Labor Market Outcomes and Trade Reforms: The Case of India*

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Introduction

The empirical literature on the impact of trade policies on compensation of factors of production has mainly had a developed country focus (see Lawrence and Slaughter, 1993; Krugman and Lawrence, 1994; Sachs and Shatz, 1994; Freeman and Katz, 1995). Much of the existing literature has been concerned with how trade liberalization has affected trends in the U.S. labor markets[i] — the widening of income inequality between skilled and unskilled labor, the decline in overall employment in manufacturing sectors, and the especially sharp decline in employment in low-skill manufacturing sectors[ii]. In contrast, the linkages between trade and labor markets are yet to be explored thoroughly in the context of developing countries[iii]. This chapter takes a step in this direction by analyzing the relationship between labor markets and international trade in the Indian context. In particular, it focuses on the trade liberalization initiated in 1992 and their consequences for labor market outcomes.

Indian Economic Policies since Independence

India, like many developing countries, in the early 1950s embarked on a socialist strategy of state-directed, heavy industry–based industrialization. The strategy implemented via a series of five-year plans, was based on the principle of export pessimism. It emphasized import substitution industrialization and envisaged an active and expansionary role for the state, as a regulator, as a provider of infrastructure services, and as a direct (and sometimes sole) producer of goods and services. India's development strategy provided high levels of protection to domestic import-competing industries and was complemented by a system of financial repression and complex licensing

requirements. State control was extensive, and covered foreign trade, investment (both domestic and foreign), prices of essential commodities, and internal trade.

While such an inward-looking policy initially raised industrial growth to about 7 percent per year, the period 1962–1980 witnessed sluggish growth rates both in the manufacturing sector (4.7 percent) and in overall GDP (3.3 percent)[iv]. The highly interventionist development policies adhered to during this period of insulation led to a severely distorted production structure as the Indian economy remained mired in a vicious circle of low productivity/product obsolescence and slow growth. Not only was the performance of the Indian economy well below the targets set by the planning authorities, the country was left lagging in terms of economic growth and development relative to its East Asian neighbors such as Indonesia, Thailand, and Korea, all of whom had broadly similar levels of per capita income at the time of India's independence.[v]

The Policy Reforms of 1991

By the early 1980s, the limitations of the earlier strategy based upon import substitution, public sector dominance, and extensive government control over private-sector activity had become evident. It was obvious to many that the pervasive regulation and controls over private economic activity by the government had had effects opposite to those intended and had inhibited economic efficiency and economic growth. Accordingly, some modest trade liberalization and a reduction of investment and output controls in select industries were initiated in this decade. However, most analysts did not regard the results as having significantly reduced the regulatory burden. While the GDP growth rate in this decade accelerated to about 5.6 percent per year, the rapid increase in fiscal deficits (8 percent of GDP) rather than the reforms was responsible for this acceleration in growth rates.

More importantly, these reforms were somewhat ad hoc and could not overcome the severe and unsustainable macroeconomic imbalances faced by the Indian economy, particularly with regard to the escalating fiscal deficits (Joshi and Little, 1996). The underlying problem was that growth spurred by excess aggregate demand resulting from fiscal deficits was unsustainable. The current account deficit and the inflation rate were rising, and by 1990, imports had to be cut back as financing was simply not available. Foreign exchange reserves fell to US$1 billion in June 1991, and faced with a looming balance of payment crisis, India entered into an IMF structural adjustment program. In addition to the conventional expenditure-switching and deficit-reducing policies, a range of far-reaching economic policy reforms in the external, industrial, financial, and public sectors were implemented (Srinivasan, 1996). This program of economic reforms constituted a significant reversal of some of the most egregious aspects of earlier policies of regulation and government intervention in the economy.

Even as the stabilization policies (which combined fiscal tightening with exchange rate devaluation) exhibited short-term success, the Indian finance minister continued to address the underlying structural issues that had hampered earlier growth. A series of other policy measures enacted in rapid succession in the first two years after the reforms reversed and reduced many of the controls on domestic economic activity. These reforms included

1. Trade policy reforms: a rapid reduction in tariff rates as well as a reduction in their dispersion, abolition of export taxes, and elimination of direct export subsidies,
2. Industrial reforms: abolition of licensing requirements for setting up of new industrial undertakings, mergers, and expansion of industrial capacities.
3. A drastic reduction of industries reserved for public sector.

