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IMPLICATIONS OF THE GLOBAL ECONOMIC CRISIS ON INDIA's SERVICES SECTOR

UNCTAD series on assuring development gains from the international trading system and trade negotiations

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PREFACE

As the focal point of the United Nations for the integrated treatment of trade and development and interrelated issues, and in accordance with the Accra Accord adopted at the twelfth session of UNCTAD in 2008, the UNCTAD secretariat supports member States in assuring development gains from international trade, the trading system and trade negotiations, with a view to their beneficial and fuller integration into the world economy and to the achievement of the United Nations Millennium Development Goals. Through intergovernmental deliberations and consensus-building, policy research and analysis, and technical cooperation and capacity-building support, the work of UNCTAD on trade negotiations and commercial diplomacy aims at enhancing human, institutional and regulatory capacities of developing countries to analyse, formulate and implement appropriate trade policies and strategies in multilateral, interregional and regional trade negotiations.

This paper is part of the series, Assuring Development Gains from the International Trading System and Trade Negotiations, with a focus on the impact of the global economic crisis and successful mitigating strategies. The targeted readership is government officials involved in trade negotiations, trade and trade-related policymakers, and other stakeholders involved in trade negotiations and policymaking, including non-governmental organizations, private-sector representatives and the research community.

The objective of the series is to improve understanding and appreciation of key and emerging trade policy and negotiating issues facing developing countries in international trade, the trading system and trade negotiations. The series seeks to do so by providing a balanced, objective and sound analysis of technical issues involved, drawing implications for development and poverty reduction objectives, and assessing policy options and approaches to international trade negotiations in goods, services and trade-related issues. It also seeks to contribute to the international policy debate on innovative ideas and practical solutions to realize a development dimension for the international trading system with a view to achieving the Millennium Development Goals. Authors are invited to express their personal opinions and the papers do not necessarily reflect the views of the UNCTAD secretariat.

The series is produced by a team led by Mina Mashayekhi, Head, Trade Negotiations and Commercial Diplomacy Branch, DITC.

ABSTRACT

The paper provides an overview of services-led growth of India in the face of falling external demand. The paper examines three services subsectors that are mostly sustaining the momentum of growth of Indian economy: retail/wholesale trade, software services and banking services. It is also analyses the contribution of disaggregated services to total gross domestic product (GDP) and decomposes growth of GDP with respect to the disaggregated sectors of the economy.

CONTENTS

ABBREVIATIONS

BPO	business process outsourcing
DEA	data envelopment analysis
FY	fiscal year
GDP	gross domestic product
ITES	information technology-enabled services
KLEMS	capital-labour-energy materials-services
NASSCOM	National Association of Software and Service Companies
Q1,2,3,4	first, second, third, fourth quarter
REER	real effective exchange rate
R&D	research and development
TFPG	total factor productivity growth

1. INTRODUCTION

Unlike many other developing countries of the world, India has shown considerable resilience to the global economic crisis by maintaining one of the highest growth rates in the world. It recorded a growth rate of 6.7 per cent in 2008–09, which was 2.1 per cent lower than its average growth during the last five years. One of the main drivers of India's growth during the global economic crisis has been the services sector, which accounted for about 88 per cent of the growth rate in real GDP in 2008–09. The services sector grew at a rate of 9.3 per cent, even as agriculture and industry recorded a steep decline in growth. India's services-led-growth becomes even more intriguing in the face of the laggard growth of the services sector, which has remained far behind the manufacturing sector and is showing few signs of recovery.[1]

To demystify the relatively resilient growth of the services sector in India in the face of the global economic slowdown, it is important to look closely at the changing structure of the Indian economy and its dependence on exports of services. The services sector, which constituted around 49 per cent of GDP in 1990–91, now contributes 64.5 per cent of GDP (2008–09). Of this, exports of services comprise around 16 per cent of the GDP of services and have less than a 10 per cent share in total GDP.[2]

Within the services sector, the major component of exports is information technology-enabled services (ITES), and business process outsourcing (BPO), which constituted almost 45 per cent of total services exports of India in 2008–09 and grew at an annual average of 30 per cent during 2005–06 to 2007–08. In 2008–09, exports of these sectors increased by 28 per cent from the previous year and reached $40.8 billion, out of total services exports of $90.1 billion.[3] The limited impact of the global economic and financial crisis on exports of the ITES-BPO services and the low share of exports of services in the total output generated by the services sector, along with limited exposure of the Indian financial sector to international financial institutions, can to a large extent explain the Indian services growth miracle. However, this macro picture does not reflect the dynamics of the restructuring of the services sector, which has taken place over time.

In this context, the main objective of this paper is to analyse the implications of the global economic and financial crisis on India's services sector and its changing composition. Trends in the different subsectors have been examined with special reference to quarterly changes during the global economic crisis. Global income elasticities have been estimated for India's aggregated and disaggregated services sector to compare the significance of existing global and domestic demand for India's services. To assess the supply-side factors contributing to the growth of services, we estimate total factor productivity growth in the following services subsectors: retail and wholesale trade, software and banking. These services have a high share of GDP and contribute significantly to the growth of the services sector. A detailed firm-level analysis using the data envelopment approach (DEA) has been undertaken for banks and IT firms to examine the sources of productivity growth in these sectors and the impact of global crisis on productivity. The paper further discusses the factors that may have affected productivity growth in the services sector, including government policies, and provides future policy directions for supporting productivity growth in the identified services subsectors and for aligning the restructuring of the services sector with growing domestic demand.

The rest of the paper is organized as follows: Section 2 examines the contribution of India's services sector to GDP growth over time. An in-depth analysis is undertaken of the changing composition within the services sector to draw inferences on the contribution of disaggregated services to GDP growth. Section 3 analyses the implications of the global economic crisis on India's exports of services by estimating income demand elasticities for those exports; section 4 examines the role played by domestic demand in services during the global economic crisis. Section 5 discusses the methodology used and presents the results of total factor productivity growth in identified services subsectors. Section 6 highlights the role played by domestic demand, global demand and productivity growth in retail and wholesale services, software services and banking services, and provides recommendations for further improving productivity growth in these services. Section 7 concludes the paper.

[1] J.P. Morgan's global services business activity index pointed to a decline in services activity for the thirteenth successive month in June 2009. It also indicated that global manufacturing activity is far stronger than services.
[2] Central Statistical Organization
[3] National Association of Software and Services Companies (NASSCOM) (2009).

2. THE CONTRIBUTION OF THE SERVICES SECTOR TO INDIA'S GROWTH

2.1 The changing sectoral composition of India and the rising significance of services

Amid the global economic crisis, the growth rate of the Indian economy slowed down to 6.7 per cent from an average growth of 8.8 per cent in the preceding five years, 2.3 percentage points lower than the previous year. Table 1 depicts the quarterly growth rate of GDP, which shows that in the fourth quarter (Q4) of 2007–08, the impact of the global economic crisis was felt for the first time when the growth rate fell from 9.3 per cent (Q3-2007–08) to 8.6 per cent (Q4-2007–08). Though the quarterly growth rate of GDP fell steadily until the third quarter of 2008–09, it stabilized in the last quarter of 2008–09, grossing 6.7 per cent of the annual growth rate.

Table 1. Growth rates of real gross domestic product **

(Per cent)

Sector	2007-08*	2008-09#	2007-08				2008-09			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1. Agriculture and allied activities	**4.9**	**1.6**	**4.3**	**3.9**	**8.1**	**2.2**	**3**	**2.7**	**-0.8**	**2.7**
	(-17.8)	**(-17)**								
2. Industry	**7.4**	**2.6**	**8.5**	**7.5**	**7.6**	**5.9**	**5.1**	**4.8**	**1.6**	**-0.5**
	(-19.2)	**(-18.5)**								
2.1 Mining and quarrying	3.3	3.6	0.1	3.8	4.2	4.7	4.6	3.7	4.9	1.6
2.2 Manufacturing	8.2	2.4	10	8.2	8.6	6.3	5.5	5.1	0.9	-1.4
2.3 Electricity, gas and water supply	5.3	3.4	6.9	5.9	3.8	4.6	2.7	3.8	3.5	3.6
3. Services	**10.8**	**9.4**	**10.8**	**10.7**	**10.2**	**11.3**	**10**	**9.8**	**9.5**	**8.4**
	(-63)	**(-64.5)**								
3.1 Trade, hotels, restaurants, transport, storage and communication	12.4	9	13.1	10.9	11.7	13.8	13	12.1	5.9	6.3
3.2 Financing, insurance, real estate and business services	11.7	7.8	12.6	12.4	11.9	10.3	6.9	6.4	8.3	9.5
3.3 Community, social and personal services	6.8	13.1	4.5	7.1	5.5	9.5	8.2	9	22.5	12.5
3.4 Construction	10.1	7.2	11	13.4	9.7	6.9	8.4	9.6	4.2	6.8
4. Real GDP at factor cost	**9**	**6.7**	**9.2**	**9**	**9.3**	**8.6**	**7.8**	**7.7**	**5.8**	**5.8**
Memo:								(Amount in Rupees crore)		
(a) Real GDP at Factor Cost										
(b) GDP at Current Market Prices										

** : At 1999-2000 prices * : Quick estimates * : Revised estimates Q : quarter

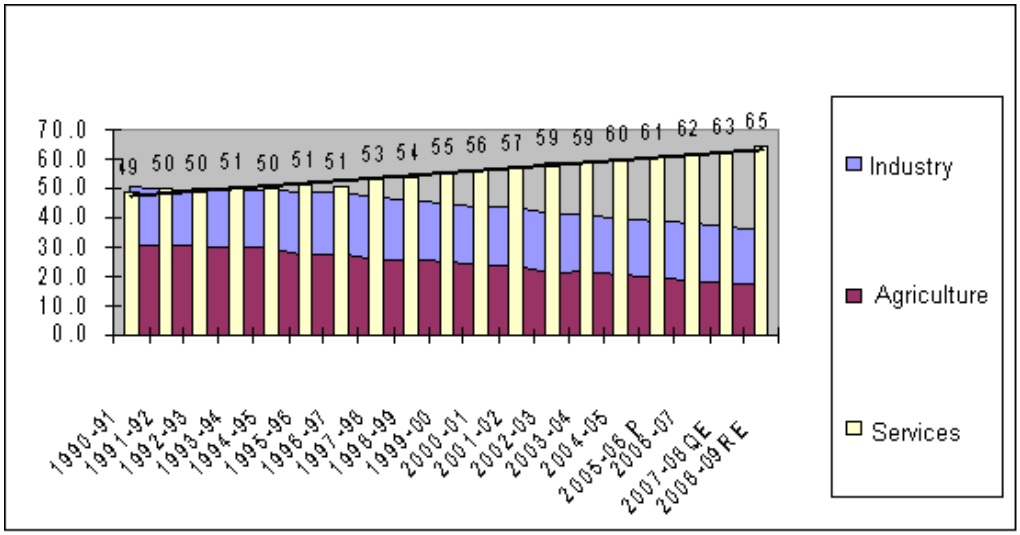
Note: Figures in parentheses indicate shares in real GDP

Source: Central Statistical Organization

India's GDP growth in 2008–09 was one of the highest in the world. It reflected the relative resilience of the country's growth impulses to a severe external shock as well as the impact of the policy response to contain the adverse effects of the global economic crisis on domestic growth.

