	1987-90	1990-95	1995-00	2000-05	2005-08	2007-08	2008-09
1	2	3	4	5	6	7	8
1. Advanced Economies	**60.3**	**55.0**	**49.6**	**38.3**	**34.3**	**35.4**	**31.8**
(i) EU	**32.8**	**28.7**	**25.7**	**19.4**	**15.6**	**15.3**	**14.3**
UK	8.4	6.3	5.6	4.6	2.2	2.0	2.0
Germany	8.8	7.8	6.1	3.7	4.0	3.9	4.0
Other EU	15.7	14.6	13.9	11.1	9.4	9.4	8.3
(ii) US	10.8	10.8	8.9	6.4	6.8	8.4	6.2
(iii) Other OECD	16.6	15.5	15.0	12.5	11.9	11.8	11.3
2. OPEC	**13.6**	**20.3**	**22.7**	**6.6**	**25.3**	**30.7**	**32.6**
(i) Saudi Arabia	4.7	6.6	5.8	1.0	5.7	7.7	6.7
(ii) UAE	3.5	5.1	4.4	2.3	5.0	5.4	7.1
(iii) Other OPEC	5.4	8.5	12.5	3.3	14.6	17.7	18.8
3. Eastern Europe	**8.3**	**4.3**	**2.8**	**1.9**	**2.1**	**1.5**	**2.3**
4. Developing Countries	**17.8**	**20.5**	**24.8**	**24.9**	**30.4**	**31.5**	**32.9**
(i) Asia	12.7	15.3	18.4	18.8	24.5	25.5	26.6
China	0.5	1.0	2.4	4.6	9.6	10.8	10.8
Hong Kong	0.6	0.8	1.1	1.6	1.5	1.1	2.2
Other Asian Countries	11.6	13.6	14.9	12.6	13.4	13.7	13.7
(ii) Africa	3.0	3.3	4.8	4.4	3.7	3.7	4.3
(iii) Latin America	2.1	1.9	1.6	1.7	2.2	2.3	2.0
5. Others	**0.0**	**0.0**	**0.0**	**28.2**	**7.9**	**0.8**	**0.5**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Directorate General of Commercial Intelligence and Statistics (DGCI&S).
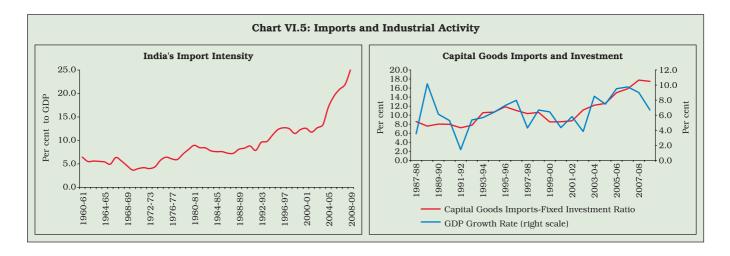
passenger baggage has declined significantly. Industries that have shown the least import propensity since the 1990s and, thereby have gradually been phased out of the import commodity basket, were mainly in the medium-to low-technology, labour-intensive sectors. Similarly, industries with the highest growth rate of imports in the past decade have been largely those with a medium- to high-technology content that produced intermediary products needed for exports.

6.38   Since the opening up of the Indian economy, imports are increasingly sourced from a wider range of countries. Traditional key trading partners like Germany, Japan, UK, and US have subsided in terms of their market share and new import partners from East Asia (especially China) have emerged (Table 6.18). Another important development has been a gradual dissipation of the East European countries as a major source of India's imports. The high share of OPEC countries in the recent period reflects the magnitude of crude oil imports due to the rising oil-intensity of the Indian economy and high oil prices. Finally, imports from China have increased significantly during recent years from almost minuscule level in the early 1990s.

6.39   Imports, especially those of capital goods, are often considered a leading indicator of industrial activity and the near-term investment climate (Chart VI.5). A sizeable portion of imports gets channelised as inputs for industrial production. A definite relationship between imports and industrial production, however, may be difficult to establish as imported commodities could be either complements or substitutes to domestic industry. As a result, an empirical test of these relations remains largely country-specific. In the Indian case, however, non-oil imports, thus far, have been mostly in the form of capital goods, raw materials and intermediate goods, which complement industrial production.

6.40   An analysis of import elasticity of output in India suggests that imports have grown at a much

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Chart VI.5: Imports and Industrial Activity

faster rate with respect to GDP in the 1990s compared to the 1980s, which is consistent with the liberalisation of external trade. The vital importance of imports for the producing sector was evident from the firm-level evidence. According to the CMIE database, the top 100 importing companies accounted for about half of the manufacturing exports in the late 1990s. By 2008, these companies accounted for 80 per cent of manufacturing exports. The import intensity of these firms, as percentage to sales, almost doubled during 1999 to 2008 (Table 6.19).
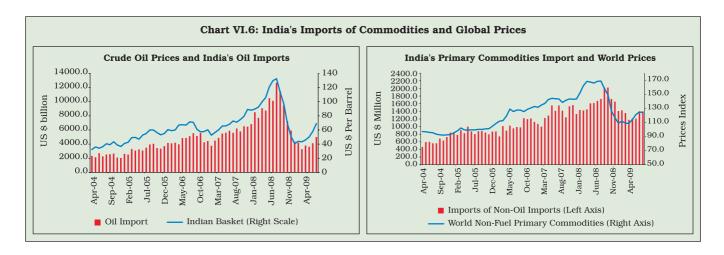
Impact through Commodity Price Channel

6.41   Another component of the trade channel transmission is global commodities prices, which, *inter alia*, affects imports and cost of production. Before the unfolding of the recent crisis, global prices of commodities such as crude oil and primary commodities surged significantly due to soaring demand and supply-side constraints and strained the balance of payments of the importing countries across the world. The crude oil prices of the Indian basket peaked at US$ 147 per barrel in July 2008. The significant hardening of global commodity prices, especially crude oil, generated inflationary pressures. The global crisis, however, drastically reduced the demand for these commodities globally and their prices fell sharply, easing the inflationary pressure significantly in the second half of 2008-09.

6.42   The impact of change in prices on value of imports depends on price elasticity of imports and the extent of trade openness. For instance, if merchandise imports are highly price elastic and trade is fairly open, then declining global commodity prices may lead to a rise in imports. The effect of global commodity prices, however, on the cost of production remains unambiguous. In India, oil

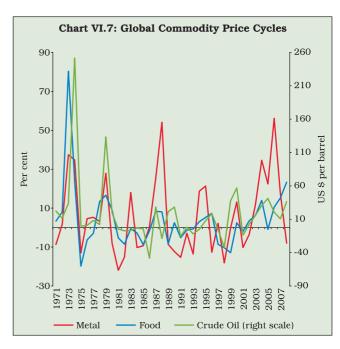**Table 6.19: Import Intensity of Production: Firm-Level Evidence**

Per cent

	1999	2003	2004	2005	2006	2007	2008
1	2	3	4	5	6	7	8
Companies	Share in Industry (manufacturing) Total Exports						
Top 50	32.4	54.1	56.0	60.6	65.3	70.0	70.8
Top 100	46.2	65.9	67.7	72.2	76.0	78.9	80.0
Top 200	62.0	76.7	78.3	82.0	85.6	87.5	88.8
Top 300	70.2	83.4	85.3	88.0	90.7	92.2	93.3
Top 500	81.8	91.1	91.7	93.5	95.1	96.5	97.4
Total	100	100	100	100	100	100	100
	Share in Industry (manufacturing) Total Imports						
Top 50	57.2	76.0	74.7	74.3	76.6	76.7	77.2
Top 100	63.2	80.4	79.2	79.0	81.0	81.0	81.4
Top 200	68.7	83.7	82.8	82.8	84.0	84.3	84.7
Top 300	71.7	85.7	84.9	85.0	86.0	86.4	86.9
Top 500	78.3	89.0	88.8	88.6	89.4	89.9	90.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Imports Intensity (Imports as percentage to Sales)						
Top 50	19.0	27.6	27.3	31.0	37.8	36.3	39.2
Top 100	18.3	26.1	25.9	29.3	35.7	34.3	36.9
Top 200	17.5	24.4	24.2	27.4	33.2	32.1	34.5
Top 300	16.9	23.6	23.4	26.6	32.3	31.3	33.5
Top 500	16.3	22.4	22.4	25.5	31.1	30.1	32.1
Total	**15.6**	**20.3**	**20.6**	**23.6**	**28.6**	**27.7**	**29.4**

Source: Prowess data, CMIE.

Chart VI.6: India's Imports of Commodities and Global Prices

Crude Oil Prices and India's Oil Imports

■ Oil Import — Indian Basket (Right Scale)

India's Primary Commodities Import and World Prices

■ Imports of Non-Oil Imports (Left Axis)
— World Non-Fuel Primary Commodities (Right Axis)

imports, which constitute a large part of total imports, are critical input for real activities. Oil imports in India are relatively price inelastic and, hence, are highly correlated with their prices. Accordingly, oil imports fell sharply in India during the second half of 2008-09, reflecting declining crude oil prices (Chart VI.6). Imports of non-oil primary commodities are also fairly correlated with their prices as manifested by the declining value of non-oil imports when prices of non-oil primary commodities were declining (Chart VI.6).

6.43   Commodity price cycles have played an important role in conditioning business cycles in the global economy. The recent global commodity price cycle that set off in 2002 reached another peak in mid-2008, which had associated implications for asset prices, investment, trade balances and growth across countries (Chart VI.7). According to the commodity price index data of the IMF and the World Bank, all commodities price indices witnessed an average 18.4 per cent increase during 2003-07 compared with a deceleration, *albeit* marginally, during the 1990s, spurred by metals, energy, and food commodities. The World Bank's commodity price index of low- and middle-income countries has also shown a sharp acceleration during the current decade compared with deflation trends in the 1980s and the 1990s. Food price inflation was the highest since the late 1970s, whereas prices of metals and non-fuel commodities were the highest since the late 1980s. This has been driven by the relatively

strong and stable performance of the world economy, rapid growth and structural changes in a number of large developing economies and increasing attention by policymakers and market participants to the challenges of climate change and shrinking oil reserves (UNCTAD, 2008). Furthermore, the commodity price cycle was relatively more prolonged compared to earlier cycles, led by the sustained expansionary phase of the business cycle (Box VI.5).

6.44   For commodity price importers, the implications of the commodity prices shocks could be distinctly different. An expansionary phase of commodity price cycles could work through

Chart VI.7: Global Commodity Price Cycles

— Metal — Food — Crude Oil (right scale)

Box VI.5
Affect of Commodity Prices on Asset Prices, Investment, Trade and Economic Activity

The overall impact of commodity price movements on economies differs considerably, depending on the composition of foreign trade, the relative weight of commodity exports and imports in their gross national income and price responsiveness. Higher prices of primary commodities for commodity-exporting countries have a favourable impact through improved export earnings. This, in turn, augments the potential for financing new investments in infrastructure and productive capacities that spurs domestic productive activities, consumption and employment. However, the impact of commodity price booms on domestic activity would also depend on the allocation of export surpluses for domestic consumption versus investment. The diversion of export surplus arising from commodity price booms could help in inter-temporal distribution of incomes and consumption smoothing. Notwithstanding the beneficial effects of the expansion in the commodity price cycle, a sudden rise in price cycles and its persistence can cause Dutch disease, which, through sharp appreciation in the real exchange rate, can result in diminishing competitiveness of the non-tradable sectors.

various channels. First, commodity price shocks could directly affect domestic prices given the degree of pass-through and exchange rate movements. Further, given that primary commodities such as oil and metals enter as inputs for manufacturing and transportation, the rise in import prices has a second-round effect on the domestic prices of manufactured goods and higher transportation costs. Second, a rise in global commodity prices would adversely affect the trade balance of the importing countries. Particularly, in the case of oil, where the demand is relatively less price elastic, price shocks could lead to wider current account deficit (CAD). At the same time, given the competitive pressures in exports of manufactured products, a rise in primary commodity prices could adversely affect the input cost and, hence, export competitiveness. Third, the indirect effect of the commodity price could be higher inflationary expectations, which in turn could push up nominal interest rates in the economy. Further, a rise in commodity price-induced inflation could create more volatility in domestic prices and, hence, bring in more uncertainty about the investment climate, which could adversely affect the investment decisions of corporates and firms.

6.45   During the recent phase of commodity cycles between 2000 and 2007, the greatest improvement in the terms of trade occurred in developing and transition economies that are exporters of crude oil and minerals. The developing countries that have emerged as important exporters of labour-intensive manufactures and are net oil importers, however, experienced a significant deterioration in their terms of trade. The pass-through of international oil prices to export prices of industrial countries and emerging market economies, as evident from the Granger causal relationship arising from the vector auto-regression model, provided crucial insights about underlying global trade in inflation across the countries. For industrial countries, export price inflation was caused by oil price inflation, but for emerging market economies it was caused by both oil price inflation as well as the export price inflation of advanced countries. This implied that in the absence of an administered price mechanism, industrial countries were in a position to pass on some of the burden of the oil price impact through higher prices of goods exported to emerging market economies. The latter, however, were not in a position to trade in inflation to industrial countries. Further, the interaction between the prices of tradable and non-tradable commodities was evident from the causal relationship among export prices, import prices and domestic consumer prices inflation for industrial and emerging market economies. For industrial countries, the prices of tradable items had a significant causal association with domestic consumer prices; in the case of emerging market economies, the prices of exports rather than imports had a significant causal relationship with domestic prices (Table 6.20).

Table 6.20: Pass-through of International Oil Prices to Export Prices of Developed and Emerging Market Economies: Granger Causal Analysis

Null Hypothesis: X does not Cause Y	Chi-square statistic	Accept/ Reject
1	2	3
(i) Oil prices do not Granger Cause export prices of Industrial countries	30.66 (0.00)	Reject
(ii) Export prices of emerging countries do not Granger Cause export prices of Industrial countries	15.26 (0.23)	Accept
(iii) Oil prices do not Granger Cause export prices of Emerging market countries	43.23 (0.00)	Reject
(iv) Export prices of Industrial countries do not Granger Cause export prices of Emerging market countries	41.67 (0.00)	Reject
(v) Export prices of Industrial countries do not Granger Cause Oil prices	21.75 (0.04)	Reject
(vi) Export prices of Emerging countries do not Granger Cause Oil prices	25.70 (0.01)	Reject

6.46   The pass-through of global to domestic prices in India takes place in two stages. First, the export prices of trading partners at global and regional levels percolate to import prices of India. Second, changes in import prices affect costs of production and domestic supply of goods and services, thus, affecting aggregate domestic inflation measured by producers' prices, which in India relates to wholesale prices. In the Indian context, the most direct impact of the global commodity cycle on the economy comes through the prices of primary commodities.

