



IMPACT OF THE GLOBAL SLOWDOWN ON INDIA'S EXPORTS AND EMPLOYMENT



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





IMPACT OF THE GLOBAL SLOWDOWN ON INDIA'S EXPORTS AND EMPLOYMENT



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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 to enhance the 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 a series on “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 the 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 the achievement of 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 study forecasts the impact of the slowdown in global GDP on India's total exports and exports of 10 major sectors and estimates economy-wide and sectoral employment impacts in 2009–10 and 2010–11. It also identifies vulnerable sectors with high potential for employment generation for immediate policy interventions.

CONTENTS

ACKNOWLEDGEMENT	iii
PREFACE	v
ABSTRACT	vii
EXECUTIVE SUMMARY	xi
Forecast of Indian Exports Using the Income Elasticity of Exports.....	xi
Impact of Global Slowdown on Employment	xii
Mitigating Strategies	xii
I. INTRODUCTION.....	1
II. TRENDS IN INDIA'S TOTAL EXPORTS	5
2.1. Trends in India's Merchandise Exports.....	5
2.2 Trends in India's Services Exports	9
2.3. Trends in India's Imports of Goods and Services	14
III. IMPACT OF THE SLOWDOWN ON INDIA'S EXPORTS.....	17
3.1 Methodology and Data.....	17
3.2 India's Income Elasticity of Total Exports	19
3.3 India's Income Elasticity of Sectoral Exports	19
IV. FORECAST OF INDIA'S EXPORTS USING INCOME ELASTICITY OF EXPORTS	21
V. IMPACT OF THE SLOWDOWN ON EMPLOYMENT THROUGH INTERNATIONAL TRADE.....	23
VI. IDENTIFICATION OF SECTORS FOR EMPLOYMENT GENERATION ..	25
VII. CONCLUSIONS AND MITIGATING STRATEGIES.....	27
REFERENCES	31
ANNEX.....	33
Results of Stationarity Tests.....	33

TABLES

Table 1. Snapshot of the World Economy	2
Table 2. Growth in India's Trade (in real terms): 2005-06 to 2007-08 (per cent)	3
Table 3. Growth in India's Sectoral Exports in 2008 over 2004 in 10 Major Sectors	6
Table 4. Change in Composition of India's Export Basket , 2004-2008	7
Table 5. Share of Region/Country in India's Exports, 1990-91 to 2007-08	8
Table 6. India's Total Exports of Services to the World and the United States	10
Table 7. Composition of India's Exports of Services	10
Table 8. Miscellaneous Receipts, Non-Software, 2005-06 to 2007-08	11
Table 9. Miscellaneous Receipts, Business Services, 2005-06 to 2007-08	12
Table 10. Services Exports to United States and Share in Global Indian Services Exports	13
Table 11. India's Oil Imports and Rates of Growth (per cent)	14
Table 12. India's Non-Oil Imports and Rates of Growth (per cent)	15
Table 13. Income Elasticities of India's Export Demand	19
Table 14. Price and Income Elasticities for India's Major Export Sectors	20
Table 15. Projected Real GDP Growth (per cent), 2009 and 2010	21
Table 16. Forecast Total Merchandise Export Growth and Sectoral Export Growth, 2008-09 and 2009-10	21
Table 17. Impact of the Slowdown on Employment, 2008-09 to 2010-11	24
Table 18. Employment Multipliers Based on Input-Output Matrix of 2004	25
Table 19. Potential Gain for India from Export of New and Potential Products	28

FIGURES

Figure 1. Slowdown in GDP Growth Rates, 2006-2008	2
Figure 2. India's Monthly Exports and Imports in 2008-09	3
Figure 3. Decline in Growth Rates of India's Merchandise Exports to the World and to the United States, 2005-2008	5
Figure 4. India's Export Growth, 2005-06 to 2008-09	6
Figure 5. Change in Composition of India's Export Basket, 2004-2008	7
Figure 6. Growth of India's Exports of Services to the World and the United States, 2002-08	9
Figure 7. India's Exports, Imports and Trade Balance, 2000-01 to 2007-08	14
Figure 8. Composition of India's Import Basket, 2004-05 to 2008-09	15

EXECUTIVE SUMMARY

Riding on the back of brisk growth in the global economy since 2002, India's exports witnessed a phenomenal threefold increase during the period 2002–03 to 2007–08. But this powerful dynamo for employment generation is now threatened by rapid contraction in global demand and weakening labour markets. It is a major challenge for India to implement strategies which not only mitigate the adverse impact of the global slowdown on its exports but also build the resilience of the economy to such future shocks. However, for designing such strategies there is a need to assess the extent to which the global slowdown may impact total exports and, more importantly, identify the sectors which are likely to be more adversely affected by it.

In this context, the study forecasts the impact of the slowdown in global GDP on India's total exports and the exports of 10 major sectors and estimates economy-wide and sectoral employment impacts in 2009–10 and 2010–11. It also identifies vulnerable sectors with high potential for employment generation for immediate policy interventions. Further, the study undertakes a detailed competitiveness analysis at six-digit levels to identify new and potential exports to regions or countries such as Western Asia, the members of the Association of Southeast Asian Nations (ASEAN), Australia and Brazil, which are expected to recover faster than other economies. Some short-term measures have also been suggested for cushioning the adverse impact of the global slowdown on exporters.

Global demand plays an important role in determining the export growth of a product. The impact of the slowdown in global demand on a country's exports will largely be determined by the income elasticity of demand for the product. Accordingly, the study estimates income elasticity for India's total exports and its sectoral components. These income elasticities, in conjunction with GDP growth forecasts for 2009 and 2010 (provided by OECD Economic Outlook, March 2009), are used to estimate India's total and sectoral export growth.

The results show that India's exports to the world are very responsive to income changes. A 1 per cent decline in GDP growth of the world will lead to a 1.88 per cent decline in Indian growth of exports to the world. Estimates of the income elasticities of 10 major export sectors of India (which are around 95 per cent of total Indian exports) show that they are high for sectors such as petroleum products, ores and minerals, gems and jewellery, chemical products and engineering products. Traditional export sectors like textiles leather and plantations have relatively low income elasticity, with the lowest being for plantations.

Along with income elasticity, price competitiveness may also determine the impact of a slowdown on exports. If the products exported are less price sensitive, during slowdown the option of lowering prices to maintain existing market shares may not be feasible. Sectors which have high income elasticity but low price elasticity are therefore relatively more vulnerable sectors of the economy in terms of the impact of a global slowdown. Two such sectors identified are gems and jewellery and textiles. These require targeted interventions.

Forecast of Indian Exports Using the Income Elasticity of Exports

Using the income elasticities for export demand for India and the forecasted change in global GDP growth, total export growth and sectoral export growth for 10 major sectors has been estimated for the years 2009–10 and 2010–11 (up to December 2010). The forecast slowdown of GDP growth as provided by the OECD, Economic Outlook (March 2009) is used.

The results show that India's total exports will grow by -2.2 per cent in 2009–10, which implies that there will be almost flat growth, marginally tending towards a negative growth. Most of those sectors are experiencing a negative growth rate. Positive growth in exports is forecast for plantations, the agriculture sector and the engineering and electronics sector. It should be noted that although positive growth rates of exports in agricultural products have been forecast, they are much lower than the 55 per cent export growth in 2007–08. The forecasts also show that petroleum products will experience the maximum decline in export growth followed by gems and jewellery, ores and minerals and textiles and textile products.

Export growth is likely to experience a significant recovery and increase to 8.3 per cent per cent in 2010–11. All sectors are projected to experience positive export growth in this period, with sectors such as agricultural products, plantations, engineering, chemicals and petroleum products reaching their initial level of exports of 2007–08.

It should be noted that these estimates are critically based on the predictions for global GDP growth in 2009 and 2010.

Impact of Global Slowdown on Employment

The predicted overall export growth for the years 2009–10 and 2010–11 and sectoral export growth have been used to estimate the impact of the global slowdown on employment in the economy. The estimates show that in the year 2008–09, due to negative export growth in sectors such as textiles, gems and jewellery, ores and minerals, etc., the total job loss in India was around 1.16 million. However, the net employment created by exports in this year was positive, i.e., 1.25 million jobs created, as many sectors experienced positive export growth. Net employment is the sum total of jobs created and lost in different sectors overtime. In the year 2009–10, export growth is predicted to be -2.2 per cent per cent and the total job loss is estimated to be around 1.3 million. However, since export growth is positive for some sectors like plantations and these sectors have high employment multipliers, the net employment loss is estimated to be 0.7 million.

For the year 2010–11, estimation could be done only for three quarters, i.e., until December 2010, as GDP growth predictions are not available beyond that period. Using the predicted export growth of 8.3 per cent per cent, the total employment generated in the economy is estimated to be 5.22 million, indicating that the loss in employment due to the decline in exports in 2009–10 will be compensated for in 2010–11.

Mitigating Strategies

To build the resilience of the economy to trade shocks and improve competitiveness of exports, it would be useful for the Government to consider mitigating strategies. This study suggests five specific mitigating strategies relating to (a) diversification of exports to new geographical destinations and new products; (b) simplification in customs procedures for reducing transaction costs; (c) examination of the likely impact of anti-dumping and safeguard duties imposed by India on down-stream user industries; (d) measures aimed at assisting exporters to retain their market presence during the crisis period; and (e) expeditious multilateral examination of adverse impact of bailouts and stimulus packages and prompt remedies.

In markets which are expected to recover fast (ASEAN, Australia, Brazil, Republic of Korea, South Africa and Western Asia), competitiveness analysis at a disaggregated level has been undertaken for India with respect to the importing country and its five major trading partners. This analysis identifies products for which India has the potential to significantly increase its exports from the current level (potential products) or start export of new products. Around 958 products have been identified. It is found that India has the potential to increase its exports of new and potential products by almost 21 per cent per cent, i.e., by \$35 billion.

With profit margins shrinking globally, cost competitiveness would be an important determinant for retaining or acquiring a share in export markets. In an attempt to reduce some of the transaction costs associated with international trade, the Government has been simplifying its customs procedures over the past few years. While this is a continuing process, it needs to gather significant additional momentum.

India has been a major user of anti-dumping measures over the past few years; there has been a significant increase in the number of new anti-dumping and safeguard investigations initiated from October 2008 onwards. In the context of the current global slowdown, it may be beneficial for the economy as a whole if a detailed economic analysis on the likely impact of the duties on downstream user industries is undertaken, prior to the imposition of duties.

With economic recovery predicted for 2010, it is important that Indian exporters do not withdraw from the export market in the intervening period of downturn, if they are to take advantage of export opportunities during the period of recovery. The Government could consider a two-pronged approach for supporting exporters to retain their presence in foreign markets. It could support them

through incentives such as easing trade financing. However, as export-related incentives can be neutralized or offset by the importing country through imposition of countervailing duty, an attempt could be made at the multilateral level to explore the possibility of a standstill on countervailing duties that might otherwise arise from incentives given by developing countries.