Figure 1 depicts the changing sectoral composition of the Indian economy and sectoral growth rates since 1990–91. The share of agriculture in total GDP declined from 31.4 per cent in 1990–01 to 17 per cent in 2008–09, and the share of industry fell from 19.8 per cent in 1990–01 to 18.5 per cent in 2008–09, while the share of services rose sharply, from 48.8 per cent in 1990–01 to 64.5 per cent in 2008–09. During the ongoing global economic crisis, the share of the services sector in real GDP further increased from 63 per cent in 2007–08 to 64.5 per cent in 2008–09, while that of agriculture and industry declined. The services sector in India experienced the steepest fall in its growth rate compared with the other two sectors. The growth rate fell from 10.8 per cent in 2007–08 to 9.3 per cent in 2008–09, a decline of 1.4 per cent, compared with 3.3 per cent in agriculture, and 4.7 in industry.

Figure 1. Change in the sectoral composition of India's gross domestic product, 1990-91 to 2008-09
(Percentage)

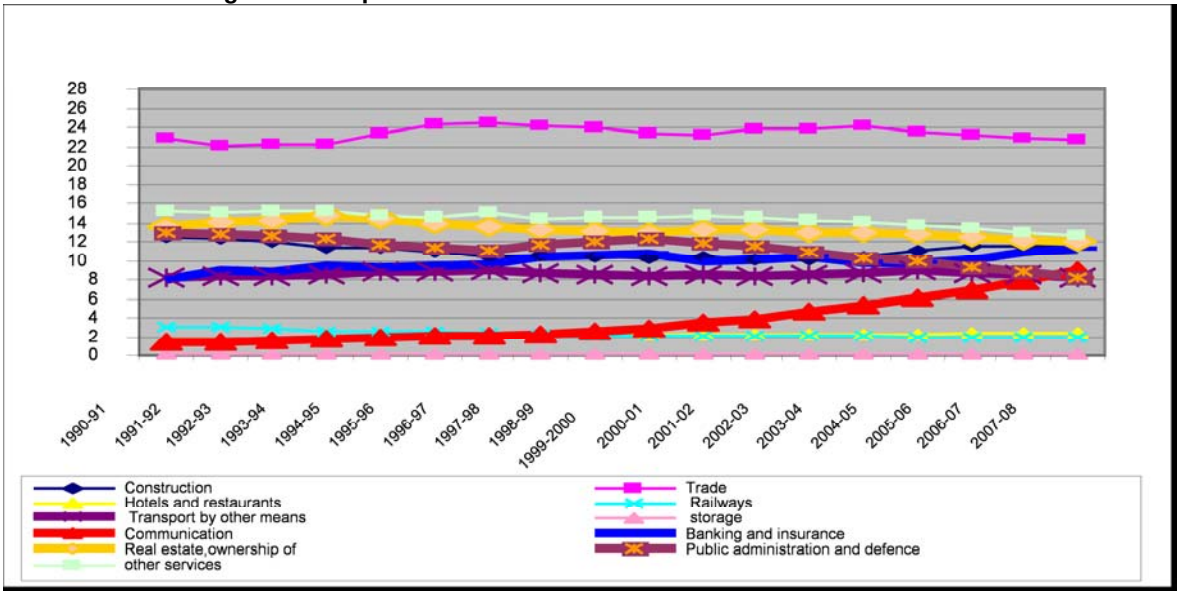


Source: Central Statistical Organization.

A close look at the composition of the services sector brings out some very interesting facts (figure 2). Within the sector, the highest share in services GDP has been of domestic trade (retail and wholesale trade), which averaged around 23.2 per cent of total services GDP in fiscal year (FY) 1990–FY 1999 and further increased to 23.4 per cent in FY 2000–FY 2007, remaining the most significant subsector in terms of its share in total services output. This was followed by the share of real estate, with an average of 13.7 per cent, which fell by one percentage point to 12.7 per cent in the subsequent period. Next in terms of the share in services output were public administration and construction services, with shares of 12 and 11.2 per cent, respectively, in the earlier period (FY 1990–FY 1999), which fell marginally to 10.8 and 10.2 per cent, respectively, in the subsequent period (FY 2000–FY 2007). What is interesting is that the top five services categories remained the same over time in terms of their share in total services sector output. These are also the services that have low tradability in India. These services are followed by banking and insurance, and transport services, which consistently averaged 10 per cent and 8.5 per cent, respectively during these periods.

What is most striking is the rise in the average share of communication services, which rose from 2.4 per cent to 7 per cent. Although there has been a steady rise in the share of communication services in total services output, the share has accounted for less than 10 per cent of total output of services at all times.

Figure 2. Composition of India's services sector: 1990–91 to 2007–08



Source: Reserve Bank of India.

2.2 The decomposition of India's gross domestic product growth rate: the contribution of the services subsectors

Decomposing GDP growth into growth in the three sectors of the economy (table 2), we find that in 2007–08, India recorded a growth rate of 9 per cent, of which 6.7 per cent was contributed by the services sector. The manufacturing sector contributed 0.5 percentage points, while the contribution of agriculture to the GDP growth rate was 0.3 percentage points. In 2008–09, almost 88 per cent of GDP growth could be attributed to growth in the services sector. The contribution of services to GDP growth over the years clearly shows that the main momentum to growth of real GDP has come from the services sector, especially during the global economic crisis.

Table 2. Sectoral decomposition of gross domestic product growth: 1990–91 to 2008–09
(Percentage)

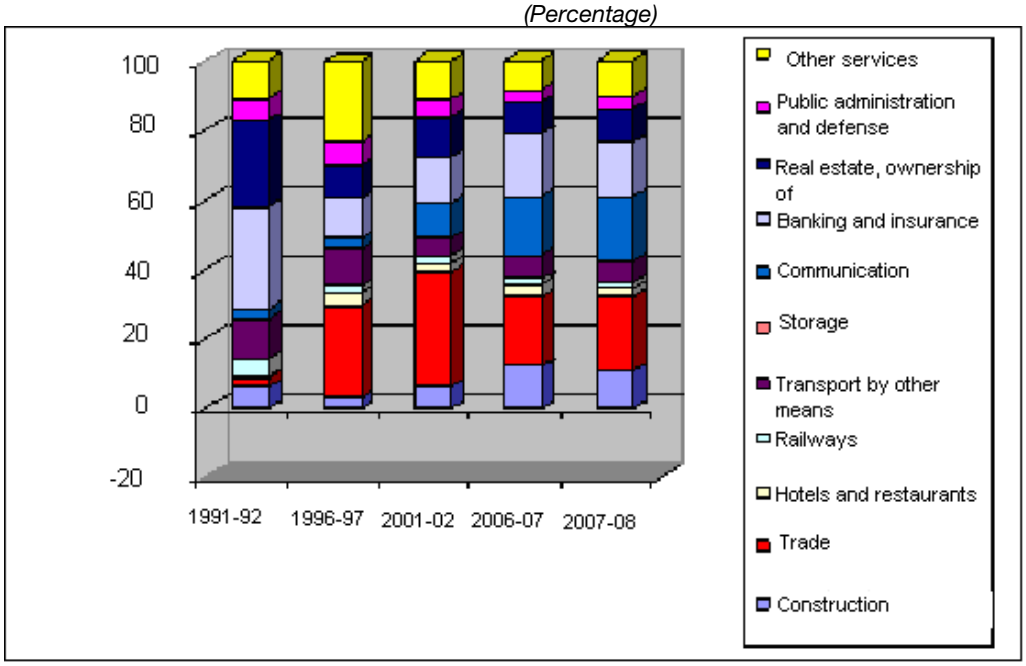
	Growth of GDP at factor cost	Agriculture	Industry	Services
1991–92	**1.4**	-0.6	-0.1	**2.1**
1992–93	**5.4**	2.0	0.6	**2.7**
1993–94	**5.7**	1.0	1.4	**3.2**
1994–95	**6.4**	1.4	2.0	**3.0**
1995–96	**7.3**	-0.2	2.6	**4.8**
1996–97	**8.0**	2.7	1.7	**3.6**
1997–98	**4.3**	-0.7	0.4	**4.6**
1998–99	**6.7**	1.6	0.7	**4.3**
1999–2000	**6.4**	0.7	0.7	**5.0**
2000–01	**4.4**	-0.1	1.3	**3.2**
2001–02	**5.8**	1.5	0.5	**3.8**
2002–03	**3.8**	-1.7	1.3	**4.3**
2003–04	**8.5**	2.1	1.2	**5.2**
2004–05	**7.5**	0.0	1.7	**5.8**
2005–06	**9.5**	1.2	1.6	**6.7**
2006–07	**9.7**	0.8	2.1	**6.9**
2007–08	**9.0**	0.9	1.4	**6.7**
2008–09	**6.7**	0.3	0.5	**5.9**

Source: Authors' calculations.

Figure 3 depicts the contribution of disaggregated services to GDP growth. Within the services sector, a breakdown of the GDP growth rate shows that the maximum contribution to the GDP growth rate in 2007–08, which was 6.7 per cent, came from the domestic trade subsector (retail and wholesale), which contributed 1.42 per cent of a 6.7 per cent growth rate. This was followed by communication services (which include telecommunication and software services) and banking and financial services, contributing 1.25 and 1.03 per cent, respectively. Construction services, other services and real estate services contributed 0.72, 0.68 and 0.65 percentage points, respectively. This was followed by transport and public administration services. The contribution of hotels, restaurants and railways to services growth has been less than 0.2 per cent.

The above analysis shows that the main drivers of GDP growth have been domestic trade, communication services, and banking and insurance.

Figure 3. Decomposition of services sector growth
(Percentage)



3. THE IMPLICATIONS OF THE GLOBAL ECONOMIC CRISIS ON INDIA'S EXPORTS OF SERVICES

3.1 The share of India's exports of services in total services output and gross domestic product

Though India's services sector has grown in a sustained fashion since 2003–04, recording a growth rate of above 5 per cent, it is important to examine to what extent this growth been driven by external demand, which is exports of services. In less than two decades, India has become one of the top five exporters of services among developing countries and has surpassed some the other Asian countries that had dominated the services trade in the 1990s. India has been deemed a major exporter of services in the world with a market share of 2.6 per cent in 2007 as against 0.6 per cent in 1995. India's services sector has matured considerably during the last few years and has been recognized worldwide for its high growth.

Indian services exports grew at a compounded annual growth rate of 17 per cent from 1993 to 2000 and at a much faster pace, reaching 24 per cent from 2001 to 2008. Exports of services grew from $20.8 billion in 2002 to $90.1 billion in 2007–08, and further to $101 billion in 2008–09. India's services sector growth has mainly been attributed to its exports. However, although there was rapid growth in the services exports from 2002 onwards, exports of services still stand at around 15.1 per cent of total services output and 9.4 per cent of total GDP of the economy(table 3).