6.47   The aggregate import price inflation in terms of domestic currency in the 2000s softened significantly compared with the trends in the decades of the 1960s through the 1990s. Second, it is interesting to gauge the foreign prices of India's imports (prices of imports in foreign currency such as the US dollar), since the import price in the domestic currency is affected by the exchange rate. The latter reveals that except for the decade of the 1970s when there was an oil price shock, India's import price inflation in US dollar terms remained subdued through the 1950s to the 1990s. In the current decade so far, however, such a measure of import price inflation averaged 5.2 per cent, in contrast to a declining trend in the 1990s and the subdued trend in the 1980s.

Table 6.21: Correlation of India's Import Prices with Global and Regional Export Prices

	India	EMEs	Industrial Countries	Oil-Producing Countries	World
1	2	3	4	5	6
India	1.00				
Emerging	0.68	1.00			
Industrial	0.63	0.71	1.00		
Oil	0.72	0.84	0.57	1.00	
World	0.70	0.86	0.97	0.72	1.00

6.48   The correlation of India's import price inflation in US dollar terms with export price inflation at global and regional levels for industrial, developing and oil-exporting countries based on annual data reveals that export price inflation of oil economies has a greater correlation with India's import price (Table 6.21). This suggests that the oil price shocks are the most significant external shocks for price stability in India.

6.49   The correlation of India's import prices in domestic currency with domestic prices suggests that the import price index has a near-perfect correlation with the domestic price index (Table 6.22). Since such a correlation could be exaggerated due to trend components in the variables, it is appropriate to consider the correlation of inflation rates. The import price inflation also has a significant correlation with domestic inflation.

6.50   One key channel for transmission of global commodity price shocks to India is oil imports. The rising share of oil imports is attributable to the sharp

Table 6.22: Correlation of India's Import Price Index with Domestic Prices (WPI)

Variables	Correlation of Import Price Index with Domestic Price Index 1950-2008	Correlation of Import Price Inflation with Domestic Inflation Rates 1950-2008
1	2	3
WPI	0.99	0.61
Domestic fuel price	0.99	0.62
Domestic manufactured price	0.99	0.56
Exchange rate	0.96	0.19

Table 6.23: Oil Imports Volume Growth

(Per cent)

Year	Domestic Consumption Growth	Oil Imports (Gross) Volume Growth	Oil Imports (net) Volume Growth
1	2	3	4
1997-98	6.5		
1998-99	7.4	10.6	14.1
1999-00	7.2	17.0	17.2
2000-01	3.1	12.0	1.8
2001-02	0.4	2.8	0.8
2002-03	3.7	4.1	4.4
2003-04	3.5	10.3	6.2
2004-05	3.6	6.4	3.2
2005-06	1.4	7.8	3.4
2006-07	6.7	14.5	6.9
2007-08	6.8	11.6	8.2
2008-09	3.6	1.6	6.0
2009-10	3.4	–	–
1997-98 to 2008-09	4.5	9.0	6.6
2000-01 to 2008-09	3.6	7.9	4.5

Note : In gross terms, total oil imports in volume include imports of crude oil and finished petroleum products. In net terms, oil import volume growth pertains to total oil imports in volume less exports of oil in volume.

Source : Petroleum Planning Analysis Cell (PPAC), Ministry of Petroleum and Natural Gas, GOI.

increase in international crude oil prices and volume growth of oil imports. According to the Petroleum Planning Analysis Cell (PPAC), Ministry of Petroleum & Natural Gas, Government of India, oil imports in volume terms grew on an average of 7.9 per cent per annum during 2000-01 to 2008-09. In quantity terms, growth in domestic consumption of petroleum products in India remained subdued at 3.6 per cent during the same period (Table 6.23).

These stylised facts about oil consumption demand and the import intensity of oil consumption amply reveal that major price shocks in India have been significantly caused by global oil price shocks (Chart VI.8). In 2008-09 also, the price shocks mainly emanated from international crude oil prices.

6.51   Another important channel of price shocks, particularly during recent years, has been volatile movements in international food prices. The rise in international food prices has been transmitted in varying degrees from international to local markets (IFPRI, 2008). This varied transmission of price changes from international to domestic markets is attributed to import dependence, exchange rate behaviour, domestic policies and discretionary market segmentation, transportation costs and natural market segmentation and imperfect transmission related to market structure and the existence of monopolistic/monopsonistic power. Depending upon the weight of food prices in the price index, the impact on the overall inflation has also varied across countries.

6.52   There has been a secular decline in India's dependence on food imports in general over the decades as reflected by the declining share of food imports in total imports over the years (Table 6.24). During the 2000s, though India's food imports in the total import basket declined in significance, the global integration of food prices through rapid financialisation of commodity markets resulted in an increase in the correlation in domestic and world food price inflation to 0.57. In fact, the global
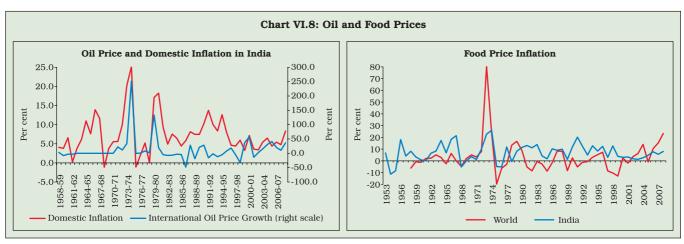

Chart VI.8: Oil and Food Prices

Table 6.24: India's Imports and Exports of Food

Period	Food Imports (per cent to total imports)	Food Exports (per cent to total exports)
1	2	3
1960s	34.3	23.2
1970s	31.7	18.3
1980s	23.5	8.3
1990s	16.8	5.0
2000s	10.8	4.8

Source: World Bank, UNCTAD.

commodity cycle of the 2000s reveals that the expansionary phase in food prices in India closely followed the movements in the global commodity price cycles. The commodity-wise analysis of the correlation coefficient between domestic and international prices reveals that during the period 1995-2008, domestic edible oil prices had the strongest positive correlation with international prices, reflecting the import dependency since a large part of India's consumption needs are met through imports (over 30 per cent) (Rajmal and Misra, 2009). Domestic prices of both food articles and edible oils have started moving in tandem with international prices, particularly during the latter half, *i.e.*, the period 2002-2008, as trade in agricultural commodities has increased.

6.53   The domestic supply and demand balance also condition the transmission of international price shocks to domestic prices. Demand significantly outstripped domestic supply in the case of edible oils and the deficit is met through imports (Table 6.25). The production of pulses has also

Table 6.25: India's Dependence on Imports for Consumption Requirements

Period	Percentage share of imports in total consumption			
	Wheat	Pulses	Sugar	Edible Oils
1	2	3	4	5
2001-02	-3.7	13.3	-0.5	41.7
2002-03	-6.8	14.2	-0.6	47.9
2003-04	-6.4	9.5	-0.5	42.9
2004-05	-3	7.5	0.3	38.9
2005-06	-1.1	8.5	0.1	34.1
2006-07	7.4	12.5	-0.5	33.5
2007-08	2.2	14.8	-1.4	31.1

Source: Ministry of Agriculture, Government of India.

lagged behind demand, resulting in dependence on imports to the extent of more than 10 per cent. The complete pass-through of global food price shocks on domestic prices would be ultimately conditioned by trade policy interventions in terms of import quotas and licensing, custom duties and domestic fiscal measures. The sustained movement of international food prices, however, would impact domestic prices despite short-run stability.

6.54   Empirical findings suggest that global factors (import prices, capital flows, and movements in exchange rate) are able to explain about 20 to 30 per cent of the variation in domestic inflation in India (Raj, Jain and Dhal, 2009). In the long run, import prices, capital flows and exchange rates could have a significant positive association with domestic inflation. The interest rate variable has a negative association with domestic prices in the long run, though its statistical significance is not as strong as other variables. The impact of capital flows on domestic prices could be more pronounced than import prices and exchange rates as capital flows affect the latter.

Impact through Trade in Services & Remittances

6.55   The trade channel also transmits the effects of global developments through services export demand. The tradability of India's services sector has witnessed a significant increase, with the services exports to GDP ratio rising about five-fold from 3.2 per cent in 1990-91 to 15.1 per cent in 2008-09. In services exports, India was among the first ten countries in the world during 2008 (Table 6.26). Among EMEs, the ranking of India was higher, at second place after China, in terms of services exports.

6.56   A large part of the services exports (about 46 per cent) are in the nature of Business Process Outsourcing (BPOs) and Information Technology-enabled Services (ITES), which are driven by the explosion in information technology and are employment-intensive with an estimated direct employment of about 2 million. Since about 80 per cent of the total demand for software exports

Table 6.26: Comparative Position of India among Top Service Exporters, 2008

Country	Exports (US$ bn)	Share (%)
1	2	3
1. USA	545.6	15.3
2. UK	286.9	8.1
3. Germany	246.7	6.9
4. France	161.8	4.5
5. Japan	148.8	4.2
6. China	147.1	4.1
7. Spain	143.6	4.0
8. Italy	123.5	3.5
9. Netherlands	104.5	2.9
10. **India**	**103.0**	**2.9**
11. Ireland	99.29	2.8
12. Hong Kong	92.3	2.6
13. Belgium	88.99	2.5

Note : Share is calculated based on adding services exports available for all countries in the BOPSY, October, 2009. However, the actual share may be slightly different from the calculated share presented here.

Source : BOPSY, IMF, October 2009.

originates in the US and the UK, a sharp contraction in these economies had an adverse impact on demand for software exports. A contraction in demand for software services adversely affected output and employment growth and, thus, reduced the consumption demand of the workforce dependent on this sector.

6.57 Exports and imports of services linked to merchandise trade have also been affected by the contraction in merchandise trade in India since the second half of 2008-09. The compression in merchandise exports since the second half of 2008-09 impacted the exports of related services such as transportation, insurance, and financial, which is discernible from the synchronised movements among merchandise exports and the exports of these services. Similarly, imports of trade-related services were adversely affected by falling merchandise imports as evident from their co-movements over the years, including the recent crisis period (Chart VI.9).

6.58 Although services exports across the board in India were adversely affected by the recent global crisis, miscellaneous services exports, primarily led by software exports, displayed relative resilience, as manifested by decelerated positive growth, whereas all other sub-groups contracted since the second half of 2008-09. Exports of insurance services recorded the highest decline followed by travel and transportation during this period. In the case of services imports, insurance services exhibited relative resilience, reflected in their positive growth, while the import of other services recorded precipitous contraction during the second half of 2008-09. Among the imports of various services, miscellaneous services, largely driven by business services, declined the most, followed by travel and transportation services (Table 6.27).

6.59 Travel services, which include earnings through foreign tourists in sectors such as food, hotels and transportation, are directly related to the
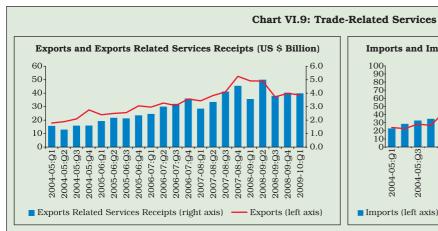

Chart VI.9: Trade-Related Services

Table 6.27: Growth in Services Exports and Imports (US$)

(per cent)

Category	2000-2001	2001-2002	2002-2005	2005-2008	2008-2009: H1	2008-2009: H2	2009-2010: H1
1	2	3	4	5	6	7	8
Exports							
Services	3.6	5.4	37.2	27.8	28.9	-0.5	-18.5
Travel	15.2	-10.3	30.0	19.5	22.0	-20.1	-8.8
Transportation	19.9	5.6	29.9	28.9	37.9	-8.0	-10.6
Insurance	16.9	6.7	49.8	23.9	0.4	-25.2	6.1
Misc.	-3.4	12.6	41.9	29.8	29.4	5.0	-21.5
Imports							
Services	25.2	-5.2	29.3	23.6	17.3	-15.5	-4.9
Travel	31.1	7.5	21.5	21.9	23.1	-13.9	-9.8
Transportation	47.6	-2.6	20.2	41.1	39.1	-11.3	-29.4
Insurance	82.8	25.6	42.5	24.9	13.9	3.8	22.9
Misc.	14.4	-11.7	38.3	23.9	6.6	-20.6	8.7

H1: April-September; H2: October-March.
Source: Reserve Bank of India.

arrivals of foreign tourists in India and affect domestic consumption demand. The growth in foreign tourist arrivals in India decelerated to (-) 4.0 per cent in 2008 from 14.3 per cent in 2007 (Table 6.28). In fact, during second half of 2008-09, the peak of the global financial crisis, the growth of the trade, hotel, transport & communications sector decelerated from 12.5 per cent to 6.1 per

Table 6.28: India's Foreign Exchange Earnings from Tourism Sector

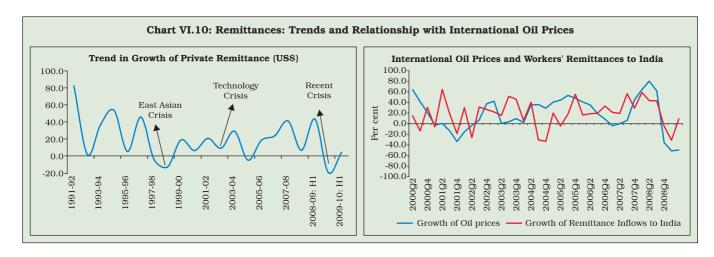| Period	Foreign Tourist Arrivals (Percentage Growth)			Foreign Exchange Earnings (US$ billion)		
1	2	3	4	5	6	7
Month	2007	2008	2009	2007	2008	2009
January	16.6	4.5	-17.6	1.1	1.4	0.9
February	14.3	21.9	-10.6	1.0	1.3	0.9
March	20.8	1.5	-12.9	0.9	1.2	0.9
April	13.4	3.0	-3.5	0.8	0.9	0.8
May	8.6	9.9	-1.9	0.6	0.7	0.7
June	11.5	10.0	0.2	0.7	0.8	0.8
July	18.5	8.0	0.6	0.8	0.9	1.0
August	17.8	6.9	-8.6	0.8	0.8	0.9
September	1.3	13.2	-4.1	0.6	0.7	0.8
October	13.6	1.2	-0.9	1.0	0.9	1.0
November	20.3	-0.1	-0.6	1.1	1.0	1.2
December	10.2	-10.5	21.0	1.3	1.0	1.5
Full Period	14.3	4.0	-3.3	9.4	10.7	11.4

*: Growth rate is for the period January-October 2009.
Source: Ministry of Tourism.

cent, which to some extent seems to have been due to the slowdown in external demand from travel and tourism.

