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Trade liberalization, employment, labour productivity, and real wages: A study of the organized manufacturing industry in India in the 1980s and 1990s

Deb Kusum Das

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Deb Kusum Das (dkd_ramjas@yahoo.com) is a reader in the Department of Economics, Ramjas College, University of Delhi. He holds a PhD from the Delhi School of Economics and was awarded the EXIM Bank Economic Development Research Annual Award in 2003 for his doctoral dissertation on "Some aspects of productivity growth and trade in Indian industry". He has taught at several universities abroad, including the Lahore University of Management Sciences (Pakistan) and Lancaster University (UK). He is also engaged with ICRIER, New Delhi, as a consultant. His research interests are issues connected with productivity growth, trade liberalization, employment, labour intensive manufacturing, and quantification of trade barriers. His publications include *India: Industrialization in a reforming economy*, a co-edited book, and "Trade barriers in manufacturing" in Kaushik Basu (ed.) *The Oxford companion to economics in India.*

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Executive Summary

The study presents industry-level evidence regarding the connection between trade policy reforms and labour market indicators within organized manufacturing industries in India. In particular, the study has two objectives: documenting the trends in employment, wages, and labour productivity, and examining the trade liberalization-employment growth nexus. Both these sets of issues are addressed using a panel data set of selected industries within the organized manufacturing industries for the period as well as panel data sets of use-based industries - intermediate, consumer, and capital goods. The period of study covers four phases of trade liberalization, 1980-85; 1986-90; 1991-95, and 1996-2000, as we believe that India's effort at trade liberalization started as early as the beginning of the 1980s with gradual decline in controls.

The study attempts to address the impact of trade liberalization on labour market indicators using explicit measures of trade policy orientation. Trade liberalization is quantified in terms of various trade policy indicators - customs tariff as well as non-tariff measures. Using these quantified trade policy indicators, the paper examines the trends in employment, wages, and productivity in the organized manufacturing industries. For organized manufacturing, we observe that successive phases of trade liberalization bring out a positive relationship between high labour productivity growth and employment growth for a large number of industry groups. Further, we observe that industries with high employment growth also tend to show upward movements in real wages.

The findings, associating trade policy indicators with employment growth, show mixed results in terms of both employment growth and decline. Tariff reductions, as captured by the lowering of effective rates of protection, show increases in employment growth in the first three phases of trade liberalization, whereas in the case of reduction in non-tariff barriers, as captured by the import coverage ratios, we find evidence of decline in employment growth in the 1990s. Assessing the joint impact of lowering both tariff and non-tariff barriers is indicative of some kind of industry rationalization taking place in the aftermath of trade policy changes, resulting in decline in employment growth due to restructuring of industries taking shape in the form of exit and entry. Overall, the study shows that in the labour intensive sectors, cotton textile, textile products, and leather and leather products, trade liberalization has a positive impact on the labour market indicators, be it employment, real wages, or labour productivity.

Foreword

This paper by Deb Kusum Das studies the trends in labour productivity and real wages in the organized manufacturing industry in India during 1980s and 1990s. It seeks to document and analyse the changes in productivity levels, employment, and wage levels with the advent of trade liberalization in the Indian economy.

The sample used by the author covers around 75 industries from the Annual Survey of Industries' three-digit classification, spread across three use-based industry groups - intermediate goods, capital goods, and consumer goods. The paper assesses India's trade policy since the advent of planned economic development focusing on the two dominant forms of trade barriers - tariff rates and non-tariff barriers. While there has been a discussion on the major changes in trade policy since the 1980s, the impact of trade liberalization on employment, labour productivity, and real wages has not been analysed in detail. This study is an attempt to fill this gap - it correlates trade policy changes as represented by effective rates of protection, import coverage ratio, and import penetration rates with the employment growth of both organized manufacturing industries and use-based sectors using explicit measures of trade liberalization.

The study shows that the successive phases of trade reforms have had a positive impact on the labour market indicators - employment, labour productivity, and real wages. Trade liberalization brings about consistent growth in labour intensive industries. It also finds that there is a positive relationship between high labour productivity growth and high employment growth. The increase in demand for labour creates an upward pressure on real wages in the organized manufacturing sector. This holds for both broad industry groups as well as use-based sectors. The study, therefore, offers an interesting insight into the impact of trade reforms on the organized industrial labour market and its ramifications on wages and poverty.

This paper is part of a series of studies that have been launched by the ILO, Delhi office, coordinated by Sukti Dasgupta, Employment and Labour Market Policy Specialist, to analyse and understand the current employment challenges that India faces.

Leyla Tegmo-Reddy
Director and ILO Representative in India
Sub Regional Office for South Asia, New Delhi
International Labour Organization

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1. Introduction

Trade liberalization, by achieving sustainable growth for the economy and the industrial sector, impacts on the issues of productivity, employment, and wages in developing countries. There is no escaping the fact that productivity growth in corporate firms can lead to job losses because as the efficiency of the production process increases, it allows firms to produce more with fewer workers. At the same time, new technology creates new products, and thus new employment opportunities. This implies that less productive firms will leave the market and new ones will take their place, perhaps in different industries/sectors. Therefore, the question of productivity change becomes critical to the formulation of employment policies.

Further, trade liberalization may also be linked to the issue of growth of real wages. It can be argued that in the initial years of trade reforms, trade liberalization might reduce the economic rents generated by restrictive trade polices. Trade reforms are supposed to create a more competitive economic environment, whereby there would be pressures on firms to reduce costs (processing margins may get reduced because of reduction in tariff and non-tariff barriers) and, thus, may contain any upward movement in nominal wages. This, in turn, will cause downward pressure on the growth of real wages.

In the 1990s, after decades of pursuing an import substitution industrialization strategy, India initiated major changes in its trade rules and regulations. The thinking for reviewing the trade policy changes, however, started as early as the 1980s with ad hoc and piecemeal efforts at trade liberalization in terms of tariff reduction and shifting of items of capital goods import from banned/restricted lists to open general licensing. As a part of the economic reforms initiated in 1991-92, considerable changes were made in India's trade regime, including substantial reduction in tariff rates and their dispersion, along with the relaxation of quantitative restrictions on imports. The relaxation of these restrictions on account of both tariff and non-tariff barriers continued well past the mid-1990s. These market-oriented reforms in trade policies were ostensibly aimed at enhancing the growth potential of the Indian economy.

India's growth experience in the last two decades (in the 1980s and 1990s) has not been striking and has remained steady at around 5.5 per cent per annum in real terms. This reflects in part an outcome of the changes in policies that have been taking place since the early 1980s and the radical liberalization of the 1990s. The manufacturing growth rate during the last two decades has been around 7 per cent per annum and this represents a turnaround when compared to the stagnation in growth in many of the preceding decades.

The impact of trade liberalization on the performance of the industrial sector in India has been well documented. Studies on productivity growth (Das, 2001) have documented the positive trade liberalization-productivity growth linkages. Goldar (2000) has shown that employment in the organized sector was stagnant in the 1980s, but grew in the 1990s. Another study by Goldar (2003) found that there has been no improvement in real wages in organized manufacturing in India during the economic reforms period. Thus, we find that even in the context of India, the effects of trade liberalization continue to be debatable with some achievements and some negatives.

The central question to be posed in the context of the above is whether the employment and productivity growth issues apply equally well to less developed countries, characterized by perpetual labour surplus and a variety of institutional shortcomings. Four observations are in order here. Productivity

improvements drive wage increases and bring about an improvement in the standard of living of a country, therefore, no country can afford to neglect productivity changes. No firm that operates in a global market, regardless of where it is located, can afford to forgo productivity increases, no matter what its employment consequences. With the exposure to competition that comes from the integration of global markets, a company's autonomy to pick and choose its production technique declines. Strong empirical support in the form of the East Asian miracle confirms that productivity and employment can go hand in hand.[1] Finally, employment and poverty in the developing countries reflect, not the absence of economic activity, but that of unproductive activity.

This study attempts to document and analyse, for the organized manufacturing sector, the relationship between trade reforms and productivity improvements, employment growth, and real wages in order to address the effects of trade liberalization. In particular, this paper analyses the impact of trade reforms on labour productivity, employment, and real wages, using a panel data set of industries classified into three use-based sectors, intermediate goods, capital goods, and consumer goods industries for the period, 1980-2000.

The rest of the paper is structured as follows:

- Section 2 highlights the major changes in trade policy since the 1980s;
- Section 3 presents trends in employment, labour productivity, and real wages in organized manufacturing;
- Section 4 attempts to relate changes in employment growth directly with measures of changes in trade protection, and
- Section 5 concludes the study.

2. India's trade policy and reforms

India's external sector policies were based on the foundation of the import substituting industrialization strategy with the end objective of a self-reliant economy. In doing so, the government effectively barred competition through strict investment rules and regulations and import licensing along with prohibitively high tariff barriers.

In order to understand and assess India's trade policy since the advent of planned economic development, it is important to look at the two dominant forms of trade barriers facing the Indian industrial set-up: tariff rates and non-tariff barriers.

Tariffs encompassed almost all items of production - industrial machinery, industrial non-machinery, agricultural products, including food, etc. Further, there were abnormally high rates of tariff, ranging as high as 300 per cent on some products. Multiple tariff rates were in existence along with wide dispersion in the rates. A high listed tariff rate did not ensure that the product was in the high tariff bracket as there were multiple exemption rates available, depending upon the nature of the end use of the product.

Tariff rates levied either at specific or at ad valorem rates were regularly supplemented with additional surcharges (auxiliary duties, countervailing duties, special additional duties) in order to keep

[1] *Refer Chapter 2 of the World Employment Report 2004-05.*

domestic industries well protected and ensure revenue generation.[2] It has been observed that the tariff system in India has provided a high level of protection to domestic industries with average rates of effective protection of about 90 per cent or more; further, there were significant inter-industry variations in the protection rates (Goldar and Hashem, 1994). Comparison of the tariff structure with other East Asian countries revealed that the average protection levels were much higher in India in the 1970s and 1980s.

Import licensing, or non-tariff barriers, was the most pervasive form of trade restriction as far as Indian industries were concerned and remained the principal means of regulating imports and protecting domestic entrepreneurs. These trade barriers included the import licensing system, canalization, phased manufacturing programmes, and the 'actual user' policy.

The import licensing system divided imports into three broad categories: consumer goods, capital goods, and intermediate raw materials, components, spare parts, and supplies. Imports of consumer goods were allowed only as canalization. The government exercised control over imports by giving permission to certain organizations to act as the sole importers of the products listed in the export-import policy. Capital goods were further divided under a bifurcated scheme: restricted and open general licence (OGL). Intermediate goods were split into four categories: banned, restricted, limited permissible, and OGL. Although OGL was a relatively less restricted licensing category, its effect was circumscribed by the 'actual user' policy.

The 'actual user' policy allowed only the actual user to import the commodity and did not allow imports for resale by excluding intermediaries from importing. This policy was phased in during the 1970s and put in place to control imports, to prevent private traders benefiting from the scarcity premiums that are inherent in the licensing regime, and to enforce the criterion of essentiality in deciding the application of import licences. The phased manufacturing programme is another prevalent non-tariff barrier. Typically, it entails industrial licences for replacing imported materials, parts, and components with local production, either in-house or by other Indian firms. Further, various aspects of the industrial regulatory system also constitute significant actual or potential non-tariff barriers.[3]

The present system of non-tariff barriers have been in place since 1956 and have been subject to modifications - tightened or relaxed - largely in response to the state of the country's foreign exchange reserves. Our observations of the 1980s indicate that almost 90 per cent of the manufacturing industries had 100 per cent non-tariff barriers (Das, 2003). Overall, the import licences have been generally allocated in a non-price, administratively ad hoc manner.

Throughout the first three decades of independence, India's trade policy stance remained inward looking on account of high tariff rates and a complicated import licensing system. Imports were subject to excessively high tariffs. The top rate was close to 400 per cent; as much as 60 per cent of the tariff lines were subject to a tariff rate range of 100-150 per cent. Among non-tariff barriers, all products -

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[2] Two papers co-authored by Goldar (1992, 1994) provide the most comprehensive account of tariff rules and regulations as witnessed in the Indian economy before the reforms in terms of nominal and effective rates of protection.

[3] Applications for industrial licences for new or expanded capacity must be cleared by the capital goods committee, which scrutinizes the foreign exchange component of the investment. This can be done regardless of whether the item is in OGL or not. Mention must be made also about the technology import policies, reservation of items in small-scale industries and government purchase preferences to domestic firms, which also act as non-tariff barriers.

consumer goods, capital goods, and raw materials - remained within the ambit of complex import rules and procedures. The OGL category was the most liberal, but it covered only 30 per cent of imports.

As with imports, exports were also subjected to restrictions, indicating that India's trade policy stance lacked faith in exports as revenue generators. Further, given the protection biases in the trade policy stance, some export concessions were made available from time to time as part of the export-import policy to overcome the anti-export biases in India's trade policy. Overall, the inward looking trade policy stance of the Indian economy led to the high cost and uncompetitive growth of firms and industries, and their utter lack of a global presence.

India's effort at trade liberalization started as early as the beginning of the 1980s. Starting the 1980s, there was a gradual liberalization of import controls as evidenced from a steady increase in the items of capital goods in the OGL category from 79 in 1976 to around 900 products in the mid-1980s. Most of these measures addressed the issue of modernization of industries and the OGL status was usually accompanied by reduced tariff rates (exemptions). As with capital goods, items of intermediate goods, too, saw an increase in the OGL. However, it should be emphasized that these additions and deductions from various lists, be it banned, restricted, or limited permissible, represented the first signs of efforts to reduce the degree of trade restrictiveness facing Indian industries.

Apart from licensing, another major source of direct government control over imports was canalization. The share of canalized products in total imports declined substantially from 67 per cent since 1981 to 50 per cent in 1985-86.

As regards tariff rates, most of the items on which the rates were lowered, were not manufactured in India; this was done essentially to encourage the modernization and development of the industries that used them. The great majority of products on which tariff rates were increased were not on the OGL list and continued to remain protected by import licensing controls, the exceptions being machine tools, pesticides, and chemicals.

We treat the decade of the 1980s as showing two phases of trade liberalization: 1980-85, when existing trade policies were being reviewed and some shifts were taking place in the import control system, and 1985-86, when some more shifts in non-tariff as well as tariff barriers were taking shape through a long-term export-import policy. The peak duty rate of tariff was lowered in stages from 150 per cent before 1991-92 to around 50 per cent in 1995-96 and 30 per cent in 1999-2000. The average industry effective rate of protection has declined from around 115 per cent in the early 1980s (1980-85) to around 40 per cent in the late 1990s (1996-2000) (Das, 2003). However, tariff rate reform has been confined to industrial goods.

The economic reforms of 1991-92 did away with import licensing on all but consumer goods. The erstwhile imposing 'negative list' of commodities now consists of a small number of items that continue to be banned, restricted, or canalized on account of social, health, and environmental considerations.[4] Another major step taken in the context of import licensing is to liberalize the imports of consumer goods under special import licence, which are freely transferable.[5] The average industry

[4] Refer to Annexure V in Chapter 2, Trade Policy, in Mishra and Goldar (1996) for a detailed description of the Negative List of Imports and Exports.

[5] These licences are issued to certain categories of exporters, including deemed exports, trading/export houses and manufacturers who have acquired ISO 900 or BIS 14000 certification of quality. See Annexure IV in Mishra and Goldar (1996) for the list of items.

import coverage ratio declined from nearly 100 per cent in the 1980s to around 25 per cent by the end of 1999-2000 (Das, 2003).

The Exim policy of 1992-97 reduced the number of commodities subject to export control from more than 400 to around 296, with the number of items under prohibition reduced to just 16. Though a number of incentives were designed to encourage exporters, the ineffectiveness of these schemes was possibly governed by the fact that these lacked transparency, coupled with procedural complications. At the end of the 1980s, some of the schemes that existed and continued were duty drawbacks, income tax exemptions, and access to duty free imports. Since the advent of the reforms, the two schemes that were discontinued are cash compensatory support and replenishment licences.

Our assessment of the trade policy reforms shows that we can discern four distinct phases of India's trade liberalization. The first phase (1980-85) saw a change in the perceptions of India's trade regime. The second phase (1985-90) started with piecemeal attempts at liberalization of capital and intermediate goods imports; the changes (additions/deductions) were more in the list of banned/restricted and freely permissible items of capital and intermediate goods. The third phase (1991-95) was a more radical overhauling of trade controls and tariffs of items of capital goods, intermediate goods, and consumer goods. The fourth phase started with the Exim Policy of 1997-2002, which aimed at simplified procedures and rationalized tariff rates.

Following the World Bank (2002), we observe that exports of goods and services grew at 10.7 per cent per annum in the 1990s as compared to 7.4 per cent in the 1980s. The same goes for imports with 5.9 per cent and 9.5 per cent per annum in the 1980s and 1990s. It is evident that there is a 3.3 per cent rise in growth rates in the 1990s.

As regards the composition of trade, we find that on the export side, the share of manufacturing grew to 75.7 per cent of total exports in the early 1990s from 68 per cent in the late 1980s. Within manufacturing, the sectors that have grown more rapidly are the capital intensive and skilled labour intensive sectors, including chemicals (drugs and pharmaceuticals) and engineering (automobiles and parts).[6] From the import side, the share of capital goods declined from 30 per cent in 1987-88 to around 20 per cent in 1992-93.

Finally, from the point of view of direction of trade, we observe that on the import side, there has been a major shift away from the industrial countries and Russia to the OPEC nations and other countries of the developing world. As regards exports, the shift has been from Russia and Japan towards Asia.

3. Trends in employment, labour productivity, and real wages

In the Indian context, issues pertaining to employment, wages, and labour productivity hold significance as far as trade policy changes are concerned. Studies by Tendulkar (2000) and Goldar (2000) have addressed the issue of manufacturing employment for India. Tendulkar compared the period of the 1990s with that of the 1980s and observed that growth of employment in manufacturing was faster in the 1990s than in the 1980s. The study showed that the growth rate of aggregate manufacturing

[6] *Refer Panagariya (2004) for an elaborate examination of India's trade reforms in terms of progress, impact, and future strategy.*

increased from -0.12 per cent per annum during the 1980s to 2.92 per cent per annum in the 1990s. Goldar also came out with similar findings - that the manufacturing sector in India was stagnant in the 1980s, but grew in the 1990s.[7] The study found acceleration in employment growth at the aggregate level as well as for most industries.

The issue of real wages in organized manufacturing industries was examined by Goldar (2003). He observed that in the post-reform period, there has been significant slowdown in the growth of real wages and that two factors accounted for this. The first was the substantial reduction of economic rents in the process of moving over from a highly restrictive trade regime to a liberal regime. The second was the weakening of trade union strength in manufacturing industries in the post-reform period. In particular, at the aggregate level, the growth rate of real wages was 5.43 per cent per annum in the 1980s, which came down to 2.57 per cent per annum in the 1990s. Further, in all five industry groups, there was a fall in the growth rate of real wages.