Table 3. Share of services exports in services output and gross domestic product: 1990–91 to 2008–09
(Percentage)

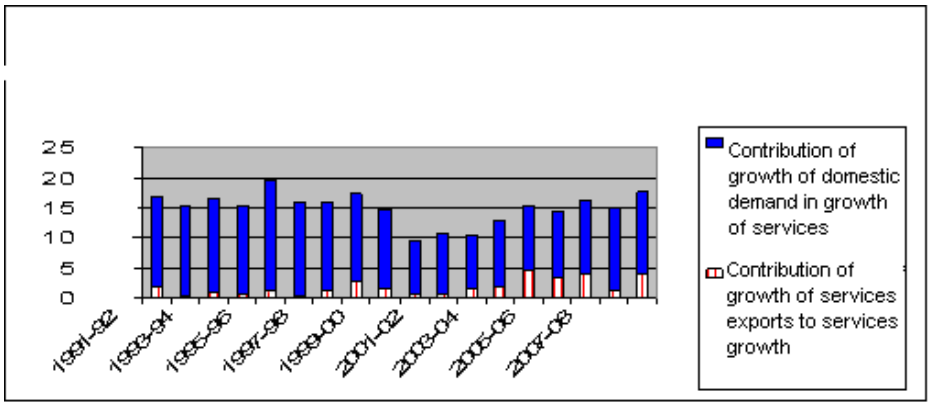
	Share of exports of services in total services output	Share of exports of services in GDP
1990–91	3.2	1.6
1991–92	4.2	2.1
1992–93	4.0	2.0
1993–94	4.2	2.1
1994–95	4.2	2.1
1995–96	4.5	2.3
1996–97	4.2	2.1
1997–98	4.8	2.5
1998–99	6.4	3.4
1999–00	6.9	3.8
2000–01	6.9	3.9
2001–02	6.8	3.9
2002–03	7.6	4.4
2003–04	8.2	4.9
2004–05	11.2	6.7
2005–06	12.9	7.8
2006–07	14.5	8.8
2007–08	13.7	8.4
2008–09	15.1	9.4

Source: Author's estimations

The decomposition of services export growth (figure 4) clearly shows that it is not growth in exports of services that is driving growth in the services sector, but growth in domestic demand. The contribution of growth in exports of services to growth in the overall services sector was only 22 per cent, that is, out of 17.5 per cent growth of services, the contribution of growth in the services sector was mere a 3.93 per cent. However, over the years, the contribution of growth in exports of services to total services growth has been rising. This indicates that although the export of services is becoming important for India's services sector, it may not be the main driver of its growth.

Figure 4. Decomposition of growth of services: Growth in domestic demand compared with growth in exports

(Percentage)

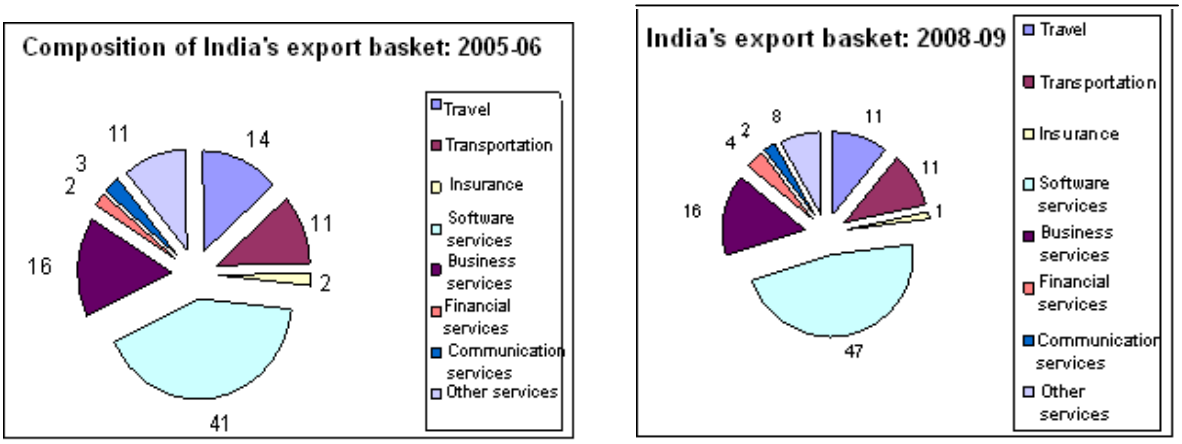


3.2 The composition of India's exports of services

Within services exports, we find that India's export basket has not diversified much over time. Only a few services comprise its export basket, with the share of software services being the largest, at around 41 per cent since 2005–06 and 47 per cent in 2008–09. Together with software services, non-software services, which cover business and professional services, account for around 70 per cent of India's exports (figure 5).

Figure 5. Composition of India's export basket: 2005–06 to 2008–09

(Percentage)



3.3 Estimating the impact of the global economic crisis on exports of India's services: Income elasticity of demand for the export of India's services

To assess the implication of the global economic crisis on the external demand for services, we estimate the income elasticity of export demand for aggregated services and some of the disaggregated services for which the data are available.

3.3.1 Existing literature

Global demand plays an important role in determining a sector's export growth. The rise in global incomes is accompanied with a rise in demand for normal and luxury products, while for inferior products or services it may decline. Income elasticity of demand[4] for luxury products is expected to be greater than one, while for normal goods it is expected to be between 0 and 1. The kind of products or services a country exports, i.e. the income elasticity of demand of the products or services, is an important factor that determines the impact of external demand shocks such as a global economic crisis on a country's exports. Along with income elasiticity, price competitiveness may determine the impact of the global economic crisis on exports. If the services exported are less price sensitive, then in case of a slowdown, the option of lowering prices to maintain market shares may not be feasible.

There is a vast literature that estimates the income or price elasticities for the export of goods, but very few studies exist, especially for developing economies, which estimate the income elasticity for the export of services. There are even fewer studies that estimate the income elasticity for services exports for India. The small number of empirical time-series studies that exist on the determinants of United States exports of services largely model export volumes in terms of foreign income and the real exchange rate. All show that conventional models of merchandise trade can be applied successfully to trade in services, as argued by van Welsum (2003). Recent examples include Huang and Viana (1995), Wren-Lewis and Driver (1998), Deardorff et al. (2000), Ansari and Ojemakinde (2003) and Mann (2004).

Most of these studies find that the income elasticity of demand is above unity, while relative price effects are comparatively small, compared with those typically found for merchandise trade. For example, Wren-Lewis and Driver (1998) use various estimation techniques and find that the income elasticity of demand for the aggregate volume of exports of services in the United States lies in the range of 1.50–1.95 per cent, while the relative price elasticity lies in the range of -0.21 to -0.40 per cent. The findings of Huang and Viana (1995), Deardorff et al. (2000) and Mann (2004) raise the possibility of heterogeneous income and price elasticities for different categories of services exports, although none of these studies seek to test this explicitly. Huang and Viana (1995) and Deardorff et al. (2000) both find much higher income and price elasticities of demand for passenger fares and other travel-related exports, than for other categories of service exports. In a panel data analysis of subcategories of business and technical services, Mann (2004) reports that relative price elasticities are typically insignificant and in some cases do not have the expected negative sign.

Empirical evidence of low price elasticity and high income elasticity of export demand in general has important implications for exports of developing countries. Firstly, this suggests that the export growth of developing countries is highly dependent on the economic performance of developed countries. Secondly, it implies that the developing countries may have a limited capacity to lower prices in order to maintain or increase exports.

It has been recognized in the literature that the higher the income elasticity of export demand, the more powerful the exports as an engine of growth.[5] Senhadji and Montenegro (1999) found that the Asian countries had the highest estimated values for income elasticity among the developing and industrial countries. This supported the view that exports had been a powerful engine of growth in Asia, which has an important implication: The higher the income elasticity of export demand, the more severe the impact of slowdown of incomes or GDP on developing countries' exports and growth.

[4] The income elasticity of demand measures the responsiveness of the demand of a good to the change in the income of the people demanding the good. It is calculated as the ratio of the percentage change in demand to the percentage change in income. For example, if, in response to a 10 per cent increase in income, the demand of a good increases by 20 per cent, the income elasticity of demand would be 20 per cent/10 per cent = 2.

[5] See Houthakker and Magee (1969), Goldstein and Khan (1985)

To estimate the likely impact of slowdown of global GDP growth on export demand for India's services, we estimate income elasticities for aggregate services exports, and exports of travel services, transportation services, financial services and software services in order to estimate the extent to which services exports can be affected in case of a decline in growth of global GDP.[6] We use time-series data for the period 1970 to 2008.

3.3.2 Methodology and data

To assess the impact of slowdown on India's exports, we estimate the standard export demand equation for India using data for 1970 to 2008. According to the standard export demand function, exports depend on price competitiveness as measured by the real exchange rate and global income as measured by global GDP.

To measure relative price, it is necessary to look at price and exchange rate data. The volume of exports depends on nominal exchange rates after adjusting for the domestic level of inflation[7] by which we arrive at the real effective exchange rate (REER). Real exports of services are derived by deflating nominal exports with a GDP deflator. World GDP in real terms captures the income effect. The model estimated is therefore as follows:

$$LNEXPSER_{INDIAt}^{d} = \alpha_1 + \alpha_2 LNGDP_{WORLDt} + \alpha_3 LNREER_t + u_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

t = 1970 to 2008

Where $LNEXPSER_{INDIA}$ is a log of real exports of services of India to the world; $LNGDP_{WORLD}$ is a log of real world GDP; and *LNREER* is a product of effective exchange rates and relative prices. The data on world GDP at current and constant prices is taken from world development indicators; the exchange rate is taken from the United States Department of Agriculture Economic Research Service International Macroeconomic Data Set; India's exports of services is taken from data from the Reserve Bank of India. The same equation is estimated for aggregate services exports, exports of travel services, transportation services, financial services and software services. However since data for software services to the world for this period are not available, estimations are made for the United States' imports of software services. For services, data have been extracted from the database of the Organization for Economic Cooperation and Development (OECD). The equation estimates income elasticity of exports of software services to the United States. These results are indicative, as 60 per cent of the total exports of India's software services are destined for the United States.

We have followed the standard procedure in the literature to check for unit roots in each series before estimating a model that involves time-series data. If there is a unit root, then that series is considered to be non-stationary. The stationarity of each series is tested by the following unit root tests: (a) Augmented Dickey-Fuller test, or the ADF test; and (b) the Phillips-Perron test, or the PP test. Since regressions have been run for aggregate exports as well as for sector-specific exports, we have conducted tests separately. The results of these are reported in annex I. We find that most of the series used are stationary at levels. Wherever we found that the series contained the unit root in levels, but no unit roots in first differences, we used the popular Engle and Granger (1987) method to estimate the export demand functions. According to Engle and Granger (1987), it is possible to have a linear combination of these non-stationary variables that is stationary. Two estimation steps are carried out. First, the best possible linear equation – as shown in equation (1) – is estimated, and residuals are collected. Then a unit root test is used to test whether residuals are stationary. We find that they are stationary, which implies that there is a long-run equilibrium relationship; therefore, a meaningful regression estimate can be carried out.

3.3.3 India's income elasticity of total exports of services

To examine the likely impact of slowdown of world GDP growth on India's export growth of services, we estimate the above equation (equation 1) for exports of disaggregated services, exports of transportation services, travel services and financial services to the world; and export of software services to the United States. Table 4 presents the results of the estimations.