Remittances

6.60   Yet another channel of transmission of global shocks to the real economy in India could be partly through the remittance channel. In the recent past, a subtle shift has been noticed in the geographical sources of inward remittances to India with a significant increase from Gulf region, Europe and Africa a decline from North America and East Asia. However, the two important sources of origin of remittances are the US and the oil-producing Gulf countries. These two regions are estimated to contribute about two-third of India's workers' remittance inflows. While the remittance inflows from the US are affected by economic activity in the US, those from the Gulf countries are conditioned by the pace of activity reflected in oil revenues. During the recent crisis, while remittances from the US could have been affected by the sharp contraction in real activity and unemployment among migrants, the adverse effect of the global crisis on remittances from the Gulf countries seems to have worked through a decline in oil prices, which in turn could have affected migrant employment in the construction and services sectors in the Gulf region. Oil prices and remittances witnessed synchronised movement during the recent period, including the crisis, which corroborates the negative impact of oil price-induced reduction in remittance inflows to India (Chart VI.10). A reduction in remittance inflows, particularly low-value remittances, directly affects the disposable incomes of the dependent households and, hence, affects their propensity to spend. Given that a large part of remittance inflows to India are for family maintenance (above 50 per cent of total remittance inflows to India), negative growth in inflows following the global shock might have adversely affected the consumption demand of the dependent households.

6.61   Accordingly, private remittances to India from advanced countries and the Gulf region, which

Chart VI.10: Remittances: Trends and Relationship with International Oil Prices

remained buoyant till the first half of 2008-09, suffered setback and decelerated in the second half of 2008-09. In fact, the growth in private remittances plunged from 46.3 per cent in the first half of 2008-09 to (-) 19.4 per cent during the second half but recovered to 4.3 per cent in the first half of 2009-10. During previous international crises, *viz.*, the East Asian crisis (1997 and 1998) and the technology crisis (2000 and 2001) also, private remittances to India behaved in tune with global economic dynamics and decelerated sharply.

Software Exports

6.62   India continued to remain the top software services exporter, followed by Ireland (Table 6.29).

Table 6.29: Software Services Export

(US$ billion)

Country	2000	2004	2005	2006	2007	2008
1	2	3	4	5	6	7
1. India	**4.7**	**16.3**	**21.9**	**29.1**	**37.5**	**49.4**
2. Ireland	7.5	18.8	19.6	21.0	26.1	34.5
3. Germany	3.8	8.1	8.4	9.9	12.6	15.1
4. United Kingdom	4.3	11.3	10.8	12.6	14.2	12.9
5. United States	5.6	6.7	7.3	10.1	11.6	12.6
6. Sweden	1.2	2.5	2.7	3.6	6.5	7.6
7. Israel	4.2	4.4	4.5	5.3	5.8	6.9
8. Netherlands	1.2	3.7	3.7	5.0	6.4	6.6
9. China	0.4	1.6	1.8	3.0	4.3	6.3
10. Spain	2.0	3.0	3.6	4.0	5.4	6.1
11. Canada	2.4	3.0	3.6	4.3	4.6	4.6
12. Belgium	....	2.4	2.6	2.9	3.0	3.7

Source: BOPSY, IMF, October 2009.

Since global banks and financial institutions, which were severely hit by the current global financial crisis, were large customers of Indian software providers, the impact of the global crisis seems to have been deceleration in exports to such verticals.

6.63   Although India's software exports remained strong over the years, the slowdown in global demand due to the crisis affected the export performance of software companies to some extent (Table 6.30). After remaining steady till the first half

Table 6.30: Software Services Exports of India

(US$ billion)

Year	IT Services Exports	Engineering Services	ITES-BPO Exports	Total Software Services Exports
1	2	3	4	5
1995-96	0.8	–	–	0.8
2000-01	5.3	–	0.9	6.2
2001-02	6.2	–	1.5	7.6
2002-03	7.0	–	2.5	9.5
2003-04	7.3	2.5	3.1	12.9
2004-05	10.0	3.1	4.6	17.7
2005-06	13.3	4.0	6.3	23.6
2006-07	17.8	4.9	8.4	31.1
2007-08	23.1	6.4	10.9	40.4
2008-09	26.5	7.1	12.7	46.3

ITES: IT-enabled services. BPO: Business Process Outsourcing.

Note : The break-up of engineering services exports is available from 2003-04 onwards; prior to that year, they were added to IT services.

Source : National Association of Software and Service Companies (NASSCOM).

of 2008-09, despite mounting pressures on the back of the global financial shock they succumbed to the falling external demand since the second half of 2008-09 and exhibited sharp deceleration in growth (Box VI.6).

6.64   To sum up, in view of India's exports being highly elastic to world income, the effect of contracting world income has been reflected in the overall decline in merchandise trade since the third quarter of 2008-09. Empirically, it was found that

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Box VI.6
Global Crisis and Impact on Software Exports

India's information technology and business process outsourcing (IT-BPO) industry has emerged over time as a key sector of the economy in terms of contribution to growth, export earnings, investment, employment and overall economic and social development. In view of the significant dependence of this sector on external demand, the current global recession emerged as a key concern for this sector. The current crisis led to mounting losses of financial institutions in advanced countries, mainly in the USA in 2008-09, which depend to a large extent on the information technology (IT) and IT-related services of Indian companies and also employ a large pool of Indians. It is amply discernible that growth in India's software exports was significantly correlated with the GDP growth of the USA during the recent period (Chart).

Further, the significance of the US' GDP growth on the growth of Indian software exports has been explored by estimating the co-integrating relationship between India's software exports, external demand conditions and exchange rate movements. The estimation reveals that over the medium to long run, a one per cent increase in the US real activity level (Log Y^{US}) leads to about a 4 per cent increase in India's software exports (Log X^{soft}). As regards the exchange rate, a one per cent depreciation in exchange rate (Log E^{RUSD}) would lead to about a 2 per cent increase in software exports over the long run (Table 1). It may be mentioned that the US dollar is the major currency of invoicing India's software exports, accounting for about 75 per cent of total
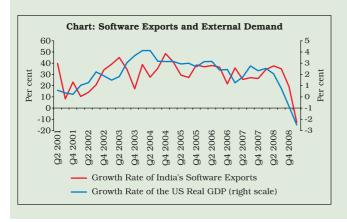
Table 1: Long-Run Co-integration Path of Software Exports to India

Variables	Coefficients
Log X^{soft}_{t-1} (Normalised)	1.000
Log Y^{US}_{t-1}	4.20 (3.28)
Log E^{RUSD}_{t-1}	2.26 (9.57)
Intercept	40.44

software exports. Thus, the co-integrating relationship underscores the dominance of real activity in the host country in determining the external demand for India's software exports.

The variance decomposition analysis reveals that the lagged values of software exports (Log Xsoft) predominantly explain the behaviour of India's software exports during the short run (Table 2). Real activity in the host country (Log Y^{US}) predominantly explains the behaviour of India's software exports over the medium to long run. The nominal exchange rate impact on India's software exports demand is also significant over the short to medium term, although its impact diminishes over time. This amply demonstrates that a large external demand shock adversely affected India's software exports.

Although India's software exports remained strong over the years, the slowdown in global demand did affect export performance to some extent, corroborating the significance of external demand shocks manifested by the estimated results.

Chart: Software Exports and External Demand

Table 2: Variance Decomposition of Software Exports

Quarter	Log X^{soft}	Log Y^{US}	Log E^{RUSD}
1	63.2	0.3	36.5
4	40.6	14.0	45.4
8	15.5	41.9	42.6
12	7.0	62.3	30.7
16	3.9	71.1	25.1
20	2.4	75.7	21.9

---

declining merchandise trade dented the overall growth of the Indian economy. It was observed that exports of engineering and chemical goods remained resilient during this crisis. The firm-level export orientation also demonstrates the growing importance of trade channels in the growth of India's manufacturing sector. On the one hand, contracting merchandise imports provided a cushion for the aggregate demand; on the other hand, declining non-oil imports negatively affected growth through investment on the back of the elevated import intensity of the industry. At the same time, the price shocks to the Indian economy were transmitted mainly through oil and food prices.

6.65   Overall, the spillover effects of the global economic crisis impacted the current account balance mainly through the merchandise trade route during 2008-09. The current account deficit as a percentage of GDP escalated to 2.4 per cent in 2008-09 on account of widened trade deficit on the back of worsening global conditions. After discussing the impact of the trade channel on the Indian economy, the spillovers effects through the financial channel are investigated in the following section.

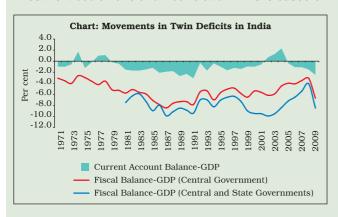## III. IMPACT ON INDIA THROUGH FINANCIAL CHANNEL

6.66   The finance channel has pronounced implications for domestic investment activity. In fact, it has been argued that the role of foreign savings has become inportant in the domestic investment in case of India during the post-reforms period (Box VI.7) The transmission of global shocks on investment demand in India could take place through a variety of conduits. These include major channels of capital flows such as FDI, portfolio inflows, external commercial borrowings, trade credit, and overseas borrowings of banks. Besides the interest rate channel, liquidity and credit risks may also impact domestic investment activity. The expectations channels, representing sudden changes in risk perception towards EME assets, uncertainty about the investment climate and sharp turnarounds in exchange rate movements also have an important bearing on domestic investment demand.

6.67   The global shocks propagated through the finance channel could have both a direct and indirect impact on consumption and investment. Such shocks could have affected domestic consumption in India in the following ways. First, a sharp correction in equity prices in response to global shocks eroded a large part of household wealth, which in turn may have adversely affected consumption demand as erosion in household wealth was associated with a sharp deceleration in private final consumption demand during 2008-09. Second, reduced access for banks and financial institutions to foreign markets reduced their lending capacity in the domestic market, including loans to households that, in turn, could have affected consumption demand. Third, contraction in trade finance might have impacted imports and, thus, domestic consumption. Fourth, higher credit spread on overseas borrowings increases the demand for bank credit, which, in turn, leads to a rationing of credit by banks. During the crisis, banks tended to reduce credit for consumption purposes as the risk perception changed significantly.

6.68   The growing financial openness in India was accompanied by a notable shift in the composition of capital flows following the reforms period. The gradual liberalisation of the capital account, the shift in emphasis from debt to non-debt flows, financial market development and stronger growth prospects helped India emerge as an increasingly important destination for foreign investment flows. Accordingly, foreign investment flows, comprising direct and portfolio equity flows, became the dominant source of capital flows in the reform period of the 1990s compared with debt and external assistance in the pre-reform period in the 1970s and the 1980s (Chart VI.11). Although the more recent period witnessed a revival of debt flows, unlike the 1970s and the 1980s when debt flows were largely from official sources, it was spurred by private debt flows reflecting the impact of capital account liberalisation in general and better terms of credit faced by corporates due to lenders' confidence in

Box VI.7
Foreign Savings and Investment in India

The shift in the composition of capital flows highlighted the role of foreign savings amidst the changing causal relationship between foreign and domestic savings. Till the 1980s, the current account deficit mainly mirrored the fiscal deficit of the government, but in the reforms period the twin deficits disappeared with the compression of fiscal deficit and financing almost entirely through domestic household savings (Chart). With a progressively open capital account, the current account gap now mainly reflects private sector absorption. Second, foreign savings are no longer planned; they now reflect the choice of market agents driven by push factors from the originating countries and pull factors in the host country. It is argued that investment need not be constrained by the availability of domestic savings, and that domestic savings and investment could have a low correlation. This is based on

the familiar permanent income hypothesis, which in an open economy translates into borrowing from international markets to smoothen consumption.

An empirical analysis of the savings-investment relationship for India based on the Granger Causal analysis between the domestic savings rate (S), domestic capital formation rate (I) and the current account balance-GDP ratio (CAB) provided useful insights. An important observation derived from the results is that in the pre-reform period (1951-1991), investment (ΔI) caused CAB, implying that typically under the strategy adopted for financing the saving-investment gap in the plans, the targeted investment rate dictated the rate of foreign savings (Singh, 2009). This unidirectional relationship was reversed in the reform period (1992-2007), with CAB Granger causing ΔI, implying that with an open current account and liberalisation of capital flows, foreign savings was also driving the investment rate as the former was determined by the decisions of market agents.

Chart: Movements in Twin Deficits in India

Legend:
- Current Account Balance-GDP
- Fiscal Balance-GDP (Central Government)
- Fiscal Balance-GDP (Central and State Governments)

Pair-wise Granger Causality Test

Null Hypothesis:	F-Statistic	Probability value
1951-1991		
ΔI does not Granger Cause CAB	8.44	0.00
CAB does not Granger Cause ΔI	2.01	0.15
1992-2007		
ΔI does not Granger Cause CAB	1.03	0.39
CAB does not Granger Cause ΔI	11.25	0.00

the growth of the Indian economy. A unique feature of capital flows to India was that even during the recent global crisis when other sources of funds dried up, FDI inflows remained steady, re-emphasising their long-run stability.