A large number of stimulus and bailout packages have been offered across the world. The Government could consider putting in place a mechanism, at least in the short term, for constantly reviewing the implementation of these packages and identifying measures, if any, which may have an adverse impact on Indian export interest.

In addition to implementing the mitigation strategies outlined above, there is a need to develop and implement long-term measures that would ensure sustained export growth which is not impeded by adverse developments in big foreign markets.

I. INTRODUCTION

Due to increased integration of world markets, transmission of economic crises from one country to the rest of the world has become smoother. The larger the country, where the crisis originates, the greater is the impact on other countries. The United States of America, one of the largest economies in the world, both in terms of its share in world GDP (27 per cent per cent) and global imports (17 per cent per cent) experienced the sub-prime mortgage collapse in August 2007. This was followed by the reversal of the housing boom in other industrialized economies, which had a ripple effect all around the world. Furthermore, integrated financial sectors unmasked other weaknesses in the global financial system, as a result of which some of the financial products and instruments became so complex and twisted, that as things started to unravel, trust in the whole system started to fail. Stock markets crashed all over the world, with declines ranging from 35 to 40 per cent per cent over the past 12 to 18 months in developed countries and even more in most emerging markets.

The crisis which emerged in the financial markets crept into the real sector of countries around the world through different channels. Credit squeezes due to instable financial instruments and stock market bursts led to contraction of output growth in the advanced financially integrated countries and resulted in lower real demand for capital and consumer goods in the advanced countries. Further, lower capital flows and investments into developing countries; lower remittances and savings; and lower commodity prices coupled with a weak dollar aggravated the recession.

One of the most important channels through which the financial crisis erupting in the United States and in other advanced countries has been transmitted to developing countries is international trade. Apart from the direct impact of lower demand for the exports of developing countries in bilateral trade with advanced economies, the impact of the slowdown can be transmitted through three other major channels of trade. Firstly, through third market effects, i.e., "echo effects", as referred to in the literature, which work through the trading partners of the country where the slowdown occurs. Apart from the direct effects of lowering exports to the country experiencing the slowdown, there is an indirect effect through lower demand from trading partners of this country as their GDP growth also slows down due to lowering of the demand for their exports. This leads to a second round of a slowdown of demand for exports of developing countries. Secondly, the impact of the slowdown may be transmitted through the "supply chain effect". The international vertical supply chains are adversely affected and developing countries which are a part of these supply chains may feel the impact of lowering of demand for their exports to other developing countries which in turns leads to lower exports. Thirdly, in addition to these, trade finance squeezes due to tighter financial markets can lead to substantial supply-side effects.

However, the impact of the slowdown may be felt differently by different countries, depending on the nature of their exportable products, the destination countries for their exports and the overall dependence of the economy on exports. Further, the higher the income elasticity of demand for a country's exports, the higher will be the adverse impact of lower GDP growth of its trading partners.

One of the unique features of the United States economy is its high-income elasticity of imports.¹ Three decades of econometric modelling² show that income elasticity of imports in the United States is greater than 1. While estimates vary, it is generally found that for every 1 per cent increase in United States income, import demand increases by 2.2 per cent. The implication of this is clear: a 1 per cent slowdown of GDP in the United States will decrease the import demand by 2.2 per cent. This can transmit the slowdown in the United States rapidly into the countries which have it as a major market for their exports.

India is one of the many developing countries which have relied heavily on the United States and other advanced countries for its exports. In 2007, around 17 per cent of Indian exports sought United States markets, while 29 per cent were directed to G7 countries³ and around 58 per cent were directed towards advanced countries (as defined by IMF). Given such heavy reliance on the

¹ Where income elasticity of import/export is defined as percentage change in growth of imports/exports for one percentage change in growth in incomes or GDP.

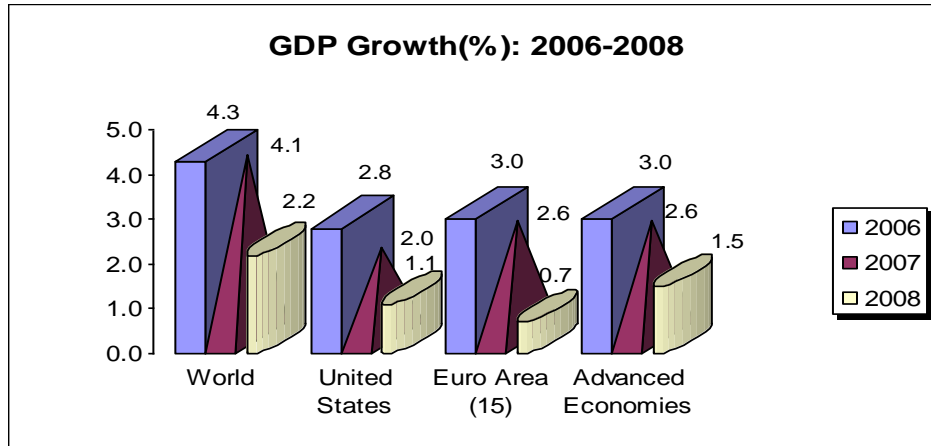
² Magee (1975), Sawyer and Sprinkle (1996), Marquez (2001)

³ G7 countries are as defined by IMF.

markets of advanced countries, the impact of the slowdown in these countries is being felt heavily in the Indian trade sector.

While the GDP growth of the world has declined from 4.3 per cent in 2006 to 2.2 per cent in 2008, it has declined much faster in advanced countries like the United States (from 2.8 per cent to 1.1 per cent) and the European Union (3.0 per cent to 0.7 per cent) (figure 1).

Figure 1. Slowdown in GDP Growth Rates, 2006-2008



Source: OECD and IMF.

Along with the global slowdown in the growth of GDP, there has also been a substantial decline in world trade which may result in echo effects. The world real trade growth (corrected for prices) declined from 9.5 per cent in 2006 to 6.9 per cent in 2007 and further to 2.5 per cent in 2008. Amidst the global economic slowdown, the Organisation for Economic Co-operation and Development (OECD) projects the global economy to grow by -2.7 per cent in 2009 and 1.2 per cent in 2010. The United States economy is expected to experience negative growth, i.e., -4 per cent in 2009 and 0 per cent growth in 2010. The EU area is expected to also experience a negative growth of -4.1 per cent in 2009 with a continued negative growth of -0.3 per cent in 2010. China is expected to grow at 6.3 per cent and growth forecast for the Indian economy is at 4.30 per cent for the year 2009.

Table 1. Snapshot of the World Economy

Snapshot of the World Economy					
Real GDP (% change)	2006	2007	2008	2009P	2010P
United States	2.80	2.00	1.10	-4.00	0.00
Euro Area	3.00	2.60	0.70	-4.10	-0.30
Canada	3.10	2.70	0.50	-3.00	0.30
United Kingdom	2.80	3.00	0.70	-3.70	-0.20
Japan	2.00	2.40	-0.60	-6.60	-0.50
India	9.70	9.00	6.00	4.30	5.80
China	11.60	13.00	9.00	6.30	8.50

Source: OECD database.

Although India is expected to grow, it has not been able to remain insulated in this global decline, especially in the trade sector. A close look at India's trade sector indicates that in real terms growth in Indian exports and imports in both goods and services has declined (table 2). Growth in exports of goods in real terms declined from 17.8 per cent in 2006-07 to 5.4 per cent in 2007-08. Maximum decline is witnessed in growth of exports of services which grew at the rate of 26.8 per cent in 2005-06, but experienced negative growth of -1.8 per cent in 2007-08. Growth in imports of goods declined from 25.2 per cent in 2005-06 to 10.6 per cent in 2007-08. Surprisingly, growth in private remittances in real terms has shown a marked improvement from 10 per cent in 2006-07 to 24.1 per cent in 2007-08.

GDP growth of India was estimated to be 9.2 per cent in 2005–06, which increased to 9.7 per cent in 2006–07 but declined to 9.2 per cent in 2007–08 and is expected to decline further to 7.2 per cent in 2008–09 according to advance estimates.

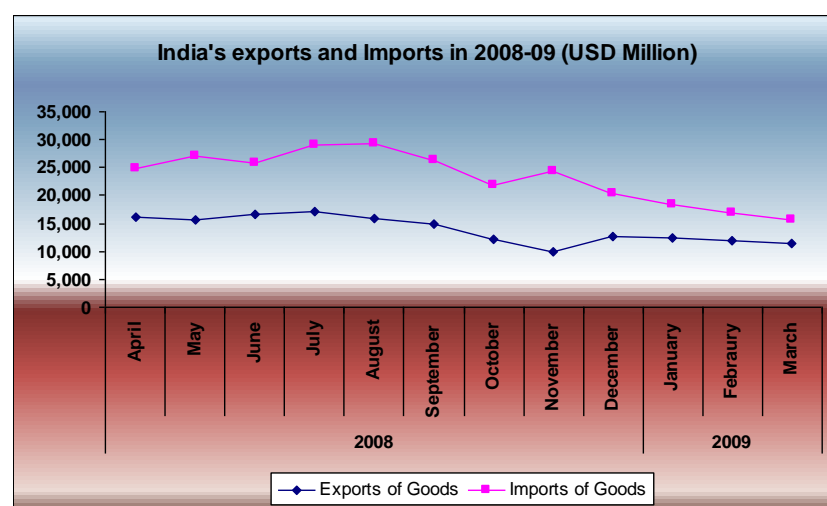
Table 2. Growth in India's Trade (in real terms): 2005-06 to 2007-08 (per cent)

	2005–06	2006–07	2007–08
Exports of goods	17.2	17.8	5.4
Exports of services	26.8	27.4	-1.8
Imports of goods	25.2	17.9	10.6
Imports of services	17.8	24.0	-3.7
Private Remittances	12.9	10.0	24.1
Real GDP at market prices	9.2	9.7	9.2

Source: National Accounts Statistics, CSO and RBI.

The slowdown in the trade sector post April 2008 is even more explicit (figure 2). Exports declined continuously from July 2008 to March 2009 except in December 2008. They declined from \$17.1 billion in July 2008 to \$11.5 billion in March 2009, which is an almost 33 per cent decline. While imports declined from \$29.2 billion in August 2008 to \$15.6 billion in March 2009, which is an almost 47 per cent decline. However, in terms of balance of trade (BOT), the deficit reduced from \$8.7 billion in April to \$4 billion in March.

Figure 2. India's Monthly Exports and Imports in 2008-09



Given the high dependence of the Indian economy on its external trade sector, where exports of goods and services (less export-related imports) is around 20 per cent of GDP, a slowdown in the trade sector can have adverse ripple effects in the economy. More importantly, it can lead to job losses and increase the number of poor in the country. The job losses may be direct, due to contraction in output in the exportable sectors and indirect, which may occur due to decline in output of the sectors which provide inputs to the exportable sectors. The increase in cheaper imports, particularly of inferior goods (whose demand increases with lowering of incomes), can further add to contraction of output and employment in the economy.