[6] The choice of services subsectors was governed by the availability of data.

[7] Real exchange rate (R) = nominal exchange rate (e) × foreign price (p*)/domestic price (p). The nominal exchange rate is measured as domestic currencies per unit of foreign currency.

Table 4. Income elasticities of India's export demand

Countries	Income demand elasticity for exports of services	Price elasticity for exports of services
Aggregate services	**3.22***	**-0.56****
Transportation services	**1.98***	**-0.57***
Travel services	**3.54***	**-0.95***
Financial services	**2.37***	**-0.64**
Software services	**6.04***	**-0.23**

Note: * = statistically significant

The results show that India's exports of aggregated services to the world are much more responsive to income changes, compared with price changes, though both factors are found to be significant. A 1 per cent decline in the world GDP growth rate will lead to a 3.22 per cent decline in India's growth of exports to the world. However, much greater price competitiveness is required to increase exports. It should be noted that the price elasticity, inter alias, captures the effects of currency depreciation and a lowering of relative prices. This implies that it will be very difficult to increase India's export growth by improving its price competitiveness.

As found by other studies, there is a large difference in the income elasiticities of different services exports. The highest income elasticity of exports to the world is found to be for travel services, which is consistent with other studies (Huang and Viana (1995) and Deardorff et al. (2000) on United States services exports. The income elasticity for transportation services is found to be higher than 1, but much lower as opposed to travel services exports. Financial services exports have an income elasticity of 2.37, which implies that as growth of global GDP rises, India's exports of financial services will rise more than proportionately.

The income elasticity of India's exports of software services to the United States is found to be the highest, at 6.04. A few other studies on exports of IT services have also found very high income elasticities. According to estimates by Nomura (2009), the income elasticity of demand for India's export of business services and ITES-BPO services to OECD countries was as high as 9.6 and 7.1, respectively. The high income elasticity of India's exports of software services explains to a large extent the exponential growth in its exports in the post-2000 period.

3.4 Exports of India's services: Implications of the global economic crisis

High income elasticities of India's export of services imply that a slowdown in the growth of global GDP will have far-reaching impacts on the external demand for India's exports. The global economic crisis brought to a halt the amazing growth of India's exports of services. The growth of exports of total services declined from 28 per cent in 2006–07 to less than half, i.e. 12.4 per cent in 2008–09. To analyse the extent to which the global economic crisis has affected the growth of services, we examine the annual and quarterly trends in the exports of services, especially those which have been identified with high income elasticity for exports.

By examining the growth of exports of disaggregated services (table 5), we find that in the period 1993–2000, the fastest-growing exports of services were of government services (not included elsewhere), followed by miscellaneous services (including both software and non-software services). However, in the period 2000–08, there was a substantial rise in the compound annual growth rate of exports of travel services (15.8 per cent), transportation services (21.96 per cent), insurance services (25.29 per cent) and software services (26.01 per cent).

Table 5. Growth of India's exports of disaggregated services

Invisibles by service export of transactions										
	Compound annual growth rate 1993-2000 (%)	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**Compound annual growth rate 2000-2008 (%)**
Travel	**4.56**	**3,497**	**3,137**	**3,312**	**5,037**	**6,666**	**7,853**	**9,123**	**11,349**	**15.85**
Year-to-year growth (percentage)		15.18	-10.29	5.58	52.08	32.34	17.81	16.17	24.4	
Transportation	**2.53**	**2,046**	**2,161**	**2,536**	**3,207**	**4,683**	**6,325**	**7,974**	**10,014**	**21.96**
Year-to-year growth (percentage)		19.86	5.62	17.35	26.46	46.02	35.06	26.07	25.58	
Insurance	**9.29**	**270**	**288**	**369**	**419**	**870**	**1,062**	**1,195**	**1,639**	**25.29**
Year-to-year growth (percentage)		16.88	6.67	28.13	15.55	107.6	22.07	12.52	37.15	
G.N.I.E	**52.75**	**651**	**518**	**293**	**240**	**401**	**314**	**253**	**330**	**-8.14**
Year-to-year growth (percentage)		11.86	-20.43	-43.44	-18.09	67.08	-21.7	-19.43	30.43	
Miscellaneous of which:	**31.99**	**9,804**	**11,036**	**14,253**	**17,965**	**30,629**	**42,105**	**55,235**	**66,745**	**27.09**
Year-to-year growth (percentage)		-3.44	12.57	29.15	26.04	70.49	37.47	31.18	20.84	
Software		**6,341**	**7,556**	**9,600**	**12,800**	**17,700**	**23,600**	**31,300**	**40,300**	**26.01**
Year-to-year growth (percentage)			19.16	27.05	33.33	38.28	33.33	32.63	28.75	
Total	**16.91**	**16,268**	**17,140**	**20,763**	**26,868**	**43,249**	**57,659**	**73,780**	**90,077**	**23.85**
Year-to-year growth (percentage)		3.56	5.36	21.14	29.4	60.97	33.32	27.96	22.09	

Note: G.N.I.E. – Government services not included elsewhere; figures in millions of dollars.
Source: www.rbi.org.in

Exports of software and IT-enabled services increased to $40.3 billion in 2007–08 and further to $47 billion in 2008–09, compared with $6.3 billion in 2000–01. Out of $40.3 billion in 2007–08, there were $29.4 billion worth of IT services exports and $0.9 billion worth of ITES-BPO services (table 6).

Table 6. India's exports of software services: 1995–96 to 2007–08

(Millions of dollars)

Year	IT services exports	ITES-BPO exports	Total software services exports
1995–96	754	–	754
1999–00	3,397	565	3,962
2000–01	5,411	930	6,341
2001–02	6,061	1,495	7,556
2002–03	7,100	2,500	9,600
2003–04	9,200	3,600	12,800
2004–05	13,100	4,600	17,700
2005–06	17,300	6,300	23,600
2006–07	22,900	8,400	31,300
2007–08	29,400	10,900	40,300

Source: NASSCOM.

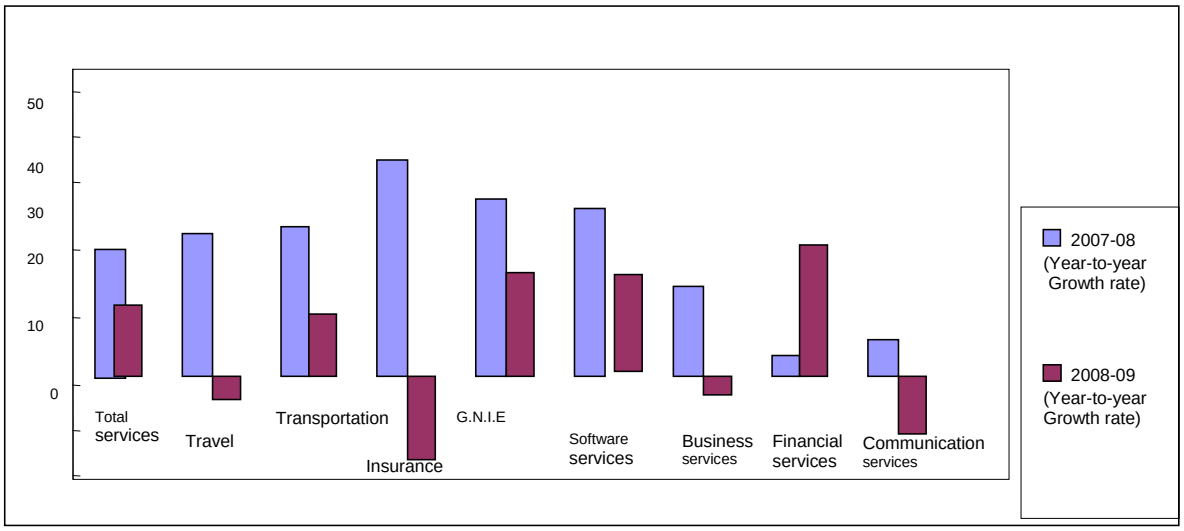
Growth in software services, which constitute close to 50 per cent of India's exports of services, has shown remarkable resilience to the global slowdown in demand. Since cutting costs becomes a top priority in times of economic deterioration, it may make outsourcing more attractive.

The banking, financial and insurance subsectors, which have been the epicentre of the global financial crisis, accounts for approximately 50 per cent of the revenues of IT and ITES providers. This makes IT and ITES highly vulnerable to the current global slowdown in terms of delayed decision-making and reductions in IT spending by customers of frontline IT companies. Given these vulnerabilities and the heavy dependence on a few markets – the United States and the United Kingdom account for 80 per cent – it is remarkable that the Indian IT-BPO sector achieved 28.7 per cent growth in 2007–08, although this is less than its growth performance in 2006–07, which was 32.6 per cent.

Figure 6 depicts the year-to-year growth rate of disaggregated services during the global economic crisis. Most of the services subsectors experienced a decline in their export growth in 2008–09, except for financial services, which saw their exports grow. Travel, insurance, business services and communication services experienced negative export growth during the same period.

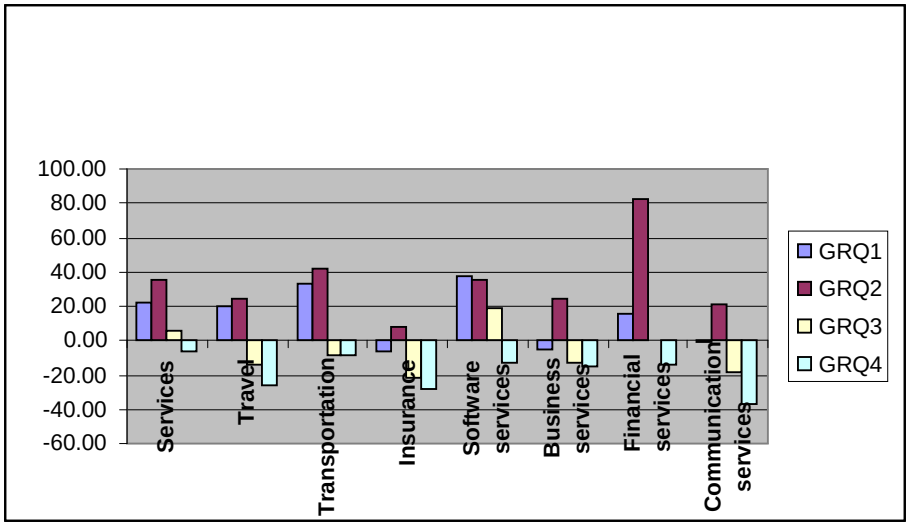
Figure 6. Year-to-year growth rate of India's exports of disaggregated services: 2007–08 to 2008–09

(Percentage)



Although the growth of software services declined from 26 per cent in 2007–08 to 16 per cent in 2008–09, it continues to remain positive and relatively high. The positive annual growth of India's exports of software services shows that the global economic crisis has led to a fall in the export growth of software services. However, it remained steady at around 16 per cent in 2008–09. Quarterly trends (figure 7) illustrate the fall in export growth more clearly. Comparing the quarterly growth of 2008–09 to the same quarter in the previous year, we see a sharp decline in services exports since the third quarter of 2008–09. The growth rate in total services exports became negative in the fourth quarter of 2008. Most of the services exports experienced a negative growth rate, the highest decline being in communication services, followed by insurance and travel services. The decline in software services exports has not been as high as in other services.