6.69 The important role of foreign investment inflows was evident from its share in domestic investment. The share of FDI flows in the net domestic capital formation increased significantly during the post-reforms period (Chart VI.11).
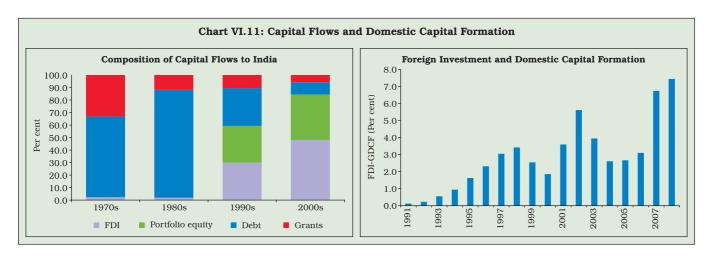

Chart VI.11: Capital Flows and Domestic Capital Formation

Composition of Capital Flows to India

Legend:
- FDI
- Portfolio equity
- Debt
- Grants

Foreign Investment and Domestic Capital Formation

Table 6.31: India: Net Capital Flows

(US$ billion)

	2007-08				2008-09				2009-10		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
1	2	3	4	5	6	7	8	9	10	11	12
1. Foreign Direct Investment	2.8	2.3	2.1	8.6	9.0	4.9	0.4	3.2	6.1	6.5	3.9
Inward FDI	7.6	4.8	7.8	14.3	11.9	8.8	6.3	8.0	8.7	10.7	7.1
Outward FDI	4.7	2.6	5.8	5.7	2.9	3.9	5.9	4.8	2.6	4.2	3.9
2. Portfolio Investment	7.5	10.9	12.7	-3.7	-4.2	-1.3	-5.8	-2.7	8.3	9.7	5.7
3. External Assistance	0.2	0.5	0.6	0.8	0.4	0.5	1.0	0.8	0.01	0.5	0.6
4. ECBs	6.9	4.2	6.2	5.2	1.5	1.7	3.8	1.0	-0.5	1.2	1.5
5. Banking Capital	-0.9	6.6	0.2	5.8	2.7	2.3	-5.0	-3.3	-3.4	4.4	1.9
NRI Deposits	-0.4	0.4	-0.9	1.1	0.8	0.3	1.0	2.2	1.8	1.0	0.6
6. Short-term Trade Credits	2.0	4.9	3.3	5.8	4.5	1.3	-4.8	-2.6	-1.5	-0.6	3.3
7. Others	-2.9	3.8	4.5	5.5	-8.9	-1.4	3.7	5.1	-3.2	0.9	-2.2
Total (1 to 7)	**15.7**	**33.2**	**29.6**	**28.0**	**4.9**	**7.1**	**-6.1**	**1.4**	**5.9**	**22.6**	**14.7**

6.70   The Indian economy, like other emerging market economies (EMEs)[7], rapidly got integrated with the global economy, particularly with advanced countries, through increasing financial flows during the 1990s and the 2000s. The turmoil in financial markets in the advanced countries during the later part of 2007 spilled over to India through financial channels, through deceleration or reversals in capital inflows, especially portfolio investments, despite sound macroeconomic fundamentals and the banking system (Table 6.31).

Foreign Investment

6.71   During the crisis, global financial institutions, as part of substantial global deleveraging, withdrew significant portfolio investments from India, like in other EMEs during 2008-09, despite strong macroeconomic fundamentals. With international financial markets stabilising and signs of early recovery in India becoming prominent, portfolio inflows resumed in the aftermath of the crisis with net inflows during 2009-10 (Table 6.32).

6.72   On the other hand, foreign direct investment in India remained almost unscathed from the ongoing global financial crisis. The continued buoyancy in FDI inflows during 2008-09 and 2009-10 reflected the relatively strong macroeconomic fundamentals of the Indian economy and recognition of India as a long-term investment destination. Despite some deceleration in the

Table 6.32: Foreign Investment in India

(US$ billion)

Period	Portfolio Investment			FDI (Net)	
	Inflows	Outflows	Net	Inward	Outward
1	2	3	4	5	6
2006-07:Q1	30.8	31.3	-0.5	3.4	-1.7
2006-07:Q2	17.9	15.8	2.1	4.4	-2.3
2006-07:Q3	28.6	25.1	3.6	9.8	-7.0
2006-07:Q4	32.2	30.4	1.8	5.1	-4.1
2007-08:Q1	34.7	27.2	7.5	7.5	-4.7
2007-08:Q2	48.7	37.8	10.9	4.7	-2.6
2007-08:Q3	78.1	63.3	14.8	7.9	-5.8
2007-08:Q4	74.2	78.0	-3.8	14.2	-5.7
2008-09:Q1	40.7	44.9	-4.2	11.9	-2.9
2008-09:Q2	42.6	43.9	-1.3	8.8	-3.9
2008-09:Q3	26.6	32.4	-5.8	6.3	-5.9
2008-09:Q4	18.6	21.2	-2.6	8.0	-4.8
2009-10:Q1	38.6	30.2	8.3	8.7	-2.6
2009-10:Q2	44.4	34.7	9.7	10.7	-4.2
2009-10:Q3	35.8	30.1	5.7	7.1	-3.2
Source: Reserve Bank of India.					

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[7]   Foreign private portfolio investment in both emerging market financial assets and cross-border lending by banks from advanced economies increased significantly in the period preceding the recent crisis. Gross private capital inflows to EMEs thus rose from 4 per cent of their combined GDP in 2003 to 10.7 per cent in 2007, compared with an increase from 4.7 per cent to 5.7 per cent of GDP between 1992 and 1996 (BIS, 2008/09).
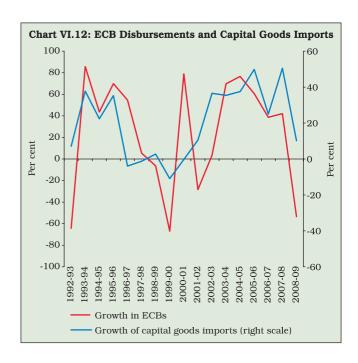
second half of 2008-09, FDI inflows reverted back on the ascending curve with further acceleration in investments since the first quarter of 2009-10, reiterating confidence in the macroeconomic fundamentals.

6.73   Interestingly, outbound FDI also remained strong during recent periods on account of Indian firms establishing their production, marketing and distribution networks overseas to achieve global scale along with accessing new technology and natural resources. Overseas investment by Indian corporates surged considerably during the second half of 2008-09, despite deteriorating conditions in international financial markets. Indian companies, particularly in the manufacturing sector, funded their overseas acquisitions by accessing liquidity from the domestic foreign exchange market on the back of worsening conditions in global credit markets.

External Commercial Borrowings (ECBs)

6.74   Corporates take recourse to ECBs mainly for the import of capital goods, project financing and modernisation of plant and capacity expansion, which is a sign of rising investment activity domestically. Commercial borrowings by Indian corporates have also declined sharply since the first half 2008-09 and, during the year, gross commercial borrowing disbursements in India were almost half of the disbursements in 2007-08. During the first quarter of 2009-10, commercial borrowing disbursements further dipped, whereas repayments continued to be strong as in the previous year resulting in net outflows, *albeit* marginal. However, commercial borrowings raised by indian corporates rebounded sharply since the second quarter of 2009-10 with returning of stability in international financial markets and growth recovery in domestic economy.

6.75   A critical issue is that the relationship between ECBs and industrial activities is not a direct one but an indirect one through imports of capital goods. As ECBs are largely used for financing the import of capital goods (machinery, equipment, *etc.*) to meet domestic investment

Chart VI.12: ECB Disbursements and Capital Goods Imports

Growth in ECBs

Growth of capital goods imports (right scale)

demand, import of capital goods is the conduit through which such shocks are transmitted. An analysis of the relationship between ECB disbursements and the import of capital goods shows that there is a close positive relationship between these two variables (Chart VI.12). This is also corroborated by a high degree of correlation (0.55) between the variables during the period 1992-93 to 2008-09. The import of capital goods, in turn, is dependent on the momentum in industrial activity. The capital goods import growth closely tracks the movements in industrial production growth. The coefficient of correlation between IIP growth and imports of capital goods is observed to be relatively high (0.50). Thus, a sharp contraction in Indian corporates' overseas borrowings during 2008-09 hampered domestic investment activity (Chart VI.12).
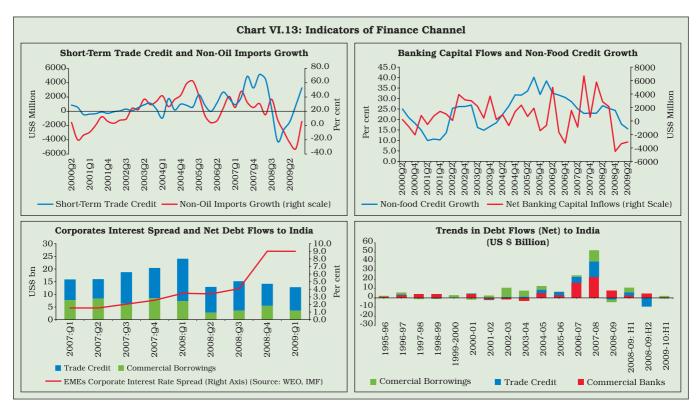
Trade Credit

6.76   The supply of international trade credit is also a key channel through which global shocks are transmitted to domestic investment and real activity. During a period of monetary tightening, firms which are likely to be constrained by declines in bank credit resort to increasing use of trade credit. Similarly, firms that experience limited

access to various sources of finance including bank credit are likely to turn to their suppliers for trade credit. With trade credit lines usually being short-term in nature and capable of being redeemed quickly at par, they are considered operationally the easiest asset class for a bank to cut at times of heightened risk aversion, often in the form of not rolling over maturing credits as part of banks' policy of overall reduction in country exposures during a crisis.

6.77   The recent global credit squeeze affected exporters and importers in terms of access to and cost of trade credit. According to the IMF (2009), during the recent global crisis the spreads on trade finance increased from 100 to 150 basis points to around 400 basis points over LIBOR, with intensifying country and counterparty risks. Although the spurt in costs of trade finance was global, the decline in availability of trade credit was felt more by EMEs, especially Asian EMEs, where much of inter-regional trade is in low-profit margin items that are part of the manufacturing supply chain for exports to advanced economies. The higher capital requirements imposed by regulators

and by banks on their own lending also increased the spreads between the banks' costs of funds and the price of trade finance to their customers. Additionally, fear of default/counterparty risk led banks to tighten lending guidelines.

6.78   A major part of the decrease in trade credit reflected lower trade volumes and commodity prices, but the decrease was also attributed to the drying-up of the secondary market for trade finance and reduced credit lines from banks specialising in the provision of such finance (BIS, 2008-09). Against this backdrop, short-term trade credit to India decelerated in the first half, but the decline accentuated during the second half of 2008-09. On the other hand, Indian corporates were finding it difficult to roll over the existing trade credit and, hence, repayments of short-term credit escalated sharply, resulting in net outflows in the second half of 2008-09 (Chart VI.13). Thus, gross disbursement of short-term trade credit to India declined sharply in 2008-09; repayments, however, increased significantly, mainly due to problems in rollover. With stabilising global financial markets and reviving growth domestically, trade credit

Chart VI.13: Indicators of Finance Channel

disbursements revived since the beginning of 2009-10 and resulted into net inflows during the second quarter of 2009-10 and subsequently.

6.79   Globally, the decline in the availability of trade finance has been attributed as a major factor in the decline in world trade. With India also witnessing a slowdown in trade credit flows during the second half of 2008-09, it was debated whether it had a role in denting India's imports from October 2008. Anecdotal evidence indicates that the cost of trade credit had risen rapidly, while, at the same time, availability had fallen substantially as reflected in higher repayments. But some of the plunge in trade credit could be attributed to a decline in imports due to the recession, while some of the rise in cost is due to the increased counterparty risk on the back of the continued slump worldwide.

6.80   An exercise has been attempted to estimate the elasticity of imports with respect to trade credit along with other controlling variables, such as industrial growth and exchange rate, with quarterly data for the period 1997-98 to 2008-09 using ordinary least squares (OLS) regression. The estimation results signify that the contribution of trade credit to growth in imports is statistically significant[8]. However, the results show that industrial growth remains the largest contributor to imports growth in India. Thus, the estimation results corroborate the conjecture that contraction in trade credit along with industrial slowdown affected import demand in India.

Banking Capital

6.81   Indian banks' access to international capital markets was also significantly affected during the crisis on account of risk aversion towards the financial sector and the significant risk in repricing of EMEs assets. In international credit markets, the risk default premia for banks and financial

institutions reached a peak in October-November 2008 and continued to be at a level higher than in the pre-Lehman episode for quite some time. Coming under the impact of the global shocks, Indian banks witnessed significant outflows under banking capital. During the early 2000s and the recent global crisis, banking capital inflows have displayed pro-cyclical behaviour.

6.82   Despite the cushion provided by NRI deposits, which remained steady during the crisis mainly due to attractive interest rate incentives, the significant net outflows of banking capital in the second half of 2008-09 and first quarter of 2009-10 were due to a significant rise in outflows on account of repayments of existing liabilities and possibly due to the recapitalisation of their overseas subsidiaries in the wake of their deteriorating balance sheets. A sudden jump in repayments of liabilities by commercial banks could also be partly explained by the factors contributing to the roll-over. This decline in access to international borrowings for banks partly constrained their ability to lend in the domestic market.

Overall Balance and Forex Reserve

6.83   The widening current account balance, on account of deteriorating trade balance in the first half of 2008-09, coupled with net capital outflows, resulting from reversal of portfolio investments and significant lowering of debt flows particularly commercial borrowings, trade credit and commercial banks (excluding NRI deposits), led overall balance into deficit in 2008-09. Due to large capital outflows, foreign exchange reserves declined during 2008-09; however, valuation changes as a result of the weakening of the US dollar against major currencies explained a significant portion (around 65 per cent) of the decline in reserves during the year (Table 6.33).

[8]   GM = 113.82 + 2.76 GIND + 0.09 GTC – 2.56 EXR + 0.67 AR(1)
               (1.62)   (2.39)   (2.18)   (-1.69)   (5.48)
R^2 = 0.70   DW = 1.93
where GM = growth in imports (US$), GIND = growth in industrial sector, GTC = growth in trade credit (US$), and EXR = nominal exchange rate.