In order to diminish the adverse impacts of the global slowdown on the Indian economy and improve the economy's resilience to external shocks to its trade sector, overall and sector-specific strategies need to be designed. However, for designing such strategies there is a need to assess the extent to which the global slowdown may impact India's total exports and, more importantly, identify the sectors which are likely to be more adversely affected by the slowdown. For this purpose, the study attempts to forecast the impact of slowdown in global GDP on India's total exports and the exports of 10 major sectors. The global income demand elasticities for total exports and sectoral exports to the world have been estimated using econometric models. Using

these income demand elasticities, the impact of lower growth in global GDP (which have been forecast by OECD) on Indian exports in the period 2009–2010 has been estimated. The changes in sectoral exports have then been used to estimate the direct and indirect impact on sectoral employment in the economy in the year 2009–2010.

An important contribution of the study is a detailed analysis of Indian competitiveness at six-digit HS codes in markets of developing countries. The projected slowdown in developing countries is much lower than those in the advanced economies. Therefore a significant step in terms of mitigating the adverse impact of slowdown on Indian exports will be to diversify the export basket and markets. The study identifies new and potential exports in countries/regions such as China, Western Asia, the ASEAN countries, Australia and Brazil (new exports refers to products where India has competitive advantage in a market but is currently not exporting while potential exports refers to products where India is exporting but has the potential to increase its exports). It estimates the likely share that India may get if it is able to diversify into new products and new markets. Further, the study makes suggestions for mitigating the adverse impact of the global slowdown on the Indian economy.

The study is organized as follows: section 2 discusses trends in India's total and sectoral exports and imports using trade data. Section 3 presents the results with respect to global income demand elasticities for India's total and sectoral exports and estimates the impact of lower growth of global GDP on sectoral exports in 2009-2010 and 2010-11. Section 4 presents the estimates of impact of predicted export growth on total and sectoral employment for the years 2008–09, 2009–2010 and 2010–11. Section 5 discusses mitigating strategies and identifies new products and new markets for Indian exports. Section 6 identifies sectors for employment generation; section 7 concludes.

II. TRENDS IN INDIA'S TOTAL EXPORTS

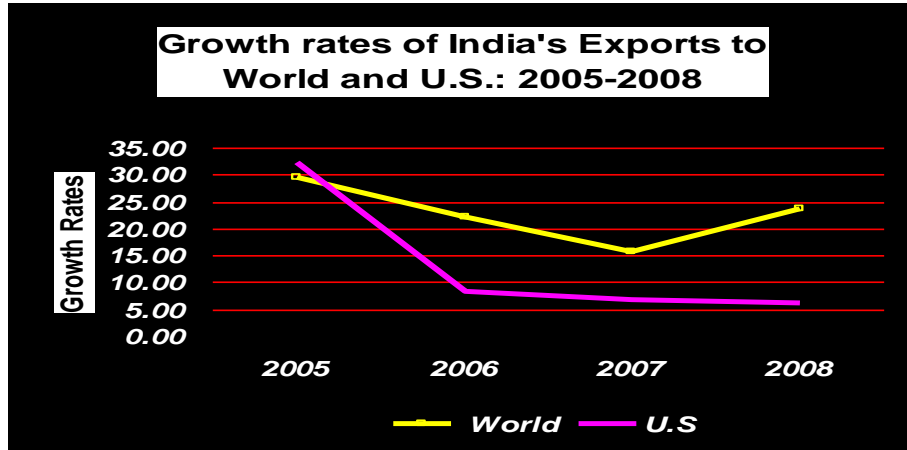
The extent to which the global slowdown may impact a country's exports depends largely on the number of trading partners of the country and the composition of its export basket. High dependence on a few markets and few exportable products may increase the severity of the impact of the slowdown on exports, both in terms of coverage and depth. In order to assess the extent of the impact of global slowdown on India's exports, we examine the trends over time in the composition of India's export basket and its direction.

2.1. Trends in India's Merchandise Exports

Growth of India's Merchandise Exports

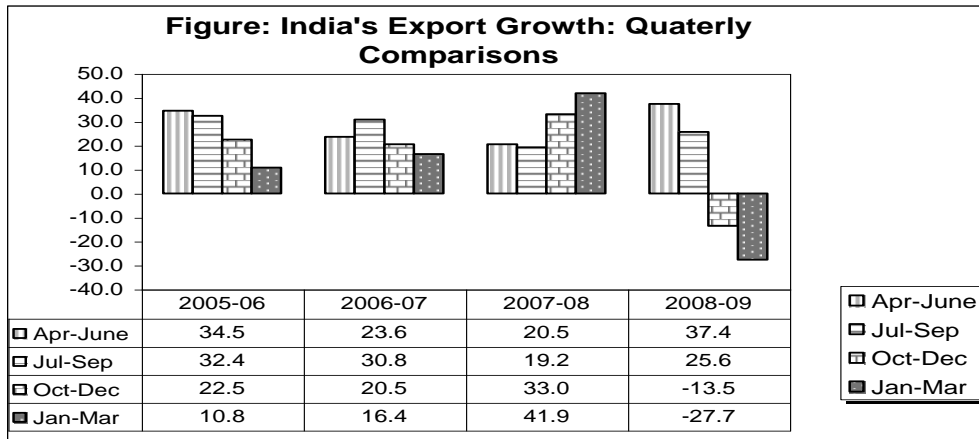
India's global merchandise exports were growing at an impressive rate before the financial crisis occurred in the United States. Global merchandise exports increased from \$79 billion in 2004 to \$145 billion in 2007, representing an average annual growth rate of 20 per cent. However, the slowdown in the United States economy led not only to a decline in India's bilateral merchandise exports to the United States but also in its exports to the world. However, the decline in the growth rate of merchandise exports to the United States was much higher than the decline in the growth rate of total merchandise exports to the world (figure 3). India's global exports, which grew at 29.5 per cent in 2005, grew at a lower rate, i.e., 23.6 per cent in 2008, while the decline in the growth rate of exports to the United States was much higher, i.e., from 32.3 per cent in 2005 to 6.15 per cent in 2008.

Figure 3. Decline in Growth Rates of India's Merchandise Exports to the World and to the United States, 2005-2008



From the above trend, two facts emerge. First, India's export growth to the world has been more buoyant than its export growth to the United States and second, the decline in growth of exports to the United States began in 2006, i.e., before the slowdown. Thus, the lack of buoyancy of India's export growth to the United States may have cushioned and delayed some of the adverse effect of the slowdown on India's exports.

The quarterly trend shows that export growth became negative for the first time since 2005–06 in the third quarter (Oct–Dec) of 2008–09 (-13.5 per cent). Further, in the last quarter of 2008–09 (Jan–March 2009) there was a much steeper fall of -27.7 per cent. The impact of slowdown was therefore felt in India from October 2008 onwards.

Figure 4. India's Export Growth, 2005–06 to 2008–09

Comparing export growth in the past five years across sectors, we find that maximum growth in exports has been in petroleum products, which experienced an export growth of 341 per cent in 2008 as compared to 2004 (table 3). Exports of engineering goods, agricultural products and chemicals and related products have also grown significantly, i.e., more than 100 per cent in this period. However, traditional export sectors, like textiles and products, leather and products and gems and jewellery have witnessed comparatively lower export growth. India's total exports increased by 110 per cent in 2008 over 2004.

Table 3. Growth in India's Sectoral Exports in 2008 over 2004 in 10 Major Sectors

S.No		(per cent)
1	Petroleum products	341.8
2	Engineering goods	165.3
3	Agriculture & allied products	146.2
4	Chemicals & related products	109.2
5	Ores & minerals	95.9
6	Textiles	52.9
7	Leather & manufactures	34.4
8	Plantation	33.5
9	Gems & jewellery	32.3
10	Marine products	7.4
	Total	110.1

Composition of India's export basket

Concentration on a few exportable products may worsen the impact of global slowdown on the exports of a country, especially if they are products whose demand is closely related to incomes, in other words, if they are not necessity products. India's traditional exports have consisted of items such as textile products, gems and jewellery, tea and coffee and leather and leather products. It is important to trace the extent of diversification of the export basket over time. The trends show that there has been some diversification in the composition of India's export basket over time. However, there still remains large scope for further diversification.

As seen in table 4 and figure 5, the share of petroleum products (including rubber and plastic products) in India's export basket has been increasing since 2004. India exported \$6.8 billion worth of petroleum products in 2004 which increased to \$23.6 billion in 2007 and further to \$30.4 billion in 2008 and its share increased from 8.6 per cent to 18.1 per cent. Interestingly, the share of textiles, which was the predominant sector in the export basket in 2004 (16.8 per cent), has been declining continuously and reached 12 per cent in 2008. Engineering goods, representing a very

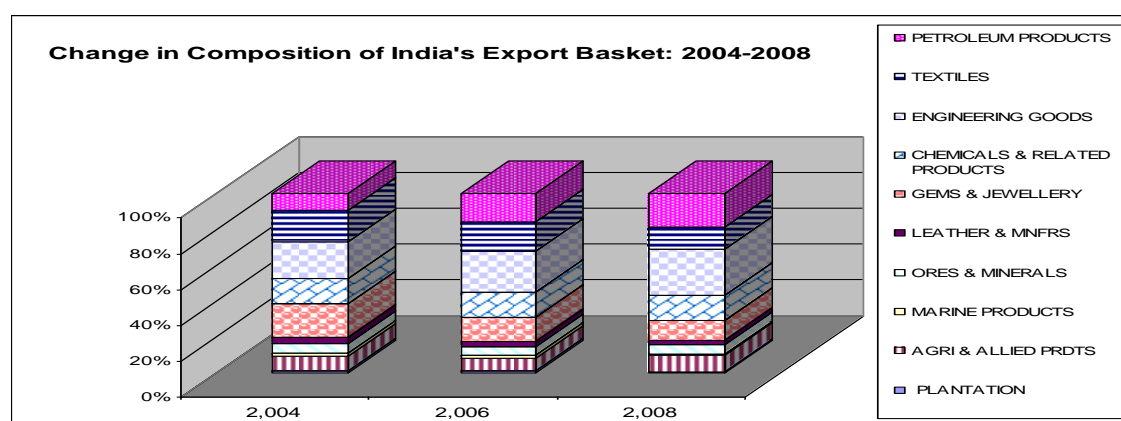
broad category, continues to be a sector with the highest share in India's export basket. Its share further increased from 19.7 per cent in 2004 to 25 per cent in 2008. The share of chemicals and chemical products has remained the same over time (13.7 per cent) while the share of gems and jewellery declined from 18 per cent in 2004 to around 11 per cent in 2008.

Interestingly, exports of India's agricultural products have been rising steadily from \$6.0 billion in 2004 to \$14.9 billion, although their share in India's export basket still remains low (around 9 per cent). Although exports of ores and minerals have nearly doubled from \$4.3 billion to \$8.4 billion in 2008, the share of this sector in the export basket remains around 5 per cent. Marine and plantations have a share of around 1 per cent, which has not changed over time. Plantations have less than a 1 per cent share in India's export basket.