Figure 7. Quarterly growth in exports of services: 2008–09



According to NASSCOM (March, 2009), within the software services, Indian IT-BPO grew by 12 per cent in FY 2009 to reach $71.7 billion in aggregate revenue. Software and services exports, which include exports of IT services, BPO, engineering services, and research and development (R&D) and software products, reached $47 billion, contributing nearly 66 per cent to overall IT-BPO aggregate revenue.

One of the reasons for the growing demand for India IT-BPO services is that although the United States (60 per cent) and the United Kingdom (19 per cent) remained the largest IT-BPO export markets in FY 2008, the industry footprint has steadily expanded to other regions – with exports to Continental Europe growing at a compounded annual growth rate of more than 51 per cent from FY 2004–FY 2008. The industry's vertical market exposure has been well diversified across several mature and emerging sectors. Banking, financial services and insurance remained the largest vertical market for Indian IT-BPO exports, followed by high technology and telecommunication exports, which together accounted for 61 per cent of the Indian IT-BPO exports in FY 2008. All this contributed to a favourable export growth of software services, which helped limit the impact of the global economic crisis on the exports of India's software services sector.

4. THE GLOBAL ECONOMIC CRISIS AND THE ROLE OF DOMESTIC DEMAND WITH REGARD TO INDIA'S SERVICES

The above analysis shows that the global economic crisis has adversely affected the growth rate of exports of almost all services. However, the growth rate of most of the services has remained positive, leading to an increase in the contribution of the services sector to total GDP, which rose from 63 per cent in 2007–08 to 65 per cent in 2008–09. Despite a decline in overall exports, growth in services sector exports – a whopping 77.6 per cent – can be explained by rising domestic demand.

One of the hallmarks of the robust growth of the Indian economy in 2003–08 has been a strong domestic demand and a weak external demand. This has provided the economy with a built-in resilience to external demand shocks, especially in the services sector. The contribution of private consumption to GDP growth increased from 46.3 per cent in 2005–06 to 53.8 per cent in 2007–08 (table 7). Government consumption contributed a much smaller part to domestic demand, which rose from 7.1 per cent in 2005–06 to 8 per cent in 2007–08. However, in 2008–09, because the global financial crisis seeped into real sector growth, the contribution of private consumption to GDP growth dipped sharply and reached 27 per cent. This decline was cushioned by a substantial increase – 32.5 per cent – in the contribution of government consumption to aggregate growth. In 2008–09, the contribution of domestic demand to aggregate GDP growth thus increased from 44.5 per cent in 2007–08 to 59.5 per cent in 2008–09, while external demand, as seen by the net exports of goods and services as a percentage of GDP, dropped from (-) 4.6 per cent in 2007–08 to (-) 6.05 in 2008–09.[8] Therefore, despite the acute decline in external demand, it was possible to moderate the fall in GDP growth.

Table 7. Contribution of domestic and external demand to gross domestic product growth

	Growth of gross domestic product					
	2003-04	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**
GDP at market prices	8.4	8.3	9.3	9.7	9.1	6.1
Consumption (private)	5.9	5.2	7.1	6.3	8.5	2.9
Consumption (government)	2.6	3.6	6.2	5.5	7.4	20.2
Gross capital formation	17.6	21.8	19.5	13.2	14.7	na
Gross fixed capital formation	13.6	18.9	17.6	14.5	12.9	8.2
Change in stocks	-8.0	140.1	61.9	5.4	51.7	2.9
Exports	9.6	27.2	17.6	21.1	2.1	12.8
Imports	13.8	22.2	41.1	24.5	6.9	17.9
	Contribution to growth (per cent)					
Consumption (private)	45.1	38.8	46.3	38.7	53.8	27.0
Consumption (government)	3.6	4.8	7.1	5.8	8.0	32.5
Gross capital formation	52.4	71.3	63.8	45.6	55.7	na
Gross fixed capital formation	38.4	56.4	51.3	43.9	43.6	42.5
Net exports	-6.3	10.1	-41.4	-13.2	-14.0	-29.5
	Relative share (per cent)					
Consumption (private)	62.3	60.5	59.3	57.5	57.2	55.5
Consumption (government)	11.1	10.6	10.3	9.9	9.8	11.1
Gross capital formation	27.1	30.5	33.3	34.4	36.2	na

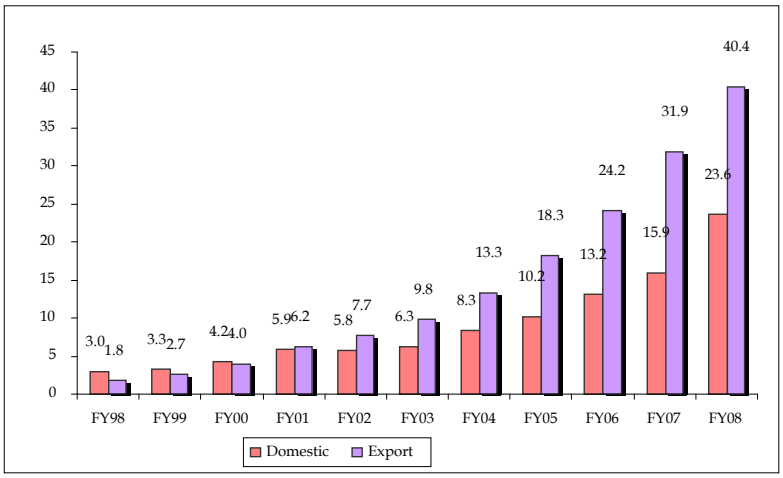
Source: Economic Survey 2009–10, Ministry of Finance, Government of India.

With regard to the role played by domestic demand in building the resilience of the Indian services sector, we find that there was only a marginal decline in the growth of private final consumption expenditure for services such as transport and communication in 2007–08, compared with 2006–07. In contrast, it increased for services such as medical care and health services, recreation, education and cultural services, and miscellaneous goods and services.[9]

[8] *Macroeconomic and Monetary Developments, First Quarter Review 2009–10*, Reserve Bank of India.
[9] See *Economic Survey (2009–10)*, Government of India, p. 5.

Domestic demand also provided much-needed support to the growth of ITES and BPO services. As shown in figure 8, software and services exports were expected to reach $40.4 billion, and the domestic market, $23.6 billion, in FY 2008 (figure 8).

Figure 8. Total revenue from domestic and external sources in Indian information technology services
(Billion dollars)



Year-to-year growth of domestic consumption of IT services increased from 22.2 per cent in 2007–08 to 43.6 per cent in 2008–09. In comparison, growth in the domestic consumption of IT-BPO services increased to 45.5 per cent in 2008–09 from 22.2 per cent in 2007–08. Growth in exports of both IT services and IT-BPO services declined in this period because of the global economic crisis. Vertical segments of IT services also witnessed a rise in their domestic demand. Growth in domestic demand for engineering and R&D and software services increased from 23.15 in 2007–08 to 30.6 per cent in 2008–09 (table 8). In 2008–09, growth in revenue from software services exports dropped from 37.2 per cent in 2005–06 to 29.1 per cent in 2008–09.

Table 8. Growth in domestic demand and exports in India's ITES-BPO services: 2005–2008
(Percentage)

	FY 2005	FY 2006	FY 2007	FY 2008
IT services – exports	37.0	33.0	35.3	28.3
IT services – domestic	12.9	28.6	22.2	43.6
ITES-BPO – exports	48.4	37.0	33.3	29.8
ITES-BPO – domestic	100.0	50.0	22.2	45.5
Engineering services, R&D and software – exports	24.0	29.0	22.5	30.6
Engineering services, R&D and software – domestic	75.0	85.7	23.1	37.5
Percentage of exports of total software and services revenues	37.2	33.3	32.6	29.1

The above trends highlight the role played by domestic demand in mitigating the adverse impact of the global economic crisis on growth in many services subsectors, including mainly exportable services such as IT-BPO services.

Literature supports the growing use of IT-BPO services domestically. Apart from IT-BPO, the growth of domestic demand for most services increases rapidly as an economy grows. Pilat (2000) finds that with the increasing complexities of modern industrial organizations, manufacturing activities have become more and more service intensive both upstream (for example, design and R&D) and downstream (for example, marketing and advertising). Further, he argues that the competitive advantage of firms will then depend more on providing specialized services like financing and after-sales facilities than on production. This explains the increased demand for intermediate specialized services.

With respect to the developing economies, the rise in service inputs into manufacturing has been confirmed by a number of empirical studies, such as those conducted by Park (1989), Park and Chan (1989) and Uno (1989). However, very few studies have empirically estimated the magnitude of the increase in the use of services in the manufacturing sector. For India, Gordon and Gupta (2004) measure the growing usage of services in other sectors through changes in the input-output coefficients. The matrices for different years show that the use of services sector inputs into industry increased by about 40 per cent between 1979–80 and 1993–94 in the Indian economy.

Alternatively, the increased usage of services by the manufacturing sector was estimated by Banga and Goldar (2004) in the 1980s and 1990s. For this purpose, they empirically estimate the contribution of services as an input to manufacturing organized output growth in Indian manufacturing using the KLEMS (capital-labour-energy materials-services) production function. The results of the analysis indicate that the growing use of services had a significant favourable effect on the growth of output in Indian manufacturing in the 1990s. The contribution of service input to output growth in manufacturing was about 1 per cent in the 1980s, increasing to about 25 per cent in the 1990s.

5. THE ROLE OF PRODUCTIVITY GROWTH IN INDIA'S SERVICES SECTOR

The resilient growth of India's services sector and its growing contribution to GDP growth during the global economic crisis can be explained to a large extent by the growing domestic demand for services. However, the mere presence of demand may not be sufficient for a sector to grow. Supply-side factors, which allow output to expand to meet existing demand, are also key. A sector's productivity growth is an important factor that may enable the sector to grow steadily and increase its share in total GDP. Using firm-level data, an attempt has been made to estimate the productivity growth of services firms in India in three subsectors: retail and wholesale trade, software services and banking services. Nonetheless, since the identification and measurement of outputs and inputs of the services sector are difficult and beset with conceptual problems, there is scant literature estimating productivity growth in services.

5.1 The productivity growth debate: services versus goods

It has often been argued in the literature that services are less productive than goods. Following Kaldor (1966), who emphasized that labour in the non-manufacturing sector is less productive, many studies have attempted to examine the lagging productivity of the services sector. Baumol (1967) points out that productivity improvements in services are harder to achieve than in goods-producing industries. The unbalanced growth models by Baumol and Fuchs (1968) helped popularize the notion that because of their labour-intensive nature, service-sector activities cannot be made more efficient by means of capital accumulation, innovation or economies of scale.

However, some studies argue that in creating new ways to meet needs, technological changes are as important in the services sector (such as health care) as in the commodity sector. However, when it comes to cost reduction for existing products or services, the effects of technological change are more frequent and more powerful in the commodity sector. Therefore, the productivity of the services sector relative to the productivity of the commodity sector may vary inversely with a country's income level (e.g. Kuznets, 1955, 1966; Chenery and Syrquin, 1975; Bhagwati, 1984; and Kravis, 1983). In other words, the productivity differential in services between poor and rich countries is found to be lower than that in commodities.