Thus, we observe from the empirical evidence that in India, while employment performance improved after the advent of the reforms, real wage growth was poor in the 1990s. Thus, India's trade policy changes since 1991-92 show different impacts on employment and real wages. To analyse what factors can be held accountable for these two observations, we need to undertake a more rigorous and in-depth study of the factors contributing to positive employment performance on one hand, and slow real wages growth on the other.

In this section, we provide a comparison of the growth patterns in organized manufacturing industries with regard to employment, productivity, and real wages for the different phases of trade reforms.[8] Under study are the user-based categories, namely intermediate goods, capital goods, and consumer goods. The basic source of data for the estimates of growth rate in employment, productivity, and real wages is the *Annual Survey of Industries* (Central Statistical Organization, Government of India).

Table 2 presents the value-added shares of the industries in the three-digit classification for three points of time: 1980-81, 1985-86 and 1990-91. In all the three years, we observe that the 75 industries contribute more than 65 per cent of total manufacturing value-added. Some of the leading contributors to manufacturing value-added across the three time-points were cotton spinning, weaving and processing in mills (235), iron and steel in primary/semi-primary forms (330), organic and inorganic chemicals (300), fertilizers and pesticides (301), drugs and medicines (304), electrical industrial machinery (360), and motor vehicles and parts (373+374). These industries are further classified as intermediate goods, capital goods, and consumer goods, respectively. In each period, intermediate goods accounted for around 40 per cent or more of total manufacturing value-added, with capital goods and consumer goods following at around 15 per cent or more and at around 12 per cent or more share, respectively. The largest contributors to manufacturing value-added within intermediate goods were cotton spinning, weaving and processing in mills (235), iron and steel in primary/semi-primary forms (330), capital goods (electrical industrial machinery (360), wagons and coaches (372)), consumer goods (drugs and medicines (304), and motor vehicles and parts (373+374).

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[7] *Nagraj (2000) re-examined Goldar's findings and suggested alternative explanations for the employment expansion of the 1990s.*

[8] *Table 1 (see Tables and Charts at the end) provides the list of industries along with NIC codes and their value-added shares.*

3.1 Growth patterns: Employment, productivity, and real wages

From Table 3A and Chart 1, we observe the growth pattern of employment across the manufacturing industries, which are grouped as intermediate goods, capital goods, and consumer goods. We have listed the user-based industry groups under four types of employment growth:

- Rapid growth industries with employment growth rates above 5 per cent per annum;
- Moderate growth industries with employment growth rates of 3-5 per cent per annum;
- Slow growth industries with employment growth rates of 0-3 per cent, and
- Negative growth industries.

Phase I of the trade reforms (1980-85) shows the maximum concentration of industries in the negative employment growth category, whereas in Phase II, (1986-90), we see that a large number of industries fall under the employment growth rate of more than 5 per cent. For Phases III and IV, (1991-95) and (1996-2000), we again see that the largest number of industries is concentrated in the 5 per cent or more employment growth range. In the employment growth range of 3-5 per cent, we find an almost doubling of industries in 1991-95 as compared to 1986-90. For the categories of negative employment growth rates and growth rates of between 0 and less than 3 per cent, we find a decline in the number of industries in these ranges since Phase I. Comparing the second half of the 1990s with the first half, we find a decline in the number of industries concentrated in the first two employment ranges, namely 3-5 per cent and more than 5 per cent as compared to the employment category of negative and the 0-3 per cent range, which records a marginal increase in industrial concentration.

Within the use-based categories, we find that there is an increase in the number of intermediate goods industries in the more than 5 per cent employment growth range from the 1980s to the 1990s. Similar is the case with capital goods industries. In the case of the consumer goods sector, comprising mostly labour intensive industries, we observe that since the early 1980s, there is also an increase in the number of industries falling under the maximum employment growth category, namely, 5 per cent or more. Comparing the 1990s with the 1980s, we see that there was an increase in the number of industries across all use-based sectors in the employment category of more than 5 per cent.

In each of the trade reform phases, we observe that labour intensive industries belonging to the categories of cotton textiles (231, 232, 233, 234, 236), textile products (260, 262, 263, 265, 267, 269), and leather and leather products (291, 292, 293, 299) consistently display high rates of employment growth. The only exception is the tanning, curing and finishing of leather industry group (290), which has consistently been in the slow growth category (Phase II, Phase III) and in the negative growth category (Phase IV). The other industries in the 5 per cent and above employment category are spread out across a large number of industry groups, namely, chemical products (30), rubber, plastics and petroleum (31), basic metals and alloys (33), metal products (34), non-electrical machinery (35), electrical machinery (36), and transport and equipment (37).

In the second half of the 1990s, however, we observe a slight decline in the number of industries in the 5 per cent and above employment category as compared with the first half.

Overall, we conclude that the growth performance of the labour intensive industries has been consistently higher through the successive phases of trade reforms. In the 1990s, however, we observe

that industries in the sectors of chemicals, energy, basic metals and metal products, and engineering industries inclusive of electrical and non-electrical, have also exhibited employment growth rates of more than 5 per cent per annum, thereby increasing the concentration of industries in the high employment growth range to around 60 per cent of the total industries.

Table 3B and Chart 2 provide the growth pattern according to labour productivity. We have identified four types of labour productivity growth:

- High rates of labour productivity growth: Industries with more than 50 per cent growth in labour productivity;
- Moderate rates of labour productivity growth: Industries in the range of 25-50 per cent;
- Slow labour productivity growth: Industries in the range of 0-25 per cent growth rates, and
- Negative labour productivity growth rates.

Our observation indicates that in each successive phase of trade reforms, the majority of the industries are concentrated in the slow labour productivity growth range of 0-25 per cent per annum. In each of the phases, almost all the industry groups in the three-digit classification belonging to both the electrical and non-electrical machinery sector and the transport and equipment sectors are concentrated in this category. The other industries in this category are from almost all industry sectors - cotton textile, textile products, leather products, basic metals, chemicals, rubber, etc.

The industries with high labour productivity in each of the phases are: Phase I: 231, 232, 234, 336, 342;
Phase II: 302+, 311, 318, 319, 336, 358;
Phase III: 291, 302+, 314, 316, 333, 336, 342, 344+, 346, and
Phase IV: 230, 231, 263, 302+, 303, 311, 319, 334, 340, 365, 371, 372, 377.

It is also important to note that with the advent of significant changes in trade rules and regulations as evident from the successive phases of trade reforms, the number of industries in the high labour productivity range has increased. Further, we find a large number of industries that are labour intensive and export oriented, such as cotton textile industries - cotton spinning, weaving and ginning (230), cotton spinning other than in mills (231), weaving and finishing of khadi cotton (232), weaving and finishing of power-loom cotton (234), carpets, shawls and rugs (263), and leather footwear (291). The industry group, synthetic rubber and manmade fibres (302+), has consistently displayed high labour productivity since Phase II of the trade reforms.

A large number of industries that have displayed negative growth rates of labour productivity belong to the intermediate goods groups. There are very few capital goods industries that exhibit negative growth rates of labour productivity. Waterproof textiles and fabrics is the only consumer goods industry that consistently shows negative labour productivity growth under all four phases of trade reforms.

Looking at Tables 3A and 3B, let us consider the relationship, if any, that can be observed from the growth patterns of labour productivity and, in turn, employment in the organized manufacturing industries under the different phases of trade reforms.[9] In Phase I (1980-85), we find that industry groups

[9] *Also refer to charts 3A, 3B and 3C for the labour productivity and employment growth across use-based groups.*

231, 232, 299 and 336 exhibit high labour productivity growth and have the highest range of employment growth (above 5 per cent). Industry group 234, also with high labour productivity, falls in the moderately growing category, whereas industry groups 234 and 342, with high labour productivity growth, perform badly in terms of employment growth.

In Phase II of the trade reforms (1986-90), we find that industry groups 231, 263, 267, 299, 311, 313, 340 show both high labour productivity and rapid employment growth. Industry groups 318 and 319 fall in the slow-growth employment category, despite being credited with high labour productivity growth. Industries 338 and 358 show negative employment growth rates. The 1990s were associated with significant trade reforms and this is reflected in the large number of industries showing high growth rates of labour productivity. In particular, we observe from Phase III (1991-95) of the trade reforms that, except for two industry groups, namely, 305 (slow employment growth) and 358 (negative employment growth), all the other industries with high labour productivity also exhibit rapid employment growth rates for the period, 1991-95.

The same relationship is found in Phase IV (1996-2000). A look at the tables would reveal that industries 233, 234, 236, 260, 262, 267, 269, 302+, 303, 304, 305, 309, 313, 319, 332, 334, 338+, 342, 346 and 361, all with high labour productivity growth rates, in turn show high employment growth rates. We conclude that in organized manufacturing, successive phases of trade reforms bring out a positive relationship between high labour productivity growth rates and employment growth for a large number of industry groups. This holds across broad industry sectors as well.

In the case of user-based industry groups, we find that in each of the phases of trade reforms, the bulk of the industries belonging to intermediate goods, capital goods, and consumer goods are concentrated in the slow labour productivity growth category. As regards intermediate goods, there is an increase in the number of industries falling in the high labour productivity grouping over the different phases of trade reforms. We do not observe a similar situation across the phases of trade reforms for the other two groups.

Let us consider the growth pattern evident with real wages in the organized manufacturing industries. We observe from Table 3C and Chart 4 that the 1990s show an improvement in real wages in comparison with the 1980s. If we consider the category of rapid growth in real wages (above 10 per cent per annum), we see that there is an increase in the number of intermediate goods and capital goods industries in the two trade reform phases of the 1990s, when compared with the situation in the 1980s. This holds true for the moderate growth in the real wages category (5-10 per cent per annum), too.

It is interesting to note that with each phase of trade reforms, we see a decline in the number of industries in the categories of both slow and negative growth in real wages. Amongst the sectoral groups in which rapid real wages growth has been concentrated are cotton textiles (231, 232, 233 in Phases I and II) and later (233, 234 in Phases III and IV), textile products (260 in Phases I and II) and later (263, 265, 267, 269 in Phases III and IV), leather products (292, 293, 299 in Phases I and II) and later (291, 292 in Phases III and IV).

Other industry groups which have displayed a consistently good performance in terms of rapid real wages growth in the 1990s are (302+, 309), (314, 316), (335), (352, 359), (368) and (370, 371). As with the 1990s, we see that cotton textiles (231, 232, 233), textile products (260, 265, 267, 269),

and leather products (292, 293, 299) are the groups that displayed real wages growth of more than 10 per cent per annum.

Studying phase-wise performance, we find that some of the industries of leading sectors such as cotton textiles, textile products, and leather products, too, have some industries that show slow and negative rates of growth in real wages. Industry groups 235 and 236 have consistently fared poorly in terms of real wages growth in all four phases of trade reforms. Similarly, industry category 290 has also been in the 0 to <5 per cent per annum range in Phases I and III and in the negative range in Phase IV. It is interesting to note that the textile products industries (262, 263, 267, 268) have been in this slow growth category in the first three phases of trade reforms, but that since the mid-1990s, there have been no industry groups from textile products in this category.

Overall, we find that as the pace of trade reforms gathered momentum, there has been a shift of industries to the rapid and moderate categories of real wages growth. This movement has been widespread both across industry groups and user-based categories. In particular, the 1990s saw an increase in the number of industries showing rapid and moderate growth in real wages for both intermediate and capital goods industries. Further, it is important to note that there has also been a substantial decline in the number of industries in negative real wages growth in the 1990s as compared to the 1980s. The growth pattern performance shows that the trade liberalization efforts that gained momentum in the 1990s encouraged the application of labour intensive methods of production and, in turn, caused an increase in demand for labour in these industries (particularly cotton textiles, textile products, and leather products), thereby causing an upward pressure in real wages in terms of real wages growth, as is evident from Table 3C. This indicates a favourable impact of the trade reforms on real wages.[10]

Finally, it is interesting to note that industries (cotton textiles, textile products, and leather products) which have experienced high growth in real wages, have also seen a rise in employment growth in the different phases of the trade reforms. This lends credence to our assertion that trade liberalization, by encouraging labour intensive development, helps employment growth gain momentum and this, in turn, puts upward pressure on real wages growth. This is what happened in the organized manufacturing sector in India in the 1990s.

4. Trade liberalization and employment growth

This section provides an analysis of the impact of trade liberalization on employment growth in the organized manufacturing sector. Economic policy, particularly industrial and trade rules and regulations, have played an important role in the size structure of industries. It was observed that in the early days of economic planning in India, factory employment was concentrated in very large establishments (Little et. al, 1986) and it was noticed that the protective policies of the government largely favoured the capital intensive, large scale and public sector industrial set-up. Against this background, the present study attempts to examine the employment growth scenario in use-based industries in the light of the trade reforms attempted in the Indian economy since the early 1980s.

We have computed three measures of trade protection, namely, effective rate of protection,

[10] *Our empirical evidence refutes Goldar's (2003) findings that after the reforms, there was a significant slowdown in the growth of real wages.*

import coverage ratio, and import penetration rates, for the four phases of trade reforms described earlier. The first two measures of trade policy show the impact of tariff and non-tariff barriers, while the third measure captures the joint impact of both tariff and non-tariff barriers which have been dominant in the Indian economy all through the four decades of industrial development. The sample industries are spread over three user-based categories: intermediate goods, capital goods, and consumer goods, comprising the industry groups in the three-digit classification from cotton textiles (23), textile products (26), leather and its products (29), chemicals and their products (30), rubber/plastics and petroleum (31), basic metals (33), metal products (34), non-electrical machinery and electrical machinery (35, 36), and transport and equipment (37). Intermediate goods industries account for 42 per cent of total value-added, whereas capital goods and consumer goods industries account for 18 and 12 per cent of value-added, respectively, across the four phases of trade reforms.

In India, the ongoing trade reforms since the 1980s encompassed doing away with non-tariff barriers and lowering the peak and spread of the tariff rates. Table 4 shows the trade barriers in Indian manufacturing for the two decades from 1980 to 2000. The average effective protection levels increased in Phase II of the trade reforms before falling to low levels in 1991-95. This pattern holds true across all the user-based categories and all industry groups. The coefficient of variation of effective protection declined across all the three user-based industries from Phase I to Phase IV of the trade reforms.

While Phase I and II of the reforms do not show much change in the import coverage ratios for the intermediate goods sector, Phase II shows a decline for capital goods and consumer goods. In Phase III, the import coverage ratios for the intermediate goods and capital goods sectors declined to 41 per cent and 20 per cent from a high of 98 per cent and 77 per cent, respectively, in the earlier phase of reforms. All the three user-based categories showed further decline in Phase IV, with capital goods accounting for only 8 per cent of import restrictions by the end of 1999-2000. The standard deviation of import coverage ratio increased across all categories from Phase I to Phase IV.

Import penetration levels in the user-based categories do not show any clear trend for the period, 1980-2000. There is however evidence of marginal improvement in the period, 1996-2000. The level of import penetration in both the capital goods and intermediate goods categories has been higher than the consumer goods category throughout the three phases. The near zero level of import penetration in the consumer goods category is in line with the import policy devised for this category, in which large restrictions are still in force. Moreover, the tariff and non-tariff changes introduced in the trade policies from the early 1980s are not reflected in the trends in import penetration as evident from the levels for the three phases of trade reforms. This is probably reflective of a delayed impact of the changes in trade policy.[11]

4.1 Effective rate of protection and employment growth

Table 5 shows the effective rates of protection (ERP) and employment growth for the three user-based categories: the intermediate goods, capital goods, and consumer goods sectors. The average ERP varies both across the user-based categories as well as the different phases of trade reforms. In Phase I, we observe that in the intermediate goods sector, except for industry categories 231, 233 and 235,

[11] *Studies by Athukorala and Rajapatirana (2000) for Sri Lanka and Das (2001) for India have shown that there is a lagged impact of trade policy changes on economic performance.*

all the other industries have single-digit employment growth rates. This category has an ERP of around 109 per cent. Most of the industries in this sector with very high ERP rates [262 (160 per cent ERP), 302+ (173 per cent ERP), 303 (171 per cent ERP), 330, 331 (225 per cent), 340, 341 (428 per cent)] have very poor employment growth rates. The industry groups with effective protection rates of less than 100 per cent have low employment growth rates.

The industry groups with employment growth of around 15 per cent belong to the cotton textiles sector. The capital goods industries have by and large low protection levels compared with the intermediate goods industries. Employment growth also seems to be generally very low here. Industry groups 365, 368, and 369 are the only industries with more than 5 per cent employment growth. However, these industries have an ERP of about 100 per cent. Industry groups 357 and 358 are the next best with around 4 per cent employment growth rates.

In line with the trade rules and regulations of the Government of India, consumer goods industries had high levels of protection in the 1980s, when almost all items remained banned. Leather products (292, 293, 299), with an ERP level of around 117 per cent, had the best employment growth performance of 18 per cent. The consumer goods sector, with an average protection level of 101 per cent, exhibited an employment growth of 3 per cent, whereas the capital goods sector, with a much lower protection level of 62 per cent, recorded a negligible growth rate. The intermediate goods industries came second with an employment growth of 2 per cent, but with much higher protection levels of nearly 147 per cent.

In Phase II, by and large, we observe that across user-based categories, there was an increase in protection levels. This was necessitated by India's growing fiscal deficit and the need to generate revenue through customs duties. Only a few industry groups within the intermediate sector had growth rates of above 5 per cent: 230, 231, 235, 313, 340, and 341. Further, all these industries had over 100 per cent ERP levels. The average for the sector, however, increased marginally from a 147 ERP in 1980-85 to an around 149 ERP in 1986-90; the employment growth for the sector, led by the cotton textile industries, jumped to around 28 per cent.

As regards the capital goods industries, except for five industry groups - 365, 368+, 369, 371, 372 - with above 5 per cent employment growth rates, all the other industries displayed either negative or low positive growth rates. The ERP levels for these industries were not only over 100 per cent, they also showed a significant increase in protection levels from the previous period. The average ERP of this sector was around 78 per cent with an employment growth of 1 per cent. Though there was increase in the ERP levels in the consumer goods sector from the levels of the previous period, this sector showed very good employment growth rates for most of the industries with an average of around 13 per cent. Average ERP levels increased by around 10 per cent in Phase II, with a resultant jump in employment growth of more than 50 per cent.

Phase III of trade liberalization saw massive cuts in customs duty and rationalization of tariff rates, which was reflected in the lowering of protection levels across the use-based sectors. The average ERP levels for the intermediate goods, capital goods, and consumer goods sectors stood at 87, 54, and 80 per cent, respectively. Employment growth rates, however, increased only for the capital goods sector; both the intermediate goods and consumer goods sectors showed a decline. In the intermediate goods sector, along with the fall in ERP levels, the employment growth rates improved in many industries (see

Table 3A), and with the exception of 290, 300, 340, and 341, most of the industries had more than 5 per cent employment growth.