Table 6.33: Change in Reserves

(US$ billion)

Quarterly	Reserve Position	Reserve Change	Valuation on account of Exchange Rates	Reserve Change excluding Valuation
1	2	3	4	5
Quarterly				
2007-08:Q1	213.4	14.2	3.0	11.2
2007-08:Q2	247.8	34.4	5.2	29.2
2007-08:Q3	275.3	27.6	0.8	26.7
2007-08:Q4	309.7	34.4	9.4	25.0
2008-09:Q1	312.1	2.4	0.1	2.2
2008-09:Q2	286.3	-25.8	-21.0	-4.7
2008-09:Q3	256.0	-30.4	-12.5	-17.9
2008-09:Q4	252.0	-4.0	-4.3	0.3
2009-10:Q1	265.1	13.2	13.1	0.1
2009-10:Q2	281.3	16.2	6.8	9.4
2009-10:Q3	283.5	2.2	0.4	1.8
Half-Yearly				
2007-08:H1	247.8	48.6	8.1	40.4
2007-08:H2	309.7	62.0	10.2	51.7
2008-09:H1	286.3	-23.4	-20.9	-2.5
2008-09:H2	252.0	-34.4	-16.8	-17.6
2009-10:H1	281.3	29.3	19.8	9.5
2009-10:H2	279.1	-2		
Full Year				
2007-08	309.7	110.5	18.4	92.2
2008-09	252.0	-57.7	-37.7	-20.1
2009-10	279.1	27.1	–	–

6.84 To sum up, during this crisis, the impact of the financial channel was more distinct with sharp decline portfolio inflows, external commercial borrowings, trade credit, and overseas borrowings of banks. Foreign direct investment and non-resident deposits, however, showed resilience. A sharp contraction in Indian corporates' overseas borrowings significantly impacted domestic investment activity. Access to trade finance was severely affected for many EMEs due to tightness in overseas liquidity. Some improvement is discernible with the return of a degree of stability in international financial markets and a recovery in the industrial sector in many advanced countries. India's balance of payments (BoP) made a turnaround, gaining strength mainly from elevated private remittances coupled with a sharp bounce-back in portfolio investment and buoyant NRI deposit inflows during 2009-10.

6.85 The final impact through the trade and financial channel penetrated the real sector, which was impacted severely during this crisis. One reason for the higher impact on the real sector was a shift in the composition of aggregate demand towards the external sector during the current decade (see Section I in this chapter). The increasing openness of the Indian economy further accentuated the transmission mechanism through which the impact traversed to the real sector (see Section I of Chapter 5). The final impact on the savings, investment and real sector is discussed in the next section.

IV. IMPACT ON SAVING, INVESTMENT AND GROWTH

6.86 The Indian economy has witnessed a distinct strengthening of the growth momentum before the recent crisis on account of multiple factors, *viz.*, improved financial intermediation, increased external demand, strengthening of physical infrastructure and conducive public polices. The recent global financial crisis and the consequent recession in major advanced economies, however, impacted the Indian economy from both the demand and supply sides with differential impact across sectors. While the deceleration in exports may be the key factor on the demand side, the drying-up of external sources of funding, slowdown in capital flows and dampening business confidence could be the supply-side constraints. To what extent these two factors will affect growth, savings and investment needs to be assessed in order to understand their implications for the economy.

Impact on Saving and Investment

6.87 The financial channel of transmission affecting capital flows, stock markets, financial intermediation, *etc.* which eventually boiled down to savings and investment. It may be noted that volatility and disruptions in financial markets during crisis periods might have led to a shift in the composition of household savings towards physical assets. During the previous crises, *viz.*, the balance

Table 6.34: Contribution to Gross Domestic Savings

Period	As % of GDP				Relative Contribution to Total Savings (%)		
	Total	Households	Private Corporate	Public	Households	Private Corporate	Public
1	2	3	4	5	6	7	8
1991-1995	23.8	17.3	3.1	2.0	68.4	20.1	11.5
1996-2000	24.9	18.1	4.4	1.1	106.1	21.4	-27.5
2001-2005	26.4	22.7	4.5	-0.2	112.9	6.1	-19.0
2005-06	34.1	22.8	8.2	3.1	56.8	35.6	7.6
2006-07	34.4	22.9	8.0	3.6	48.8	26.0	25.2
2007-08	36.4	22.6	8.7	5.0	42.9	27.4	29.8
2008-09	32.5	22.6	8.4	1.4	1394.9	382.2	-1677.1

of payments (BOP) crisis (1990-91), the East Asian Crisis (1997-1998) and the dot-com crisis in the US (2001-2002), India experienced some slowdown in its growth momentum and a concurrent deceleration in the growth of gross domestic savings. A similar phenomenon has been observed during the recent global financial crisis as growth of gross domestic savings decelerated sharply during 2008-09, reflecting growth slowdown in the economy (Table 6.34). Drawing inferences from past behaviour consequent to international crises, gross domestic savings could surge in the coming years.

6.88   Further, an attempt has been made to find the major factors behind the movements in household savings in India in order to assess the unfolding behaviour during the recent global crisis and coming years. The household savings were regressed on various independent variables, *viz.*, personal disposable income, interest rate (yield on government securities), financial deepening (M3/GDP) and fiscal deficit during the period from 1970-

1971 to 2008-2009. The regression results show that coefficients of personal disposable income and financial deepening are positive and significant, while the coefficients of interest rate and fiscal deficit are found to be positive but insignificant[9]. The regression results defy the Ricardian Equivalence (RE) hypothesis[10] in the case of India, as the fiscal deficit has not been found not causing any significant movement in household savings. In a study, Ghatak and Subrata (1996) also found invalidation of RE hyphthesis in India. Nevertheless, savings, particularly in the household and private sectors, may accelerate during post-crisis periods on account of other factors, *viz.,* to create cushions for the possible recurrence of such events in future and to pay off liabilities incurred during the crisis.

6.89   The global financial crisis weakened the capacity of companies to invest through reduced access to financial resources, both internally and externally, coupled with collapsed growth prospects and heightened uncertainty severely affecting the

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[9] $LHHSt = -1.5528 + 0.5426*LPDIt + 0.0124*LFISDt-1 + 0.0012*RINTt + 0.0052*LFINDt + 0.4884*LHHSt-1$
         (-2.6497) (3.2955)   (0.2702)   (0.5001)   (1.5880)   (3.4054)

$R2 = 0.9981$, DW= 2.0771
LHHS= Log of household savings.
LPDI= Log of personal disposable income.
LFISD= Log of fiscal deficit.
RINT= Real interest rate (simple average deposits interest rates).
LFID= Financial deepening (M3/GDP)

[10] The Ricardian Equivalence hypothesis provides that government expenditure funded through borrowings would be internalised by rational consumers in their consumption behaviour, leading to more saving in order to pay higher taxes in future to the government for repaying these borrowings.

private sector's propensity to invest. All these factors led to a perceptible contraction in private investment in the economy during 2008-09. It may be noted that private investment behaved similarly during the past two international crises, *i.e.*, the East Asian and dot-com crises, when the pace of private investment depleted significantly in the former and overall investment contracted in the latter. During these crises, the growth of investment in the household and public sectors also dipped substantially. Therefore, private investment supported by other sectors led to a sharp fall in the growth of gross domestic capital formation during the past crises. Since the government has enhanced expenditure in infrastructure as a counter-cyclical measure during the recent global crisis, the pace of incremental public investment have not witnessed a sharp decline. At the same time, households investment accelerated sharply during 2008-09. Since, the gross domestic capital formation during the last few years was powered by private investment, the steep contraction in private investment led to sharp deceleration in its growth during the recent crisis (Table 6.35).

6.90   In light of the significance of private investment to propel gross domestic capital formation, an analysis of the factors driving the momentum of private investment was undertaken. The possible major factors driving private investment could be bank credit, net capital flows and interest rate from the supply side and personal disposable income from the demand side. All these variables were tested for stationarity and they were found to be of the I(1) order. Since all these variables had a unit root problem, instead of a simple VAR, the Johansen Cointegration (1988, 1991) methodology was used to estimate the variance decomposition of private investment with respect to select explanatory variables[11]. The Cholesky Variance Decomposition suggests that bank credit explains about 28 per cent of the variation in private investment, while personal disposable income and interest rate explain about 8 per cent and 5 per cent variation, respectively. The net capital flows, however, explains negligible variation in private investment. The extent of variation in private investment explained by bank credit, however, increases over the period, while it

Table 6.35: Gross Domestic Capital Formation at Current Prices

Year/Period	Growth (Per cent)				Share in GDP (Per cent)			
	Household	Private	Public	Total	Household	Private	Public	Total
1	2	3	4	5	6	7	8	9
1990-1991	23.2	20.6	14.4	18.9	9.7	4.5	10.0	24.2
1991-1992	**-24.9**	**58.1**	**9.1**	**4.6**	**6.3**	**6.2**	**9.5**	**22.0**
1992-1996	24.7	34.3	12.3	22.4	7.2	7.7	8.9	23.8
1996-1999	**19.9**	**0.3**	**8.0**	**8.2**	**7.4**	**8.3**	**7.2**	**22.9**
1999-2000	37.8	15.6	17.7	28.5	10.5	7.4	7.4	26.1
2000-2002	**11.7**	**-5.3**	**4.1**	**1.4**	**11.3**	**5.3**	**6.9**	**24.2**
2002-2003	20.8	17.7	-4.6	12.3	12.6	5.9	6.1	25.2
2003-2004	13.2	29.4	16.9	19.3	12.7	6.8	6.3	26.8
2004-2005	13.8	79.9	24.3	34.9	13.5	10.3	7.4	32.5
2005-2006	0.0	50.1	21.8	20.9	11.8	13.5	7.9	34.3
2006-2007	16.8	24.5	22.7	21.3	11.9	14.5	8.4	36.0
2007-2008	11.0	28.1	22.9	20.6	11.5	16.1	8.9	37.6
2008-2009	19.8	-11.0	18.6	6.7	12.2	12.7	9.4	35.6

Source : Handbook of Statistics on Indian Economy.
Note : The growth in gross domestic capital formation was 4.7 per cent during the first quarter of 2009-10.

[11]   The rank of co-integrating vectors has been found to be 1, implying only one co-integrating relationship. The various lag selection criterions indicated only one lag.

declined in the case of personal disposable income. Further, the results[12] of the VAR Granger Casualty test show that unidirectional causality runs from bank credit to private investment at the 10 per cent significance level and is bidirectional from personal disposable income to private investment at a 1 per cent level of significance. The causality from interest rates and net capital flows to private investment and *vice versa* has not been found significant. The above empirical results demonstrate the importance of like personal disposable income and bank credit in influencing private investment. In the present context also, both these factors on the back of the economic slowdown appear to have triggered the significant deceleration in private investment eventually leading to a sharp decline in the growth of gross domestic capital formation in 2008-09.

Impact on Overall Growth

6.91   Although the growth of the Indian economy started slowing down from the last quarter of 2007-08 and the trend continued in subsequent quarters taking a cue from world growth, slowdown accentuated in the third and fourth quarter of 2008-09 before improving somewhat during the first quarter of 2009-10 (Table 6.36). In fact, the Indian economy was already on the moderating growth trajectory of the business cycle from the fourth quarter of 2006, but the current global crisis made the slowdown more pronounced from the third quarter of 2008-09 (RBI Annual Report, 2008-09)[13]. Hence, the Indian economy would have witnessed a slowdown during 2008-09 even in the absence of the global financial crisis, *albeit* at a lower pace.

6.92   The Indian economy, as mentioned above, witnessed incipient signs of slowdown in the last quarter of 2007-08 but the actual impact was felt in the second half of 2008-09. On the demand side, the first to respond to the global financial crisis were investments (capital formation) and private consumption, as growth in both these components started decelerating concomitantly in the last quarter of 2007-08. Exports of goods and services got impacted in the third quarter of 2008-09 and their growth plummeted sharply on account of a large decline in the spending of advanced economies (Chart VI.14).
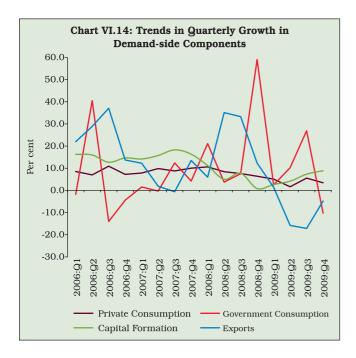
Table 6.36: Quarterly Growth in GDP at Factor Cost

(Per cent)

Sector	2007-08	2008-09	2009-10	2007-08				2008-09				2009-10			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Agriculture & Allied	4.7	1.6	0.2	3.1	3.9	8.7	2.1	3.2	2.4	-1.4	3.3	1.9	0.9	-1.8	0.7
Industry	9.3	3.1	10.4	10.5	9.5	9.5	7.8	5.2	4.9	1.7	0.8	4.6	9.0	12.3	15.1
Services	10.4	9.3	8.3	10.7	10.5	10.2	10.4	9.8	9.3	10.0	8.0	7.5	10.0	7.3	8.5
Total	**9.2**	**6.7**	**7.4**	**9.3**	**9.4**	**9.7**	**8.5**	**7.8**	**7.5**	**6.1**	**5.8**	**6.0**	**8.6**	**6.5**	**8.6**

Source: Central Statistical Organisation, Government of India.

[12]   **VAR Granger Causality /Block Exogeneity Wald Tests**

Null Hypothesis	Chi-square statistics	Accept / Reject (X does not cause Y)
Bank credit does not cause private investment	3.06 (0.10)	Reject
Net capital flows does not cause private investment	1.33 (0.25)	Accept
Personal disposable income does not cause private investment	18.26 (0.00)	Reject
Interest rate does not cause private investment	0.45 (0.50)	Accept

[13]   During the current business cycle, the expansionary phase lasted for about 8 to 9 quarters beginning in 2004 (Q4) and reached its peak closer to 10 per cent in the second and third quarters of 2006. Thereafter, the momentum of underlying growth showed some moderation until 2008-09 (Q4).

Chart VI.14: Trends in Quarterly Growth in Demand-side Components

Table 6.37: Cyclical Co-movements of GDP with Components of Aggregate Demand (Correlation Coefficient)

Component	1996-2000	2001-2005	2006-2009:Q2
1	2	3	4
Gross Domestic Capital Formation	0.67	0.44	0.64
Private Consumption	0.00	0.50	0.60
Government Consumption	0.42	0.16	-0.72
Exports of Goods & Services	-0.01	0.14	0.32

Source: National Accounts Statistics, CSO, Govt. of India.

6.93   The positive cyclical co-movements between GDP and private consumption and gross domestic capital formation (investment) further strengthened during recent periods (2006-2009) (Table 6.37). The cyclical co-movements between GDP and government consumption turned negative in the recent past, primarily resulting from the counter-cyclical fiscal policy stance executed in the form of fiscal stimulus measures providing support to the weakening growth in the wake of the global crisis. The cyclical synchronisation between the growth of GDP and various components of aggregate demand was also assessed by estimating the relationship between the variables with ordinary least squares (OLS) regression for the period from the second quarter of 1996 to the second quarter of 2009. The results of the regression demonstrate that the causality running from cyclical gross domestic capital formation and

private consumption to cyclical GDP is significant, while it is insignificant in case of government consumption and exports of goods and services[14]. This indicates the primacy of private financial consumption and investment in driving the growth of the Indian economy in recent periods. Hence, it could be inferred that the recent global crisis accentuated the cyclical downturn in the Indian economy, adversely affecting private consumption and investment.