4. Automatic approval for up to 100 percent foreign equity in certain areas, opening up of most sectors to FDI and permission for portfolio investments.

5. Abolition of various investment controls and a sharp reduction in public investment in all sectors.

The External Sector: Composition, Trends, and Reforms

Composition

From 1988–90 to 1998—2000 India's export dependence on primary products, as indicated by its average share in India's total merchandise exports, declined over the period (from 24 percent in 1988–90 to about 19 percent in 1998–2000), and that on manufactured products increased slightly (from 71 percent in 1988–90 to 77 percent by 1998–2000). This composition has remained almost unchanged over the past decade or more.[vi] The three main components of India's imports are raw materials and intermediate goods (38 percent), petroleum and crude oil (20 percent), and capital goods (18 percent). The balance consists primarily of manufactured imports. Over the last decade the relative share of oil in the total import bill has been falling consistently. While raw materials still contribute the majority of the imports, the relative share of manufactured products has been going up.

Trends

India's exports have grown much faster than GDP over the past few decades. From 1970 to 1998 exports have grown over 11 percent per year while annual GDP growth has averaged 5 percent per year.[vii] Table 1 summarizes the key indicators of India's external sector for the period 1980 1997. The following general observations may be made on the basis of this data: India has been able to gradually increase its share in global merchandise trade and exports from 0.59 percent and 0.44 percent in 1980 to 0.75

percent and 0.65 percent, respectively, in 1997. While this increase may not appear particularly striking at first, it is significant, considering that India's share in world merchandise trade was on a declining trend up until 1991. Between 1990 and 1999 India's merchandise trade and exports grew at an annual compound average of 8.2 percent and 9.0 percent, respectively. Since this growth was matched by an expansion of the overall economy, India's level of openness, as measured by the trade (X + M) to GDP ratio, has remained more or less constant over the past few years at 25 percent (though this was almost 70 percent higher than that in 1980). In terms of the services sector, India's share in world service exports has declined from 0.79 in 1980 to 0.68 in 1997. Simultaneously, India's share in world service imports has risen from 0.74 percent to 0.95 percent during the same period. During the last few years, India's software exports have risen to $5.1 billion with average export growth rate of over 50 percent.

<Table 1 about here>

Reforms

As Table 2 shows, in the post-reform regime, the average tariff rate fell from 113 percent in 1990 to 29 percent in 1999, while the trade-weighted tariffs declined from 87 percent in 1990 to around 30 percent by 1999. Moreover, significant progress has been made in recent years toward a compression and simplification of tariff structures: the tariff structures have become more uniform across goods, as observed by a decline in the dispersion of tariff rates over the period 1990–1999 (Table 1).

<Table 2 about here>

Prior to 1991, quantitative restrictions existed on 90 percent of value added of the manufacturing sector. The reforms reduced such nontariff barriers by eliminating quantitative restrictions (quotas and import licensing requirements), particularly on intermediate and capital goods. The import licensing regime was replaced by a "negative list," which listed all those goods (including consumer goods) that could *not* be imported. Those items not so listed were eligible for importation without license. In addition, import of technology was also liberalized to provide access to modern and efficient techniques of production by Indian industries. Finally, export controls on 432 items were mostly lifted after 1992.

Similarly, the government of India for the first time attempted to attract foreign direct and portfolio investment by reducing and removing restrictions on it. Until 1991, foreign investment was permitted only in cases in which it provided technology transfer, and equity participation above 40 percent was generally not permitted. In July 1991, foreign technology agreements, foreign direct investments, and industrial licensing were all liberalized. Last but not least, the Indian rupee was allowed to float in March 1992 and currency convertibility on the current account was introduced in August 1994.

The Manufacturing Sector

Indian exports are dominated by manufactured goods, which accounted for about a 76 percent share by 1997–98, increased from 50 percent in 1970–71. From Table 1 we can see that while the share of primary exports (food and agricultural raw materials) in total merchandise exports has fallen, the share of the manufactured sector has risen. Within the manufactured sector, in the period 1998–2000, the largest share of exports consisted of handicrafts, primarily gems and jewelry (18.0 percent), engineering goods

(14.0 percent), ready-made garments (12.3 percent), textile yarn fabrics (11.6 percent), and chemicals and allied products (9.0 percent). Table 3 shows the tariff rates by three-digit ISIC codes in the manufacturing sector. As we can see, after 1992 there was a significant decline in protection levels across all sectors as well as a decline in the standard deviation of tariffs (from 24.9 in 1992 to 16.2 in 1999).