However, lower productivity in services compared with goods would imply that the shift of the economy towards a larger services sector might lead to a reduction in the national rate of productivity improvement. However, these notions have led to alternative arguments for lower productivity in services. Two important arguments put forward are as follows: (a) larger investments have been made in new technology in the services sector, and this may take time to lead to productivity enhancement and (b) the low productivity of services is a product of the mismeasurement of output in services, since an increasing portion of output is not captured in the basic statistics. Some studies have also attributed slower productivity in services to a lack of competition in the services sector (Fingleton, 1995). A higher level of regulation in services, including foreign investment controls and less exposure to foreign trade, are found to be important reasons for lower competition in services.

5.2 Problems in measuring services productivity

A key problem in measuring productivity relates to obtaining a suitable measure of output of services over time. Griliches (1994) points out that some of the services whose productivity growth rates in the 1947–1973 era were as high or higher than productivity growth in manufacturing industries have experienced much lower productivity growth since 1973. Additionally, studies have found the productivity slowdown particularly acute in services, where output is hard to measure – for example, health services generally experience the largest labour productivity slowdown in services, and both banking and health services have large multifactor productivity slowdowns. These point to the possible problem of mismeasurement, since it is very difficult to define and measure output in both health and banking services.

The problems pointed out in the literature that lead to mismeasurement are as follows:

(a) Market prices are not available for publicly provided services;
(b) It is difficult to identify precisely what constitutes the service activity in a particular industry and to account correctly for the quality changes in services. This is further complicated by inappropriate deflators that cannot distinguish quality improvements;
(c) The quantity of services is difficult to capture, as it often represents a process by which a user (consumer) or the user's good is changed (Hill, 1977);

(d) Compared with goods, many services are characterized by a greater degree of heterogeneity –even uniqueness – therefore, it is difficult to aggregate them;
(e) The poor quality of data concerning services compounds the problems.

Apart from the above-mentioned problems in the measurement of output and labour input, it is also recognized that there is no overall theme to measurement problems in different services. Each appears to be a special case, with specific measurement problems unique to the services measured.

5.3 Measurement of total factor productivity growth in key services

Given the role played by productivity growth in the services sector, we attempt to estimate total factor productivity growth in some of the key services in India and provide policy recommendations for improving the productivity and efficiency of these services. The identified services are those which have a large share in total services output and also contribute to the growth of the services sector. If productivity rises in these services, the potential gains to the economy would be substantial, as these services in turn will improve productivity growth in other sectors where they are widely used. The identified services for India are trade (retail and wholesale), software services and financial services. A firm-level analysis has been carried out to estimate total factor productivity growth in these sectors over time.

Given the nature of retail services in India, where only 2 per cent of retail activities are undertaken in the organized sector, and the availability of data for a very low number of organized retail firms making productivity growth estimates for India at firm level has been avoided. However, broad policy directions for improving the efficiency of the sector are provided. For software services, a firm-level analysis was carried out for 18 IT firms from 1994–95 to 2007–08 (18 years). For banking services, total factor productivity growth was estimated for 67 banks over a 10-year period (1998–1999 to 2007–08).

5.3.1 Productivity measurement: Methodology adopted

Productivity growth in most services is estimated either by using labour productivity estimates, that is, output measured per unit of labour employed or by constructing multifactor productivity indices. Calculations of multifactor productivity take into account capital inputs as well as employment and hours worked. Many studies find that the multifactor productivity data are broadly consistent with the labour productivity numbers (Maclean, 1997), but multifactor productivity indices are considered to be superior, as they relate to total factor productivity (Worthington, 1999).

Most of the studies in the current literature use the data envelopment analysis (DEA) approach, a linear programming methodology that constructs a nonparametric, piecewise-linear, best-practice frontier from observable input and output data to measure productivity in different services subsectors. Using DEA, the Malmquist indices are estimated to arrive at total factor productivity.[10] This index is a valuable tool because it allows for the decomposition of productivity into two components: innovation and imitation. The first component, also called technological change, captures any expansion of the production possibilities frontier. The second component captures the convergence of firms toward the existing technology; this phenomenon is also called efficiency change or catching up. The DEA technique has been most widely used for estimating productivity in the services sector.

Some reasons for preferring DEA to other approaches are that it does not require a preconceived structure or specific functional form to be imposed on the data in identifying and determining the efficient frontier, error and inefficiency structures of the firms. Hababou (2002) adds that it is better to adopt the DEA technique when it has been shown that a commonly agreed functional form relating inputs to outputs is difficult to prove or find. Such a specific functional form is truly difficult to show for the sectors analysed: financial services entities, IT firms and hospitals. Finally, Avkiran (1999) acknowledges the edge of DEA by stating that this technique allows the researchers to choose any kind of input and output depending on the objective of the exercise, regardless of different measurement units. There is no need for standardization. However, the main weakness of DEA is that it assumes data are free from measurement errors. Furthermore, since efficiency is measured in a relative way, its analysis is confined to the sample set used. This means that an efficient firm found in the analysis cannot be compared with other firms outside the sample.

[10] We use version 2.1 of DEAP, which stands for Data Envelopment Analysis Program and was written by Tim Coelli.

Productivity growth in information technology firms

Given the significance of IT in the aggregate services sector, both in terms of domestic and external demand, an attempt has been made to estimate change in total factor productivity growth using a panel of 18 firms for 14 years (1994–95 to 2007–08). Since the objective is to determine whether there has been an improvement in productivity growth over time, a longer time period has been selected. To arrive at a balanced panel, the number of firms for which the data are available for this period was limited.[11] Data have been extracted from the *Capital Line* database, which provides data for all listed firms in India.

DEA makes it possible to examine the sources of productivity growth, that is to say, whether total factor productivity has increased because of technological progress (technical change or innovation) and/or because of pure efficiency improvements and/or scale economies. To estimate productivity, total income has been used as an output; number of employees, and expenditure on plants, machinery and buildings have been used as inputs. The results of the estimations are reported in table 9.

Table 9. Malmquist indices for total factor productivity growth in information technology firms in India
(Means across firms)

	Malmquist indices (total factor productivity)	Change in technology	Change in pure efficiency	Change in scale
1995–96	0.4364	0.0444	1.1203	0.272
1996–97	0.5931	0.0698	0.9746	0.5487
1997–98	0.6108	0.7473	0.9273	0.9363
1998–99	1.0867	0.5411	1.3126	1.233
1999–00	0.7603	0.8774	0.976	0.9069
2000–01	1.2369	1.2167	0.9273	1.093
2001–02	1.9272	2.2118	0.9341	0.7813
2002–03	1.1584	1.2123	0.9978	0.9483
2003–04	1.2587	0.9545	1.2892	1.015
2004–05	1.7232	1.6808	1.3962	0.6462
2005–06	1.5249	0.4714	1.2354	1.8182
2006–07	1.3189	1.3961	0.9781	0.9448
2007–08	0.5736	0.7905	0.7234	1.0597
Annual growth (1995–2000)	-33.4%	-74.4%	5.34%	-3.01%
Annual growth (2000–2008)	27.3%	13.34%	3.92%	-0.42%

Note: 1.000 indicates no change in productivity growth. 1.0188 would indicate 1.8 per cent total factor productivity growth.

Table 9 summarizes productivity change results. The results show a decline in productivity in from 1995 to 1998. Productivity increased by 8.6 per cent in 1998–99. However, IT firms experienced a spurt in productivity after 1999–00. They experienced an annual productivity growth of 27.3 per cent during the period 2000–2007.

Much of the change in total factor productivity growth in the post-2000 period can be explained by technological change or innovation. Productivity due to efficiency improvement increased by an average annual growth rate of 3.92 per cent, while productivity due to technical change or technological progress increased by 13.3 per cent. Productivity change due to scale effects has been relatively less important for improving productivity in this period.
Overall, the results indicate that productivity growth has been an important factor in the growth of software services in India, especially after 2000. The global economic crisis led to a fall in productivity in 2007–08, which may have occurred because of excess capacity caused by a fall in external demand.

[11] The major IT firms are included in the sample, e.g. Hewlett-Packard, Wipro and Satyam.

5.3.2 Productivity growth in banks

Given the significance of banking in the aggregate services sector, an attempt has been made to estimate total factor productivity growth in banks using a panel of 67 banks for 10 years (2003–04 to 2007–08). Data have been extracted from the *Capital Line* database, which provides data for all listed firms in India.

Banks are typically multi-input and multi-output firms. As a result, defining what constitutes input and output is fraught with difficulties, since many of the financial services are jointly produced, and prices are typically assigned to a bundle of financial services. Additionally, banks may not be homogeneous with respect to the types of outputs actually produced. Given these limitations, following one of the common approaches used in the literature, we use loans, advances and deposits as outputs, and labour and capital (plants and machinery) as inputs. The summary of the results is reported in table 10.

The results show that total factor productivity in the banks grew at annual growth of 11.27 per cent in the period 1999–2008. In 2007–08, there was a fall of 19 per cent in productivity from the previous year. Productivity growth in banks can be explained by a mix of factors: technological change, which grew 5.46 per cent per annum, and efficiency improvement and scale economies, which showed an annual growth of 2 per cent.

Table 10. Malmquist indices for total factor productivity growth in banks in India
(Means across firms)

Year	Malmquist indices (total factor productivity)	Change in technology	Change in pure efficiency	Change in scale
1999–00	0.9136	0.7443	1.0455	1.1238
2000–01	1.2564	1.2211	1.0136	1.0228
2001–02	1.2173	1.1796	1.0318	1.0059
2002–02	0.968	0.991	0.9804	0.9966
2003–04	1.4411	1.5113	0.9444	0.9854
2004–05	1.1159	0.8182	1.2331	1.0646
2005–06	1.1524	1.1431	0.9777	1.0317
2006–07	1.2869	1.2998	1.0046	0.9825
2007–08	0.8105	0.8266	0.9911	0.9928
Annual growth (percentage)	11.27	5.46	2.19	2.20

Several factors could have been at work to promote the gradual deregulation of Indian banks: a significant shift of the best-practice frontier, driven by a combination of technological advances, financial innovation and different strategies pursued by banks suited to their business philosophy and risk-return profile, the changing composition of banks' input–output, and a reduction in total cost brought about by improvements in overall efficiency. While it is difficult to pinpoint the relative mix of these factors in raising productivity, the bottom line is clear: Indian banks have witnessed significant productivity improvements since the year 2000.

6. GROWTH RE-BALANCING: THE ROLE OF GOVERNMENT POLICIES

The analysis in the previous sections highlights the role played by the services sector in sustaining India's growth rate during the global economic crisis and building the resilience of the economy. Due to their growing contribution to GDP and rising productivity, services have emerged as the most dynamic sector of the economy. There are a host of factors behind the sustained growth of the services sector during the global crisis. For example, the low ratio of services exports to GDP and the limited direct exposure of Indian banks to the United States mortgage market have considerably reduced the direct impact of the crisis.