6.94   The real growth in GDP at market prices started slowing down from the first half of 2008-09, after witnessing a higher trajectory during 2005-2008, on the back of the global crisis adversely affecting investment and private consumption during this period (Table 6.38). The growth in exports of goods & services, which had surged significantly in the first half of 2008-09, decelerated steeply during the second half. The growth in capital formation, which decelerated substantially in the first half of 2008-09, plunged further in the second half. Similarly, private consumption continued to decelerate during the second half of 2008-09 on account of a continued slide in the stock market and heightened uncertainty. At the same time, government consumption increased massively in

[14] $CGGDP = 4.97 + 0.12 \, CGPFCF - 0.02 \, CGGFCE + 0.28 \, CGGDCF + 0.0001 \, CGNX$
         (2.38)   (1.77)   (-1.08)   (4.92)   (0.25)

$R^2 = 0.41$ DW = 1.65

CGGDP = Cyclical Growth in Gross Domestic Product.
CGGDCF = Cyclical Growth in Gross Domestic Capital Formation.
CGGFCE = Cyclical Growth in Government Final Consumption Expenditure.
CGPFCE = Cyclical Growth in Private Final Consumption Expenditure.
CGNX = Cyclical Growth in Net Exports of goods and services.

Table 6.38: Growth in Demand Components of GDP (At 2004-05 Prices)

(Per cent)

Period	Private Consumption	Government Consumption	Capital Formation	Exports	Imports	Overall GDP (Market Prices)
1	2	3	4	5	6	7
Trend						
1990-95	3.7	2.8	7.8	10.8	13.3	4.7
1995-00	5.9	9.8	8.0	13.4	13.3	6.6
2000-05	4.6	1.8	10.0	16.1	11.1	5.9
2005-08	9.0	7.2	15.3	17.6	21.5	9.5
Annual						
2007-08	9.8	9.7	16.9	5.2	10.0	9.6
2008-09	6.8	16.7	-1.7	19.3	23.0	5.1
2009-10	4.3	10.5	7.1	-6.7	-7.3	7.7
Half Yearly						
2007-08:H1	9.3	5.2	16.2	0.6	1.2	9.6
2007-08:H2	10.3	13.5	13.5	9.4	18.7	9.6
2008-09:H1	8.0	5.5	0.9	34.2	40.0	7.1
2008-09:H2	5.8	25.7	-3.9	6.6	8.6	3.4
2009-10:H1	4.6	22.5	0.9	-15.9	-9.5	5.8
2009-10:H2	4.0	2.3	13.0	3.3	-4.8	9.3
Quarterly						
2008-09:Q1	8.4	3.7	0.1	35.1	34.4	7.3
2008-09:Q2	7.6	7.5	1.6	33.3	45.2	6.9
2008-09:Q3	6.4	59.0	-4.9	12.3	23.2	3.0
2008-09:Q4	5.1	2.5	-2.9	1.4	-4.4	3.8
2009-10:Q1	2.9	15.3	-0.3	-16.0	-8.5	5.2
2009-10:Q2	6.4	30.5	2.1	-15.8	-10.5	6.4
2009-10:Q3	5.3	2.5	8.4	-7.5	-5.8	7.3
2009-10:Q4	2.6	2.1	17.3	14.2	-3.7	11.2

Source: Central Statistical Organisation, Govt. of India.

the second half of 2008-09 as the government took counter-cyclical measures. The component-wise (demand-side) analysis shows that the upturn in growth during the first half of 2009-10 has come from the upturn in gross domestic capital formation supported by robust growth in government consumption. All other demand components, *viz.*, private consumption, exports and imports, which directly contribute to growth, continued to witness growth deceleration/contraction during this period.

Sectoral Impact of Slowdown

6.95   Industrial growth decelerated significantly in the first half of 2008-09 from a high level during the past three years as a result of spill-over effects of the global crisis penetrating through trade and financial channels. The decline in industrial growth

was higher than the deceleration in overall growth and, accordingly, the relative contribution of the industrial sector in GDP also declined considerably during 2008-09. On the other hand, the services sector experienced moderate slowdown in growth compared to industry during the 2008-09 and its relative contribution in GDP improved (Table 6.39). Moderation in the growth of the services sector during this period emanated from the financial channel and drying up of external demand.

6.96   The impact on the industrial and services sectors got amplified in the second half of 2008-09 with overall contraction in merchandise exports and deceleration in the growth of services exports along with shattered confidence reinforcing the adverse affects stemming from the financial channel. During this period again, the growth

Table 6.39: Sectoral Growth in GDP (At 2004-05 Prices)

(Per cent)

Period	Contribution to Incremental GDP			Growth			
Period	Agriculture	Industry	Services	Agriculture	Industry	Services	Overall
1	2	3	4	5	6	7	8
Trend							
1990-95	11.8	17.2	71.0	3.4	5.3	5.6	4.8
1995-00	10.0	17.9	72.1	3.1	6.0	8.6	6.6
2000-05	2.9	21.5	75.6	1.8	6.0	7.8	6.0
2006-08	8.7	22.0	69.3	4.6	10.3	10.6	9.5
Annual							
2007-08	8.8	20.8	70.4	4.7	9.3	10.4	9.2
2008-09	3.9	9.5	86.6	1.6	3.1	9.3	6.7
2009-10	0.5	27.9	71.7	0.2	10.4	8.3	7.4
Half Yearly							
2007-08:H1	5.8	22.5	71.7	3.5	10.0	10.6	9.4
2007-08:H2	11.5	19.3	69.2	5.7	8.7	10.3	9.1
2008-09:H1	5.5	14.2	80.3	2.9	5.1	9.6	7.6
2008-09:H2	2.0	4.2	93.7	0.7	1.2	9.0	5.9
2009-10:H1	2.7	19.4	77.9	1.4	6.8	8.7	7.3
2009-10:H2	-1.5	35.1	66.4	-0.7	13.8	7.9	7.6
Quarterly							
2008-09:Q1	6.7	14.2	79.1	3.2	5.2	9.8	7.8
2008-09:Q2	4.3	14.2	81.5	2.4	4.9	9.3	7.5
2008-09:Q3	-4.6	5.7	98.9	-1.4	1.7	10.0	6.1
2008-09:Q4	8.9	2.8	88.3	3.3	0.8	8.0	5.8
2009-10:Q1	4.8	15.6	79.6	1.9	4.6	7.5	6.0
2009-10:Q2	1.3	22.0	76.7	0.9	9.0	10.0	8.6
2009-10:Q3	-5.1	35.9	69.2	-1.8	12.3	7.3	6.5
2009-10:Q4	1.2	34.6	64.2	0.7	15.1	8.5	8.6

deceleration was more severe in the industrial sector than the services sector, as manufacturing exports, which contribute a large part to industrial sector demand, contracted sharply on the back of a sharp fall in the spending of the advanced economies on consumer durables. It may, however, be mentioned that services sector growth continued to decelerate during 2009-10, whereas industrial growth revived significantly.

6.97   Agriculture and allied activities, which largely remain unconnected to global developments, grew at a healthy rate due to robust monsoons and provided support to industry and services in the form of rural demand during the first half of 2008-09. The growth in agriculture and allied activities, however, decelerated significantly and, accordingly, the rural demand component

weakened in the second half of 2008-09. The failure of the south-west monsoon in 2009 and the consequent fall in agricultural output appears to have weakened rural demand during 2009-10.

Industry: Disaggregated Analysis

6.98   The cross-country analysis reveals that the impact of the crisis on the industrial sector has been quite severe and broad-based as manifested by a sharp deceleration in growth or contraction in industrial output in many advanced and emerging market economies, including India, during 2008 and 2009 (Table 6.40). Although the industrial sector of the advanced economies was hit first, the ripple effects travelled with a lag to emerging markets and other developing economies through trade and financial channels.

Table 6.40: Industrial Growth in Advanced and Emerging Market Economies

(Per cent)

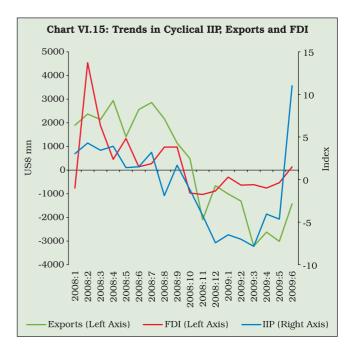| Country	2007				2008				2009				2010
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Emerging													
Brazil	3.8	5.6	6.3	7.9	6.9	5.9	6.3	-7.2	-13.8	-11.6	-8.7	6.3	17.2
China	15.1	18.3	18.1	17.5	10.9	15.9	13.0	6.4	9.7	9.0	12.3	17.9	-
India	10.3	8.7	8.3	7.0	5.3	4.7	0.8	0.5	3.8	9.0	13.4	15.1	12.9
Korea	4.1	6.3	6.1	10.9	11.2	9.2	5.9	-10.9	-15.7	-6.1	4.3	16.1	25.6
Malaysia	0.6	1.8	2.1	4.5	6.6	2.4	0.1	-9.1	-14.4	-10.9	-6.6	2.6	-
Mexico	2.5	1.5	2.1	1.8	0.4	1.3	-1.4	-2.6	-9.6	-11.1	-6.3	-2.0	5.2
Advanced													
Canada	-1.6	0.1	0.2	0.0	-5.0	-4.6	-4.3	-7.2	-10.6	-14.5	-13.0	-7.1	-
France	0.5	-0.1	1.5	2.7	1.0	1.3	-1.2	-8.9	-15.7	-16.4	-10.6	-4.6	-
Germany	8.9	6.7	6.3	5.9	5.3	3.3	0.4	-7.6	-21.8	-21.3	-17.4	-10.1	-
Italy	3.9	2.0	3.0	-1.5	1.0	0.2	-5.2	-10.4	-22.3	-23.2	-17.2	-9.3	-
Japan	2.9	2.4	2.6	3.3	2.5	0.8	-1.3	-14.1	-33.5	-26.6	-18.9	-4.2	26.0
UK	-1.3	0.7	0.4	1.6	-0.6	-0.9	-2.1	-8.0	-12.6	-12.8	-11.0	-6.3	-
USA	1.3	1.5	1.4	1.8	1.2	-0.3	-3.2	-6.7	-11.5	-13.5	-9.2	-4.6	2.5

Source: International Financial Statistics, IMF; CSO, Government of India.

6.99 After witnessing buoyant growth during the past few years, the industrial sector was already on the slowdown curve of the business cycle from November 2007 [based on the index of industrial production (IIP)]. This sector was hit severely by the spillover effects of the recent financial crisis, resulting in a more pronounced slowdown beginning from October 2008. The growth in industrial production decelerated sharply in the second half 0f 2008-09. However, the industrial sector turned around and recorded accelerated growth during 2009-10.

6.100 The correlation between the cyclical component of IIP and merchandise exports weakened substantially and turned insignificant during the period of contracting merchandise exports, *i.e.,* from October 2008 to June 2009. At the same time, the correlation between cyclical IIP and non-food credit and FDI further strengthened during this period, implying the increasing association of the financial channel in the pronounced slowdown in the industrial sector during this period (Chart VI.15). The steep rise in correlation between cyclical components of the IIP and non-food credit during recent periods could be on account of shrinking demand for credit during

the crisis period on the back of the economic slowdown and heightened uncertainty. The correlation does not imply any cause-and-effect relationship between the variables and hence, to ascertain this relationship, further investigation with a technical exercise was taken up.

6.101 To further investigate the role of different factors, the Granger causality between industrial

Chart VI.15: Trends in Cyclical IIP, Exports and FDI

growth (based on the IIP), growth in bank credit (non-food credit) and exports was estimated from the vector autoregression model (VAR) using monthly data from 1995-96 to 2009-10 to see the cause-and-effect relationships. The results[15] show bidirectional causality running between bank credit and industrial growth and exports. The causality running from industrial growth to bank credit is more significant than bank credit to industrial growth. On the basis of the Granger causality results, it can be inferred that in the beginning of the recent crisis, lower bank credit was caused by a slowdown in industry which, in turn, further dampened both industrial slowdown and bank credit as part of the cycle. Further, the VAR Granger causality suggests that contracting exports hampered industrial growth during the crisis period. The causality from industrial growth to exports growth probably reflects the technological improvement and competitiveness effects of exports. In sum, the Granger causality results suggest that the global crisis affected the industrial sector through contracting exports and, in turn, affected bank credit.

Disaggregated Analysis

6.102   At the disaggregated level, the manufacturing sector, which carries the largest weight of 74.4 per cent in IIP, was affected the most (Table 6.41). The significant slowdown in the manufacturing sector immediately reflected in a sharp fall in the growth of the overall industrial sector. Other sectors, *viz*., mining & quarrying and electricity, gas & water supply, also witnessed a slowdown in the second half of 2008-09.

6.103   The cyclical slowdown in the manufacturing sector became more broad-based, with 15 out of 17 two-digit manufacturing industries experiencing negative/ decelerated growth during 2008-09. Like in the previous two phases of slowdown, cotton textiles, wood & wood products, and furniture & fixtures exhibited negative growth in the current phase (Table 6.42). However, the manufacturing sector rebounded with significant positive growth since the first quarter of 2009-10, drawing strength from domestic factors and stabilising international financial markets.