Table 4. Change in Composition of India's Export Basket, 2004–2008

S.No		2004	2006	2008
1	Engineering goods	19.70	21.79	24.87
2	Petroleum products	8.63	14.96	18.15
3	Chemicals & related products	13.72	13.67	13.65
4	Textiles	16.77	15.40	12.20
5	Gems & jewellery	17.84	12.72	11.23
6	Agriculture & allied products	7.63	6.78	8.94
7	Ores & minerals	5.42	4.78	5.05
8	Leather & manufactures	3.20	2.66	2.05
9	Marine products	1.71	1.40	0.87
10	Plantation	0.99	0.94	0.63
	Total	100.00	100.00	100.00

Figure 5. Change in Composition of India's Export Basket, 2004–2008



The above trends in the composition of India's export basket show that it has diversified in the past five years, with engineering goods, petroleum products and chemical products increasing their share in the export basket, while traditional exports like textiles, gems and jewellery and leather and leather products losing their shares.

There exists considerable scope for further diversification of India's export basket in terms of its composition. A disaggregated level analysis at HS 6-digit level on the number of products accounting for 50 per cent of the total trade brings out this point more clearly. A quinquennial comparison over the period starting from 1996-97 to 2007-08 shows that in 2007-08 around 34

products at 6-digit level accounted for 50 per cent of global exports of India. This number had declined from around 45 products in 2000-01. There exists large scope to further diversify India's export basket by identifying products at 6-digit level where India may have higher competitiveness in production.

Direction of India's Exports

As discussed earlier, the extent to which the global slowdown affects a country's exports is likely to be determined by the extent of the dependence of exports on trading partners affected by the slowdown. Concentration of exports in a few markets which are facing a slowdown may hasten the transmission of the adverse impact of a slowdown.

In the 1990s, more than half of India's exports were directed towards OECD markets, with 28 per cent directed to EU markets and around 15 per cent to the United States. Around 16 per cent went to the Russian Federation and a similar percentage to developing countries, with Asian markets being more dominant (table 5). However, over time there has been some diversification in terms of the direction of India's exports. The share of the EU has declined from 28 per cent in 1995-96 to 20 per cent in 2007-08, while the share of the United States has declined from 17.4 per cent in 1995-96 to 13 per cent in 2007-08. The share of the United Arab Emirates has increased from 4.5 per cent in 1995-96 to 9.7 per cent in 2007-08. There has been considerable increase in the share of Asian developing countries in India's export basket, from 23 per cent in 1995-96 to 31.5 per cent in 2007-08. The share of Africa has also increased over time. It is interesting to note that the share of developing countries in India's exports increased from 17 per cent in 1990-91 to 42 per cent in 2007-08.

The fact that India was able to diversify its exports to different countries has helped in softening the impact of the global slowdown on its exports. However, the bulk of India's exports, i.e., 33 per cent is still directed towards the EU and the United States. There is a need to further diversify exports in terms of new destinations.

Table 5. Share of Region/Country in India's Exports, 1990-91 to 2007-08

Group / Country				1990-91	1995-96	2000-01	2005-06	2007-08
I.	OECD			56.5	55.7	52.7	44.5	38.8
	A.	EU		27.5	27.4	23.4	21.7	20.2
	B.	North America					17.8	13.8
		1	Canada	0.9	1.0	1.5	1.0	0.8
		2	United States	14.7	17.4	20.9	16.8	13.0
	C.	Asia and Oceania				5.1	3.3	3.1
		of which:						
		1	Australia	1.0	1.2	0.9	0.8	0.7
		2	Japan	9.3	7.0	4.0	2.4	2.2
	D.	Other OECD countries				1.9	1.6	1.7
II.	OPEC			5.6	9.7	10.9	14.8	16.5
	of which:							
		1	United Arab Emirates	2.4	4.5	5.8	8.3	9.7
III.	Eastern Europe			17.9	4.2	3.0	1.9	2.1

	of which:							
	1.	Russian Federation		16.1	3.3	2.0	0.7	0.6
						0.0	0.0	0.0
IV.	Developing countries			17.1	28.9	29.2	38.5	42.3
	of which:							
	A.	Asia		14.4	23.0	22.5	30.1	31.5
		a)	SAARC	2.9	5.4	4.3	5.4	5.7
		b)	Other Asian		17.6	18.2	24.7	25.8
	B.	Africa		2.2	4.8	4.4	5.5	7.6
	C.	Latin American countries		0.5	1.2	2.3	3.0	3.2
V.	Others / unspecified			2.9	1.5	4.3	0.3	0.4
	Total trade			100.0	100.0	100.0	100.0	100.0

Source: Estimated from RBI "Handbook of Statistics on Indian Economy", Directorate General of Commercial Intelligence and Statistics.

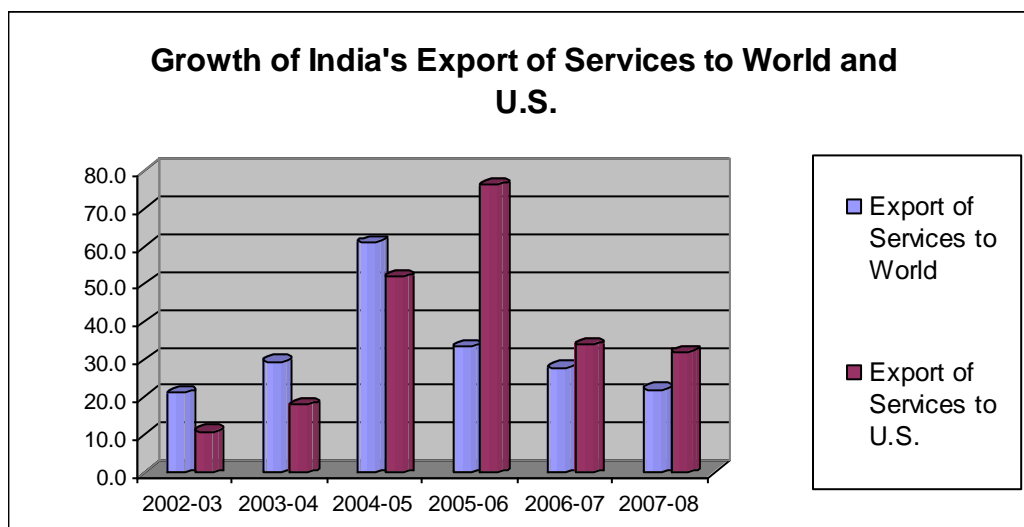
2.2 Trends in India's Services Exports

Growth in India's services exports over time

In less than two decades, India has become one of the top five exporters of services amongst developing countries and has surpassed some of 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 globally recognized for its high growth and development. Indian services exports grew at a compounded annual growth rate (CAGR) of 17 per cent during 1993–2000 but have grown at a much faster pace, recording CAGR of about 24 per cent, during 2001–2008. There has been rapid growth in services exports from 2002. Exports have grown from \$20.8 billion in 2002 to \$90.1 billion in 2008.

The United States is one of the major markets for export of services for India. Its share in total services exports has been around 10 per cent with the growth of services exports to the United States being higher than that to the world since 2005–06 (figure 6).

Figure 6. Growth of India's Exports of Services to the World and the United States, 2002-2008



Slowdown in the United States has led to lower growth of services exports to the United States as well as to the world. India's export of services to the United States grew at a rate of 76.2 per cent in 2005–06 as compared to the previous year, but declined to 34 per cent and further to 31 per cent in 2006–07 and 2007–08. Growth of exports of services to the world has declined marginally from 28 per cent to 22 per cent in this period. Interestingly, the share of the United States in India's exports of services has not changed much over time. Its share increased from 10.7 per cent in 2006–07 to 11.6 per cent in 2007–08 (table 6).

Table 6. India's Total Exports of Services to the World and the United States

	Export of total services (\$ millions)	Export of services to the United States (\$ millions)	Share of the United States in total exports of services (per cent)
2000–01	16 268	1 955	12.0
2001–02	17 140	1 692	9.9
2002–03	20 763	1 875	9.0
2003–04	26 868	2 212	8.2
2004–05	43 249	3 359	7.8
2005–06	57 659	5 917	10.3
2006–07	73 780	7 919	10.7
2007–08	90 077	10 443	11.6

Source: Bureau of Economic Analysis and RBI.

Composition of India's Services Exports

India's export basket has not diversified very much over time, as around 40 per cent of exports have consisted of software services since 2000–01. Export of software services has grown at a compound rate of growth of 26 per cent as compared to 24 per cent of total services (table 7). Apart from software services, travel and transportation services constitute the export basket, with a share of around 12 per cent and 11 per cent respectively in 2007–08.

Table 7. Composition of India's Exports of Services

Invisibles by Service Export of Transactions										
	CAGR 1993 2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	CAGR 2000 2008
Travel	4.56%	3,497	3,137	3,312	5,037	6,666	7,853	9,123	11,349	15.85%
YoY Growth		15.18%	-10.29%	5.58%	52.08%	32.34%	17.81%	16.17%	24.40%	
Transportation	2.53%	2,046	2,161	2,536	3,207	4,683	6,325	7,974	10,014	21.96%
YoY Growth		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%
YoY Growth		16.88%	6.67%	28.13%	13.55%	107.64%	22.07%	12.52%	37.15%	
G.N.I.E	52.75%	651	518	293	240	401	314	253	330	-8.14%
YoY Growth		11.86%	-20.43%	-43.44%	-18.09%	67.08%	-21.70%	-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%
YoY Growth		-3.44%	12.57%	29.15%	26.04%	70.49%	37.47%	31.18%	20.84%	
Software		6341	7556	9600	12800	17700	23600	31300	40,300	26.01%
YoY Growth			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%
YoY Growth		3.56%	5.36%	21.14%	29.40%	60.97%	33.32%	27.96%	22.09%	

*G.N.I.E: Govt. Services not included elsewhere, figures in \$millions.

Source: www.rbi.org.in.

The major drivers of sustained year-on-year growth rates registered by aggregate Indian exportable services have been earnings from travel, transportation and miscellaneous services, which accounts for both software and non-software services.