In the capital goods sector, we observe the lowering of ERP levels, and in many industries, this results in higher employment growth rates. The transport and equipment industries (370, 371, 372, 377, 379) show employment growth rates in excess of 10 per cent, also associated with the lowering of ERP levels. The performance of the consumer goods sector shows that with the lowering of protection, the employment growth rates have declined appreciably from past periods. Textile products (260, 265, 267), leather products (292, 293, 299) and metal products (342, 346) show growth rates in excess of 10 per cent, though for textile and leather, the growth rates have slowed down in comparison with the past phase. The average employment growth for the sector is 6 per cent, with an ERP level of 80 per cent.

Phase IV of the trade reforms saw further cuts in customs duties in line with WTO norms and the easing of restrictions on consumer goods imports. The average ERP levels for each of the use-based sectors were below 50 per cent, with the capital goods industries recording the lowest level at 33 per cent. There was, however, a decline in the average employment growth levels for both intermediate goods and capital goods. In most intermediate industries, with the easing of protection, there was a decline in the employment growth rates for many industries. Industry group 302+ achieved the maximum growth rate of 13 per cent in this period. The average employment level in this sector also declined to 4.5 per cent from 8 per cent.

In the case of the capital goods sector, general-purpose machinery industries (356, 359) achieved the maximum growth rate of around 25 per cent. With an almost unchanged growth rate of 6 per cent, the consumer goods sector showed better performance than the capital goods and intermediate goods industries.

However, many of the industry groups had better employment growth than in the previous phase. It is interesting to note that the 1990s, captured in our study in Phases III and IV, saw a significant lowering of tariff rates and, consequently, protection levels as captured by ERP, but this does not reflect in employment generation and is contrary to what the proponents of trade liberalization would have us feel.

4.2 Import coverage ratio and employment growth

Non-tariff barriers and high tariff rates formed a binding constraint on industrial performance by protecting industries from competition. The first two phases of trade liberalization saw hardly any changes in the rules regarding non-tariff barriers on imports. It was only in the 1990s that there was complete withdrawal of all kinds of non-tariff barriers on imports. By the end of Phase IV of the trade reforms, we have very low levels of import barriers and, in compliance with the WTO norms, these are required to be lowered further. Table 6 outlines the non-tariff barriers and employment growth scenario.

In Phase I of the trade reforms (1980-85) in the intermediate goods sector, we see that only three industry groups have zero import barriers (230, 231, 290). The employment growth rates for these industries are -3.8, 52, and 4.2 per cent, respectively. All the other industries have 100 per cent import barriers in the form of non-tariffs, but within this category, we find industry groups 314, 316, and 318 in the category of petroleum and coal sectors with near 10 per cent employment growth rates (9.1, 9.6,

and 9.5 per cent, respectively). Apart from cotton spinning, zinc manufacturing (336) is the only intermediate goods industry with second best employment growth of 14 per cent.

Amongst the capital goods industries, machine tools is the only one with zero non-tariff barriers in Phase I, but with an employment growth of around 4 per cent. The industries with above 5 per cent employment growth are 352 (6.6 per cent), 365+ (7.8 per cent), 368 (7.3 per cent), and 369 (7 per cent). It is important to note that these industries were covered with 100 per cent non-tariff barriers. The average employment growth for the capital goods sector is only 1 per cent.

In the consumer goods sector, amongst the industries with zero non-tariff barriers in Phase I, only industry group 232 achieved 11 per cent employment growth in that phase. The industry groups with more than 5 per cent growth rates are 236, 260, 269, 292, 293, 299 375, and 376. These industries belong to the cotton textiles, textile products, leather products, and transport equipment sectors. The average employment growth witnessed by this sector is below 5 per cent.

Except for a few industries, there wasn't much change in the non-tariff barriers even in Phase II of the trade reforms. In the intermediate goods sector, certain industries (231, 313, 332, 335, 338+, 340) had employment growth rates of more than 5 per cent and, except for industry group 231, all the others had 100 per cent import protection. In the capital goods sector, industry group 368, with below 50 per cent non-tariff protection, had the second highest employment growth (17.6 per cent) in Phase II. The best employment growth performance, however, was observed in industry 379 (33 per cent), with a non-tariff barrier of 100 per cent. Industries 351 and 354, with non-tariff barrier levels of around 68 per cent, had 7 and 6 per cent employment growth rates, respectively.

The average for the sector saw a marginal improvement to 2.6 per cent per annum from nearly 1 per cent per annum in the previous period. The consumer goods sector shows only three industries (232, 233, 234) in the zero import restrictions bracket and, out of these, two industries have growth rates of nearly 30 per cent (232, 233). The other industries with high employment growth rates (267, 269, 292, 293, 299, 305) all have 100 per cent non-tariff restrictions. The average for the sector shows a large quantum jump from 4.2 per cent in Phase I to around 15 per cent in Phase II.

The beginning of the 1990s and, in particular, the trade policy document of 1992-97 shows the removal of practically all kinds of non-tariff barriers in organized manufacturing, except in a few cases such as health and environment. This is reflected in the across the board decline in the levels of non-tariff barriers for all use-based sectors.

The intermediate goods sector saw a decline from almost 100 per cent in the 1990s to a low 40 per cent by the end of Phase III of trade liberalization. In the capital goods sector, some lowering of non-tariff barriers had started from Phase II and this was further lowered in 1991-92 to 20 per cent. In consumer goods, some restrictions on imports were still in place, but with special import licences coming into place, there was a sharp fall here, too (45 per cent). Thus, we witness a large and drastic lowering of non-tariff barrier levels.

In the intermediate industries, along with the lowering of non-tariff barrier levels, we find increases in employment levels in many industries. A large number of industries have employment growth rates of over 5 per cent. Many of the industries also have zero restrictions on import. The average for the industry, however, shows a decline in this phase. In the capital goods sector, the average employment

growth increases to 6 per cent per annum from 2 per cent in the late 1980s. Many industries with low non-tariff barrier levels show good employment growth rates. Some industries (365+, 368, 370, 371, 377) register double-digit employment growth rates and have low non-tariff barrier levels, too.

In the case of the consumer goods industries, the average employment rate declines from around 15 per cent in the last phase to around 8 per cent, a decline of close to 50 per cent. As is the trend throughout the study, the labour intensive consumer goods industries (265, 267, 292, 293, 299, 342) all show high rates of employment growth and many of them have low levels of non-tariff barrier protection.

The period, 1996-2000, is when the trade policies of 1992-97 were consolidated, supplemented by further easing of trade rules and regulations in the trade policy of 1997-2002. From the table, we observe that across all use-based sectors, there is a sharp decline in employment growth rates. This perhaps reflects a period of rationalization of industrial structure, which takes place in the aftermath of trade policy reforms with a lagged effect. In the intermediate industries, average employment growth rates decline to nearly 3 per cent from 7 per cent (a decline of 50 per cent). In the capital goods and consumer goods sectors also, the decline is noticeable - from 6 per cent to 4.6 per cent and from 8 per cent to 6.7 per cent, respectively.

Despite the overall decline in employment growth rates, some of the intermediate industries in which the employment growth rate increased in the second half of the 1990s are 262 (from 5.7 to 6.2 per cent), 301 (from 4.3 to 5.4 per cent), 309 (from 9.4 to 10 per cent), 310 (from 7.1 to 8.3 per cent), 313 (from 5.7 to 9 per cent) and 333 (from 7.2 to 12.1 per cent), respectively. A similar pattern exists in the capital goods sector, too: 356 (from 3.7 to 46.3 per cent), 359 (from 3.0 to 5.1 per cent), 369 (from 2.1 to 9.7 per cent) and 379 (from 5.2 to 10.5 per cent). In the consumer goods sector, the corresponding figures are: 234 (from 5.6 to 7.4 per cent), 263 (from 5.8 to 16.1 per cent), 346 (from 4.6 to 8.1 per cent), 373+ (from 5.1 to 5.5 per cent), 375 (from 3.4 to 7.5 per cent) and 376 (from 4.8 to 10.3 per cent). All these industries show an improvement in employment growth from the earlier period.

Thus, though the macro picture shows a decline in average employment growth, yet, at the micro level of individual industries, we do observe a decline in the non-tariff barriers associated with improvements in employment levels, thereby showing that trade reforms impact the labour market positively.[12]

4.3 Import penetration rates and employment growth

The impact of trade liberalization on employment growth can be assessed with a measure of trade reforms, import penetration rates. Import penetration rates capture both tariff and non-tariff barriers, dominant in the Indian economy for almost four decades of economic planning. We have computed import penetration ratios for all the industries and use-based sectors for each of the four phases of trade reforms.

From Table 7A,[13] we observe that while each of the use-based sectors displays an improvement in employment growth rates in the second half of the 1980s, they display a decline in employment growth

[12] *Appendix Tables A1 and A2 show the impact of effective rates of protection and import coverage ratio on labour productivity during the different phases of the trade reforms.*

[13] *Tables 7B and 7C highlight the impact of import penetration rates on labour productivity and real wages growth. The findings are in line with that of employment growth.*

rates in the second half of the 1990s. It is interesting to note that in the second half of the 1990s, the decline in employment growth may perhaps reflect the rationalization of the industrial set-up and, consequently, low employment growth due to the closure of many factories/plants, unable to survive in a competitive free trade regime.

The intermediate good industries show average employment growth rates of 2, 5.6, 6.6 and 2.8 per cent in each of the four phases of trade liberalization. In Phase I, except for industries 308, 314, 318, 319, 332, and 336, all the others show employment growth of less than 5 per cent. Further, these industries are also characterized by low levels of import penetration. In Phase II, only four industries (235, 314, 338+, 340) register employment growth rates of more than 10 per cent; 314 is the only industry to show an increase in employment growth also.

The beginning of the 1990s also saw an improvement in employment growth rates, with almost two-thirds of the industries showing growth rates in excess of 5 per cent. This is reflective of the changes in non-tariff barriers and tariff rates which have been taking place since the 1985 Exim policy changes. The final phase of trade reforms in our study shows a decline in the sectoral average, which is manifested in many industries actually showing a decline in growth rates. This period also sees changes in import penetration rates.

The capital goods sector shows hardly any changes in the average import penetration rates for the first three phases of trade reforms, though changes in employment have been taking place in the form of an increase in growth rates. At the level of the industries, we find either zero or small positive growth rates of employment. This is true of all the phases of trade reforms. Industry group 368, with an import penetration rate (MPR) of 0.708 per cent, shows an employment growth rate of 7 per cent in Phase I. In Phase II, this industry registers an employment growth rate of 17 per cent with an MPR of 0.635. Only two other industries, 351 (MPR of 0.364) and 354 (MPR of 0.353) have employment growth rates of 7 and 6 per cent, respectively.

Phase III sees positive employment growth rates for all the capital goods industries and, in some industries (365+, 368, 370, 371, 377), growth rates of above 10 per cent. Industry group 368 continues to have high rates of growth (MPR of 0.504). In Phase IV, except for two industries, 372 and 377, all the others show positive employment growth, though in many cases, there is a decline from the past phase's growth rates.

The consumer goods industries show more than 5 per cent growth rates for only four industries in Phase I - 236, 260, 269, 375, and 376. However, the MPR levels for these industries are low. In Phase II, we see high rates of employment growth in 260, 265, 269, 291, 305, 311, 355, and 375. We see that these industries are spread across textile products, leather, chemicals, petroleum, non-electrical goods, and transport. The import penetration levels continue to remain insignificant.

In the consumer goods sector, in line with the trade policy rules governing the industries, there are hardly any noticeable changes in import penetration ratios even in Phase III; however, some industry groups (260, 265, 269, 291, 304, 346, 373+, 375, 376) show high rates of employment growth. In Phase IV of the trade reforms, we observe high rates of employment growth in 260, 291, 304, 346, 373+, 375, and 376, and improvement over Phase III in 260, 291, 346, 375, and 376. The import penetration rates continue to remain insignificant for these industries even in the final period of the study.

In concluding this section, the pertinent question to ask ourselves is whether we observe any association between the changes in trade policies as captured by different measures encompassing tariff as well as non-tariff reductions and employment growth rates in the use-based sectors. The tariff reduction as captured by the lowering of effective rates of protection shows increases in employment growth in the first three phases of trade reforms and a decline in Phase IV. In the case of non-tariff barriers, the import coverage ratios show an increase in employment in the second half of the 1980s, when by and large there were 100 per cent restrictions on imports in many industries, but with the easing of restrictions in 1991-92, there seems to have been a decline in employment in the late 1990s - a lagged effect of non-tariff reductions.

The import penetration ratios tell the same story as the non-tariff restrictions, thereby indicating that some kind of industry rationalization is taking place in the aftermath of the trade policy changes, resulting in decline in employment growth due to the restructuring of industries taking shape in the form of exit and entry as a result of the competitive forces of a free trade regime. We need to undertake a rigorous quantitative exercise to ascertain if at all trade policy reforms constitute an important determinant of labour market outcomes - employment growth.

5. Summary and conclusion

This paper seeks to document the trends in employment, productivity, and real wages in organized manufacturing industries, which have resulted from the trade liberalization attempts in the Indian economy from the early 1980s. An attempt is also made to associate changes in trade policy with employment growth rates. The period of study is from 1980-81 to 1999-2000, and the sample covers around 75 industries in the three-digit classification of the Annual Survey of Industries, spread across three use-based industry groups: intermediate goods, capital goods, and consumer goods. The study unfortunately could not be updated to the present decade because of data inconsistency and incompatibility.

The study offers some interesting insights into the trade reforms-labour market nexus, which has an important bearing on the organized manufacturing industries with respect to employment, labour productivity, and real wages.

As regards employment growth, we find that the growth performance of labour-intensive industry groups such as cotton textiles, textile products, and leather products have been consistently high through the successive phases of trade reforms. The 1990s saw the introduction of chemicals, energy, and metal product industries, as well as engineering industries, including electrical and non-electrical machinery, into these industry groups.

Though most industries seem concentrated in the range of low and negative labour productivity over the different phases of trade reforms, the advent of significant changes in trade rules and regulations as governed by various trade policies is responsible for a reduction of this category over the successive periods of trade reforms. As with employment growth, the best productivity performance comes from industries in labour intensive sectors such as cotton textiles, textile products, and leather products.

Trade liberalization, by enhancing productivity growth, is supposed to bring about employment growth in the industrial sector. Our study shows that in the organized manufacturing industries, successive phases of trade reforms bring out a positive relationship between high labour productivity

growth rates and high employment growth. This holds across broad industry sectors as well as the use-based sectors - the intermediate goods, capital goods, and consumer goods industries.

Another important feature of the trade reforms is that they create upward pressure on real wages through an increase in demand for labour by promoting labour intensive development in organized manufacturing. Overall, we find that as the pace of trade reforms gathers momentum, there has been a positive upward shift in real wages. This movement has been widespread both across industry groups and use-based sectors. In particular, the 1990s also saw an increase in the number of industries showing rapid and moderate growth in real wages in both the intermediate goods and capital goods industries.

It is interesting to note that sectors (cotton textiles, textile products, and leather products) that have experienced high growth in real wages have also seen a rise in employment growth under the different phases of trade reforms. This lends credence to our assertion that trade liberalization, by encouraging labour intensive development, helps employment growth gain momentum and this, in turn, exerts upward pressure on real wages growth. This is what happened in the organized manufacturing sector in India in the 1990s.

The study observes that, as with other indicators of labour market performance, the growth rates of output per worker have been high in many industries in the use-based sectors. Across industry groups, we find that many labour-intensive industry groups, such as cotton textiles, textile products, and leather products, have been at the forefront of good productivity performance when measured in terms of output per worker. This constitutes an important aspect of the trade reforms that have been taking place in the Indian organized sector since the early 1980s.

The study also probed whether we observe any association between the changes in trade policies as captured by different measures encompassing tariff and non-tariff reductions and employment growth rates in the use-based sectors. The tariff reduction, as captured by the lowering of effective rates of protection, shows increases in employment growth in Phases I, II, and III of the trade reforms and a decline in Phase IV.

In the case of non-tariff barriers, the import coverage ratios show an increase in employment in the second half of the 1980s, when by and large, there were 100 per cent restrictions on imports in many industries, whereas with the easing of restrictions in 1991-92, there seems to have been a decline in employment in the late 1990s, a lagged effect of non-tariff reductions.

The import penetration ratios tell the same story as the non-tariff restrictions, indicating that some kind of industry rationalization is taking place in the aftermath of the trade policy changes, resulting in a decline in employment growth due to the restructuring of industries in the form of exit and entry. In conclusion, we can say that trade reforms have an important bearing on the employment growth of the industries as we observe that lowering of trade restrictions did lead to a rise in employment growth across use-based sectors.

We can further conclude that in labour intensive sectors, such as cotton textiles, textile products, and leather and leather products, trade liberalization has had a positive impact on labour market indicators, be it employment, real wages, or labour productivity. There is a need to undertake a rigorous econometric assessment to ascertain if trade policy constitutes an important determinant for employment, real wages, and labour productivity growth rates.

This study presents industry level evidence regarding the connection between trade policy reforms and employment, labour productivity, and real wages growth in the organized manufacturing industries. It contributes to the existing literature in several respects. First, it attempts to document employment growth, labour productivity growth, and real wages growth at the level of the three-digit industrial classification across the trade regimes.

Second, it is the first attempt at quantification of trade orientation by industry groups for Indian manufacturing. Third, it is the first study to address the effects of trade reforms on employment growth using explicit measures of trade policy orientation. Finally, this is one of only a handful of studies capturing the impact of trade reforms on employment growth based on panel data for the period, 1980-2000.

An important drawback of the study is its inability to highlight alongside, the impact of trade liberalization on employment growth in the informal sector, which is one of the largest providers of employment. It is extremely difficult to create trade policy indicators based exclusively on informal sector trade due to paucity of information on regular and continuous time points. This has constrained us from comparing or highlighting the role of trade liberalization on labour productivity, employment growth, and real wages in the unorganized sector; this forms the core of future research.