Growing domestic demand has provided a much-needed cushion to falling external demand in the last two years. Much of this domestic demand has been engineered by an increase in government final consumption when both private final consumption and investments decelerated. The rise in government consumption came in the form of four fiscal stimulus packages. These packages included tax relief to boost demand, and increased expenditure on public projects to create employment and generate growth in the economy. This led to an increase in fiscal deficit from 2.7 per cent in 2007–08 to 6.2 per cent of GDP in 2008–09.

Apart from providing the cushion effect to falling private consumption by increasing its expenditure, the Indian Government's response to the global economic crisis has been felt at various other levels. A number of monetary easing- and liquidity-enhancing measures have been implemented, including a reduction in the cash reserve ratio and the statutory liquidity ratio. The objective has been to ease liquidity in the economy and boost consumer and investor confidence. To meet social objectives during a time of crisis, the Government increased its expenditure in social services. The share of social services expenditure in total government expenditure increased from 19 per cent in 2002–03 to 22 per cent in 2007–08, and further to 24 per cent in 2008–09, 11 per cent of which was spent on health, and 5 per cent, on education.

In order to maintain the growth-enhancing role of the services sector, it becomes important to ensure that the services that contribute relatively more to growth are placed on a higher productivity trajectory. The priority software services identified in the analysis are software services, domestic trade (retail and wholesale distributive services) and financial services. For these services, a road map of specific policies needs to be drawn, not only to support their growth during the global economic crisis, but also to accelerate their growth in the future. These sectors have shown remarkable resilience, with relatively less support, compared with other sectors. Efforts will be necessary to improve both demand-side and supply-side factors. On the demand side, specific policies will be required to improve domestic and external demand; on the supply side, targeted policies will be necessary to boost productivity growth in these services subsectors.

6.1 Distributive trade (retail and wholesale)[12]

Distributive trade is an important sector for India, as it has the potential to provide employment to a large proportion of the population, in addition to making a significant contribution to GDP. However, 98 per cent of the trading activities are carried out in the unorganized segment of the economy. A major impediment in policy formulation in this sector is that the statistics of this segment have not been adequately developed and are lacking in quality, comparability and timeliness. There is no regular flow of data either from official sources or annual surveys. As a result, estimates on the true size of the retail business in India vary widely.

[12]The term distributive trade refers to wholesale trade and retail trade, which can be defined as an act of purchase of goods and their disposal by way of sale without any intermediate physical transformation of goods. This includes commission agents, commodity brokers and auctioneers, and all other wholesalers who trade on their own behalf and on that of others. Retail trade covers units that mainly resell without transforming new and used goods for personal or household consumption. The terms wholesale trade and retail trade have comprehensively been defined in section G of the National Industrial Classification – 2004, which is based on International Standard Industrial Classification Rev.3.1. For national accounting purposes in India, the distributive trade activities form part of the services sector. This subsector covers a wide range of economic activities: trade, hotel and restaurant, transport, storage, communication, real estate and ownership of dwellings, banking and public administration, business services and "other services". Business services include business accounting, software development and data processing, business and management consultancy, and advertisement. "Other services" include education, research and scientific services, medical and health services, veterinary services, sanitary services, religious and other community services, recreation and entertainment services, and personal services such as domestic, laundry, dyeing and dry cleaning, and barbers and beauty shops.

According to estimates provided by the Central Statistical Organization, total domestic trade, including both wholesale and retail trade, constituted about 15.1 per cent of India's GDP in 2006–07, an increase from 13 per cent of GDP in 1999–00. The *Employment and Unemployment Survey* for 2004–05, conducted by the National Sample Survey Organization, reports employment in the retail trade of around 35.06 million, which represented about 7.3 per cent of the workforce in the country (459 million). The corresponding retail employment figure was about 30.62 million in 1999–00, which means that an additional employment of 4.44 million people was added in this sector during the five-year period, 2000–05, showing an annual employment growth of 2.7 per cent per annum. In contrast, wholesale trade contributed to an employment of 5.48 million people. Indian retail is dominated by a large number of small retailers consisting of the local *kirana* shops, which together make up the so-called unorganized retail, or traditional retail, sector, with a gradually rising organized retail sector. The total number of organized retail outlets rose from 3,125, covering an area of 3.3 million square feet in 2001, to 27,076, with an area of 31 million square feet in 2006.

The impact of the global crisis on the retail and wholesale trade sector has been low. In 2007–08, the sector's contribution to GDP growth increased to 1.42 per cent, compared with 1.4 per cent during 2006–07, in spite of a slight decline in the overall contribution of the services sector to GDP growth from 6.9 per cent in 2006–07 to 6.7 per cent in 2007–08.

6.1.1 Rising domestic demand and foreign direct investment in the retail sector

The steadily growing domestic demand in the Indian retail sector can be explained by a rapidly expanding middle class, sustained high economic growth during the last few years that has raised disposable incomes rapidly, favourable demographics placing incomes on younger population with less dependency and growing urbanization. Retail sales in India were about $322 billion in 2006–07[13], amounting to about 35 per cent of India's GDP. India is now the seventh-largest retail market in the world, and the Indian retail industry is projected to grow to about $590 billion by 2011–12 and further, to over $1 trillion by 2016–17. This implies a huge growth potential for retail in the country.

However, most of the retail sector activities are in the unorganized sector. In 2006–07, organized retail contributed roughly 4 per cent of total Indian retail, which is very small, even compared with most of the emerging market economies. But the scenario is changing fast. The organized retail real estate sector grew from a miniscule 0.9 million square feet in 1999 to 28 million square feet in 2006. Growth has been developing at a scorching pace of over 60 per cent per annum for the last seven years – though on a smaller base – and is expected to grow at least at 50 per cent per annum in the next 4 to 5 years. It is estimated that it will contribute 16 per cent to the total Indian retail by 2011–12. In this scenario, lack of domestic demand may not be a serious hurdle to the growth of retail and wholesale trade sector.

The growing retail sector in India has attracted the attention of many foreign retailers. A.T. Kearney annually ranks emerging market economies based on more than 25 macroeconomic and retail-specific variables by means of their global retail development index. In 2005, 2006 and 2007, India was ranked number one, indicating that the country is the most attractive market for global retailers to enter. This is indicative of an untapped demand. While restrictions on FDI have been a major deterrent to the entry of foreign players in this sector, there has been a calibrated liberalization over the past few years.

To facilitate easier FDI inflow, instead of having to seek approval from the Foreign Investment Promotion Board, up to 100 per cent FDI is now allowed under the automatic route for cash-and-carry wholesale trading and export trading. Up to 51 per cent FDI has also been allowed with prior government approval for retail trade in single brand products with the aim of attracting investment, technology and global best practices and catering to the demand for such branded goods in India. Notwithstanding these measures, restrictions on FDI in retail continue. In addition to cash-and-carry wholesale trading, strategic licensing and franchising arrangements are commonly used channels for the entry of foreign retailers.

One of the main reasons for the Government's cautious approach towards opening of retail trade in India is the existing structure of the retail sector and its capacity for generating employment for unskilled labour. Since a large part of the retail activity takes place in the unorganized sector, it absorbs labour across all ages, skills, education levels and income classes. Retailing that has low capital and infrastructure needs is, to a large

[13] National Council of Applied Economic Research (NCAER), *Market Information Survey of Households.*

extent, providing a social safety net for the unemployed. This is supported by the fact that the self-employed in the retail sector are the largest category of labour.
It is widely acknowledged that FDI can benefit the sector tremendously by improving its efficiency, leading to greater integration to the global market and ultimately benefiting the consumers by providing price reductions and an improved selection. This may in turn lead to higher output of the sector with greater growth. However, FDI-driven modern retailing is found to displace labour, and may therefore generate unemployment in the sector, which has acted as a safety valve for the economy in terms of employment generation. Thus, in the face of large growing domestic demand, the Government is taking a prudent approach towards tapping the external demand.

6.1.2 Recommendations for improving productivity growth in the retail sector

Organized retail has a potential for reducing inefficiencies and improving the productivity of the retail sector. Studies have shown that in the United States, organized retail contributed one fourth of the rise in productivity growth in the period 1995–99. However, organized retail in India is less than 4 per cent of total retail. It is expected that organized retail can lead to higher productivity by forming linkages with the agriculture sector. Working with organized retail can encourage the farmers to (a) improve yields by enabling them to obtain quality input supplies, (b) adopt superior farm technology and practices, (c) access timely credit at reasonable rates and (d) bypass unproductive intermediaries. The tie-up with organized retail may drive small and medium-sized enterprises to become more efficient in order to meet the stringent delivery conditions of the retail market. Private labelling is the creation of brands in the name of modern retailers. It has already begun in India in the food and grocery, and apparel segments, and is expected to expand rapidly. Small-scale manufacturers will be the major beneficiaries of private labels. The retail services sector, if more organized, therefore has a potential for improving not only its own productivity but also of other sectors, especially agriculture, which is marked by low productivity growth.

In order to increase the size of the organized sector and by encouraging people to shift from unorganized retailing to the organized retail sector, the following policy directions should be considered:

(a) The retail sector in India is severely constrained by limited availability of bank finance. Suitable lending policies need to be designed that will enable retailers in the unorganized sectors to expand, employ better technology and improve efficiencies. Policies that encourage unorganized sector retailers to migrate to the organized sector by investing in space and equipment should be encouraged;
(b) The Government must actively encourage the establishment of cooperative stores to procure and stock commodities from small producers. This will tackle the dual problem of limited promotion and marketing ability, as well as market penetration for the retailer. The Government can also facilitate the setting up of warehousing units and cold chains, thereby lowering the capital costs for the small retailers.
(c) With 3.6 million shops retailing food and employing 4 per cent of the total workforce, the food-retailing segment offers the Government a focused opportunity to catalyse growth and employment. The Government can play a proactive role in the provision of training in areas such as handling, storing, transporting, grading, sorting, maintaining hygiene standards, ensuring the upkeep of refrigeration equipment and packing. This can give a substantial boost to productivity in this sector;
(d) Quality regulation, certification and price administration bodies can be created at district and lower levels for upgrading the technical and human interface in the rural to urban supply chain;
(e) Competition generates productivity. Calibrated and gradual exposure to competition may lead to productivity spillover effects as domestic organized retailers learn ways of building effective supply chains from foreign players. Some competition has already been induced by the Government by allowing entry to foreign firms selling single brands. However, domestic organized retailers need to acquire some threshold size to derive productivity gains from competition. Incentives to increase the size of domestic retail firms need to be designed.

6.2 Software services

6.2.1 High domestic and external demand

Indian software services comprising ITES and IT-BPO services have shown remarkable resilience to the global economic crisis. It grossed $47 billion in 2008–09, growing by 17 per cent from the previous year. This sector is a major contributor to economic growth and has a multiplier effect in terms of export earnings, investments, employment and overall economic growth. Total IT services employment was estimated to reach the 2 million mark in 2007–08, compared with 1.63 million in 2006–07, a growth of 22.7 per cent. This represented a net addition of 375,000 professionals to the industry employee base in 2007–08. Indirect employment attributed to the sector was estimated at 8 million people in 2007–08. This translates into the creation of about 10 million job opportunities attributed to growth in this sector.[14]

One the key features of this subsector is its wide use across other services subsectors and manufacturing industries. This provides a strong domestic demand for sector activities. The revenue earned by software services from the domestic market was estimated to be $11.7 billion in 2007–08, compared with $8.2 billion in 2006–07, a growth of about 42.7 per cent. Along with strong domestic demand, the sector has a steadily rising external demand. Indian IT-BPO services in India are characterized by low operational costs, high quality and English-speaking, readily available skilled manpower. A favourable time-zone difference with the United States and Europe has added to its advantage. This has led to a double-digit growth in exports of IT-BPO services.