<Table 3 about here>

Labor Markets: Structure, Trends, and Reforms

Structure

Between 1977–78 and 1993–94, India's population increased from 639.1 million to 902.8 million, an annual growth rate of 2.2 percent, while its labor force grew from 276.3 million to 385.5 million, an annual growth rate of 2.1 percent[viii]. Two-thirds of India's workforce finds employment in agriculture and rural industries. One-third of rural households are agricultural labor households, subsisting on wage employment. Only about 9 percent of India's workforce is in the organized sector[ix]; the remaining 91 percent are in the unorganized sector, self-employed, or employed as casual wage laborers. To a large extent this reflects the high share of agriculture in the workforce, as well as the low growth in manufacturing employment. Within the organized sector, the public sector accounts for about two-thirds of the employment. Table 4 shows how the distribution of employment by status has changed over the years.

<Table 4 about here>

The labor force in the nonagricultural sector can be divided into three different segments. At one end are the elite white-collar workers, consisting of senior public sector officials and the managerial class in the private sector. It is estimated that this segment accounts for no more than 1 percent of the labor force, roughly 3 million workers. At the other end are self-employed, informal-sector workers, and casual laborers making up the unorganized sector. This sector accounts for 92 percent of the labor force, about 300 million workers. In the middle are the regular wage employees in the public sector and in the organized private sector, who account for about 7 percent of the labor force, about 22 million people (Agarwala and Khan, 2002). In the nonagriculture sector, workers are more skilled since they have access to formal education as well as to training facilities. India is endowed with an abundant and technologically skilled labor force (especially engineers and scientists), and is ranked first among 53 countries for both these criteria in the Global Competitiveness Report (GCR) 1998.[x] As mentioned in the previous section, the recent surge in computer software exports reflects this growing comparative advantage in the skilled-labor sector.

Trends

Despite the ambitious industrialization program undertaken in 1950, there has been only a modest decline in the agricultural sector's share of the workforce (from 71.2 percent to 66.8 percent). In the experience of most countries, as the country develops, the workforce shifts initially from the primary to the industrial sector, and only then to the services sector. In contrast, in India, the workforce has shifted from the primary to the services sector, and *not* to the industry sector. Moreover, within the industry and services sectors, the share of the organized sector has declined to some extent (see Table 4). Therefore, (within the nonagricultural sector), it is the unorganized sector that accounts

for most of the additional employment generated. This, perhaps, reflects rigidities in the labor market and had labor markets functioned more flexibly, pensions been more mobile, and legislation been more conducive, the organized sector might have occupied a more prominent share of the workforce.

As Table 5 shows, from 1982–83 to 1988–89, the growth of real wages in public corporations was 6.46 percent per year. This was in striking contrast to the growth rate of real wages in smaller industrial enterprises (with 10 to 99 workers), which barely experienced a 1 percent growth in real wages. Organized-sector labor, which is highly unionized, has managed to achieve significant growth in real wages, much ahead of the growth of per capita income in the economy. Such a trend contradicts the rhetoric of reducing income disparity and providing greater increases in income to the lower-income groups. Large industries managed to absorb these higher wages, because the markets were protected from world competition through trade restrictions and the firms could pass on the higher costs to consumers.

<Table 5 about here>

By the 1980s, employment elasticities in major sectors had fallen (Table 6) and average annual growth rates in GDP (approximately 4.6 percent in the 1980s) had outstripped average annual growth rates in employment (Table 7). The declining employment elasticities (which implies that more output is attained with less employment) can be attributed to employers investing in more capital-intensive technologies, and the considerable amount of labor shedding in the private and public-sector enterprises since the mid-1980s (Bhattacherjee, 1999).

<Table 6 about here>

<Table 7 about here>

Reforms

Modifying labor laws to enhance flexibility in labor markets was envisaged as part of the economic reform program that commenced in 1991. However, the lack of consensus and political instability at the center has delayed the passage of industrial relations reforms. A handful of changes have been initiated in recent years. For instance, as part of the restructuring of unprofitable public-sector enterprises, a voluntary retirement scheme (assisted by the National Renewal Fund) was instituted by the government to reduce their workforce. This, in turn, triggered similar programs in the private sector. In 2002, the government decided to amend the Industrial Disputes Act of 1947 (summarized in the next section), allowing companies to lay off employees without seeking its permission, if they employ less than 1,000 workers. This change is likely to impact 95 percent of Indian enterprises, provide employers with greater freedom in their labor decisions and improve labor market flexibility[xi].