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Table 1: Industry description and codes

Code: NIC87	Industry description
23	**Cotton textiles**
230	Cotton ginning, bailing and cleaning
231	Cotton spinning other than mills
232	Weaving and finishing of khadi cotton
233	Weaving and finishing of handloom cotton
234	Weaving and finishing of power-loom cotton
235	Cotton spinning, weaving, processing in mills
236	Printing of cotton textiles
26	**Textile products**
260	Knitted or crocheted textiles
262	Thread, cordage, rope, twine, etc.
263	Blankets, shawls, carpets and rugs
265	Textile garments and accessories
267	Made-up textiles
268	Waterproof textile fabrics
269	Textile products not classified elsewhere
29	**Leather and leather products**
290	Tanning, curing, finishing of leather
291	Leather footwear
292	Apparel of leather and substitutes
293	Leather products and substitutes
299	Leather and fur products not classified elsewhere
30	**Chemicals and chemical products**
300	Organic and inorganic chemicals
301	Fertilizers and pesticides
302+306	Synthetic rubber and manmade fibre
303	Paints, varnishes and products
304	Drugs and medicines
305	Perfumes, cosmetics and lotions
307	Safety matches

308	Explosives and fireworks
309	Chemical products, not classified elsewhere
31	**Rubber, plastics, petroleum, etc.**
310	Tyres and tubes
311	Rubber and plastic footwear
312	Rubber products, not classified elsewhere
313	Plastic products, not classified elsewhere
314	Refined petroleum products
316	Refined petroleum products, not classified elsewhere
318	Coke-oven products,
319	Other coal/tar products
33	**Basic metals and alloys**
330	Iron and steel in primary and semi-primary forms
331	Semi-finished iron and steel
332	Ferro-alloys
333	Copper manufacturing
334	Brass manufacturing
335	Aluminium manufacturing
336	Zinc manufacturing
338+339	Metal scraps and non-ferrous metals
34	**Metal products**
340	Fabricated structural metal products
341	Fabricated structural metal products, Nec
342	Furniture and fixtures
343+349	Hand tools, weights, etc.
344+345	Metal products and stamping/forging of metals
346	Metal kitchen ware
35	**Non-electrical machinery and parts**
350	Agricultural machinery, equipment and parts
351	Construction/mining machines and equipment
352	Prime movers and boilers
353	Food and textile machinery

355	Refrigerators and air-conditioners
354	Other machinery
356	General purpose machinery
357	Machine tools, parts and accessories
358	Office and computing machines
359	Special purpose machinery
36	**Electrical machinery and parts**
360	Electrical industrial machinery
361	Wires and cables
362	Cells and batteries
363+364	Electric lamps, fans and domestic appliances
365+366	Radio and TV apparatus
368	Electronic valves and tubes, etc.
369	X-ray machines and electrical equipment, Nec
37	**Transport equipment and parts**
370	Ships and boats
371	Locomotives and parts
372	Wagons and coaches
373+374	Motor vehicles, cars and products
375	Motorcycles, scooters and products
376	Bicycles and parts
377	Aircraft and related products
379	Transport equipment, not classified elsewhere

Source: Annual Survey of Industries

Table 2 : Sample industries and value-added shares: Three-digit industrial classification

Code : Three-digit industries				
NIC87	**Description**	**1980/81**	**1985/86**	**1990/91**
23	**Cotton textiles**	**16.83**	**10.31**	**9.54**
230	Cotton ginning, bailing and cleaning	0.35	0.37	0.28
231	Cotton spinning other than mills	0.00	0.00	0.02
232	Weaving and finishing of khadi cotton	0.01	0.03	0.01
233	Weaving and finishing of handloom cotton	0.05	0.04	0.02
234	Weaving and finishing of power-loom cotton	0.10	0.10	0.08
235	Cotton spinning/weaving/processing in mills	11.27	6.36	5.87
236	Printing of cotton textiles	0.39	0.41	0.33
26	**Textile products**	**1.21**	**1.20**	**2.31**
260	Knitted or crocheted textiles	0.18	0.24	0.35
262	Thread, Cordage, rope, twine, etc.	0.06	0.04	0.03
263	Blankets, shawls, carpets and rugs	0.10	0.06	0.09
265	Textile garments and accessories	0.41	0.45	1.04
267	Made-up textiles	0.01	0.01	0.01
268	Water-proof textile fabrics	0.09	0.05	0.05
269	Textile products, Nec	0.03	0.02	0.03
29	**Leather and leather products**	**0.89**	**0.90**	**1.37**
290	Tanning, curing, finishing of leather	0.36	0.31	0.41
291	Leather footwear	0.26	0.30	0.40
292	Apparel of leather and substitutes	0.01	0.02	0.08
293	Leather products and substitutes	0.00	0.01	0.04
299	Leather and fur products, Nec	0.00	0.00	0.01
30	**Chemicals and chemical products**	**20.37**	**20.98**	**21.40**
300	Organic and inorganic chemicals	3.54	3.61	3.03
301	Fertilizers and pesticides	3.46	3.70	3.44
302+306	Synthetic rubber and manmade fibres	1.50	1.88	2.29
303	Paints, varnishes and products	1.18	0.84	1.10
304	Drugs and medicines	3.00	3.03	2.79

305	Perfumes, cosmetics and lotions	0.67	0.60	1.12
307	Safety matches	0.24	0.21	0.10
308	Explosives and fireworks	0.22	0.25	0.19
309	Chemical products, Nec	0.92	0.80	0.81
31	**Rubber, plastics, petroleum, etc.**	**7.18**	**13.05**	**11.72**
310	Tyres and tubes	1.12	1.58	1.30
311	Rubber and plastic footwear	0.14	0.12	0.56
312	Rubber products, Nec	0.54	0.50	0.44
313	Plastic products, Nec	0.72	1.03	1.25
314	Refined petroleum products	1.60	5.57	4.02
316	Refined petroleum products, Nec	0.40	0.21	0.23
318	Coke-oven products	0.51	0.14	0.18
319	Other coal/tar products	0.17	0.11	0.16
33	**Basic metals and alloys**	**17.84**	**18.08**	**18.32**
330	Iron and steel in primary/semi-primary forms	8.29	8.81	9.40
331	Semi-finished iron and steel	3.22	2.87	1.34
332	Ferro-alloys	0.29	0.27	0.22
333	Copper manufacturing	0.21	0.11	0.23
334	Brass manufacturing	0.16	0.12	0.07
335	Aluminium manufacturing	0.43	0.48	1.19
336	Zinc manufacturing	0.21	0.10	0.18
338+339	Metal scraps and non-ferrous metals	0.09	0.09	0.09
34	**Metal products**	**2.85**	**3.49**	**3.25**
340	Fabricated structural metal products	0.37	0.38	0.44
341	Fabricated structural metal products, Nec	0.79	0.71	0.52
342	Furniture and fixtures	0.34	0.30	0.03
343+349	Hand tools, weights, etc.	0.18	0.78	0.70
344+345	Metal products and stamping/forging of metals	0.06	0.08	0.41
346	Metal kitchen ware	0.31	0.23	0.15
35	**Non-electrical machinery and parts**	**11.35**	**12.46**	**10.02**
350	Agricultural machinery, equipment and parts	0.82	0.80	0.88
351	Construction/mining machines and equipment	0.68	0.52	0.37

352	Prime movers and boilers	1.32	2.30	0.95
353	Food and textile machinery	1.39	0.93	0.91
355	Refrigerators and air-conditioners	0.77	0.75	0.69
354	Other machinery	0.43	0.41	0.61
356	General purpose machinery	1.48	1.52	1.55
357	Machine tools, parts and accessories	0.86	1.10	0.60
358	Office and computing machines	0.13	0.16	0.08
359	Special purpose machinery	0.34	0.36	0.32
36	**Electrical machinery and parts**	**9.88**	**9.00**	**10.87**
360	Electrical industrial machinery	3.51	2.84	3.48
361	Wires and cables	1.26	0.67	0.95
362	Cells and batteries	0.46	0.38	0.35
363+364	Electric lamps, fans and domestic appliances	0.66	0.65	0.59
365+366	Radio and TV apparatus	0.98	1.54	1.75
368	Electronic valves and tubes, etc.	0.13	0.17	0.27
369	X-ray machines and electrical equipment, Nec	0.15	0.15	0.15
37	**Transport equipment and parts**	**11.61**	**10.53**	**11.20**
370	Ships and boats	0.82	0.23	0.15
371	Locomotives and parts	1.16	0.19	0.21
372	Wagons and coaches	1.36	1.33	1.10
373+374	Motor vehicles, cars and products	3.93	4.38	4.35
375	Motorcycles, scooters and products	0.52	0.85	1.28
376	Bicycles and parts	0.29	0.26	0.40
377	Aircraft and related products	0.19	0.16	0.13
379	Transport equipment, Nec	0.13	0.07	0.15
	All industries	**72.33**	**71.05**	**69.51**

Notes

1. Value-added share represents share in total manufacturing gross value-added.
2. Sectors' shares are computed as the sum of individual industries' share in sample manufacturing gross value-added.

Source: Author's calculation based on the Annual Survey of Industries

Table 3A: Employment growth patterns in organized manufacturing industries under different phases of trade reforms: Use-based sectors

Classification	Industries	Phase I 1980/85	Phase II 1986/90	Phase III 1991/95	Phase IV 1996/2000
Employment	Rapid growth (>5%)	[1] 231, 308, 313, 314, 316, 318, 318, 332, 336, [2] 352, 365+, 368, 369 [3] 232, 236, 260, 269, 292, 293, 299, 375, 376	[1] 231, 310, 313, 332, 335,338+, 340, 344+ [2] 351, 354, 368, 379 [3] 232, 233, 260, 263, 265, 267, 269, 291, 292, 293, 299, 305, 311, 355, 375	[1] 231, 262, 302+, 303, 308, 309, 310, 312, 313, 314, 316, 318,319, 331, 332, 333, 334, 335, 336, 338+, 344+ [2] 352,357, 361, 365+, 368 370, 371, 377, 379 [3] 232,.234, 260, 263, 265 267,269,291, 292, 293 299, 304, 307, 342, 373+	[1] 262, 300, 301, 302+, 303, 308, 309, 310, 312, 313, 314, 319 331, 332, 333, 334, 335, 341, 344+ [2] 352, 354, 356, 359, 365+, 368, 369, 370, 379 [3] 232, 234, 260, 263, 267, 291, 292, 293, 299, 304, 346, 373+, 375, 376
	Moderate growth (3% &<5%)	[1] 290, 300, 341 [2] 356, 357, 358, 379 [3] 265, 291, 305, 363+	[1] 302+, 303, 308, 314, [2] 360, 361, 365+ [3] 234, 376	[1] 230, 301, 341, 343+ [2] 353, 354, 356, 359, 362, 372 [3] 236, 268, 346, 375, 376	[1] 316, 343+ [2] 350, 357, 361, [3] 233, 236, 265, 269, 363+
	Slow growth (0% & <3%)	[1] 301, 302+, 309, 310, 319 330, 333, 335, 340, 344+ [2] 350, 351, 354, 359, 360 [3] 233, 267, 304, 307, 355, 373+	[1] 290, 301, 312, 318, 319, 330, 343+ [2] 350, 356, 359, 362, 369, 377 [3] 268, 304, 307, 363+, 373+	[1] 290, 300, 330, 340 [2] 350. 351, 360, 369 [3] 233, 305, 363+	[1] 330, 340 [2] 351, 353, 360, 362, 371 [3] 305, 307, 311,342
	Negative growth (<0%)	[1] 230, 235, 262, 303, 312 331, 334, 338+, 343+ [2] 353, 361, 362, 370, 371 372, 377 [3] 234, 263, 268, 311, 342 346	[1] 230, 235, 262, 300, 309 316, 331, 333, 334, 336, 341 [2] 352, 353, 357, 358, 370, 371, 372 [3] 236, 342, 346	[1] 235, [2] 358 [3] 311, 355	[1] 230, 231, 235, 290 318, 336, 338+ [2] 358, 372, 377 [3] 268, 355

Notes

[1]: Industry codes in intermediate goods industries

[2]: Industry codes in capital goods industries

[3]: Industry codes in consumer goods industries

Source: Author's calculation based on Annual Survey of Industries, Government of India

Table 3B: Labour productivity growth patterns in organized manufacturing industries under different phases of trade reforms: Use-based sectors					
Classification	**Industries**	**Phase I 1980/85**	**Phase II 1986/90**	**Phase III 1991/95**	**Phase IV 1996/2000**
Labour Productivity	High growth (>50%)	[1] 231, 336 [2] [3] 232, 234, 342	[1] 302+, 318, 319, 336 [2] 358 [3] 311	[1] 302+, 314, 316, 333, 336, 344+ [2] [3] 291, 342, 346	[1] 230, 231, 302+, 303, 319, 334, 340. [2] 361, 365+, 371, 372, 377 [3] 263, 311
	Moderate growth (25% &<50%)	[1] 290 [2] [3] 299	[1] 231, 313, 340 [2] 371 [3] 263, 267, 299	[1] 231, 290, 303, 309, 335 [2] 358, 359, 377 [3] 233, 234, 236, 269, 293, 305	[1] 262, 309, 313, 332, 338+ [2] 354, 369 [3] 233, 234, 236, 260, 267 269, 304, 305, 342, 346 355, 363+
	Slow growth (0% & <25%)	[1] 230, 235, 300, 301, 302+ 308, 309, 310, 312, 330, 333, 335, 334, 338+ 343+, 344+ [2] 350, 351, 352, 353, 354, 356, 357, 358, 359 360, 362,365+, 368, 369, 370, 372, 377, 379 [3] 233, 236, 260, 263, 265 269, 291, 293, 304, 305 307, 346, 355, 363+, 373+, 375	[1] 235, 262, 290, 300, 301, 303, 308, 309, 310, 312, 330, 331, 335, 338+, 344+ [2] 350, 351, 352, 353, 354, 356, 357, 359, 360, 361, 362, 365+, 368, 369, 370, 372, 377, 379 [3] 232,2 36, 260, 265, 269, 291, 292, 293, 304, 305, 307, 342, 355, 363+, 373+, 375, 376	[1] 235, 262, 300, 301, 310 318, 319, 330, 331, 332 338+, 341, 343+ [2] 350, 351, 352, 353, 354 356, 357, 361, 362, 365+ 368, 369, 370, 379 [3] 232, 260, 263, 265, 267 292, 299, 304, 307, 311, 355, 363+, 373+, 375, 376	[1] 235, 290, 300, 301, 310 312, 318, 330, 331, 335 343+, 344+ [2] 350, 351, 352, 353, 356, 357, 358, 359, 360, 368 370, 379 [3] 232, 265, 291, 292, 299 307 ,375, 376
	Negative growth	[1] 262, 303, 313, 314, 316 318, 319, 331, 332, 340, 341 [2] 361, 371 [3] 267, 268, 292, 311, 376	[1] 230, 314, 316, 332, 333, 334, 341, 343+ [2] [3] 233, 234, 268, 346	[1] 230, 308, 312 ,313, 334, 340 [2] 360, 371, 372 [3] 268	[1] 308, 314, 316, 333, 336 341 [2] 362 [3] 268, 293, 373+

Notes

[1]: Industry codes in intermediate goods industries

[2]: Industry codes in capital goods industries

[3]: Industry codes in consumer goods industries

Source: Author's calculation based on Annual Survey of Industries, Government of India

Table 3C: Real wages growth patterns in organized manufacturing industries under different phases of trade reforms: Use-based sectors					
Classification	**Industries**	**Phase I 1980/85**	**Phase II 1986/90**	**Phase III 1991/95**	**Phase IV 1996/2000**
Real wages	Rapid growth (>10%)	[1] 231, 308, 314, 336 [2] 352, 357, 365+ [3] 232, 233, 260, 293, 299, 342, 375	[1] 231, 332, 340, 344+ [2] 368, 369, 379 [3] 232, 233, 260, 265, 267, 269, 292, 293, 305, 311, 355, 375	[1] 231, 262, 302+, 309, 314, 316, 330, 332 335, 336, 338+ [2] 352, 359, 368, 370 371, 377 [3] 233, 234, 265, 267, 269, 291, 292, 342	[1] 262, 302+, 309, 310 313, 314, 316, 335, 341 344+ [2] 350, 352, 359, 368, 369 370, 371, 379 [3] 232, 233, 234, 260, 263 267, 269, 291, 292, 346 375
	Moderate growth (5% & <10%)	[1] 230, 300, 302+, 313, 316, 318, 332, 33, 338+, 340 [2] 350, 351, 356, 358, 359 368, 369, [3] 265, 269, 292, 304, 305 363+, 373+, 376	[1] 290, 301, 302+, 303, 308, 310, 313, 318, 335, 338+ [2] 350, 351, 354, 359, 360, 365+, 377 [3] 234, 263, 291, 376	[1] 230, 300, 301, 303, 308 310, 312, 313, 318, 331 333, 334, 341, 343+, 344+ [2] 350, 353, 356, 357 360, 362, 365+, 379 [3] 232, 260, 268, 293, 304 307, 346, 373+, 375, 376	[1] 300, 301, 312, 331, 333 334, 343+ [2] 354, 356, 357, 362, 365+ 377 [3] 236, 265, 268, 293, 355, 363+, 373+, 376
	Slow growth (0% & <5%)	[1] 290, 301, 303, 309, 310, 319, 330, 331, 335, 341, 344+ [2] 353, 354, 360, 361, 362, 371, 372, 377 [3] 236, 267, 268, 291 307, 346, 355	[1] 230, 235, 309, 312, 314, 316, 319, 330, 333, 343+ [2] 356, 361, 362, [3] 236, 268, 304, 307 346, 363+, 373+	[1] 290, 340 [2] 351, 354, 361, 369, 372 [3] 236, 263, 299, 355, 363+	[1] 230, 303, 308, 318, 319 332, 336, 340, [2] 351, 353, 358, 360, 361 [3] 299, 304, 305, 307, 311
	Negative growth	[1] 235, 262, 312, 334, 343+ [2] 370, 379 [3] 234, 263, 311	[1] 262, 300, 331, 334, 336, 341 [2] 352, 353, 357, 358, 370, 371, 372 [3] 299, 342	[1] 235, 319 [2] 358 [3] 305, 311	[1] 231, 235, 290, 330, 338+ [2] 372 [3] 342

Notes

[1]: Industry codes in intermediate goods industries

[2]: Industry codes in capital goods industries

[3]: Industry codes in consumer goods industries

Source: Author's calculation based on Annual Survey of Industries, Government of India

Table 4 : Indicators of trade barriers in Indian manufacturing: Use-based classification

Industry group	Phase I 1980/85	Phase II 1986/90	Phase III 1991/95	Phase IV 1996/2000	All phases 1980/2000
Effective rate of protection (%)					
Intermediate goods					
Average	147.03	149.18	87.58	40.13	112.36
S.D.	75.79	64.85	24.15	9.11	44.27
C.V.	52.00	43.00	28.00	23.00	39.00
Capital goods					
Average	62.77	78.45	54.23	33.30	61.87
S.D.	29.02	30.18	18.49	12.03	22.64
C.V.	46.00	38.00	34.00	36.00	37.00
Consumer goods					
Average	101.51	111.55	80.55	48.28	87.47
S.D.	19.87	33.77	10.50	5.53	16.60
C.V.	20.00	30.00	13.00	11.00	19.00
All industries					
Average	115.11	125.93	80.18	40.43	95.19
S.D.	67.62	63.48	23.77	10.71	40.96
C.V.	59.00	50.00	30.00	26.00	43.00
Import coverage ratio (%)					
Intermediate goods					
Average	98.31	98.26	41.77	27.60	71.47
S.D.	12.89	12.65	42.63	37.88	20.43
C.V.	13.00	13.00	102.00	137.00	29.00
Capital goods					
Average	95.11	77.21	20.47	8.15	54.37
S.D.	21.56	26.94	25.36	16.96	16.69
C.V.	23.00	35.00	124.00	208.00	31.00
Consumer goods					
Average	98.69	87.85	45.69	33.43	68.77
S.D.	11.35	21.64	39.23	38.53	20.89
C.V.	12.00	25.00	86.00	115.00	30.00

All industries					
Average	97.59	91.64	37.97	24.82	67.11
S.D.	15.33	20.45	39.88	35.84	20.93
C.V.	16.00	22.00	105.00	144.00	31.00
Import penetration rates (%)					
Intermediate goods					
Average	0.11	0.13	0.15	0.18	0.14
S.D.	0.12	0.11	0.15	0.15	0.12
C.V.	105.00	84.00	100.00	87.00	87.00
Capital goods					
Average	0.12	0.12	0.12	0.19	0.14
S.D.	0.15	0.12	0.11	0.15	0.13
C.V.	143.00	64.00	69.00	170.00	97.00
Consumer goods					
Average	0.04	0.04	0.04	0.10	0.05
S.D.	0.06	0.03	0.03	0.10	0.04
C.V.	143.00	64.00	69.00	170.00	74.00
All industries					
Average	0.10	0.11	0.12	0.16	0.12
S.D.	0.12	0.11	0.13	0.16	0.12
C.V.	119.00	97.00	112.00	98.00	98.00

Notes

1. Period averages are computed as a value-added share weighted average of the yearly figures.
2. For all industries, the ERP and MCR are averaged over 72 three-digit industries, whereas for MPR, it is averaged over 60 three-digit industries.