The global economic crisis led to a fall in growth of software services, but the growth in domestic demand cushioned the adverse effects. Domestic demand for both IT and IT-BPO services grew much faster than their exports. Double-digit growth in exports of IT-BPO (29.8 per cent) in times of crisis reflects the competitive edge of Indian IT-BPO services over other suppliers. At present, India has over 400 delivery centres across 52 countries. This strategy of geographical diversification, along with productivity growth and operational efficiency, has provided a strong footing to the sector.

6.2.2 Recommendations for improving productivity growth in software services

Estimations of productivity growth undertaken for 18 firms for the period 1994–95 to 2007–08 is indicative of the high growth of total factor productivity in this sector. If the sample can be taken as representative of the sector, it indicates that productivity growth started from the year 2000–01 on a sustained basis. However in 2008–09, there was a marked decline in productivity growth, probably because of excess capacity with lower external demand. Most of the productivity growth in the sector can be explained by improvements in technology and efficiency, while changes in scale do not seem to have added to productivity growth.

To sustain the growth of software services, targeted policies and strategies are needed. The sector is already at the frontier of the world, and there is a need to capitalize the gains that growing domestic and external demands offer. Some recommendations for sustained improvements for productivity growth are as follows:

(a) With the changing global scenario, especially after the slowdown in the growth rate of advanced countries, the nature of demand for software services, especially IT-BPO, is also changing. A recent NASSCOM-Everest research report shows that the outsourcing needs of buyers are changing with companies focusing on value drivers (integrated delivery models offering scale and value and speedy implementation); minimizing risks; and re-evaluating the sourcing model (rethinking captive versus supplier mix, evolving risk–reward relationships with vendors and opting for outcome-based pricing). It is important for the IT-BPO services providers to build a strong and unmatched value proposition for themselves in specific, focused niche segments. Super-specialization segments now need to be explored. Policy incentives need to be built for encouraging IT-BPO services to enter such specialty segments;
(b) IT-BPO services are not only increasing their depth by entering super-specialty segments, they are also increasing in width by bringing new areas into their ambit, for example, legal process

[14] Source: Indian IT-BPO Industry Factsheet – 2009, NASSCOM.

outsourcing, clinical research outsourcing, mobile applications, energy efficiency and climate change. These are new areas that require massive investments and knowledge creation. It is recommended that the Government take the initiative and encourage IT firms to enter these areas by creating policy incentives;

(c) Along with entering new segments and climbing up the value-chain, what is also needed for the sustained productivity growth of the sector is innovation. In line with providing incentives for R&D activities to the manufacturing sector, the Government should also focus on developing incentives for innovations in IT services. Collaborative research between industry, academia and government should be encouraged.

(d) The government can provide direct support by greater outsourcing; moving away from low-value, high-volume back-office jobs and customer support activities to higher value offerings by BPO services providers is also recommended. The Government's role in expanding the domestic BPO industry is expected to be critical, as it can boost domestic business by taking forward programmes related to e-governance and connectivity. This will further increase growth of the domestic market and inject productivity growth into the economy;

(e) The Indian software services sector has the potential to emerge as an IT hub in the region. However, for that to happen, it is important that the Government provide the opportunities within its various bilateral free trade agreements. Concessions for IT service providers in these countries can be negotiated to increase their exports, as well as investments in other countries. Low-value end services can be outsourced to these countries and attempts can be made to develop supply chains.

6.3 Banking services

The share of banking and insurance services in total services output has remained consistent at around 10 per cent, while its share in GDP growth has increased steadily over time. In 2008, India had scheduled commercial banks as follows: 27 public-sector banks (that is, with the Government of India holding a stake), 31 private banks (these do not have a government stake; they may be publicly listed and traded on stock exchanges) and 38 foreign banks. They have a combined network of over 53,000 branches and 17,000 automatic teller machines. According to a report by ICRA Limited, a rating agency, the public-sector banks hold over 75 per cent of total assets of the banking industry, with the private and foreign banks holding 18.2 per cent and 6.5 per cent, respectively.

Banking sector reforms started in India in 1991, so as to promote a diversified, efficient and competitive financial system with the ultimate objective of enhanced efficiency, financial viability and institutional strengthening. As from 1992, Indian banks have been gradually exposed to the rigors of domestic and international competition. Newly opened banks from the private sector and the entry and expansion of several foreign banks resulted in greater competition in both deposit and credit markets. As a result, there has been a consistent decline in the share of public-sector banks in total assets of commercial banks. With time, a stream of literature has evolved in India that explores the performance of financial institutions in the wake of financial liberalization. These studies are essentially microeconomic in nature and seek to analyse the efficiency and productivity of banking systems.

A priori, privatization is expected to unleash competitive forces. Such competition would, in turn, enable banks to alter their input and output mix. This, when combined with technological developments, facilitates an increase in output that raises overall bank productivity and efficiency. This has led to a rising debate on the impact of ownership on bank efficiency, which is based on incentives for being efficient. On one hand, it is argued that private ownership will have more incentives for improving efficiency; on the other, it is expected that privatization is, in general, accompanied by an increase in banks' operational costs and could induce financial fragility due to overexpansion of banking activity. Another debate in the area of banking productivity is the relationship between bank size and efficiency – as banking in the current world is technology driven and technological progress itself is scale augmenting – whether size it is argued that productivity gains after privatization could be temporary and not sustainable in the long run. As a result, evidence in support of a unidirectional relationship between privatization and efficiency or productivity is not conclusive.

Most of the studies have found that that total factor productivity growth has improved marginally in the post-deregulation period, but there was little evidence of a narrowing of productivity differentials across ownership categories following deregulation (for example, Kumbhakar and Sarkar, 2003). Among various productivity indicators, labour productivity indicators such as business per employee and profit per employee are most commonly used. In addition, business per branch is also used to judge branch-level productivity. Studies have found that profit per employee increased by a compound growth of around 17 per cent from 1992 to 2004

(Ram Mohan, 2005). Overall, the balance of evidence suggests distinctive productivity improvements in the banking sector over the reform period.

The total factor productivity growth undertaken in commercial banks over 10 years also indicated a substantial rise in total factor productivity growth of banks over the years. Except for the year 2007–08, there has been a continuous increase in bank productivity since 2000–01. Such an increase could be driven by two factors: technological improvement, which expands the range of production possibilities, and a catching-up effect, as peer pressure among banks compels them to raise productivity levels. Within the context of the gradual deregulation of the financial sector, several factors could have been at work: a significant shift of the best-practice frontier, driven by a combination of technological advances; financial innovation and different strategies pursued by banks; and/or reduction in total cost due to improvements in overall efficiency. Results indicate that in different years different factors became relatively more important. Though it is difficult to pinpoint the relative mix of these factors in raising productivity, the bottom line is clear: Indian banks have witnessed significant productivity improvements after the reforms were implemented.

6.3.1 Recommendations for increasing productivity growth in banking services

Higher sustainable growth is creating greater demand for financial savings. The Indian banking sector faces many challenges, with the economy growing at the one of the highest growth rates in the world. Not only must the banking sector increase penetration to reach out to a wider customer base, it must also provide the best value to the customer in terms of service levels and transparency. Indian banks will have to find ways to optimize customer relationships as they compete with global players with deep pockets and deep customer insights. The recommendations below are aimed at helping banks improve their productivity and efficiency and providing the much-needed support to the industry:

(a) Banks not only need to invest in infrastructure, but they also need to leverage information technology to find more innovative ways to reach the customer by means of new delivery mechanisms, saving on transaction costs and providing better access to the underserved. Electronic transactions substantially improve the efficiency of the system since they are faster in comparison with paper-based transactions. To help banks undertake these costs, more deregulation is required;
(b) Another critical challenge would be to hire and retain talent in the face of stiff competition from private players on compensation. Banks will also have to invest in new skills development and training. Government can provide the vital support at this end. As the share of public sector banks is the highest, skill development and staff training should be undertaken regularly so as to update them with the latest technologies and customer care programmes;
(c) Indian banks need to build on existing capabilities and add new capabilities as well. This would pose a serious managerial challenge, given the dynamic environment in which banks will be forced to continuously learn and reorient themselves in adopting new technologies for risk management, building innovative service mechanisms of delivery and customer care. Bank consolidation can prove to be an effective tool to achieve this objective. Banks with similar operations have an incentive to merge, thereby eliminating overlapping branches and freeing resources such as back office, administration and marketing. Productivity gains derived from the implementation of new technologies is also enhanced, as large initial investments are incurred, compared with the scale of operations. This may also lead to risk diversification, which is more relevant for smaller banks concentrated in particular regions and serving niche markets. As banks merge and grow bigger, they are in a much better position to introduce customized financial instruments. Government can play a vital role in this by making strategic policy interventions;
(d) With the implementation and acceptance of the Basel II norms, banks would be able to capture operational risks more efficiently, and therefore may need additional capital. This may make them turn increasingly to the flourishing capital market. The Government needs to increasingly facilitate this process.

The onset of the global economic crisis has posed many new challenges to the Indian economy and has also prompted a review of the growth strategies that the economy has been following. A cautious, calibrated, but steady approach to the liberalization of key sectors has improved the economy's resilience towards external shocks. At the same time, however, the role of strong domestic demand and supply-side factors, such as productivity growth in providing momentum to economic growth, has been brought to the forefront. The impact of the global economic crisis on the Indian economy was relatively less severe because of its lessened dependence on exports and the sizeable contribution of the services sector to GDP. This sector continued to grow steadily, contributing more than 80 per cent to India's 6.7 per cent growth rate in 2008–09.

In this context, the paper attempts to demystify the services-led growth of India in the face of falling external demand. It examines the contribution of disaggregated services to total GDP, and decomposes GDP growth with respect to the disaggregated sectors of the economy. Most of the sectors that have high shares in GDP are not dependent on external demand. A fall in external demand has therefore not led to a sharp decline in their growth rates. However, domestic demand has also fallen in the wake of the current economic crisis as the second-stage effects of the crisis take their toll on the economy. A fall in private consumption has been compensated by a substantial increase in government consumption, which has cushioned the adverse effects that may have been felt caused by lower private consumption.

Three sectors have been identified for sustaining the growth momentum of the Indian economy. These are retail and wholesale trade, software services and banking services. All these services have high shares in GDP and contribute substantially to its growth. They have a strong growing domestic demand and are on a rising productivity trajectory. Total factor productivity growth has been estimated at firm level for software firms and banks, which show that both the sectors experienced a productivity growth of above 10 per cent in the post-2000 period. Interestingly, all three services form important inputs into the manufacturing sector and contribute significantly to its productivity growth. Efforts should be made to further boost productivity growth in these services, as this will enhance productivity growth in other sectors of the economy, particularly manufacturing. Higher productivity in services can lead to a sectorally linked productivity spiral.

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