Table 6.41: Performance of Broad-Based Sectors in Industry

	2005Q2-2008Q1	2008: Q2	2008: Q3	2008: Q4	2009: Q1	2009: Q2	2009: Q3	2009: Q4	2010: Q1
1	2	3	4	5	6	7	8	9	10
Growth in Value Addition (%)									
Mining & quarrying	4.6	2.6	1.6	2.7	-0.3	8.2	10.1	9.6	14.0
Manufacturing	11.6	5.9	5.5	1.3	0.6	3.8	9.1	13.8	16.3
Electricity, gas & water supply	8.4	3.3	4.3	4.0	4.1	6.6	7.7	4.7	7.1
Industry	10.3	5.2	4.9	1.7	0.8	4.6	9.0	12.3	15.1
Relative Contribution in Value Addition (%)									
Mining & quarrying	5.2	5.8	3.8	19.3	-5.0	20.6	12.3	9.6	11.6
Manufacturing	86.6	87.8	87.5	58.5	56.0	65.0	79.2	86.7	83.9
Electricity, gas & water supply	8.3	6.4	8.8	22.3	48.9	14.5	8.5	3.7	4.5

[15]

VAR Granger Causality / Block Exogeneity Wald Tests		
Null Hypothesis	Chi-square statistics	Accept/ Reject (X does not cause Y)
Growth in non-food credit does not cause industrial growth	12.55 (0.05)	Reject
Exports growth does not cause industrial growth	25.04 (0.00)	Reject
Industrial growth does not cause growth in non-food credit	48.09 (0.00)	Reject
Industrial growth does not cause exports growth	(75.60) (0.09)	Reject

Table 6.42: Growth Performance of 17 two-digit Manufacturing Industries

(Per cent)

Industry	2007-08				2008-09				2009-10			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Food products	26.8	-1.6	-4.9	9.9	-7.1	7.6	0.6	-25.2	-17.2	-5.2	0.7	10.2
2. Beverages, tobacco and related products	9.7	8.8	17.7	11.9	30.7	9.8	12.2	12.5	-6.2	2.1	1.7	3.1
3. Cotton textiles	7.3	5.0	2.0	2.9	3.5	-3.2	-3.5	-4.3	-1.7	4.3	9.9	9.7
4. Wool, silk and man-made fibre textiles	3.3	6.1	0.4	9.4	7.3	-8.8	1.3	0.5	4.8	21.2	10.7	-1.9
5. Jute and other vegetable fibre textiles (except cotton)	30.1	9.9	-0.7	205.7	-8.1	-2.9	-23.2	-6.3	-16.2	-18.3	-6.3	-52.8
6. Textile products (including apparel) apparel)	5.9	0.7	6.1	2.3	6.3	4.0	3.8	8.7	8.2	11.0	12.8	2.5
7. Wood and wood products, furniture & fixtures	93.0	66.9	45.8	-3.7	-11.9	-0.5	-10.0	-16.3	14.7	1.3	11.2	13.1
8. Paper and paper products and printing, publishing and allied industries.	1.6	0.2	4.0	5.0	1.3	7.7	1.3	-2.8	3.6	-0.5	3.5	9.4
9. Leather and leather & fur products	8.5	10.8	11.4	16.2	5.8	-8.7	-10.5	-13.0	-3.5	4.8	1.3	7.1
10. Chemicals and chemical products (except products of petroleum & coal)	6.9	10.5	14.9	10.4	11.2	1.2	-4.6	8.8	2.0	13.8	21.9	5.5
11. Rubber, plastic, petroleum and coal products	12.5	11.3	6.5	5.6	-3.5	-4.5	-0.9	2.7	10.6	14.3	18.4	17.8
12. Non-metallic mineral products	6.6	10.6	3.8	2.3	1.0	0.1	1.9	1.7	8.3	4.9	6.5	11.1
13. Basic metal and alloy industries	20.1	16.9	6.8	6.8	4.9	8.4	5.0	-2.0	7.7	2.6	3.8	12.0
14. Metal products and parts (except machinery and equipment)	-0.1	-1.9	-16.9	-2.2	2.0	1.8	-0.4	-16.8	-4.8	4.9	16.4	45.9
15. Machinery and equipment other than transport equipment	14.3	8.4	13.5	6.6	7.9	12.3	4.7	10.3	7.2	15.0	24.4	35.0
16. Transport equipment and parts	1.5	2.1	5.3	2.6	10.3	13.9	-10.9	-1.5	6.9	12.0	44.0	37.2
17. Other manufacturing industries	7.4	18.2	35.8	17.1	-9.4	6.5	5.6	-2.7	14.9	12.3	1.3	16.6

6.104 In the manufacturing sector, the group of export-oriented industries (*viz.*, basic chemical and chemical products, textile products, wool, silk and man-made fibre textiles, cotton textiles and leather and leather & fur products), which experienced sizable growth during 2003-08, had suffered along with domestic-oriented units. Interestingly, both export-oriented and domestic-oriented industries rebounded with significant acceleration in their growth during 2009-10 (April-September), which remains considerably higher than the second half of 2008-09 (Table 6.43).

6.105 The sluggish performance of the basic goods and consumer goods industries in the first half of 2008-09 also deteriorated further in the

second half of 2008-09 (Table 6.44). All the sub-groups experienced deceleration/ negative growth in the second half of 2008-09, but some of the sub-groups, *viz.*, intermediate goods and basic goods, turned around with improved performance from the beginning of 2009-10, illustrating recovery from the slump. The performance of corporates in the private sector, after remaining subdued in the second half of 2008-09, also witnessed a turnaround in their margins, despite a decline in their sales in the first quarter of 2009-10 (Box VI.8).

6.106 The analysis of the behaviour of use-based sub-groups during the previous international crises and afterwards could provide vital leads about the sustainability of the industrial recovery witnessed

Table 6.43: Average Growth in Export-Oriented Manufacturing Industries (based on IIP)

(per cent)

Group	2000-03	2003-08	2008-09: H1	2008-09: H2	2009-10: H1	2009-10: H2
1	2	3	4	5	6	7
Exports-Oriented* (weight = 25.46)	4.3	8.8	4.4	2.1	7.4	11.0
Domestic-Oriented (weight = 53.90)	4.9	9.7	5.8	0.7	5.8	17.1
Total Manufacturing (weight = 79.36)	4.7	9.4	5.3	0.4	6.3	15.4

Note : Growth has been calculated aggregating the index of these industries as per their weights in IIP.
* Five industries have been taken where the major portion of sales comes through exports.

Table 6.44: Monthly Growth of Use-based Industries

(Per cent)

	Basic Goods			Capital Goods			Intermediate Goods			Consumer Goods		
	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10	2007-08	2008-09	2009-10
1	2	3	4	5	6	7	8	9	10	11	12	13
April	8.6	4.0	4.4	10.9	12.4	-5.9	10.6	3.1	7.9	14.7	8.5	-4.6
May	10.3	3.0	3.8	22.4	4.3	-3.6	8.8	1.9	6.6	8.7	7.4	-1.1
June	9.2	2.2	10.7	23.1	7.8	13.4	8.6	2.8	7.9	3.6	9.9	4.4
July	8.7	5.3	4.7	12.3	17.9	1.7	7.7	3.0	9.8	7.1	5.9	9.7
August	12.7	3.9	7.7	30.8	0.9	9.2	13.8	-5.5	14.4	0.0	6.4	10.9
September	6.5	5.0	5.3	20.9	20.8	13.5	10.1	-2.5	11.0	-0.2	7.4	9.7
October	6.5	3.2	4.0	20.9	4.2	10.2	13.9	-4.4	15.5	13.7	-0.9	12.1
November	5.2	2.2	6.0	24.2	0.5	11.1	5.5	-3.9	19.6	-2.9	9.4	12.2
December	3.4	2.0	8.4	17.6	6.6	38.7	7.6	-8.9	22.8	8.7	1.7	13.1
January	3.6	-0.7	11.5	2.6	15.9	53.7	8.0	-7.2	21.9	8.4	3.6	3.0
February	7.3	-0.1	8.4	10.7	11.8	44.7	8.5	-3.0	15.0	11.7	-1.3	9.1
March	3.3	1.9	10.4	20.3	-6.3	28.4	4.9	1.9	13.1	0.9	1.3	10.7
Apr.-Mar.	7.0	2.6	7.1	18.0	7.3	19.2	8.9	-1.9	13.6	6.1	4.7	7.3

Source: CSO, Government of India.

in 2009-10. Capital goods led the recovery in the industrial sector during the East Asian crisis, whereas in the case of the dot-com crisis phase, all the sectors jointly pulled the industry from a slowdown, but it was again the capital goods sector that made the largest contribution. On the basis of

Box VI.8
Global Crisis and Performance of Corporates in India

The global crisis affected the performance of corporates in India through all three channels of transmission, *viz.*, trade, financial and confidence. The impact on private sector corporates became precipitous from the third quarter of 2008-09 on the back of accentuating disruptions in international financial markets that eventually mutated into a world recession/ economic slowdown. Tightening domestic and foreign liquidity resulted in a steep escalation in the cost of funds as well as reduced accessibility. On the other hand, the recession in advanced economies pulled down the demand for Indian corporates as manifested by contracting exports since October 2008. The uncertainty prevailing in the world economy also dampened investor confidence and, hence, private corporates were hesitant to undertake fresh investments. All these factors dampened both

domestic and external demand, availability of funds, and investment prospects and were reflected in the subdued performance of private sector corporates during the second half of 2008-09. The performance of the corporate sector, however, improved considerably during the second half of 2009-10 owing to revival in both domestic and external demand alongwith stability in global financial markets (Table 1).

The revenue growth of private corporates, which was quite impressive during the first half of 2008-09, decelerated sharply in the second half of 2008-09. Sales growth after averaging about 22 per cent for 20 quarters (from the 3rd quarter of 2004 to the 2nd quarter of 2009) moderated sharply to 9.5 per cent in the third quarter and further to 1.9 per cent in the fourth quarter of 2008-09. The deceleration in net profits of private corporates,

Table 1. Performance of the Private Corporate Sector

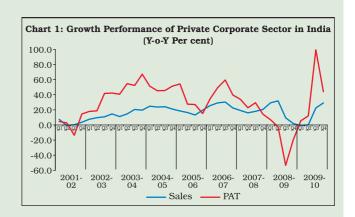|	2007-08	2008-09	2009-10	2008-09: Q1	2008-09: Q2	2008-09: Q3	2008-09: Q4	2009-10: Q1	2009-10: Q2	2009-10: Q3	2009-10: Q4
						Growth (%)					
Sales	18.6	17.2	11.7	29.3	31.8	9.5	1.9	-0.9	0.1	22.5	29.1
Expenditure	19.4	19.5	9.6	33.5	37.5	12.6	-0.5	-4.4	-2.5	20.6	30.7
Gross Profit	24.9	-4.2	24.9	11.9	8.7	-26.7	-8.8	5.8	10.9	60.0	336.7
Net Profit	26.0	-18.4	28.8	6.9	-2.6	-53.4	-19.9	5.5	12.0	99.3	44.0
						Ratio (% of Sales)					
Interest	2.5	3.1	2.7	2.4	2.9	3.8	3.2	2.8	3.1	2.7	2.4
Gross Profit	14.9	13.3	14.8	14.5	13.5	11.0	13.7	15.7	14.9	14.3	14.6
Net Profit	9.8	8.1	9.4	9.7	8.6	5.3	8.1	10.2	9.4	8.8	9.0

(Contd...)

(....Concld.)

which erupted from the fourth quarter of 2006-07 after an average acceleration of 42 per cent for 21 quarters from the third quarter of 2001-02 to the third quarter of 2006-07, became more severe at (-) 53 per cent during the third quarter of 2008-09, before turning around with a rise of 19 per cent in the fourth quarter of 2008-09 (Chart 1). The non-core 'other income' comprising mostly forex gains and treasury income, which contributed significantly to net profits in the past couple of years, also showed a decline impacted by subdued stock market activity and a weakening rupee during 2008-09.

The sales of select small companies (defined as annual sales of less than Rs.100 crore), which increased year-on-year by above 10 per cent in the first two quarters, plummeted post-September 2008. Likewise, year-on-year growth of around 30 per cent in the sales of large companies (defined as having annual sales of more than Rs.100 crore) in the first two quarters fell to less than 10 per cent in the last two quarters of 2008-09. Operating margins weakened by around 400 basis points compared to that recorded in Q3 of 2007-08. However, the pressure on margins seemed to have eased since Q1 of 2009-10, owing primarily to falling input costs and lower rise in interest outflow, resulting in improvement in margins to levels recorded prior to the Lehman Brothers' collapse in September 2008.

In terms of sectoral breakdown, the slowdown in sales and profits performance for companies in the manufacturing sector was more evident vis-à-vis those in IT and other services sectors. The net

Chart 1: Growth Performance of Private Corporate Sector in India (Y-o-Y Per cent)

profit margin, measured as net income-to-sales ratio, has mostly been the lowest for the manufacturing sector and reduced from the two-digit level in the third quarter of 2007-08 to less than 5.0 per cent during the third quarter of 2008-09. The net margin, however, appeared to have slowly returned to close to 10 per cent in the first quarter of 2009-10. In comparison, companies in services were able to maintain profit margins despite decelerating sales during the quarters of 2008-09; the rise in commodity prices during the first half of 2008-09 had a lower impact on the services industries because raw material consumption formed a relatively low share in their total expenses.

the experiences during the past two international crises, it can be inferred that capital goods recovery is pivotal for sustainable recovery in the industrial sector from the current slowdown, underscoring the need to accelerate investment. Thus, the buoyant growth in capital goods during 2009-10 suggests that industrial recovery has become firm and sustainable.

6.107   The core infrastructure industries, which constitute a large part of the industrial sector (27 per cent weight in IIP), were also impacted by the spillover effects of the current global crisis. The infrastructure sector, which continued to be in deficit mode and a major bottleneck despite the high growth trajectory in the recent past, suffered due to non-availability of the requisite funds especially projects in the private sector since the onset of the amplified global crisis in September 2008. The gap between the target and achievements further widened among various infrastructure industries during 2008-09 and 2009-10, reflecting the global crisis (Table 6.45). The Eleventh Five-Year Plan had envisaged stepping up the gross domestic capital formation in infrastructure from 5 per cent

of GDP in 2006-07 to 9 per cent of GDP in 2011-12 for improving availability and bridging the gap between demand and supply.

Services Sector: Disaggregated Analysis

6.108   The high growth in the services sector has been underpinning the buoyancy in India's growth. This sector exhibited an average growth of above

Table 6.45: Gap Between Targets and Achievements of Infrastructure Industries

(Per cent)

Sector	2007-08	2008-09	2009-10
1	2	3	4
Power	-0.8	-6.5	-2.3
Coal	-1.0	-0.9	0.1
Finished Steel	-3.1	-7.3	-
Railways	0.5	-2.0	-0.2
Shipping (Cargo handled at Major Ports)	0.7	-7.9	-3.5
Fertilisers	-12.6	-12.2	-0.1
Crude Petroleum	-2.5	-6.8	-11.4
Petroleum Products	6.7	-2.4	4.5
Natural Gas Production	-2.9	-11.1	-8.8

Source: Ministry of Statistics and Programme Implementation, Govt. of India.