Source: Author's calculations based on:

(1) Customs Tariff Working Schedule, Central Excise and Customs, Government of India;

(2) Monthly Statistics of Foreign Trade, Ministry of Commerce, Government of India, and

(3) Export-Import Policy Documents, Ministry of Commerce, Government of India

Table 5 : Effective rate of protection (%) and employment growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector	V-A share	ERP	EMP	ERP	EMP	ERP	EMP	ERP	EMP
230, 231, 235	Cotton textiles	11.62	109.77	14.08	125.38	474.8	68.38	43.9	42.93	-4.2
262	Threads, cordage, etc.	0.06	160.91	-7.00	151.23	-5.6	95.79	5.7	48.22	6.2
290	Tanning and curing of leather	0.36	117.73	4.20	123.15	1.6	78.86	1.0	52.42	-2.1
300	Organic and inorganic chemicals	3.54	95.85	3.40	115.90	-3.8	85.79	2.2	38.94	5.1
301	Fertilizers and Pesticides	3.46	50.79	1.00	60.05	2.1	60.49	4.3	28.70	5.4
302+306	Synthetic rubber and fibres	1.50	173.07	1.40	157.73	4.5	78.75	18.1	40.63	13.0
303	Paints, varnishes, etc.	1.18	171.73	-0.70	434.42	3.7	123.36	6.9	39.17	5.1
308, 309	Explosives, chemicals, Nec, etc.	1.14	97.30	4.20	116.33	0.45	81.09	8.8	37.49	8.80
310, 312	Rubber products, tyres and tubes	1.64	123.74	0.15	146.70	4.30	88.69	6.1	53.73	6.55
313	Plastic products, Nec	0.72	150.71	5.70	166.34	10.5	97.18	5.7	42.85	9.0
314, 316	Petroleum products	2.00	96.22	9.30	107.68	1.55	68.93	7.4	26.16	4.40
318, 319	Coke, coal	0.68	56.68	5.80	76.56	2.25	62.68	6.0	34.73	-8.10
330, 331	Iron and steel	11.51	225.23	0.70	195.01	-5.30	109.73	3.8	51.69	4.15
332	Ferro alloys	0.29	93.29	-0.50	109.18	-13.2	65.55	6.6	28.85	6.0
333, 335, 336, 338	Copper, aluminium, zinc	0.94	87.51	2.60	109.59	-1.22	69.32	9.1	34.85	8.8
340, 341	Fabricated structural metals	1.33	428.65	2.40	314.76	8.0	181.96	2.2	50.56	5.6
343+349	Hand tools and weights	0.18	86.02	-3.80	106.68	1.4	71.60	4.9	37.39	3.3
	Sectoral average	**42.22**	**147.03**	**2.60**	**149.18**	**28.6**	**87.58**	**8.4**	**40.13**	**4.5**
	Capital goods sector									
350	Agricultural machinery, parts and equipment	0.82	30.40	0.50	44.36	1.50	39.90	2.500	27.90	4.00
351, 352, 354	Mining machinery, boilers, other machinery	2.77	51.85	2.80	61.98	2.70	39.06	4.6	25.85	4.70
353	Food and textile machinery	1.39	48.66	-2.10	59.97	-1.40	37.75	3.00	29.31	1.70
356, 359	General purpose machinery	1.82	52.73	3.00	76.65	2.00	47.72	3.30	29.47	25.70
357	Machine tools and accessories	0.86	33.27	4.10	64.33	-5.20	41.69	5.00	24.60	3.50
358	Office and computing machinery	0.13	101.15	4.30	98.24	-11.20	73.74	-3.80	39.25	-6.80

360	Electrical industrial machinery	3.51	83.15	0.40	64.26	4.00	46.47	1.40	26.45	0.00
361	Wires and cables	1.26	51.53	-0.80	134.31	3.70	89.79	5.70	66.50	4.10
362	Cells and batteries	0.46	199.92	-4.70	177.86	2.20	102.81	4.10	61.80	2.50
365, 368, 369	Apparatus, valves, machines	1.26	91.15	7.20	130.07	9.10	79.72	6.70	33.43	8.50
370	Ships and boats	0.82	47.25	-10.60	62.15	-3.00	46.24	13.40	42.03	11.50
371, 372	Locomotives, wagons, coaches	2.52	47.12	-1.00	64.33	-4.90	45.36	10.30	28.78	-15.10
377, 379	Aircraft, transport, Nec, etc.	0.32	85.69	1.60	112.16	17.90	85.60	9.90	53.85	5.10
	Sectoral average	17.94	62.77	0.40	78.45	1.30	54.23	5.10	33.30	3.80
	Consumer goods sector									
232, 233	Khadi and handloom cotton	0.06	109.36	6.60	126.85	31.90	70.95	4.00	42.99	4.60
234, 236	Power loom and printed cotton	0.49	109.77	-5.00	125.38	1.30	68.38	4.30	42.93	6.20
260, 265, 267	Textiles	0.60	138.33	4.60	149.89	18.90	98.45	16.10	54.25	10.70
263	Blankets, shawls, rugs, etc.	0.10	102.52	-5.20	91.80	12.30	63.30	5.80	44.66	16.10
268, 269	Waterproof textiles and others	0.12	160.91	2.00	151.23	13.50	95.79	6.30	48.20	0.60
291	Leather footwear	0.36	151.87	4.60	158.49	10.40	91.57	5.20	35.71	6.70
292, 293, 299	Leather products	0.01	117.73	18.10	123.15	29.40	78.86	13.60	52.42	12.20
304	Drugs and medicines	3.00	80.36	2.70	97.30	2.70	82.02	9.00	40.19	5.00
305	Perfumes, etc.	0.01	133.40	3.90	234.25	36.30	98.63	0.00	56.95	1.80
311	Footwear: rubber and plastics	0.14	137.22	-2.40	157.28	12.00	92.93	-0.30	48.29	1.70
342, 346	Furniture and metalware	0.65	116.63	-0.70	147.80	-4.80	92.75	14.80	47.58	5.20
355, 363+64	ACs/Refrigerators, lamps, appliances	1.09	100.45	2.40	110.73	9.20	78.03	-0.80	46.85	1.70
373+374	Vehicles, cars and products	3.93	94.17	1.70	96.57	1.50	71.96	5.10	49.03	5.50
375	Motor cycles and parts	0.52	119.51	7.70	93.52	11.70	75.00	3.40	52.43	7.50
376	Bicycles and parts	0.29	121.76	6.10	50.99	3.60	61.58	4.80	53.18	10.30
	Sectoral average	12.17	101.51	3.10	111.56	12.70	80.55	6.10	48.28	6.40

Notes

The sectoral average for the phases is the simple average of the yearly effective rate of protection and employment growth

Source: Author's calculations based on:

(1) Customs Tariff Working Schedule, Central Excise and Customs, Government of India, and

(2) Input-Output Transaction Table 1983-84 and 1989-90, Central Statistical Organization, Government of India, and Annual Survey of Industries (yearly issues), Government of India

Table 6 : Import coverage ratio (%) and employment growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase-1 1980/85		Phase-2 1986/90		Phase-3 1991/95		Phase-4 1996/00	
	Intermediate goods sector		NTB	EMP	NTB	EMP	NTB	EMP	NTB	EMP
230	Cotton ginning, bailing and cleaning	0.35	0.00	-3.80	0.00	-1.10	0.00	4.80	0.00	-0.10
231	Cotton spinning, not in mills	0.00	0.00	52.10	0.00	1427.10	0.00	7.20	0.00	-12.50
235	Cotton spinning in mills	11.27	100.00	-3.80	100.00	-1.50	100.00	-0.10	100.00	-0.10
262	Threads, cordage, ropes, etc.	0.06	100.00	-7.00	100.00	-5.60	75.48	5.70	18.9	6.20
290	Tanning and curing of leather	0.36	0.00	4.20	0.00	1.60	0.00	1.00	0.00	-2.10
300	Organic and inorganic chemicals	3.54	100.00	3.40	100.00	-3.80	0.22	2.20	0.22	5.10
301	Fertilizers and pesticides	3.46	100.00	1.00	100.00	2.10	100.00	4.30	40.70	5.40
302+306	Synthetic rubber and manmade fibres	1.50	100.00	1.40	100.00	4.50	22.61	18.10	4.08	13.00
303	Paints, varnishes, etc.	1.18	100.00	-0.70	100.00	3.70	25.75	6.90	6.30	5.10
308	Explosives, etc.	0.22	100.00	7.30	100.00	3.80	100.00	8.20	96.50	5.30
309	Chemical products, Nec	0.92	100.00	1.10	93.78	-2.90	14.10	9.40	3.27	10.00
310	Tyres and tubes	1.12	100.00	0.40	100.00	7.00	100.00	7.10	29.43	8.30
312	Rubber products, Nec	0.54	100.00	-0.10	100.00	1.60	18.11	5.10	11.46	5.00
313	Plastic products, Nec	0.72	100.00	5.70	100.00	10.50	52.32	5.70	23.76	9.00
314	Refined petroleum products	1.60	100.00	9.10	100.00	3.70	72.43	5.70	100.00	5.50
316	Refined petroleum products, Nec	0.40	100.00	9.60	100.00	-0.60	34.60	9.20	0.00	3.30
318	Coke oven products	0.51	100.00	9.50	100.00	2.90	0.00	5.50	0.00	-21.50
319	Other coal tar products	0.17	100.00	2.20	100.00	1.60	0.00	6.50	0.00	5.30
330	Iron and steel in P/SF form	8.29	100.00	1.90	100.00	2.60	0.00	1.10	0.00	2.30
331	Iron and steel in SF form	3.22	100.00	-0.50	100.00	-13.20	0.00	6.60	0.00	6.00
332	Ferro alloys	0.29	100.00	7.10	100.00	6.70	0.00	13.00	0.00	5.10
333	Copper manufacturing	0.21	100.00	0.40	100.00	-0.70	5.50	7.20	34.01	12.10
335	Aluminium manufacturing	0.43	100.00	0.10	100.00	6.20	8.89	21.00	3.17	12.10
336	Zinc manufacturing	0.21	100.00	14.10	100.00	-4.70	2.87	5.70	15.12	-3.00
338+ 339	Metal scraps and non-ferrous	0.09	100.00	-1.60	100.00	7.20	4.65	11.10	3.82	-20.80
340	Fabricated structural metal products	0.37	100.00	1.90	100.00	16.80	80.00	0.50	0.00	1.70

341	Fabricated structural metal, Nec	0.79	100.00	3.00	100.00	-0.80	51.53	4.00	13.86	9.50
343+349	Hand tools, weights, etc.	0.18	100.00	-3.80	100.00	1.40	31.84	4.90	7.62	3.30
	Sectoral average	42.22	98.31	4.10	98.26	52.70	41.77	6.70	27.60	2.80
	Capital goods sector									
350	Agricultural machinery, equipment and parts	0.82	100.00	0.50	100.00	1.50	20.14	2.50	11.99	4.00
351	Construction/mining machinery	0.68	100.00	1.30	68.74	7.10	2.17	0.00	0.00	2.30
352	Prime movers and boilers	1.32	100.00	6.60	100.00	-5.30	40.04	9.50	0.23	5.80
353	Food and textile machinery	1.39	100.00	-2.10	76.86	-1.40	0.00	3.00	0.00	1.70
354	Other machinery	0.77	100.00	0.50	68.24	6.30	0.00	4.40	0.00	6.10
356	General purpose machinery	1.48	100.00	3.80	60.00	2.10	0.00	3.70	0.00	46.30
357	Machine tools and accessories	0.86	0.00	4.10	0.00	-5.20	0.00	5.00	0.00	3.50
358	Office and computing machinery	0.13	100.00	4.30	100.00	-11.20	1.66	-3.80	0.22	-6.80
359	Special purpose machinery	0.34	100.00	2.30	80.64	1.90	1.22	3.00	0.83	5.10
360	Electrical industrial machinery	3.51	100.00	0.40	65.57	4.00	11.69	1.40	0.00	0.00
361	Wires and cables	1.26	100.00	-0.80	100.00	3.70	80.00	5.70	16.86	4.10
362	Cells and batteries	0.46	100.00	-4.70	60.00	2.20	20.00	4.10	51.15	2.50
365+366	Radio and TV	0.98	100.00	7.80	97.25	4.50	56.51	15.30	14.59	8.80
368	Electronic valves and tubes	0.13	100.00	7.30	44.34	17.60	20.02	11.20	19.65	7.30
369	X-ray machinery	0.15	100.00	7.00	63.11	0.50	0.00	2.10	0.00	9.70
370	Ships and boats	0.82	100.00	-10.60	100.00	-3.00	74.35	13.40	29.51	11.50
371	Locomotives and parts	1.16	100.00	-1.60	100.00	-5.50	0.00	16.60	0.00	2.60
372	Wagons and coaches	1.36	100.00	-0.50	100.00	-4.30	0.00	4.00	0.00	-32.80
377	Aircraft and related products	0.19	100.00	-0.20	100.00	2.40	77.51	14.60	99.89	-0.30
379	Transport equipment, Nec	0.13	100.00	3.40	100.00	33.40	0.00	5.20	0.00	10.50
	Sectoral average	**17.94**	**95.11**	**1.40**	**77.21**	**2.60**	**20.47**	**6.00**	**8.15**	**4.60**
	Consumer goods sector									
232	W&F khadi cotton	0.01	0.00	11.30	0.00	31.20	0.00	6.80	0.00	6.00
233	W&F of handloom cotton	0.05	0.00	1.80	0.00	32.50	0.00	1.20	0.00	3.10
234	W&F of power-loom cotton	0.10	0.00	-17.00	0.00	4.30	0.00	5.60	0.00	7.40
236	Printing of cotton textiles	0.39	100.00	7.00	100.00	-1.70	100.00	3.00	100.00	4.90
260	Knitted or crocheted textiles	0.18	100.00	7.20	100.00	13.60	99.96	9.70	97.38	13.60
263	Blankets, shawls, carpets and rugs	0.10	100.00	-5.20	100.00	12.30	100.00	5.80	69.49	16.10

265	Textile garments and accessories	0.41	100.00	4.30	100.00	12.40	78.57	20.00	74.30	3.10
267	Made-up textiles	0.01	100.00	2.40	100.00	30.60	59.64	18.70	16.45	15.50
268	Waterproof textiles	0.09	100.00	-3.60	100.00	0.70	82.55	3.90	0.21	-3.50
269	Textile products, Nec	0.03	100.00	7.60	100.00	26.30	17.99	8.60	0.67	4.60
291	Leather footwear	0.26	100.00	4.60	100.00	10.40	100.00	5.20	100.00	6.70
292	Apparel of leather and substitutes	0.01	100.00	8.00	100.00	30.90	100.00	18.50	100.00	7.00
293	Leather products and substitutes	0.00	100.00	22.90	100.00	48.20	100.00	20.00	100.00	15.00
299	Leather and fur products, Nec	0.00	100.00	26.70	100.00	29.70	38.42	15.50	30.31	14.80
304	Drugs and medicines	3.00	100.00	2.70	58.56	2.70	1.46	9.00	2.12	5.00
305	Perfumes, cosmetics and lotions	0.67	100.00	3.90	99.52	36.30	65.04	0.00	21.59	1.80
311	Rubber and plastic footwear	0.14	100.00	-2.40	100.00	12.00	0.00	-0.30	0.00	1.70
342	Furniture and fixtures	0.34	100.00	-1.20	100.00	-5.30	19.06	25.00	8.28	2.20
346	Metal kitchenware	0.31	100.00	-0.10	100.00	-4.20	100.00	4.60	50.00	8.10
355	Refrigerators and air-conditioners	0.43	100.00	1.40	100.00	15.90	100.00	-3.00	50.00	-1.20
363+365	Lamps and domestic appliances	0.66	100.00	3.30	100.00	2.40	86.85	1.50	75.23	4.50
373+374	Motor vehicles, cars and products	3.93	100.00	1.70	100.00	1.50	23.67	5.10	6.61	5.50
375	Motor-cycles and related products	0.52	100.00	7.70	100.00	11.70	100	3.40	100	7.50
376	Bicycles and parts	0.29	100.00	6.10	100.00	3.60	6.24	4.80	2.64	10.30
	Sectoral average	**12.17**	**98.69**	**4.20**	**87.85**	**14.90**	**45.69**	**8.00**	**33.43**	**6.70**

Notes

The sectoral average is the simple average of the yearly import coverage ratio and employment growth rates.