- Travel, which is represented by foreign tourist arrivals and foreign exchange earnings, registered a higher year-on-year growth rate of 24.40 per cent in 2007–08 as compared to the previous year's growth rate of 16.17 per cent. Foreign tourist arrivals during 2008 were 5.37 million as compared to 5.08 million during 2007. Foreign exchange earnings in dollar terms during 2008 were \$11.7 billion as compared to \$10.7 billion in 2007. During April–September 2008, travel services registered a 22 per cent growth rate as compared to 24 per cent in the same period a year previously. However, the impact of the global financial meltdown is evident in the latest numbers released by the Ministry of Tourism, which reports foreign tourist arrivals at 1.461 million in 4Q 2008–09, 13.75 per cent lower as compared to 1.694 million in 4Q 2007–08. Also, foreign exchange earnings during the same period were lower at \$2.7 billion as compared to \$ 3.9 billion from January to March 2008.
- Exports of transportation services have slowed down in the past few years registering 25.58 per cent year-on-year growth in 2007–08 as compared to a growth rate of 46.02 per cent in 2004–05 and 26.07 per cent in 2006–07. Transportation was the only service recording a higher growth rate of 38 per cent in April–September 2008 from a 10 per cent growth rate in April–September 2007.
- Insurance services registered a higher year-on year growth rate of 37.15 per cent over the previous year's growth rate of 12.52 per cent. During April–September 2008, insurance services observed a meagre 1 per cent growth rate as compared to a 29 per cent growth rate in April–September 2007.
- Non-software services, under miscellaneous receipts, recorded a fall in the year-on-year growth rate from 29.34 per cent in 2006–07 to 10.49 per cent in 2007–08. Communication, business and financial services were the major contributors to the decline in non-software services. Although communications and financial services recorded positive growth rates in 2007–08, the growth rates were substantially lower than in the previous year and similarly the decline was also attributable to a major negative growth rate recorded in the export of business services. This slowdown was the result of the banking, financial services and insurance sector being at the core of the global economic slowdown. However, services such as construction, news agency, royalties, copyrights and licence fees and personal, cultural recreational services registered higher year-on-year growth rates in the non-software category.

Table 8. Miscellaneous Receipts, Non-Software, 2005–06 to 2007–08

Miscellaneous Receipts: Non-Software			
	2005-06	2006-07	2007-08
Communication Services	1,575	2,099	2,436
<i>YoY Growth</i>		33.27%	16.06%
Construction	242	332	780
<i>YoY Growth</i>		37.19%	134.94%
Financial	1,209	2,913	3,085
<i>YoY Growth</i>		140.94%	5.90%
News Agency	185	334	643
<i>YoY Growth</i>		80.54%	92.51%
Royalties, copyrights and license fees	191	97	157
<i>YoY Growth</i>		-49.21%	61.86%
Business Services	9307	19266	16624
<i>YoY Growth</i>		107.01%	-13.71%
Personal, Cultural, Recreational	189	173	559
<i>YoY Growth</i>		-8.47%	223.12%
Others	5607	1042	335
Total	18,505	26,256	24,619
<i>YoY Growth</i>		41.89%	-6.23%

Source: www.rbi.org.in.

- Amongst the export of business services, business & management consultancy, as well as architectural, engineering and other technical services registered the largest decline. Trade-related services recorded a substantial increase of 137 per cent over the previous year.

Table 9. Miscellaneous Receipts, Business Services, 2005–06 to 2007–08

Miscellaneous Receipts: Business Services			
	2005-06	2006-07	2007-08
Trade Related	521	939	2,223
<i>YoY Growth</i>		80.23%	136.74%
Business and Management Consultancy	2,320	7,346	4,215
<i>YoY Growth</i>		216.64%	-42.62%
Architectural, Engineering and Other Technical	3,193	6,134	3,287
<i>YoY Growth</i>		92.11%	-46.41%
Maintenance of Offices	1,577	2,334	2,867
<i>YoY Growth</i>		48.00%	22.84%
Others	1696	2513	4032
<i>YoY Growth</i>		48.17%	60.45%
Total	9,307	19,266	16,624
<i>YoY Growth</i>		107.01%	-13.71%

Source: www.rbi.org.in.

The non-software category recorded a 16 per cent growth rate in April–September 2008 from the corresponding period a year previously. All services under the non-software category recorded positive growth rates but of importance were the construction and personal, cultural & recreational services registering the highest year-on-year growth rate of 45 per cent and 52 per cent respectively. Business services recorded a moderate 14 per cent year-on-year growth rate in April–September 2008.

- Under miscellaneous receipts, the export of software services has been a major contributor to the growth of exportable services, accounting for 45 per cent of total services export in 2007–08. During April–September 2008, software receipts stood at \$21.9 billion, showing a lower growth of 22.3 per cent than that of 26.3 per cent in same period a year earlier. It should be pointed out that cost-cutting becomes a top priority in times like the current economic deterioration which could mean a reduction in IT spending by advanced economies with negative implications for the growth of Indian software exports.

- In addition, the banking, financial and insurance, sector which has been the epicentre of this global financial crisis accounts for approximately 50 per cent of the revenues of IT & ITeS providers which makes IT & ITeS highly vulnerable to the current global slowdown in terms of delayed decision-making and reduction in IT spending by customers of front-line IT companies.

Direction of India's exports of services

Exports of services from India have been oriented mostly towards the EU25 and United States in the developed world. India's country-wise exports of services show that the United States and the United Kingdom are the two most important destinations for service exports. The EU and South-East Asia are relatively less important destinations. According to the Economic Survey 2007–08, India exports travel services mainly to the EU and transportation services to South-East Asia.

Around 13 per cent of total Indian services exports were oriented towards the EU25 in 2003. However, the share had come down to 10 per cent in 2005. The United States accounted for about 8.7 per cent of India's total services exports in 2005. Interestingly, the share of the United States had gone up to around 10.7 per cent in 2007 (table 10).

Table 10. Services Exports to United States and Share in Global Indian Services Exports

Year	Exports to United States (\$m)	Share of United States in total exports (per cent)
2003	2 000	7.4
2004	2 886	6.7
2005	5 057	8.8
2006	7 693	10.4
2007	9 664	10.7
2008	12 141	-

Source: Bureau of Economic Analysis.

Although the impact of the global slowdown on India's exports of services has not been as deep as the impact on goods, and services exports are still recording positive export growth, the increasing legislation and inbuilt conditions in the stimulus packages offered for revival in the developed countries may lead to an escalation in the impact of the slowdown on services exports over time.

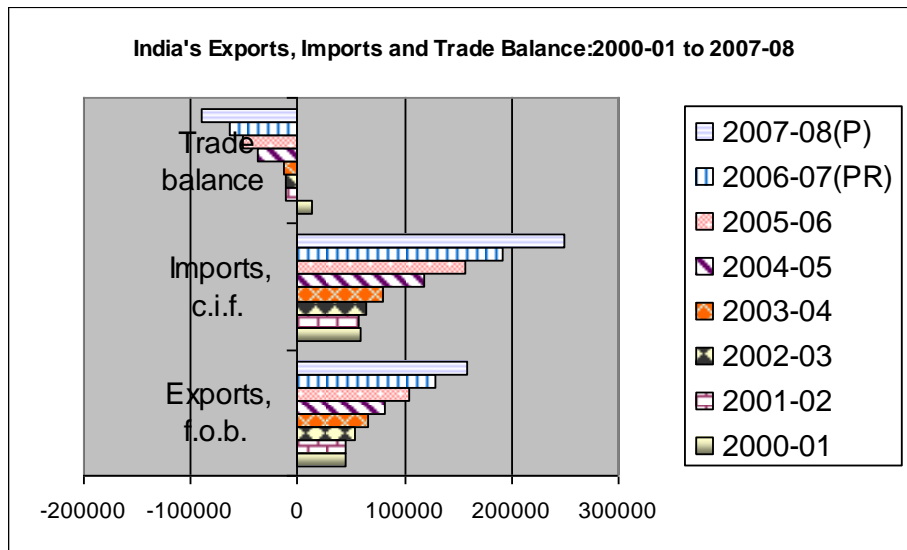
For example, under the American Recovery and Reinvestment Act (ARRA), 2009, the United States Government has restricted the companies taking advantage of bailout packages from replacing American laid-off workers with low-cost H1 B visa professionals. Currently, the cap for H1 B visa holders stands at 65,000 a year, of which approximately 40,000–45,000 holders are IT professionals of Indian origin. This will have an adverse impact on services exports under GATS Mode 4.

Similarly, the British Government has raised the minimum requirement to enter Britain under the Tier 1 category from a graduate degree with a minimum salary of £17,000 to a master's degree with a minimum salary of £20,000. The ban by the United States and a restrictive employment policy by the United Kingdom will on an aggregate level affect Indian export of services under GATS mode 4 and possibly restrain the new employment generation for the Indian IT and ITeS sector.

2.3. Trends in India's Imports of Goods and Services

Since 2001–02 onwards, India's merchandise imports have always been higher than its merchandise exports, leading to a negative trade balance which has grown over the years (figure 7). Not only are imports higher than exports, they are also growing at a much higher rate. In 2008, India's exports grew by 23.7 per cent while its imports grew by 38 per cent.

Figure 7. India's Exports, Imports and Trade Balance, 2000–01 to 2007–08



In terms of services, however, export growth is much stronger than import growth which has led to an ever-growing positive trade balance in India's services trade. This reflects the importance of services sector in India's total trade.

Within merchandise imports, oil imports are much higher than the non-oil imports.

- Oil imports. Since October 2007, there has been a steady rise in imports of oil. However, much of this increase can be attributed to the increase in oil prices. After July 2008, there was a drastic decline in India's oil imports on account of the fall in prices. Volumes of oil imports grew at almost 212 per cent in 2008–09 over 2004–05 (table 11). The rate of growth of oil imports in each financial year over the previous financial year remained greater than 30 per cent except in 2008–09 (17 per cent).

Table 11. India's Oil Imports and Rates of Growth (per cent)

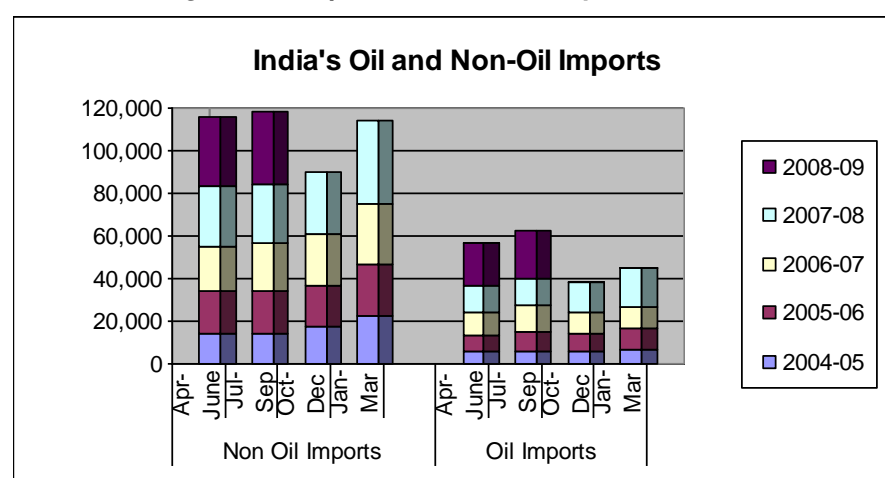
FY	Oil imports (\$ millions)	ROG (per cent)
2004–05	29,844	
2005–06	43,963	47.31
2006–07	57,099	29.88
2007–08	79,715	39.60
2008–09	93,176	16.88

- Non-oil imports. India's non-oil imports have increased steadily over time (table 12). Non-oil imports grew at almost 138 per cent in 2008–09 over 2004–05. However, in 2008–09 the growth rate fell from 33.8 per cent in 2007–08 to 13.16 per cent.