10 per cent during the five years preceding 2008-09 and its share and relative contribution in GDP amounted to above 60 per cent and 70 per cent, respectively during this period. The contribution of services exports in overall value-added accelerated sharply from 6.9 per cent in 2000-01 to 15.1 per cent during 2008-09. Despite decelerating growth during 2008-09 and 2009-10 against the backdrop of knock-on effects of the global economic crisis, the services sector continued to grow at a higher pace than overall growth in the Indian economy. The resilience displayed by the services sector during the recent crisis cushioned the Indian economy from the worsening growth witnessed by most of the advanced and emerging market economies, especially on the back of the crumbling industrial sector. Interestingly, the services sector provided a similar cushioning to the Indian economy during the previous international crises, such as the Gulf crisis (1990-1991), the East Asian crisis (1997-1998), and the technology crisis (2000-2001) (Chart VI.16).

6.109 The disaggregated analysis of the services sector shows that different sub-groups were affected at different points of time by unfolding international developments. Interestingly, when one sub-group was adversely hit, the better performance of another sub-group mitigated the effects on the overall growth of the services sector. For example, in the first half of 2008-09, the financial, insurance, real estate and business services sub-group was impacted severely, but

another sub-group – trade, hotels, transport and communications – continued to grow at an elevated pace and cushioned the services sector from sharp deterioration. Similarly, during the second half of 2008-09, the growth of trade, hotels, transport & communications plunged sharply, but growth in the financial, insurance, real estate and business services sub-group recovered, along with acceleration in the growth of community, and social & personal services, providing a cushion to services sector growth (Table 6.46).

6.110 In sum, the Indian economy witnessed incipient signs of a slowdown in the last quarter of 2007-08 but the actual impact was felt in the second half of 2008-09. The recent global crisis accentuated the cyclical downturn in Indian economy, adversely affecting private consumption and investment. Industrial growth decelerated significantly, while the services sector experienced a moderate slowdown in growth compared to industry during the first half of 2008-09. The steep fall in correlation between cyclical components of the index of industrial production and non-food credit could be on account of shrinking demand for credit during the crisis period on the back of the economic slowdown and heightened uncertainty. The performance of corporates in India was affected through all four channels of transmission, *viz*., trade, financial, commodity prices and confidence. The moderation in the growth of the services sector was due to heightened volatility and uncertainty in domestic financial markets in tune
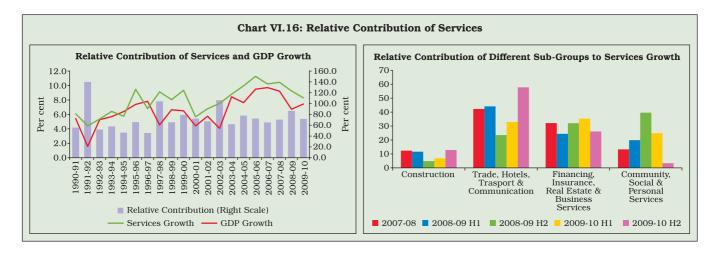

Chart VI.16: Relative Contribution of Services

Table 6.46: Growth of Services Sector at Disaggregated Level (At 2004-05 Prices)

(Per cent)

Year	Construction	Trade, hotels, transports, communications	Financing, insurance, real estate & business services	Community, social & personal services	Services
1	2	3	4	5	6
Trend					
2000-2002	5.1	8.2	5.7	4.4	6.3
2002-2005	12.0	10.7	7.4	5.4	8.7
2006-2008	11.0	11.5	13.5	5.7	10.6
Annual					
2007-08	10.0	10.7	13.2	6.7	10.4
2008-09	5.9	7.6	10.1	13.9	9.3
2009-10	6.5	9.3	9.7	5.6	8.3
Half Yearly					
2007-08:H1	11.9	10.7	13.9	5.6	10.6
2007-08:H2	8.3	10.8	12.6	7.7	10.3
2008-09:H1	8.5	10.4	8.8	9.6	9.6
2008-09:H2	3.4	5.1	11.3	17.8	9.0
2009-10:H1	4.6	7.0	11.7	11.0	8.7
2009-10:H2	8.4	11.3	7.9	1.2	7.9
Quarterly					
2008-09:Q1	9.8	10.8	9.1	8.7	9.8
2008-09:Q2	7.2	10.0	8.5	10.4	9.3
2008-09:Q3	1.1	4.4	10.2	28.7	10.0
2008-09:Q4	5.7	5.7	12.3	8.8	8.0
2009-10:Q1	4.6	5.5	11.8	7.6	7.5
2009-10:Q2	4.7	8.5	11.5	14.0	10.0
2009-10:Q3	8.1	10.2	7.9	0.8	7.3
2009-10:Q4	8.7	12.4	7.9	1.6	8.5

with international financial markets. Indian economy has, however, come out of slowdown with firm recovery specially in industrial sector and external trade since the second half of 2009-10.

V. CONCLUDING OBSERVATIONS

6.111   The recent global crisis was unique in terms of its intensity and synchronisation of slowdown across countries. The transmission of global shocks to the real sector in India has worked through various channels, notably, trade, finance, expectations and commodity price channels. In the Indian context, while traditionally the trade channel was the primary conduit of transmission of shocks to the real sector, financial channels have emerged stronger over time. Even the trade channel has become relatively prominent over time with a rising trade-to-GDP ratio for goods and services.

6.112   India's business cycle synchronisation has been strengthened by financial openness during the past few years. After the onset of the sub-prime crisis, it was debated whether India, along with other EMEs, had remained unscathed and decoupled from advanced economies, which were witnessing a severe slowdown. However, the growth of the Indian economy also slowed down from the third quarter of 2008-09, reflecting the increased business cycle synchronisation of India with advanced countries and EMEs, which invalidated the decoupling hypothesis.

6.113 The impact of the recent global financial crisis on the Indian economy was experienced directly through the trade channel, with export demand predominantly determined by external demand conditions. The Granger causal analysis revealed the direction of causal relation from exports to GDP growth rates but not *vice versa*. Commodity-wise patterns showed that engineering goods were more responsive to the global economy. On the other hand, the direction of the causal relationship between the trade deficit ratio and economic growth was from the latter to the former, attributable to the role of import demand driven by domestic economic activity. Thus, as the import demand also contracted in tandem with domestic activity, the adverse impact of the slowdown in external demand on the balance of payments position was contained. It is felt that to improve the prospects for exports on a more sustainable basis the emphasis should be on diversification, in terms of both markets and export items, and competitiveness, without making the sector remain dependent on incentives like tax breaks, lower excise and customs duties on inputs used for exports, and concessional interest rates on financing for exporters, even though such incentives may be necessary in a phase of contraction in global demand as a temporary support to the export sector.

6.114 The transmission of global shocks to India was also through services such as travel, software

and other ITES-BPO services. The global shocks adversely affected tourist arrivals and, hence, the demand for travel-related services such as hotels and transportation mirrored the slowdown. ITES-BPO services, which are highly export-dependent, experienced the direct and indirect effects of the global shocks in terms of loss of exports, which indirectly but significantly affected employment and domestic consumption demand emanating from this sector.

6.115 The commodity price channel operated mainly through shocks to international prices of primary commodities such as food, metals, oil, and minerals. The impact of such shocks on prices and real activity in an economy depends on their weight in the consumption basket. In India, the shocks to oil price, which are predominantly import-dependent, contributed significantly to domestic prices and real activity in the past. During the recent global crisis, the oil price shocks led to large fluctuations in domestic inflation. In recent periods, though India's food imports in the total import basket declined in significance, the global integration of food prices through rapid financialisation of commodity markets resulted in an increase in the correlation in domestic and world food price inflation. In fact, the global commodity cycle in the recent period reveals that the expansionary phase in food prices in India closely followed movements in the global commodity price cycles.

6.116 Consumption demand in India, though primarily driven by domestic consumption, was indirectly influenced by the external shocks. First, a slowdown in remittance inflows, which were impacted by both the slowdown in the US economy and the sudden collapse of oil prices in the Middle East countries, seems to have impacted consumption demand in India as a large part of the money repatriated to India is for family maintenance. The empirical literature also suggests some relationship between private consumption demand and remittance transfers to India. Second, the employment impact of export-dependent and employment-intensive sectors,

such as gems and jewellery, cotton textiles, leather goods, and ITES-BPO services directly resulted in a significant loss of employment in these sectors and, hence, adversely affected consumption demand. Third, the uncertainty created by the loss of external demand and volatile global financial markets impacted the investment decisions of domestic firms, which led to overall compression in domestic investment demand.

6.117 The impact of the finance channel was mainly carried through portfolio flows external commercial borrowings, banking capital and trade credit. The decade of the 1980s heralded a regime shift in capital flows to India with the ascendancy of private capital flows in the form of external commercial borrowings (ECBs), Non-Resident Indian (NRI) deposits and short-term trade credit. The liberalisation of the foreign investment regime in the 1990s brought a further shift in capital flows to India, particularly equity flows. Capital flows have been intricately linked to interest rates, stock prices, exchange rates and commodity prices.

6.118 The deleveraging by global financial institutions and hedge funds resulted in a sharp reversal of capital inflows from India in 2008-09, which impacted the economy through a sharp reduction in equity prices, exchange rate and interest rate movements. The reversal of FIIs flows had a direct contribution to the fall of equity prices which, in turn, reduced the access of corporates to capital markets as their balance sheets became weak and the primary market turned illiquid. The tightening of credit conditions in international markets reduced Indian firms' access to overseas bond markets. At the same time, access to trade credit significantly declined, with rollover problems leading to compression in import demand. Banking capital also witnessed significant outflows which, in turn, led to deterioration in domestic credit conditions. The impact of capital inflows was reflected in slowdown in the growth of investment demand in the economy.

6.119 Despite substantial decline in net capital inflows from US$ 107 billion in 2007-08 to US$ 7.2

billion in 2008-09, the external sector of the economy exhibited resilience as the reserve loss (excluding valuation) was only US$ 20 billion during 2008-09. For the year as a whole, the current account deficit widened to 2.4 per cent of GDP in 2008-09 from 1.5 per cent of GDP in 2007-08. The significance of maintaining comfortable foreign exchange reserves, even with a largely flexible exchange rate regime, became evident during the year when one of the severest external shocks could be managed without any exceptional measures to modulate specific transactions in the current and capital accounts.

6.120   The final impact through trade, financial and commodity prices channels was reflected on growth. Growth, which decelerated with the cyclical slowdown in the first half of 2008-09, was magnified in the second half due to the contagion from the global crisis. The significant deceleration in private consumption and gross domestic capital formation along with contracting external demand necessitated expansion in public sector demand, both consumption and investment. In fact, it has been found that cyclical movements in GDP growth have been mainly driven by cyclical private consumption and gross domestic capital formations.

6.121   The industrial sector witnessed a slowdown or recession in most of the advanced countries and EMEs during the current crisis and the movements of the industrial sector in India have become highly correlated with advanced and EMEs in recent periods. The services sector also caught the downswings generated by the global crisis, but displayed strong resilience and cushioned the growth rate of the Indian economy. Although India's services sector has a competitive edge in several knowledge-based services, India needs to gain the competitive edge by improving physical infrastructure along with quality human resources in the remaining services. The services sector faces multiple challenges notwithstanding the high growth and resilience displayed in the recent period. In this regard, attention will have to be devoted to improve the policy framework in health and education, while the potential of services like professional, legal, postal, accountancy and insurance need to explored with further liberalisation.

6.122   Adequate infrastructure is the key to the development process. However, the development of infrastructure has large financing requirements and for this both the public and private sector need to collaborate. The Eleventh Five-Year Plan has estimated an investment requirement of over US$ 500 billion. The recent global crisis dampening the investment climate made it really challenging to realise this investment. The challenge here is to make the investment attractive in terms of expected return on capital while also being fair to consumers and actual users of the infrastructure to enable the active participation of the private sector. In recent years, some progress is discernible in attracting private investment in infrastructure sectors such as telecommunications, power generation, airports, ports, roads and the railways through public-private partnerships (PPPs).

6.123   The Government of India and the Reserve Bank responded with appropriate fiscal and monetary policy measures, which were swiftly delivered in a forward-looking manner. While the Reserve Bank of India undertook swift and calibrated policy measures to improve both domestic and foreign exchange liquidity in the system, the government implemented counter-cyclical fiscal stimulus measures to support the sagging aggregate demand. Both monetary and fiscal policy measures appear to have brought the desired result as manifested recovery in GDP growth in 2009-10. The industrial sector has recovered from the slump witnessed in the second half of 2008-09 with buoyancy in growth since the first quarter of 2009-10. The services sector, however, continued to experience decelerated growth in 2009-10, although upturn in growth was witnessed in Q2 on account at payment of arrears of sixth pay commission. The services sector has been seen responding with a lag to the industrial sector and the current industrial recovery would spur the growth of industry-related services such as travel, transportation, financing, and business

services, generating some impulses for upward movement in the growth of the services sector.

6.124   There is an active debate on the timing and sequencing of expansionary monetary stance around the world. The exit from the current monetary policy accommodation could, however, be different across countries depending on the balance of risk to growth and price stability, types of balance sheet adjustments that have taken place during the crisis and the position of the economy in the business cycle. In the case of advanced countries, where central bank balance sheets have expanded substantially including the portfolio comprising mortgage-backed securities, commercial papers and corporate bonds, the exit policies may be constrained by the speed of revival and developments in the specific market segments. In contrast, the central bank accommodation in India was mainly done through unwinding of MSS and conduct of OMO, including LAF, and through special refinancing facilities in the banking system. Thus, the withdrawal of monetary accommodation in India should be feasible without an adverse impact on specific market segments (Mohanty, 2009).

6.125   The October 2009 Review of Monetary Policy for the Year 2009-10 brought forward the challenges faced by the indian economy while managing the recovery. The precise challenge for the Reserve Bank is to support the recovery process without compromising on price stability. This calls for a careful management of trade-offs. Growth drivers warrant a delayed exit, while inflation concerns call for an early exit. Premature exit will derail the fragile growth, but a delayed exit can potentially engender inflation expectations. The balance of judgment at the current juncture is that it may be appropriate to sequence the 'exit' in a calibrated way so that while the recovery process is not hampered, inflation expectations remain anchored. Thus, the 'exit' process began with the closure of some special liquidity support measures. The Reserve Bank began the first phase of 'exit', in October 2009 by withdrawal of most of the unconventional measures taken during the crisis period, followed by increase in CRR and policy rates. The government also, acting on the recommendations of the Thirteenth Finance Commission, initiated exit of the expansionary fiscal stance with partially rolling back the indirect tax rates and compressing non-plan expenditure during the budget 2010-11.