Source: Author's calculations

Table 7A : Import penetration rate (%) and employment growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector		MPR	EMP	MPR	EMP	MPRB	EMP	MPR	EMP
230	Cotton ginning, bailing and cleaning	0.35	0.099	-3.80	0.035	-1.10	0.039	4.80	0.001	-0.10
235	Cotton spinning in mills	11.3	0.000	-3.80	0.000	1427.10	0.002	7.20	0.003	-12.50
262	Threads, cordage, ropes, etc.	0.06	0.007	-7.00	0.007	-1.50	0.023	-0.10	-0.053	-0.10
290	Tanning and curing of leather	0.36	0.004	4.20	0.027	-5.60	0.140	5.70	0.096	6.20
300	Organic and inorganic chemicals	3.54	0.096	3.40	0.234	1.60	0.428	1.00	0.469	-2.10
301	Fertilizers and pesticides	3.46	0.156	1.00	0.087	-3.80	0.111	2.20	0.089	5.10
302+306	Synthetic rubber and manmade fibres	1.50	0.099	1.40	0.057	2.10	0.164	4.30	0.156	5.40
303	Paints, varnishes, etc.	1.18	0.020	-0.70	0.084	4.50	0.070	18.10	0.084	13.00
308	Explosives, etc.	0.22	0.017	7.30	0.008	3.70	0.013	6.90	0.004	5.10
309	Chemical products, Nec	0.92	0.165	1.10	0.171	3.80	0.147	8.20	0.198	8.20
310	Tyres and tubes	1.12	0.002	0.40	0.003	-2.90	0.006	9.40	0.008	9.40
312	Rubber products, Nec	0.54	0.242	-0.10	0.194	70	0.196	7.10	0.191	8.30
313	Plastic products, Nec	0.72	0.024	5.70	0.034	1.60	0.052	5.10	0.037	5.00
314	Refined petroleum products	0.40	0.465	9.10	0.262	10.50	0.399	5.70	0.455	9.00
318	Coke oven products	0.51	0.106	9.50	0.299	2.90	0.537	5.70	0.618	-21.50
319	Other coal tar products	0.17	0.267	2.20	0.130	1.60	0.113	5.50	0.492	5.30
330	Iron and steel in P/SF form	8.29	0.007	1.90	0.112	2.60	0.085	6.50	0.149	2.30
331	Iron and steel in SF form	3.22	0.056	-0.50	0.301	-13.20	0.253	1.10	0.154	6.00
332	Ferro alloys	0.29	0.236	7.10	0.494	6.70	0.503	6.60	0.386	5.10
333	Copper manufacturing	0.21	0.419	0.40	0.460	-0.70	0.485	13.00	0.408	12.10
335	Aluminium manufacturing	0.43	0.174	0.10	0.088	6.20	0.064	21.00	0.103	12.10
336	Zinc manufacturing	0.21	0.329	14.10	0.271	-4.70	0.116	5.70	0.224	-3.00

338+ 339	Metal scraps and non-ferrous	0.09	0.449	-1.60	0.456	7.20	0.446	11.10	0.344	-20.80
340	Fabricated structural metal products	0.37	0.205	1.90	0.011	16.80	0.005	0.50	0.009	1.70
341	Fabricated structural metal, Nec	0.79	0.006	3.00	0.010	-0.80	0.019	4.00	0.030	9.50
343+349	Hand tools, weights, etc.	0.18	0.056	-3.80	0.027	1.40	0.022	4.90	0.052	3.30
	Sectoral average	**42.22**	**0.11**	**2.00**	**0.13**	**56.70**	**0.15**	**6.60**	**0.18**	**2.80**
	Capital goods sector									
350	Agricultural machinery, equipment and parts	0.82	0.009	0.50	0.006	1.50	0.009	2.50	0.008	4.00
351	Construction/mining machinery	0.68	0.200	1.30	0.364	7.10	0.399	0.00	0.421	2.30
352	Prime movers and boilers	1.32	0.099	6.60	0.083	-5.30	0.132	9.50	0.126	5.80
353	Food and textile machinery	1.39	0.119	-2.10	0.112	-1.40	0.235	3.00	0.270	1.70
354	Other machinery	0.77	0.436	0.50	0.353	6.30	0.265	4.40	0.344	6.10
356	General purpose machinery	1.48	0.095	3.80	0.096	2.10	0.099	3.70	0.140	46.30
357	Machine tools and accessories	0.86	0.465	4.10	0.284	-5.20	0.254	5.00	0.404	3.50
359	Special purpose machinery	0.34	0.588	2.30	0.459	1.90	0.337	3.00	0.532	5.10
360	Electrical industrial machinery	3.51	0.008	0.40	0.038	4.00	0.047	1.40	0.061	0.00
361	Wires and cables	1.26	0.026	-0.80	0.052	3.70	0.061	5.70	0.073	4.10
362	Cells and batteries	0.46	0.217	-4.70	0.093	2.20	0.021	4.10	0.058	2.50
365+366	Radio and TV	0.98	0.111	7.80	0.102	4.50	0.080	15.30	0.202	8.80
368	Electronic valves and tubes	0.13	0.708	7.30	0.635	17.60	0.504	11.20	0.438	7.30
369	X-ray machinery	0.15	0.076	7.00	0.170	0.50	0.214	2.10	0.301	9.70
370	Ships and boats	0.82	0.100	-10.60	0.344	-3.00	0.124	13.40	0.351	11.50
371	Locomotives and parts	1.16	0.103	-1.60	0.119	-5.50	0.078	16.60	0.161	2.60
372	Wagons and coaches	1.36	0.059	-0.50	0.014	-4.30	0.024	4.00	0.069	-32.80
377	Aircraft and related products	0.19	0.631	-0.20	0.412	2.40	0.493	14.60	0.550	-0.30
	Sectoral average	**17.94**	**0.12**	**1.20**	**0.12**	**1.60**	**0.12**	**6.60**	**0.19**	**4.90**

	Consumer goods sector									
236	Printing of cotton textiles	0.39	0.002	7.00	0.025	-1.70	0.035	3.00	0.048	4.90
260	Knitted or crocheted textiles	0.18	0.002	7.20	0.019	13.60	0.008	9.70	0.031	13.60
265	Textile garments and accessories	0.41	0.001	4.30	0.001	12.40	0.098	20.00	0.566	3.10
268	Waterproof textiles	0.09	0.013	-3.60	0.017	0.70	0.044	3.90	0.291	-3.50
269	Textile products, Nec	0.03	0.230	7.60	0.223	26.30	0.231	8.60	0.260	4.60
291	Leather footwear	0.26	0.003	4.60	0.001	10.40	0.000	5.20	0.000	6.70
304	Drugs and medicines	3.00	0.044	2.70	0.064	2.70	0.048	9.00	0.017	5.00
305	Perfumes, cosmetics and lotions	0.67	0.064	3.90	0.071	36.30	0.033	0.00	0.034	1.80
311	Rubber and plastic footwear	0.14	0.007	-2.40	0.036	12.00	0.083	-0.30	0.179	1.70
342	Furniture and fixtures	0.34	0.002	-1.20	0.042	-5.30	0.068	25.00	0.183	2.20
346	Metal kitchenware	0.31	0.000	-0.10	0.001	-4.20	0.001	4.60	0.003	8.10
355	Refrigerators and air-conditioners	0.43	0.258	1.40	0.105	15.90	0.028	-3.00	0.064	-1.20
363+365	Lamps and domestic appliances	0.66	0.011	3.30	0.015	2.40	0.018	1.50	0.035	4.50
373+374	Motor vehicles, cars and products	3.93	0.034	1.70	0.032	1.50	0.032	5.10	0.054	5.50
375	Motorcycles and related products	0.52	0.015	7.70	0.016	11.70	0.005	3.40	0.027	7.50
376	Bicycles and parts	0.29	0.002	6.10	0.047	3.60	0.025	4.80	0.031	10.30
	Sectoral average	**12.17**	**0.04**	**3.10**	**0.04**	**8.60**	**0.04**	**6.30**	**0.10**	**4.70**

Notes

The sectoral average for the phases is the simple average of the yearly import coverage ratio and employment growth rates.

Source: Author's calculations based on:

(1) The Monthly Statistics of Foreign Trade, Ministry of Commerce, Government of India, and

(2) Annual Survey of Industries, Central Statistical Organization, Government of India

Table 7B : Import penetration rates (%) and labour productivity growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector		MPR	LPG	MPR	LPG	MPRB	LPG	MPR	LPG
230	Cotton ginning, bailing and cleaning	0.35	0.099	8.00	0.035	-56.40	0.039	-147.10	0.001	3249.50
235	Cotton spinning in mills	11.3	0.000	67.90	0.000	36.40	0.002	35.40	0.003	116.40
262	Threads, cordage, ropes, etc.	0.06	0.007	-4.10	0.007	7.40	0.023	10.70	-0.053	40.10
290	Tanning and curing of leather	0.36	0.004	33.70	0.027	6.10	0.140	27.10	0.096	1.90
300	Organic and inorganic chemicals	3.54	0.096	9.00	0.234	18.40	0.428	19.00	0.469	22.20
301	Fertilizers and pesticides	3.46	0.156	18.10	0.087	22.20	0.111	22.80	0.089	24.50
302+306	Synthetic rubber and manmade fibres	1.50	0.099	10.70	0.057	57.20	0.164	105.40	0.156	148.20
303	Paints, varnishes, etc.	1.18	0.020	-16.80	0.084	17.60	0.070	48.60	0.084	77.50
308	Explosives, etc.	0.22	0.017	24.10	0.008	7.80	0.013	-0.30	0.004	-10.10
309	Chemical products, Nec	0.92	0.165	10.80	0.171	22.20	0.147	36.60	0.198	48.60
310	Tyres and tubes	1.12	0.002	4.50	0.003	15.10	0.006	4.00	0.008	14.30
312	Rubber products, Nec	0.54	0.242	3.40	0.194	17.60	0.196	-2.50	0.191	20.10
313	Plastic products, Nec	0.72	0.024	-7.00	0.034	41.10	0.052	-0.90	0.037	41.30
314	Refined petroleum products	0.40	0.465	-125.40	0.262	-290.70	0.399	63.90	0.455	-22.10
318	Coke oven products	0.51	0.106	-96.60	0.299	60.40	0.537	15.90	0.618	14.60
319	Other coal tar products	0.17	0.267	-4.90	0.130	157.10	0.113	13.40	0.492	771.20
330	Iron and steel in P/SF form	8.29	0.007	11.10	0.112	12.50	0.085	12.10	0.149	15.20
331	Iron and steel in SF form	3.22	0.056	-5.50	0.301	16.50	0.253	18.10	0.154	23.60
332	Ferro alloys	0.29	0.236	-4.10	0.494	-7.70	0.503	0.80	0.386	28.20
333	Copper manufacturing	0.21	0.419	15.40	0.460	-155.10	0.485	237.50	0.408	-434.00
335	Aluminium manufacturing	0.43	0.174	16.10	0.088	14.20	0.064	34.70	0.103	10.10

336	Zinc manufacturing	0.21	0.329	164.70	0.271	55.30	0.116	432.50	0.224	-8.90
338+ 339	Metal scraps and non-ferrous	0.09	0.449	4.30	0.456	3.70	0.446	14.50	0.344	25.60
340	Fabricated structural metal products	0.37	0.205	-8.30	0.011	28.40	0.005	-17.30	0.009	100.10
341	Fabricated structural metal, Nec	0.79	0.006	-159.80	0.010	-302.80	0.019	8.80	0.030	-150.30
343+349	Hand tools, weights, etc.	0.18	0.056	8.10	0.027	-3.90	0.022	10.80	0.052	15.40
	Sectoral average	**42.22**	**0.11**	**-0.90**	**0.13**	**-7.70**	**0.15**	**36.60**	**0.18**	**160.90**
	Capital goods sector									
350	Agricultural machinery, equipment and parts	0.82	0.009	7.60	0.006	11.70	0.009	10.70	0.008	9.10
351	Construction/mining machinery	0.68	0.200	5.80	0.364	4.20	0.399	1.20	0.421	12.00
352	Prime movers and boilers	1.32	0.099	11.30	0.083	4.20	0.132	1.20	0.126	14.60
353	Food and textile machinery	1.39	0.119	5.90	0.112	14.90	0.235	10.10	0.270	0.00
354	Other machinery	0.77	0.436	11.00	0.353	3.80	0.265	0.00	0.344	27.80
356	General purpose machinery	1.48	0.095	7.10	0.096	6.80	0.099	8.50	0.140	23.20
357	Machine tools and accessories	0.86	0.465	17.50	0.284	4.00	0.254	6.90	0.404	7.50
359	Special purpose machinery	0.34	0.588	8.80	0.459	6.10	0.337	26.50	0.532	2.40
360	Electrical industrial machinery	3.51	0.008	4.20	0.038	15.80	0.047	-0.30	0.061	9.60
361	Wires and cables	1.26	0.026	-102.10	0.052	16.10	0.061	5.80	0.073	54.70
362	Cells and batteries	0.46	0.217	12.40	0.093	18.10	0.021	24.10	0.058	-2.80
365+366	Radio and TV	0.98	0.111	17.30	0.102	18.80	0.080	8.10	0.202	72.70
368	Electronic valves and tubes	0.13	0.708	12.60	0.635	18.20	0.504	18.40	0.438	23.70
369	X-ray machinery	0.15	0.076	6.90	0.170	19.30	0.214	22.20	0.301	38.90
370	Ships and boats	0.82	0.100	4.00	0.344	9.80	0.124	14.50	0.351	10.20
371	Locomotives and parts	1.16	0.103	-11.90	0.119	36.00	0.078	-75.60	0.161	185.80
372	Wagons and coaches	1.36	0.059	12.90	0.014	17.10	0.024	-0.40	0.069	66.40
377	Aircraft and related products	0.19	0.631	18.70	0.412	7.80	0.493	29.00	0.550	54.10
	Sectoral average	**17.94**	**0.12**	**2.80**	**0.12**	**12.90**	**0.12**	**6.20**	**0.19**	**33.90**

	Consumer goods sector									
236	Printing of cotton textiles	0.39	0.002	7.70	0.025	6.10	0.035	28.10	0.048	32.40
260	Knitted or crocheted textiles	0.18	0.002	0.50	0.019	6.80	0.008	6.40	0.031	35.30
265	Textile garments and accessories	0.41	0.001	1.50	0.001	12.10	0.098	3.10	0.566	18.70
268	Waterproof textiles	0.09	0.013	-418.00	0.017	-17.00	0.044	-157.10	0.291	-95.70
269	Textile products, Nec	0.03	0.230	4.50	0.223	8.00	0.231	31.30	0.260	40.80
291	Leather footwear	0.26	0.003	15.20	0.001	0.10	0.000	58.00	0.000	19.60
304	Drugs and medicines	3.00	0.044	5.10	0.064	11.90	0.048	19.30	0.017	25.80
305	Perfumes, cosmetics and lotions	0.67	0.064	1.70	0.071	16.50	0.033	25.80	0.034	35.80
311	Rubber and plastic footwear	0.14	0.007	5.10	0.036	11.90	0.083	19.30	0.179	25.80
342	Furniture and fixtures	0.34	0.002	1.70	0.042	16.50	0.068	25.80	0.183	35.80
346	Metal kitchenware	0.31	0.000	-0.10	0.001	183.90	0.001	4.70	0.003	148.20
355	Refrigerators and air-conditioners	0.43	0.258	50.60	0.105	7.00	0.028	72.90	0.064	33.00
363+365	Lamps and domestic appliances	0.66	0.011	13.80	0.015	-3.60	0.018	168.10	0.035	36.70
373+374	Motor vehicles, cars and products	3.93	0.034	10.00	0.032	4.90	0.032	23.60	0.054	33.40
375	Motorcycles and related products	0.52	0.015	11.80	0.016	12.50	0.005	15.00	0.027	28.60
376	Bicycles and parts	0.29	0.002	12.50	0.047	23.30	0.025	20.00	0.031	-1.70
	Sectoral average	**12.17**	**0.04**	**-17.30**	**0.04**	**18.80**	**0.04**	**22.80**	**0.10**	**22.30**

Notes

The sectoral average for the phases is a simple average of the yearly import coverage ratio and employment growth rates.

Source: Author's calculations based on:
(1) The Monthly Statistics of Foreign Trade, Ministry of Commerce, Government of India, and
(2) Annual Survey of Industries, Central Statistical Organization, Government of India

Table 7C : Import penetration rates (%) and real wages growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector		MPR	RW	MPR	RW	MPR	RW	MPR	RW
230	Cotton ginning, bailing and cleaning	0.35	0.099	7.80	0.035	3.10	0.039	8.30	0.001	1.30
235	Cotton spinning in mills	11.3	0.000	-2.80	0.000	0.70	0.002	-18.70	0.003	-19.00
262	Threads, cordage, ropes, etc.	0.06	0.007	-7.40	0.007	-1.50	0.023	11.00	-0.053	14.20
290	Tanning and curing of leather	0.36	0.004	2.60	0.027	6.00	0.140	1.20	0.096	-1.60
300	Organic and inorganic chemicals	3.54	0.096	6.40	0.234	-3.90	0.428	7.20	0.469	8.70
301	Fertilizers and pesticides	3.46	0.156	3.80	0.087	7.90	0.111	7.40	0.089	7.00
302+306	Synthetic rubber and manmade fibres	1.50	0.099	5.40	0.057	9.70	0.164	14.60	0.156	14.90
303	Paints, varnishes, etc.	1.18	0.020	2.20	0.084	6.10	0.070	7.00	0.084	4.30
308	Explosives, etc.	0.22	0.017	14.70	0.008	6.40	0.013	6.70	0.004	3.20
309	Chemical products, Nec	0.92	0.165	4.30	0.171	1.30	0.147	16.00	0.198	10.80
310	Tyres and tubes	1.12	0.002	3.70	0.003	9.20	0.006	7.40	0.008	10.40
312	Rubber products, Nec	0.54	0.242	-4.90	0.194	4.40	0.196	5.80	0.191	7.10
313	Plastic products, Nec	0.72	0.024	8.50	0.034	9.90	0.052	9.70	0.037	16.40
314	Refined petroleum products	0.40	0.465	21.90	0.262	3.90	0.399	19.40	0.455	12.90
318	Coke oven products	0.51	0.106	8.20	0.299	6.20	0.537	6.00	0.618	4.00
319	Other coal tar products	0.17	0.267	4.80	0.130	4.80	0.113	-0.90	0.492	4.50
330	Iron and steel in P/SF form	8.29	0.007	4.70	0.112	4.80	0.085	12.20	0.149	-22.00
331	Iron and steel in SF form	3.22	0.056	1.50	0.301	-12.90	0.253	8.00	0.154	7.70
332	Ferro alloys	0.29	0.236	8.50	0.494	10.80	0.503	13.40	0.386	2.20
333	Copper manufacturing	0.21	0.419	5.70	0.460	2.20	0.485	5.80	0.408	5.50
335	Aluminium manufacturing	0.43	0.174	2.30	0.088	8.00	0.064	31.00	0.103	20.80