Table 12. India's Non-Oil Imports and Rates of Growth (per cent)

FY	Non-oil imports (\$ millions)	ROG (per cent)
2004–05	81,673	
2005–06	105,203	28.81
2006–07	128,505	22.15
2007–08	171,940	33.8
2008–09	194,584	13.16

Within the import basket, the composition of imports between oil and non-oil imports does not seem to have changed much over time for India (figure 8).

Figure 8. Composition of India's Import Basket, 2004–05 to 2008–09

Conclusions from Trends

1. The financial crisis in the United States which began in the second quarter of 2007, adversely affected India's merchandise exports to the United States with negative effects becoming pronounced from October 2008 onwards. A likely explanation for this lag is that India's exports to the world had grown at a much higher rate as compared to exports to the United States since 2005. Also, the share of the United States in India's exports has declined over the years which has reduced the dependence of India's exports on the United States market.
2. India's export basket in terms of its composition has diversified over time and the share of traditional exports has declined in the export basket. This has led to reduced dependence on a few exportable products and helped moderate the impact of the reduced demand of exports. However, there exists large scope for further diversification.
3. Overtime, the significance of South-South trade for India is increasing, with the share of developing countries increasing from 17 per cent in 1990–91 to 42 per cent in 2007–08. In particular, the direction of India's exports is slowly shifting towards Asian developing countries. However, developed countries, like the EU and the United States, are still India's major export markets.
4. In terms of exports of services, there has been an exponential rise over time with CAGR of about 24 per cent during 2001–2008. The United States remains the major export market for India's services and software exports remain the major exportable service with a 40 per cent share.

5. The major drivers of sustained year-on-year growth rates registered by aggregate Indian exportable services have been earnings from travel, transportation and miscellaneous services, which accounts for both software and non-software services. Growth rate of exports has drastically fallen in all these services since 2007–2008 but has remained positive.

6. India's import growth has declined during the slowdown but the decline has been lower than the decline in exports. Non-oil import growth declined from 29 per cent in 2005–06 to 13 per cent in 2008-09 while oil imports declined from 47 per cent in 2005–06 to 17 per cent in 2008-09. Unlike the growth rate of exports, the growth rate of imports has remained positive

The trends in India's exports and imports indicate that the impact of the slowdown on India was felt with a lag probably due to diversification over time in India's exports, both in terms of composition and direction. However, there is a large scope for further diversification, both in terms of composition and direction of exports. Around 30 per cent of exports are still directed towards developed countries, which need to be diversified to developing countries. The share of fewer commodities in the top 50 per cent of India's exports at 6-digit level in 2007 as compared to the earlier period reflects the need and scope for further diversification.

III. IMPACT OF THE SLOWDOWN ON INDIA'S EXPORTS

Global demand plays an important role in determining the export growth of a product. With a rise in global incomes, demand for normal and luxury products rises while for inferior products it may decline. Income elasticity of demand⁴ 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 a country exports, i.e., the income elasticity of demand of the product, is an important factor which determines the impact of a slowdown on the country's exports. Along with income elasticity, price competitiveness may also determine the impact of a slowdown on exports. If the products exported are less price-sensitive, then in the case of a slowdown the option of lowering prices to maintain market shares may not be feasible.

Econometric estimation of the price and income elasticity of imports has been the subject of a large literature⁵ both for developed and developing countries. Apart from price competitiveness, many other factors may affect demand for a product, e.g. income of consumers, tastes and preferences, etc. Income elasticities of demand are said to capture market sensitivity to non-price factors (Fagerberg, 1988 and Meliciani 2001). Most empirical studies find that the exports of developing countries, especially in Asia, have low price elasticities but high income elasticities (Goldstein and Khan, 1985; Marques and McNeilly, 1988; Feenstra, 1994, Senhadji and Montenegro, 1999).

The 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 limited feasibility of using price competition to maintain or increase exports.

It has been recognized in the literature that the higher the income elasticity of the export demand, the more powerful will exports be as an engine of growth.⁶ Senhadji and Montenegro (1999) found that the Asian countries had the highest estimated values for income elasticity among the developing and industrial countries. This advocated the view that exports had been a powerful engine of growth in the Asian region. This has an important implication: the higher the income elasticity of export demand the more severe will be the impact of a slowdown of incomes/GDP on the exports and growth of developing countries.

To estimate the extent of the impact of the slowdown of global GDP growth on India's exports, the study estimates income elasticity of export demand for India's total exports and its sectoral components. The elasticities indicate the extent to which India's exports will increase/decrease in response to changes in global demand captured by changes in global GDP growth. These income elasticities are then used with GDP growth forecasts for 2009 and 2010 (provided by OECD Economic Outlook, March 2009) to arrive at the estimated impact on India's total and sectoral export growth to world.

3.1 Methodology and Data

For assessing the impact of the 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. For India, many of the tradables comprise low-technology products, such as leather footwear, gems and jewellery, marine products, etc., therefore there is a strong possibility of these being highly differentiated products, with close

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 increased by 20 per cent, the income elasticity of demand would be 20 per cent/10 per cent = 2.

⁵ See, for example, Malley and Moutos (2002), Erkel-Rousse and Mirza (2002), Caporale and Chui (1999), Hooper et. al. (1998).

⁶ See Huuthaskker and Magee (1969), Goldstein and Khan (1985).

substitutes available. Demand for these products is therefore expected to be price-sensitive. Firms offering a lower relative price would be able to sell more than their competitors.

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 inflation⁷ by which we arrive at a real effective exchange rate (REER). While considering exports, a country's REER would preferably reflect not only its price competitiveness vis-à-vis the importing country but also its price competitiveness versus competing exporters to the same country. In other words, relative exchange rate index construction for exports involves the added complication of taking third party competition into account. This approach has been followed by a number of studies (e.g. Spilimbergo et al. 2003, Wijeweera et al 2008).

To capture the relative difference in international and domestic market prices, a ratio of world GDP deflator to India's GDP deflator is used. Real exports are arrived at by deflating nominal exports with an export unit value index (*source*: Reserve Bank of India). World GDP in real terms captures the income effect. This is a standard proxy for capturing income effect. The model estimated is therefore as follows:

$$LNEXP_{INDIA_t}^d = \alpha_1 + \alpha_2 LNGDP_{WORLD_t} + \alpha_3 LNREER_t + u_t \dots\dots\dots(1)$$

t = 1970 to 2008

Where $LNEXP_{INDIA}$ is log of real exports of India to the world; $LNGDP_{WORLD}$ is a log of real world GDP and $LNREER$ is a product of the effective exchange rate and relative prices proxied by a ratio of world GDP deflators and India's GDP deflator. The data for world GDP at current and constant prices is taken from the World Bank World Development Indicators; the exchange rate is taken from the ERS International Macroeconomic Data Set; and India's merchandise export is taken from World Integrated Solutions (WITS; COMTRADE).

Empirical evidence suggests that India's exports react favourably to devaluation or depreciation. Following the devaluation of the rupee in 1991 there was a spurt in export growth. Studies have reported that the price competitiveness of India's exports is an important determinant of the volume of exports and that rupee depreciation can have a significant positive effect on its current account balance (Joshi and Little, 1994; Srinivasan 1996; Banik 1999). It is therefore expected that the price elasticity given by α_3 will be negative.

Apart from relative prices, global GDP is also considered to be an important variable for estimating export demand functions. As stated above, many studies have found income elasticity, which is given by coefficient of $LNGDP_{WORLD_t}$ i.e., α_2 will be positive.

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 (ADF test); and (b) the Phillips-Perron test (PP test). Since regressions have been run for aggregate exports as well as sector-specific exports, we have undertaken the tests separately. The results of these are reported in the annex. We find that most of the series used are stationary at levels. Wherever we found that the series contains the unit root in levels, but no unit roots in first differences, we have 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 exists a long-run equilibrium relationship and therefore a meaningful regression estimate can be carried out.

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.

3.2 India's Income Elasticity of Total Exports

To estimate the impact of the slowdown of world GDP growth on India's export growth, we estimate the above equation (equation 1). Similar equations have been estimated to arrive at price and income elasticities of India's exports to the United States, the G7 countries, advanced economies (as defined by IMF) and the ASEAN 5. The results are reported in table 13.

Table 13. Income Elasticities of India's Export Demand

Countries	Price elasticity for exports	Income demand elasticity for exports
World	-0.54*	1.88*
G 7 countries	-0.21*	1.06*
USA	-0.36*	2.48*
ASEAN 5	-0.42*	1.11*

Note: G7 countries are as per the IMF definition. * Denotes significant at 1 per cent.

The results show that India's exports to the world are much more responsive to income changes as compared to price changes, although both factors are found to be significant. A 1 per cent decline in GDP growth of the world will lead to 1.88 per cent decline in India's growth of exports to the world. However, much higher price competitiveness is required to increase exports. It should be noted that the price elasticity, inter alia, captures the effect of depreciation of the currency and lowering of relative prices. This implies that to compensate for the loss in export growth, it will be very difficult to increase India's export growth through improvements in its price competitiveness. A 10 per cent reduction in prices will lead to a 5.4 per cent increase in exports.

Income elasticity of India's exports is found to be highest with respect to the United States, i.e. 2.48, which implies that a slowdown in the United States with respect to GDP growth will have a more significant impact on India's export to the United States as compared to a decline in the growth of world GDP. The income elasticity with respect to ASEAN 5 countries is found to be 1.11, which is comparatively lower than the income elasticity of India's exports with respect to world and the United States. This implies that a slowdown in growth of ASEAN GDP will have a lower impact on the export growth of India to ASEAN 5 as compared to the world.

India's exports are found to be more price elastic with respect to ASEAN 5 as compared to the United States and the G7. This indicates that with respect to ASEAN 5, India is exporting much more differentiated products with close substitutes as compared to other developed countries. Although earlier studies have found a much higher price elasticity for India (e.g. Srinivasan 1996), more recent studies have found lower price elasticity (e.g., Banik 2008). An apparent reason for this is a change in the composition of India's exports from price-sensitive items to less price-sensitive items such as chemicals, engineering goods and petroleum products. An important implication of this is that a slowdown in ASEAN 5 countries may have a less adverse impact on India's export growth, therefore exploring further export opportunities in these countries could be considered.

3.3 India's Income Elasticity of Sectoral Exports

Following a similar methodology to that outlined in the earlier section, income and price elasticities are estimated for 10 major Indian export sectors to the world. Detailed results with respect to the stationarity of the series and other test statistics are presented in the annex. The price and income elasticities are reported in table 14.