336	Zinc manufacturing	0.21	0.329	10.70	0.271	-0.90	0.116	13.80	0.224	3.10
338+ 339	Metal scraps and non-ferrous	0.09	0.449	6.90	0.456	9.30	0.446	11.90	0.344	-24.20
340	Fabricated structural metal products	0.37	0.205	5.70	0.011	25.00	0.005	1.30	0.009	3.30
341	Fabricated structural metal, Nec	0.79	0.006	4.40	0.010	-0.20	0.019	7.70	0.030	10.80
343+349	Hand tools, weights, etc.	0.18	0.056	-1.60	0.027	2.80	0.022	7.20	0.052	5.10
	Sectoral average	**42.22**	**0.11**	**4.90**	**0.13**	**4.70**	**0.15**	**8.50**	**0.18**	**4.30**
	Capital goods sector									
350	Agricultural machinery, equipment and parts	0.82	0.009	6.00	0.006	7.40	0.009	9.30	0.008	12.80
351	Construction /mining machinery	0.68	0.200	5.10	0.364	9.00	0.399	2.20	0.421	4.90
352	Prime movers and boilers	1.32	0.099	10.50	0.083	-2.80	0.132	16.80	0.126	14.00
353	Food and textile machinery	1.39	0.119	1.40	0.112	-0.30	0.235	6.50	0.270	4.90
354	Other machinery	0.77	0.436	3.10	0.353	7.40	0.265	3.90	0.344	9.10
356	General purpose machinery	1.48	0.095	8.40	0.096	4.40	0.099	5.20	0.140	6.20
357	Machine tools and accessories	0.86	0.465	10.00	0.284	-2.30	0.254	7.10	0.404	5.50
359	Special purpose machinery	0.34	0.588	6.80	0.459	6.70	0.337	10.00	0.532	13.30
360	Electrical industrial machinery	3.51	0.008	3.20	0.038	7.40	0.047	5.90	0.061	1.20
361	Wires and cables	1.26	0.026	3.10	0.052	4.60	0.061	4.10	0.073	3.90
362	Cells and batteries	0.46	0.217	0.30	0.093	2.70	0.021	7.30	0.058	7.30
365+366	Radio and TV	0.98	0.111	11.10	0.102	7.10	0.080	7.50	0.202	8.50
368	Electronic valves and tubes	0.13	0.708	9.70	0.635	39.70	0.504	13.10	0.438	13.00
369	X-ray machinery	0.15	0.076	9.50	0.170	11.50	0.214	3.90	0.301	16.70
370	Ships and boats	0.82	0.100	-8.70	0.344	-1.90	0.124	14.80	0.351	15.00
371	Locomotives and parts	1.16	0.103	2.10	0.119	-2.90	0.078	16.20	0.161	11.80
372	Wagons and coaches	1.36	0.059	2.40	0.014	-0.90	0.024	3.70	0.069	-29.70
377	Aircraft and related products	0.19	0.631	0.30	0.412	9.90	0.493	18.20	0.550	9.50
	Sectoral average	**17.94**	**0.12**	**4.70**	**0.12**	**5.90**	**0.12**	**8.70**	**0.19**	**7.10**

	Consumer goods sector									
236	Printing of cotton textiles	0.39	0.002	4.30	0.025	3.40	0.035	4.10	0.048	6.40
260	Knitted or crocheted textiles	0.18	0.002	12.50	0.019	18.30	0.008	9.60	0.031	16.80
265	Textile garments and accessories	0.41	0.001	8.90	0.001	15.00	0.098	21.70	0.566	6.30
268	Waterproof textiles	0.09	0.013	1.80	0.017	2.20	0.044	5.50	0.291	6.40
269	Textile products, Nec	0.03	0.230	7.60	0.223	37.70	0.231	21.20	0.260	12.50
291	Leather footwear	0.26	0.003	4.90	0.001	8.30	0.000	22.50	0.000	15.00
304	Drugs and medicines	3.00	0.044	5.00	0.064	3.80	0.048	8.90	0.017	3.70
305	Perfumes, cosmetics and lotions	0.67	0.064	5.40	0.071	91.10	0.033	-4.40	0.034	2.40
311	Rubber and plastic footwear	0.14	0.007	-3.40	0.036	24.20	0.083	-4.40	0.179	2.40
342	Furniture and fixtures	0.34	0.002	25.60	0.042	-9.80	0.068	117.30	0.183	-7.0
346	Metal kitchenware	0.31	0.000	2.50	0.001	2.70	0.001	9.80	0.003	12.50
355	Refrigerators and air-conditioners	0.43	0.258	4.90	0.105	34.20	0.028	1.30	0.064	5.00
363+365	Lamps and domestic appliances	0.66	0.011	5.50	0.015	3.40	0.018	3.10	0.035	5.90
373+374	Motor vehicles, cars and products	3.93	0.034	7.10	0.032	3.80	0.032	9.60	0.054	8.50
375	Motorcycles and related products	0.52	0.015	15.50	0.016	14.90	0.005	8.50	0.027	10.20
376	Bicycles and parts	0.29	0.002	7.40	0.047	7.70	0.025	7.20	0.031	5.70
	Sectoral average	**12.17**	**0.04**	**7.20**	**0.04**	**16.30**	**0.04**	**15.10**	**0.10**	**7.00**

Notes

The sectoral average for the phases is a simple average of the yearly import coverage ratio and employment growth rates.

Source: Author's calculations based on:
(1) The Monthly Statistics of Foreign Trade, Ministry of Commerce, Government of India, and
(2) Annual Survey of Industries, Central Statistical Organization, Government of India

Appendix Tables

Table A1 : Import coverage ratio (%) and labour productivity growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector		NTB	LPG	NTB	LPG	NTB	LPG	NTB	LPG
230	Cotton ginning, bailing and cleaning	0.35	0.00	8.00	0.00	-56.40	0.00	-147.1	0.00	3249.50
231	Cotton spinning, not in mills	0.00	0.00	67.90	0.00	36.40	0.00	35.40	0.00	116.40
235	Cotton spinning in mills	11.27	100.00	1.30	100.00	16.50	100.00	7.30	100.00	9.20
262	Threads, cordage, ropes, etc.	0.06	100.00	-4.10	100.00	7.40	75.48	10.70	18.9	40.10
290	Tanning and curing of leather	0.36	0.00	33.70	0.00	6.10	0.00	27.10	0.00	1.90
300	Organic and inorganic chemicals	3.54	100.00	9.00	100.00	18.40	0.22	19.00	0.22	22.20
301	Fertilizers and pesticides	3.46	100.00	18.10	100.00	22.20	100.00	22.80	40.70	24.50
302+306	Synthetic rubber and manmade fibres	1.50	100.00	10.70	100.00	57.20	22.61	105.40	4.08	148.20
303	Paints, varnishes, etc.	1.18	100.00	-16.80	100.00	17.60	25.75	48.60	6.30	77.50
308	Explosives, etc.	0.22	100.00	24.10	100.00	7.80	100.00	-0.30	96.50	-10.10
309	Chemical products, Nec	0.92	100.00	10.80	93.78	22.20	14.10	36.60	3.27	48.60
310	Tyres and tubes	1.12	100.00	4.50	100.00	15.10	100.00	4.00	29.43	14.30
312	Rubber products, Nec	0.54	100.00	3.40	100.00	17.60	18.11	-2.50	11.46	20.10
313	Plastic products, Nec	0.72	100.00	-7.00	100.00	41.10	52.32	-0.90	23.76	41.30
314	Refined petroleum products	1.60	100.00	-125.40	100.00	-290.70	72.43	63.90	100.00	-22.10
316	Refined petroleum products, Nec	0.40	100.00	-257.70	100.00	-369.10	34.60	348.20	0.00	-39.40
318	Coke oven products	0.51	100.00	-96.60	100.00	60.40	0.00	15.90	0.00	14.60
319	Other coal tar products	0.17	100.00	-4.90	100.00	157.10	0.00	13.40	0.00	771.20
330	Iron and steel in P/SF form	8.29	100.00	11.10	100.00	12.50	0.00	12.10	0.00	15.20

331	Iron and steel in SF form	3.22	100.00	-5.50	100.00	16.50	0.00	18.10	0.00	23.60
332	Ferro alloys	0.29	100.00	-4.10	100.00	-7.70	0.00	0.80	0.00	28.20
333	Copper manufacturing	0.21	100.00	15.40	100.00	-155.10	5.50	237.50	34.01	-434.00
335	Aluminium manufacturing	0.43	100.00	0.90	100.00	-78.60	8.89	-338.80	3.17	57.00
336	Zinc manufacturing	0.21	100.00	16.10	100.00	14.20	2.87	34.70	15.12	10.10
338+ 339	Metal scraps and non-ferrous	0.09	100.00	164.70	100.00	55.30	4.65	432.50	3.82	-8.90
340	Fabricated structural metal products	0.37	100.00	4.30	100.00	3.70	80.00	14.50	0.00	25.60
341	Fabricated structural metal, Nec	0.79	100.00	-8.30	100.00	28.40	51.53	-17.30	13.86	100.10
343+349	Hand tools, weights, etc.	0.18	100.00	-159.80	100.00	-302.80	31.84	8.80	7.62	-150.30
	Sectoral average	**42.22**	**98.31**	**-10.20**	**98.26**	**-22.40**	**41.77**	**36.10**	**27.60**	**149.80**
	Capital goods sector									
350	Agricultural machinery, equipment and parts	0.82	100.00	7.60	100.00	11.70	20.14	10.70	11.99	9.10
351	Construction/mining machinery	0.68	100.00	5.80	68.74	4.20	2.17	1.20	0.00	12.00
352	Prime movers and boilers	1.32	100.00	11.30	100.00	4.20	40.04	1.20	0.23	14.60
353	Food and textile machinery	1.39	100.00	5.90	76.86	14.90	0.00	10.10	0.00	0.00
354	Other machinery	0.77	100.00	11.00	68.24	3.80	0.00	0.00	0.00	27.80
356	General purpose machinery	1.48	100.00	7.10	60.00	6.80	0.00	8.50	0.00	23.20
357	Machine tools and accessories	0.86	0.00	17.50	0.00	4.00	0.00	6.90	0.00	7.50
358	Office and computing machinery	0.13	100.00	11.60	100.00	59.80	1.66	28.50	0.22	2.50
359	Special purpose machinery	0.34	100.00	8.80	80.64	6.10	1.22	26.50	0.83	2.40
360	Electrical industrial machinery	3.51	100.00	4.20	65.57	15.80	11.69	-0.30	0.00	9.60
361	Wires and cables	1.26	100.00	-102.10	100.00	16.10	80.00	5.80	16.86	54.70
362	Cells and batteries	0.46	100.00	12.40	60.00	18.10	20.00	24.10	51.15	-2.80
365+366	Radio and TV	0.98	100.00	17.30	97.25	18.80	56.51	8.10	14.59	72.70
368	Electronic valves and tubes	0.13	100.00	12.60	44.34	18.20	20.02	18.40	19.65	23.70
369	X-ray machinery	0.15	100.00	6.90	63.11	19.30	0.00	22.20	0.00	38.90
370	Ships and boats	0.82	100.00	4.00	100.00	9.80	74.35	14.50	29.51	10.20
371	Locomotives and parts	1.16	100.00	-11.90	100.00	36.00	0.00	-75.60	0.00	185.80
372	Wagons and coaches	1.36	100.00	12.90	100.00	17.10	0.00	-0.40	0.00	66.40

377	Aircraft and related products	0.19	100.00	18.70	100.00	7.80	77.51	29.00	99.89	54.10
379	Transport equipment, Nec	0.13	100.00	1.60	100.00	6.60	0.00	17.10	0.00	0.30
	Sectoral average	**17.94**	**95.11**	**3.20**	**77.21**	**15.00**	**20.47**	**7.80**	**8.15**	**30.80**
	Consumer goods sector									
232	W&F of khadi cotton	0.01	0.00	248.60	0.00	19.80	0.00	21.50	0.00	0.20
233	W&F of handloom cotton	0.05	0.00	21.80	0.00	-7.40	0.00	34.80	0.00	29.40
234	W&F of power-loom cotton	0.10	0.00	83.00	0.00	-4.80	0.00	49.80	0.00	41.00
236	Printing of cotton textiles	0.39	100.00	7.70	100.00	6.10	100.00	28.10	100.00	32.40
260	Knitted or crocheted textiles	0.18	100.00	0.50	100.00	6.80	99.96	6.40	97.38	35.30
263	Blankets, shawls, carpets and rugs	0.10	100.00	4.80	100.00	38.80	100.00	6.20	69.49	57.20
265	Textile garments and accessories	0.41	100.00	1.50	100.00	12.10	78.57	3.10	74.30	18.70
267	Made-up textiles	0.01	100.00	-19.10	100.00	25.00	59.64	23.70	16.45	27.60
268	Waterproof textiles	0.09	100.00	-418.00	100.00	-17.00	82.55	-157.10	0.21	-95.70
269	Textile products, Nec	0.03	100.00	4.50	100.00	8.00	17.99	31.30	0.67	40.80
291	Leather footwear	0.26	100.00	15.20	100.00	0.10	100.00	58.00	100.00	19.60
292	Apparel of leather and substitutes	0.01	100.00	-3.50	100.00	13.60	100.00	10.90	100.00	19.90
293	Leather products and substitutes	0.00	100.00	12.00	100.00	12.20	100.00	29.00	100.00	-4.50
299	Leather and fur products, Nec	0.00	100.00	29.60	100.00	32.90	38.42	18.60	30.31	7.50
304	Drugs and medicines	3.00	100.00	5.10	58.56	11.90	1.46	19.30	2.12	25.80
305	Perfumes, cosmetics and lotions	0.67	100.00	1.70	99.52	16.50	65.04	25.80	21.59	35.80
311	Rubber and plastic footwear	0.14	100.00	9.30	100.00	5.60	0.00	4.30	0.00	2.50
342	Furniture and fixtures	0.34	100.00	-0.10	100.00	183.90	19.06	4.70	8.28	148.20
346	Metal kitchenware	0.31	100.00	50.60	100.00	7.00	100.00	72.90	50.00	33.00
355	Refrigerators and air-conditioners	0.43	100.00	13.80	100.00	-3.60	100.00	168.10	50.00	36.70
363+365	Lamps and domestic appliances	0.66	100.00	10.00	100.00	4.90	86.85	23.60	75.23	33.40
373+374	Motor vehicles, cars and products	3.93	100.00	11.80	100.00	12.50	23.67	15.00	6.61	28.60
375	Motorcycles and related products	0.52	100.00	12.50	100.00	23.30	100	20.00	100	-1.70
376	Bicycles and parts	0.29	100.00	7.60	100.00	15.20	6.24	10.80	2.64	11.10
	Sectoral average	**12.17**	**98.69**	**4.60**	**87.85**	**17.60**	**45.69**	**22.00**	**33.43**	**24.30**

Table A2 : Effective rate of protection (%) and labour productivity growth (%) in Indian manufacturing: Use-based classification										
Code: NIC87	Three-digit classification description	Gross value-added share 1980/81	Phase I 1980/85		Phase II 1986/90		Phase III 1991/95		Phase IV 1996/2000	
	Intermediate goods sector		ERP	LPG	ERP	LPG	ERP	LPG	ERP	LPG
230,231,235	Cotton textiles	11.62	109.77	25.70	125.38	-1.20	68.38	-34.80	42.93	1125.00
262	Threads, cordage, etc.	0.06	160.91	-4.10	151.23	7.40	95.79	10.70	48.22	40.10
290	Tanning and curing of leather	0.36	117.73	33.70	123.15	6.10	78.86	27.10	52.42	1.90
300	Organic and inorganic chemicals	3.54	95.85	9.00	115.90	18.40	85.79	19.00	38.94	19.00
301	Fertilizers and pesticides	3.46	50.79	18.10	60.05	22.20	60.49	22.80	28.70	24.50
302+306	Synthetic rubber and fibres	1.50	173.07	10.70	157.73	57.20	78.75	105.40	40.63	148.20
303	Paints, varnishes, etc.	1.18	171.73	-16.80	434.42	17.60	123.36	48.60	39.17	77.50
308,309	Explosives, chemicals, Nec, etc.	1.14	97.30	17.50	116.33	15.00	81.09	18.20	37.49	19.30
310,312	Rubber products, tyres and tubes	1.64	123.74	3.95	146.70	16.35	88.69	0.75	53.73	17.20
313	Plastic products, Nec	0.72	150.71	-7.00	166.34	41.10	97.18	-0.90	42.85	41.30
314, 316	Petroleum products	2.00	96.22	-191.50	107.68	-329.90	68.93	206.00	26.16	-30.750
318, 319	Coke, coal	0.68	56.68	-50.75	76.56	108.80	62.68	14.70	34.73	392.90
330,331	Iron and steel	11.51	225.23	2.80	195.01	14.50	109.73	15.10	51.69	19.40
332	Ferro alloys	0.29	93.29	-4.10	109.18	-7.70	65.55	0.80	28.85	28.20
333,35,36,38	Copper, aluminium, zinc	0.94	87.51	50.10	109.59	-20.50	69.32	179.80	34.85	-101.80
340,341	Fabricated structural metals	1.33	428.65	-84.05	314.76	-137.20	181.96	-4.25	50.56	-25.10
343+349	Hand tools and weights	0.18	86.02	8.10	106.68	-3.90	71.60	10.80	37.39	15.40
	Sectoral average	**42.22**	**147.03**	**-10.50**	**149.18**	**-10.30**	**87.58**	**37.60**	**40.13**	**106.60**
	Capital goods sector									
350	Agricultural machinery, parts and equipment	0.82	30.40	7.60	44.36	11.70	39.90	10.70	27.90	9.10
351,352,354	Mining machinery, boilers, other machinery	2.77	51.85	9.40	61.98	4.10	39.06	0.80	25.85	18.10

353	Food and textile machinery	1.39	48.66	5.90	59.97	14.90	37.75	10.10	29.31	0.00
356, 359	General purpose machinery	1.82	52.73	8.00	76.65	6.50	47.72	17.50	29.47	12.80
357	Machine tools and accessories	0.86	33.27	17.50	64.33	4.00	41.69	6.90	24.60	7.50
358	Office and computing machinery	0.13	101.15	11.60	98.24	59.80	73.74	28.50	39.25	2.50
360	Electrical industrial machinery	3.51	83.15	4.20	64.26	15.80	46.47	-0.30	26.45	9.60
361	Wires are cables	1.26	51.53	-102.10	134.31	16.10	89.79	5.80	66.50	54.70
362	Cells and batteries	0.46	199.92	12.40	177.86	18.10	102.81	24.10	61.80	-2.80
365,368,369	Apparatus, valves, machines	1.26	91.15	15.00	130.07	18.50	79.72	13.30	33.43	48.20
370	Ships and boats	0.82	47.25	4.00	62.15	9.80	46.24	14.50	42.03	10.20
371, 372	Locomotives, wagon, coaches	2.52	47.12	0.50	64.33	26.60	45.36	-38.00	28.78	126.10
377, 379	Aircraft, transport, Nec, etc.	0.32	85.69	10.20	112.16	7.20	85.60	23.10	53.85	27.20
	Sectoral average	**17.94**	**62.77**	**0.30**	**78.45**	**16.40**	**54.23**	**9.00**	**33.30**	**24.90**
	Consumer goods sector									
232, 233	Khadi and handloom cotton	0.06	109.36	135.20	126.85	6.20	70.95	28.20	42.99	14.80
234, 236	Power-loom and printed cotton	0.49	109.77	45.40	125.38	0.70	68.38	39.00	42.93	36.70
260,265,267	Textiles	0.60	138.33	-5.70	149.89	14.60	98.45	11.10	54.25	27.20
263	Blankets, shawls, rugs, etc.	0.10	102.52	4.80	91.80	38.80	63.30	6.20	44.66	57.20
268, 269	Waterproof textiles and others	0.12	160.91	-206.75	151.23	-4.50	95.79	-62.90	48.20	-27.45
291	Leather footwear	0.36	151.87	15.20	158.49	0.10	91.57	58.00	35.71	19.60
292,293,299	Leather products	0.01	117.73	12.70	123.15	19.60	78.86	19.50	52.42	7.60
304	Drugs and medicines,	3.00	80.36	5.10	97.30	11.90	82.02	19.30	40.19	25.80
305	Perfumes, etc.	0.01	133.40	1.70	234.25	16.50	98.63	25.80	56.95	35.80

311	Footwear rubber and plastics	0.14	137.22	-0.10	157.28	183.90	92.93	4.70	48.29	148.20
342, 346	Furniture and metal ware	0.65	116.63	32.20	147.80	1.70	92.75	120.50	47.58	34.90
355, 363+64	ACs/refrigerators, lamps, appliances	1.09	100.45	10.90	110.73	8.70	78.03	19.30	46.85	31.00
373+374	Vehicles, cars and products	3.93	94.17	12.50	96.57	23.30	71.96	20.00	49.03	-1.70
375	Motorcycles and parts	0.52	119.51	7.60	93.52	15.20	75.00	10.80	52.43	11.10
376	Bicycles and parts	0.29	121.76	- 4.40	50.99	20.00	61.58	6.60	53.18	13.50
	Sectoral average	**12.17**	**101.51**	**4.40**	**111.56**	**23.80**	**80.55**	**21.70**	**48.28**	**29.00**

Notes:

The sectoral average for the phases is a simple average of the yearly effective rate of protection and labour productivity growth rates.