Table 14. Price and Income Elasticities for India's Major Export Sectors

		Price elasticity (1)	Income elasticity (2)
1	Textiles and textile products	-0.29*	1.16*
2	Ore & minerals	-1.27*	4.85*
3	Leather and leather products	-0.88*	1.25*
4	Marine products	-0.47*	1.26*
5	Plantations	-1.05*	0.33*
6	Chemicals and chemical products	-0.23	2.55*
7	Petroleum products	-1.30	5.40*
8	Engineering and electronic products	-0.56*	2.28*
9	Agriculture and allied products	-0.71*	1.38*
10	Gems & jewellery	-0.92*	4.11*
	Total Exports	-0.54*	1.88*

Note: * Denotes significant at 1 per cent.

The results show that the income elasticity of total Indian exports is very high, i.e., 1.88. Estimates of the income elasticities of 10 major Indian export sectors (which are around 95 per cent of India's total exports) show that they are high for sectors such as petroleum products, ores and minerals, gems and jewellery, chemical products and engineering products. India's traditional export sectors, like textiles leather and plantations, have relatively low income elasticity, with the lowest being for plantations. This also explains the shift in India's exports away from traditional exports and the growing diversification of the export basket in the period 2000-2007 in which global GDP grew consistently.

Two observations can be made here. First, India's exports of textiles are not high value added exports, since as people's incomes rise, their demand for India's textiles does not grow as significantly as their demand for other products exported by India. Improvement in brand names and quality is needed for increasing the income demand elasticity for textiles. The same is true for leather and leather products. For both textiles and leather exports, price elasticity is low which implies that improving cost competitiveness or lowering prices may not be a feasible option for boosting exports of these sectors during a slowdown.

Second, exports of products like plantations are not expected to be income elastic as their demand may not be linked to people's incomes. However, price elasticity is found to be very high for plantations, which implies that lowering their prices and improving their cost competitiveness can boost their exports during a slowdown. High price elasticities are also found for ores and minerals. Lowering their prices to boost exports during a slowdown can be considered as a mitigating step. However, price elasticities are not found to be a significant factor in export growth for petroleum and chemical products and these are the products which are increasing their share of India's total exports.

An important implication of these elasticities is that during a slowdown in growth of global GDP, sectors with higher income elasticities will experience a higher decline in their export growth. But if the price elasticities are also high then these sectors can lower their prices to improve exports, but such an option may not be available to products with high income elasticity but low price elasticity like gems and jewellery and textiles. These sectors are relatively more vulnerable sectors of the economy in terms of impact of global slowdown.

IV. FORECAST OF INDIA'S EXPORTS USING INCOME ELASTICITY OF EXPORTS

Using the income elasticities for export demand for India and the forecast change in global GDP growth, India's total export growth and sectoral export growth for ten major sectors has been estimated for the year 2009–10 and from April 2010 to 2010 December 2010. The forecast slowdown of GDP growth as provided by OECD Economic Outlook (March 2009) is used. The slowdown in GDP growth projected by OECD is as follows:

Table 15. Projected Real GDP Growth (per cent), 2009 and 2010

	2006	2007	2008	2009	2010
World	4.3	4.1	2.2	-2.7	1.2
USA	2.8	2	1.1	-4	0
Euro Area	3	2.6	0.7	-4.1	-0.3
Japan	2	2.4	-0.6	-6.6	-0.5

Source: OECD Economic Outlook (March 2009).

According to the projections, global GDP growth is expected to decline from 2.2 per cent in 2008 to -2.7 per cent in 2009 but it is expected to revive in 2010 to 1.2 per cent. However, positive GDP growth is not forecast for developed countries like the United States, the eurozone and Japan in 2010.

The results of the estimates are presented in table 16. The results show that total exports will grow by -2.2 per cent in 2009–10, which implies that there will be almost flat growth, marginally tending towards negative growth. Most of the sectors experience a negative growth rate. Positive growth in exports is forecast for plantations, the agriculture sector and the engineering and electronics sector. It should be noted that although positive growth rates of exports in agricultural products has been forecast, it is much lower than the 55 per cent export growth in 2007–08.

Table 16. Forecast Total Merchandise Export Growth and Sectoral Export Growth, 2008–09 and 2009–2010

	Export growth in 2007–08	Export growth 2008–09 over 2007–08	Export growth 2009–10 over 2008–09	Projected export growth 2010 over 2009
Textiles and textile products	15.7	-8.9	-3.6	4.6
Ore & minerals	30.4	-12.3	-4.9	26.6
Leather and leather products	16.3	2.5	-1.6	5.7
Marine products	-2.6	-4.4	-0.1	5.3
Agriculture	55.6	2.6	1.5	14.6
Plantation	11.6	54.6	14.2	14.3
Engineering & electronics	26.6	22.0	0.4	9.5
Chemicals & products	21.5	9.7	-4.3	8.1
Gems & jewellery	23.3	-4.9	-11.1	15.3
Petroleum products	52.0	4.7	-11.8	21.2
Total sectors	29.1	3.40	-2.2	8.3

The forecasts show that petroleum products will experience the maximum decline in export followed by gems and jewellery, ores and minerals and textiles and textile products. Total exports grew by 3.4 per cent in 2008–09, declining from 29.1 per cent growth in 2007–08. The predicted export growth in 2009–2010 is -2.2 per cent, which is predicted to increase to 8.3 per cent in 2010–11 (April to December). The estimates show that all sectors experience a positive growth in exports if global GDP growth is positive, as predicted by OECD.

However, although many sectors show positive export growth rate in 2008–09, a close examination of quarterly trends reveal that this positive export growth masks the decline in export growth during October 2008–March 2009. For example, sectors such as leather and leather products and petroleum products experienced a negative export growth of 10 per cent and 28 per cent. In 2010–11, sectors such as agricultural products, plantations, engineering, chemicals and petroleum products are expected to reach the initial level of exports in 2007–08.

V. IMPACT OF THE SLOWDOWN ON EMPLOYMENT THROUGH INTERNATIONAL TRADE

The predicted overall export growth for the years 2009–2010 and 2010–11 and sectoral export growths have been used to estimate the impact of the global slowdown on employment in the economy. The methodology adopted for this is described in the box below.

Box: Methodology for Estimating Impact on Employment

Using the latest available input-output matrix for India for the years 2003–04, the impact of a predicted change in exports on employment has been estimated for 10 major sectors of the Indian economy for the years 2008–09, 2009–2010 and 2010 (April to December).

Using the actual sector-wise exports for the years 2006–07 and 2007–08, provided by RBI, the change in exports has been calculated for subsectors of the input-output matrix. Using a Leontif inverse matrix, the change in output across different sectors consequent to change in output for each sector (due to change in exports) has been estimated. Applying the labour coefficients across the sectors, total employment change (which is direct as well as indirect) is arrived at for each sector. These are further summed up to arrive at the change in total employment and the change in employment for 10 major sectors.

The estimated impact on employment for a sector includes both a direct increase in employment of the sector caused by exports and an indirect increase in employment which is generated because of the rise in exports of other sectors which use the sector's output as inputs. For example, employment in agricultural products may rise because of increase in their exports and also because of increase in demand for their products as exports of processed food products and textiles and textile products increase.

The results are presented in table 17. The estimates show that in the year 2008–09, with export growth of 3.4 per cent, the total job loss in India due to lower export growth was around 1.16 million. However, since the impact of the slowdown on India's exports was strongly felt only after September 2008, the net employment created by exports in this year was positive, i.e., 1.25 million. The net employment is the sum total of jobs created and lost in different sectors over time. In the year 2009–10, export growth is predicted to be -2.2 per cent, and the total job loss is estimated to be around 1.3 million. However, since export growth is positive for some sectors like plantations and these sectors have high employment multipliers, the net employment loss is estimated to be -748 thousand.

For the year 2010–11, estimation could be done only for three quarters, i.e., until December 2010, as GDP growth predictions are not available beyond that. Using the predicted export growth of 8.3 per cent, the total employment generated in the economy is estimated to be 5.22 million. No job losses are expected as all sectors are expected to experience positive export growth.

Sector-specific employment changes are reported in table 17. In 2008–09, job losses are likely to arise in sectors with negative export growth like textiles and textile products, ores and minerals, marine products and gems and jewellery. In 2009–2010, most sectors are predicted to have job

losses, except for agriculture and plantations, for which positive export growth has been predicted. Maximum job losses are likely to occur in the gems and jewellery sector followed by ores and minerals, textiles and textile products and petroleum products. For the year 2010–11 (until December), we find that there is employment generated due to changes in exports in all sectors.

Table 17. Impact of the Slowdown on Employment, 2008–09 to 2010–11

	Employment projection in 2008–09	Employment projection in 2009–10	Employment projection in 2010–11 (until December 2010)
Ores and minerals	-373,023	-440,961	936,824
Textiles & products	-559,621	-253,810	260,172
Leather & products	30,787	-21,102	54,784
Marine products	-16,498	-96	16,484
Agriculture	373,148	159,070	2,468,094
Plantation	1,275,376	422,672	561,494
Engineering and electronics	665,445	-24,927	332,997
Chemicals & products	45,114	-29,856	49,504
Gems & jewellery	-217,151	-505,023	465,005
Petroleum products	33,749	-54,045	79,445
Net employment	1,257,327	-748,078	5,224,802
Job loss	-1,166,293	-1,329,820	

During 2010–11 (until December 2010) with all sectors likely to experience positive export growth, the declining trend in employment would be reversed. In sectors such as ore and minerals, leather and leather products, engineering products, chemicals and petroleum products, the additional employment generated due to export growth in 2010–11 is likely to compensate for job losses due to a decline in exports during the preceding two years. However, in respect of the textile sector and gems and jewellery, export growth during the nine months of 2010–11 would not be sufficiently buoyant as to compensate for job losses during the preceding two years.

VI. IDENTIFICATION OF SECTORS FOR EMPLOYMENT GENERATION

One of the immediate policy actions which may be required to mitigate the impact of the global slowdown on employment is to identify the export sectors which have large employment multipliers. An employment multiplier of a sector gives an estimate of aggregate direct and indirect employment changes (in person years) resulting from increase in one unit of output of the sector. The indirect employment changes occur due to backward and forward linkages of the sector in the economy. Thus, employment multipliers will indicate the extent of economy-wide employment generated.

Using the latest available input-output matrix, employment multipliers have been generated for the 10 major sectors, which are as follows.

Table 18. Employment Multipliers Based on Input-Output Matrix of 2004

	Employment Multiplier
Plantation	2.15
Agriculture	3.20
Marine products	0.56
Ores and minerals	2.00
Leather & products	1.11
Gems & jewellery	0.50
Textiles & products	1.22
Chemicals & products	0.36
Engineering and electronics	0.38
Petroleum products	0.26

As seen in table 18, the employment multiplier for the agricultural sector is the highest at 3.2, followed by ores and minerals. However, the employment generated in the economy will depend on the value of exports of the sector and its employment multiplier. Sectors with high employment multipliers which may not be able to regain their export growth to the initial level of 2007–08 in 2010 are textiles and products (1.22); leather and products (1.11); and gems and jewellery (0.5).