Source : Author's calculations based on:

(1) Customs Tariff Working Schedule, Central Excise and Customs, Government of India, and

(2) Input-Output Transaction Table 1983-84 and 1989-90, Central Statistical Organization, Government of India, and Annual Survey of Industries (Yearly Issues), Government of India

CHART 1
Employment growth in use-based sectors: 1980/2000

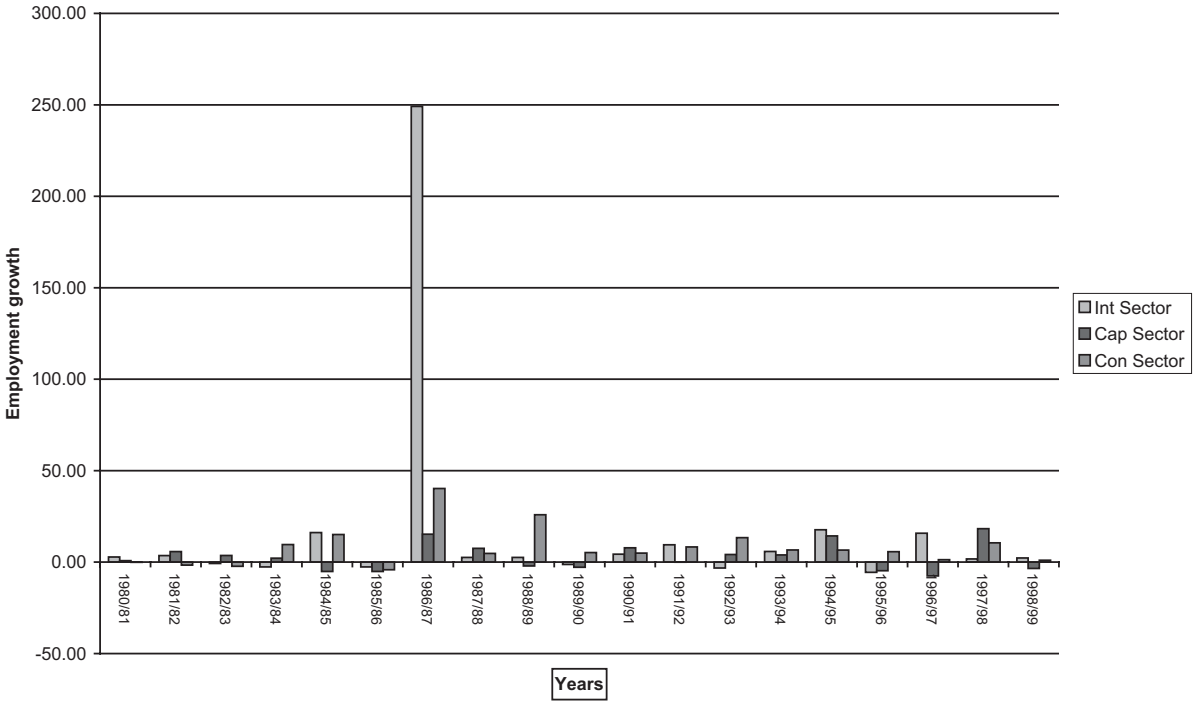


CHART 2
Productivity growth in use-based sectors: 1980/2000

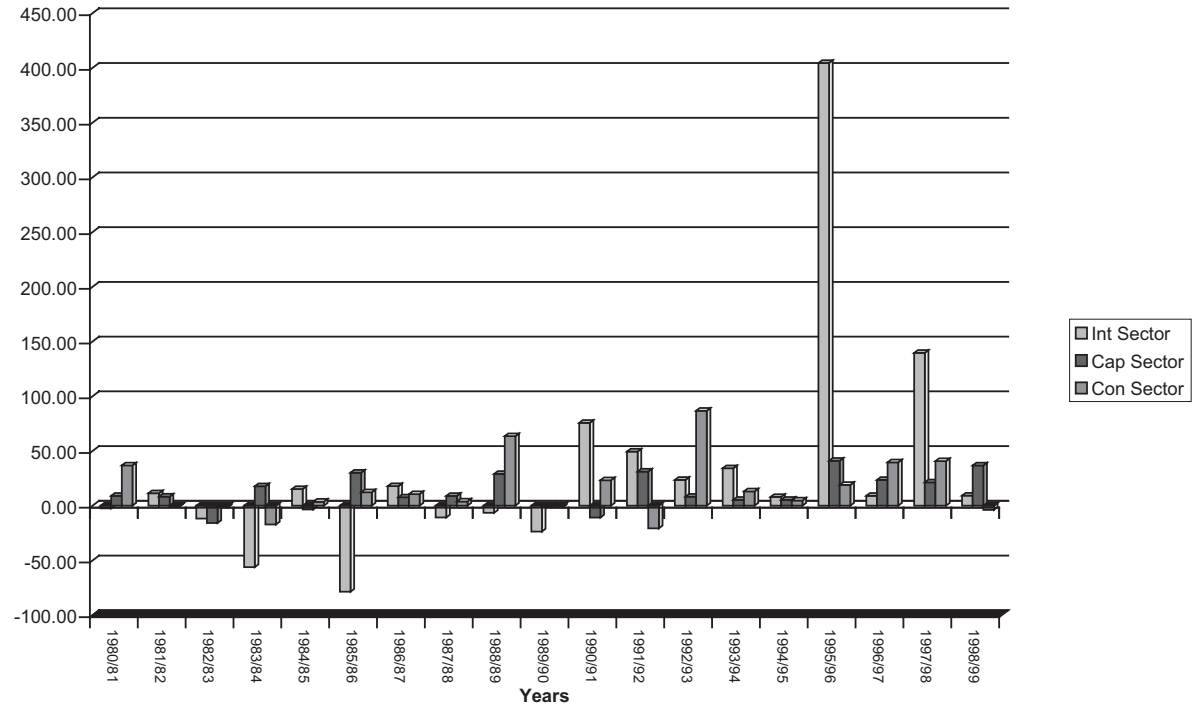


CHART 3A

Labour Productivity growth and Employment growth by use-based sectors: Intermediate industries (1980/2000)

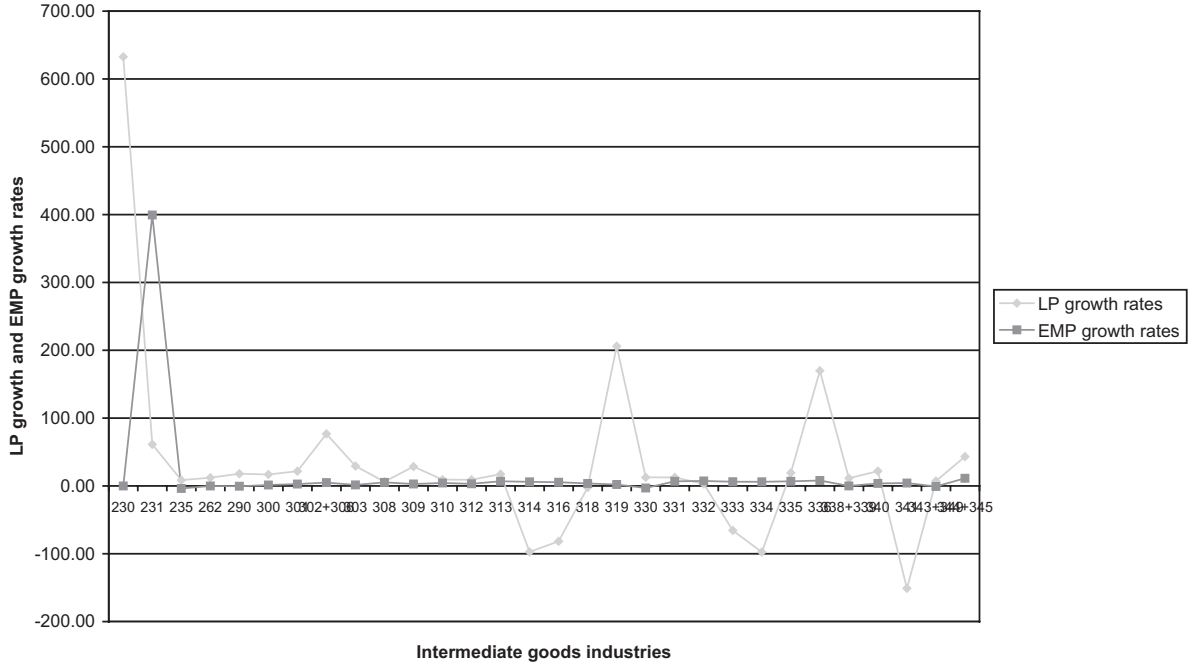


CHART 3B

Labour Productivity (LP) growth and Employment growth by use-based sectors: Capital goods industries (1980/2000)

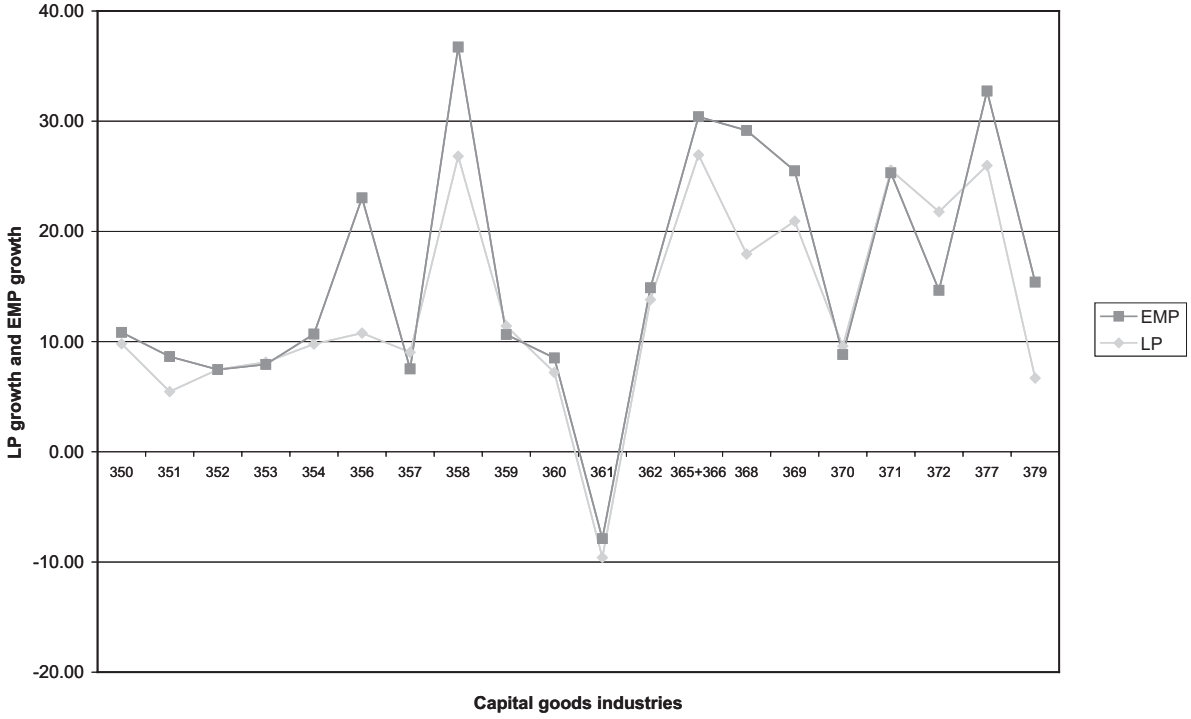


CHART 3C

Labour Productivity (LP) growth and Employment growth by Use-based groups: Consumer goods industries (1980/2000)

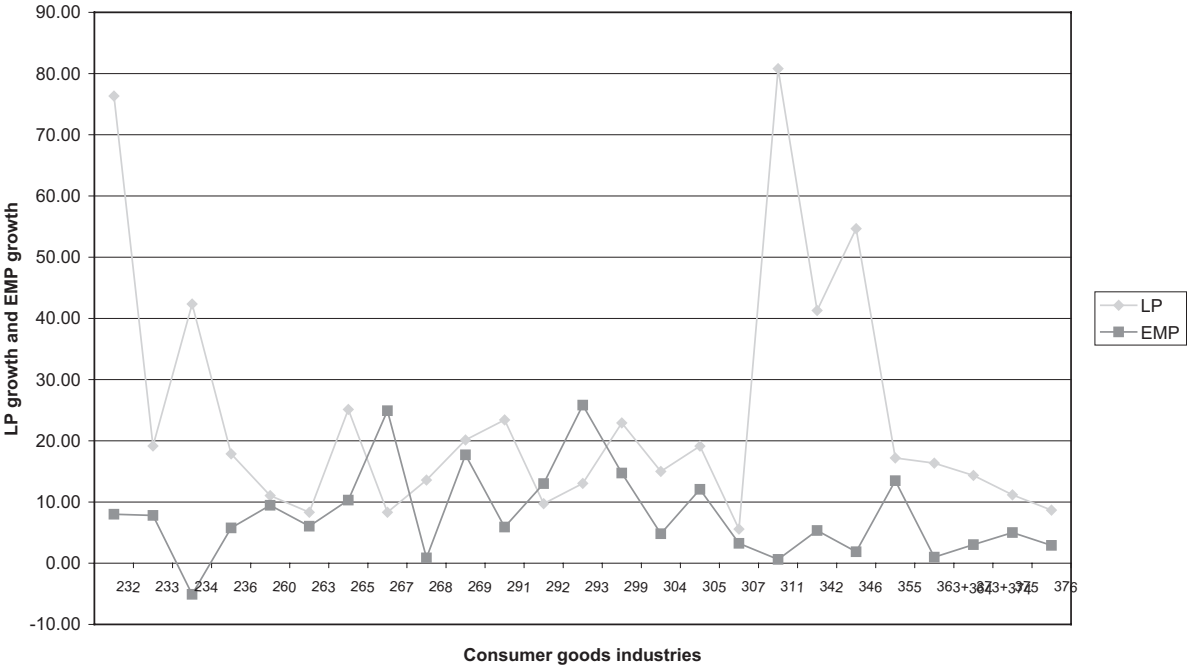
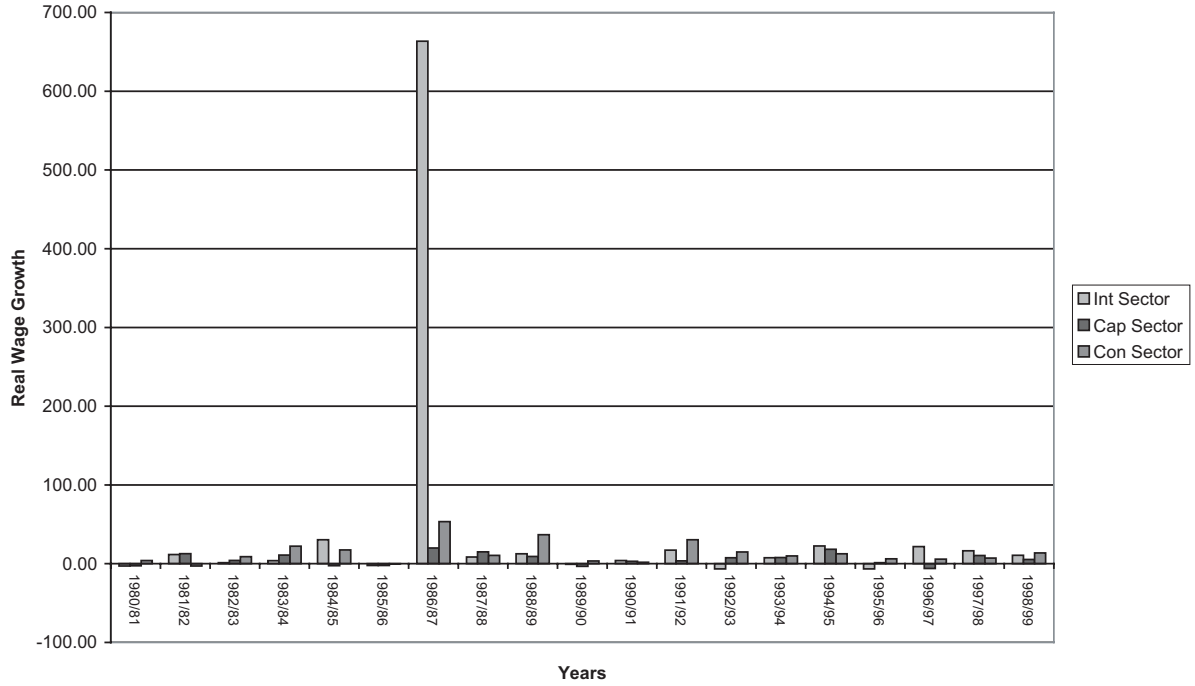
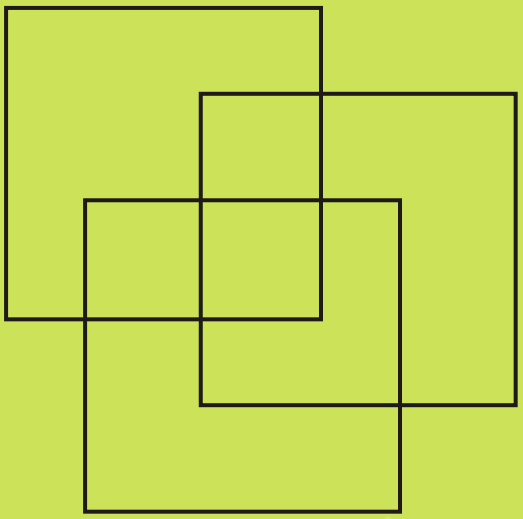


CHART 4

Real wage growth in use-based sectors: 1980/2000





For more information please contact:

Phone: +91 11 2460 2101
Fax: +91 11 2460 2111
Email: sro-delhi@ilodel.org.in

International Labour Office
Subregional Office for South Asia
India Habitat Centre, Core-4B, 3rd Flr
Lodhi Road, New Delhi-110 003, India
www.ilo.org/india