VII. CONCLUSIONS AND MITIGATING STRATEGIES

Riding on the back of brisk growth in the global economy since 2002, India's exports witnessed a phenomenal threefold increase during the period 2002–03 and 2007–08. This powerful dynamo for employment generation is now threatened by rapid contraction in global demand and a weakening labour market. It is a major challenge for India to properly manage the fallout from the current global slowdown on its export sector and limit the adverse consequences for the employment situation in the country.

As estimated in this paper, India's export growth during 2009–10 over the previous year is likely to be flat, tending towards the negative side (-2.2 per cent). However, in conjunction with recovery in demand in developed economies, India's export prospects are likely to improve during the period 2010–11. Exports in sectors such as textiles and clothing, ores, marine products and gems and jewellery are likely to decline significantly during 2009–10, as compared to the previous financial year. Relatively high employment – output multipliers in these sectors is likely to result in high job losses. The position of export-related employment is likely to improve during April–December 2010, due to improved export performance in sectors such as chemicals, petroleum products, and engineering and electronic products. However, additional employment created due to export growth during this period in textiles and gems and jewellery will not compensate for job losses in these two sectors for the preceding two years.

Overall, it is apprehended that the contribution of the export sector in generating employment in India is likely to remain under stress till 2009–2010 with improvements in the year 2010–11. The net employment loss is estimated to be around 748,000 in 2009–2010, with exports generating total employment of 5.2 million in the year 2010–11 (until the third quarter).

To build the resilience of the economy to trade shocks and improve competitiveness of exports, it would be useful for the Government to consider mitigating strategies. This study suggest five specific mitigating strategies relating to (a) diversification of exports to new geographical destinations and new products; (b) simplification in customs procedures for reducing transaction costs; (c) examination of the likely impact of anti-dumping and safeguard duties imposed by India on downstream user industries; (d) measures aimed at assisting exporters to retain their market presence during the crisis period; and (e) expeditious multilateral examination of the adverse impact of bailouts and stimulus packages and prompt remedies.

(a) Diversification of exports: identifying new markets and new products

Despite targeted efforts by the Government for seeking new geographical destinations for exports, the European Union and the United States continue to be the main destination of India's exports. These two main markets account for nearly 30 per cent of exports, although the share of the United States has reduced gradually over the years. While demand in most countries has been adversely affected by the current global slowdown, the extent and timelines for recovery vary considerably. On the basis of available forecasts, it is likely that countries/regions such as Western Asia, ASEAN, Australia and Brazil are likely to witness a faster recovery than other economies. These countries can provide viable and sustainable alternative markets for reducing India's overwhelming reliance on the EU and the United States for its exports. There is a need to develop and implement measures that would ensure sustained export growth which is not impeded by adverse developments in big foreign markets or in respect of a few products.

In each of the importing destinations (ASEAN, Australia, Brazil, Republic of Korea, Western Asia, and South Africa) a competitiveness analysis of India, the importing country and five main exporting countries has been undertaken for identifying products in which India has the potential to significantly increase its exports from the current level (potential products) or start exporting new products.⁸ Around 958 products were identified. As shown in table 19, India has the potential to increase its exports of new and potential products by almost \$35 billion.

⁸ Bilateral and global RCAs (revealed comparative advantage) have been used for the competitiveness analysis.

Table 19. Potential Gain for India from Export of New and Potential Products

Country	Estimated value of new exports of India (in \$bns)	Estimated value of potential products exports of India (in \$bns)
Australia	1.98	2.19
Brazil	3.36	0.19
Republic of Korea	6.55	1.45
United Arab Emirates	0.70	2.70
Malaysia	3.65	0.80
Philippines	2.20	1.05
Thailand	2.60	0.85
Singapore	0.85	2.52
South Africa	1.35	0.20
TOTAL	23.24	11.95

As a first step in harnessing this potential, it may be useful for industry and the Government to identify specific reasons as to why India's comparative advantage in these products has not translated into export gains. As India is in the process of negotiating free trade agreements with most of these countries, this opportunity could be used to address border and behind-the-border trade-related constraints identified in the importing country. Early conclusion of free trade agreement negotiations and implementation of the agreement with some of these countries could provide India with attractive markets for reducing the risk of overall exports being adversely affected by developments in a few big markets.

For India to again achieve the export growth witnessed prior to the global slowdown, the need to preserve the existing market access in big economies becomes extremely important. While an early and satisfactory conclusion of the Doha Round would help in this regard, it is also essential to be vigilant that non-tariff measures do not act as a disguised trade restriction.

(b) Simplification in Customs Procedures for Reducing Transaction Costs

With profit margins shrinking globally, cost competitiveness would be an important determinant for retaining or acquiring a share in export markets. A part of the cost-cutting efforts are linked with the Government's initiatives aimed at facilitating trade. In an attempt to reduce some of the transaction costs associated with international trade, the Government has been simplifying its customs procedures over the past few years. While this is a continuing process, it needs to gather significant additional momentum, if India's exporters are to cut costs further, enhance their competitiveness and retain or increase their market share in foreign markets. Using the costs and procedures involved in importing and exporting a standardized shipment of goods, the World Bank report *Doing Business 2009* states that India has slipped 9 ranks in respect of trading across borders. This report suggests that considerable procedural improvements related to international trade remain to be undertaken, as India's exporters require twice the number of documents for exports as OECD countries. Similarly, the time required for export and import continues to be considerably higher in India compared to OECD countries. The possibility of further simplification, at least in these two areas in the short term, merits the close attention of the Government.

(c) Examining the Likely Impact of Anti-Dumping and Safeguard Duties on Downstream User Industries Prior to the Imposition of Duties

While India has been a major user of anti-dumping measures over the past few years, there has been a significant increase in the number of fresh anti-dumping and safeguard investigations initiated from October 2008 onwards. Many of the products currently under investigation are chemicals and other intermediate products which are inputs for downstream industry. The imposition of anti-dumping and safeguard duties on products which are inputs for subsequent stages of industrial production, would increase the overall cost of production. The duties would also adversely affect export prospects, if the duties are imposed on imported inputs used for producing export-oriented goods. While the underlying anti-dumping and safeguard investigations are required to be undertaken in accordance with the requirement under relevant domestic law, the

possibility of not imposing the duty on account of consumer interest does exist. In the context of the current global slowdown, it may be beneficial for the economy as a whole if a detailed economic analysis on the likely impact of the duties on downstream user industries is undertaken, prior to the imposition of the duties. In case the economic analysis estimates a considerable increase in production costs, particularly of exports, the option of not imposing the duty on grounds of consumer interest could be considered by the Government. This would prevent the possibility of India's exports becoming uncompetitive on account of anti-dumping and safeguard duties on imported inputs.

(d) Measures Aimed at Assisting Exporters to Retain their Market Presence During the Crisis Period

With economic recovery being predicted for 2010, it is important that India's exporters do not withdraw from the export market in the intervening period of downturn, if they are to take advantage of export opportunities during the period of recovery. Government could consider a two-pronged approach for supporting exporters to retain their presence in foreign markets. On the one hand it could support exporters through incentives such as easing trade financing. However, as export related incentives can be neutralized or offset by the importing country through the imposition of countervailing duty, an attempt could be made at the multilateral level to explore the possibility of a standstill on countervailing duties that might otherwise arise from incentives given by developing countries. As an alternative, the WTO Subsidies Committee could consider the possibility of increasing the threshold level of subsidization, below which no countervailing duty would be levied. This option could represent a balance between the interests of exporters and domestic industry in the importing country.

(e) Expedient Multilateral Examination of the Adverse Impact of Bailouts and Stimulus Packages and Prompt Remedies

Many developed and some developing countries have implemented bailout and stimulus packages for countering the adverse impact of the global slowdown and stimulating domestic demand. The Government could consider putting in place a mechanism, at least in the short term, for constantly reviewing the implementation of these packages and identifying measures, if any, which have an adverse impact on India's interests. While India could consider resorting to the WTO dispute settlement mechanism for seeking redress against the identified measures, this is a time-consuming process which could take up to two years and hence is not likely to provide prompt relief to India. The Government could consider a multilateral solution to this problem, whereby WTO members would agree that the Subsidies Committee constitute a group of experts (comprising legal experts and economists), which would examine the complaints against specific measures in the bailout and stimulus packages and give its findings expeditiously, say within three months of the matter being referred to it. The specific measure would need to be modified or withdrawn promptly, if the group of experts finds that adverse effects have arisen due to the bailout and stimulus packages.

In addition to implementing the mitigation strategies outlined above, there is a need to develop and implement long-term measures that would ensure sustained export growth which are not impeded by adverse developments in big foreign markets. The current global slowdown will have a silver lining if the opportunity offered to diversify exportable products and markets and enhance competitiveness is fully utilized by Indian industry.

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3. Stationarity Test for Exports to G7

. dfuller lnexpg7uvdef, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 27

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-2.174	-4.362	-3.592	-3.235

Mackinnon approximate p-value for Z(t) = **0.5047**

. dfuller lngdpg7, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 27

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-1.748	-4.362	-3.592	-3.235

Mackinnon approximate p-value for Z(t) = **0.7291**

. dfuller lnreerdef, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 27

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	0.915	-4.362	-3.592	-3.235

Mackinnon approximate p-value for Z(t) = **1.0000**

. dfuller lnreerdef, lags(0)

Dickey-Fuller test for unit root Number of obs = 27

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-2.244	-3.736	-2.994	-2.628

Mackinnon approximate p-value for Z(t) = **0.1905**

.

4. Stationarity Tests for Sectors

. dfuller LNTEXTDEFUV, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-3.419	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.0489**

. dfuller lnplantdefuv, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-1.701	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.7503**

. dfuller lnmarinedefuv, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-3.332	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.0612**

.

Dickey-Fuller test for unit root Number of obs = 37

	Test Statistic	1% Critical Value	Interpolated 5% Critical Value	Dickey-Fuller 10% Critical Value
Z(t)	-2.150	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.5178**

Dickey-Fuller test for unit root Number of obs = 37

Z(t)	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
	-2.216	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.4806**

. dfuller lnengdefuv, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 37

Z(t)	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
	-0.374	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.9876**

. dfuller lnagri, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 37

Z(t)	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
	-1.470	-4.270	-3.552	-3.211

Mackinnon approximate p-value for Z(t) = **0.8392**

5. Stationarity Tests for REER

Dickey-Fuller test for unit root Number of obs = 38

Z(t)	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
	-2.660	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = **0.2532**

6. Stationarity Tests for Log Global GDP

. dfuller lnggdp, trend lags(0)

Dickey-Fuller test for unit root Number of obs = 38

Z(t)	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
	-3.153	-4.260	-3.548	-3.209

Mackinnon approximate p-value for Z(t) = **0.0941**