The Manufacturing Sector

In India, employment in manufacturing grew at an average annual rate of 1.83 percent over the 1972–1992 period, while real wages grew at an average annual rate of 1.12 percent. This is in stark contrast to East Asian countries where the corresponding figures are 6.4 percent and 5.3 percent. In the last two decades, the registered manufacturing sector[xii] has witnessed an investment boom; growth in fixed investment increased from 9 percent per year in the 1980s to 15 percent per year in the 1990s. Most

of this investment was domestically financed, with realized inward FDI only about $9 billion since the reforms (Nagaraj, 2002). As a result of this investment boom, employment growth in registered manufacturing, improved in the 1990s, accelerating to approximately 3.7 percent.

However, there seems to be no association between growth in earnings and employment across industries. Table 8 shows how the share of wages in value added has changed over the years for the manufacturing sector, disaggregated at three-digit ISIC codes. As we can see, in 13 of the 28 industries the share of wages fell by more than 10 percent after structural reforms were undertaken. In only two industry groups (paper and other nonmetallic mineral products) did the share of wages rise. Comparing 1998 to 1993, we see that for most industry groups the share of wages was stagnant and even in cases where they did rise (e.g., other manufactured products), they never recovered to pre-reform levels. Next, simple tests performed on real wage per employee reveal that there is no evidence for a significant acceleration in the *growth rate* of real wage per employee.

<Table 8 about here>

The Indian manufacturing sector is characterized by a significant presence of small scale and unregistered manufacturing — it accounts for 24 percent of the capital employed and 82 percent of the workforce. In unregistered manufacturing, growth rates of employment, output, and investment have slowed after the reforms. Poor employment growth and a sharp fall in the number of establishments (Table 9) have adversely affected unregistered manufacturing (Nagaraj, 2002).

<Table 9 about here>

Labor Markets: Regulations and Rigidities

The agrarian and the informal sectors of the economy, which account for the bulk of employment, have remained outside the scope of labor laws and labor-market institutions. The few laws applicable to the unorganized sector (including agriculture) are difficult to administer and enforce owing to the decentralized nature and geographic dispersion of these activities. Furthermore, the informal nature of employment contracts, the illiteracy of the workers, and the surplus labor in the rural economy have doomed attempts to unionize these workers.[xiii] Most labor laws in India are therefore applicable to the organized sector. While the organized sector employs only a small proportion of the labor force in the country, slow growth of employment in the sector has economy-wide repercussions. The organized sector offers what can be called "good" jobs and failure of the sector to draw out labor from unorganized sectors leads to a general deterioration in employment conditions.

The Legislative Framework

While there are as many as 165 labor legislations, including 47 central acts (Debroy, 1997), this discussion will be limited to the most important ones that regulate the labor markets in India. The Factories Act of 1948 is the fundamental labor law in the organized sector and is mandated for all factories.[xiv] It aims to regulate working conditions in factories and ensures minimum standards of safety, health, and welfare conditions of factory workers. The act also regulates the working hours, leave, holiday, overtime, and employment of children, women, and young persons. The Shops and

Establishments Act regulates the working conditions of workers in the unorganized sector, including shops and establishments that do not fall under the Factories Act.

The Trade Union Act of 1926 provides for the registration and operation of the trade unions. The act allows any seven workers to register their trade union, but has no provision for union recognition (e.g., through a secret ballot procedure). This has led to a multiplicity of unions with outsiders playing a prominent role. In 1996 India had 58,805 registered unions, the vast majority of which were small unions that depend on their affiliates at the national labor centers to do their bargaining. In many cases, the outsiders controlling the unions are not really concerned about the genuine interests of the organization and workers — they misguide workers and use them to pursue their own agenda. The large number of trade unions (affiliated to various political parties) has also led to inter union rivalry for members. This rivalry manifests itself in labor militancy. From 1950 to 1975 almost 30 percent of the industrial disputes in India could be attributed the problems of union recognition and inter union rivalry (Datta Chaudhuri, 1996).

Employment security in India is regulated mainly on the basis of the Industrial Disputes Act of 1947 and the Industrial Employment (Standing Orders) Act of 1946. The Industrial Disputes Act (IDA) of 1947 governs the relationship between the worker and her employer. This act applies to establishments employing 50 or more workers in the organized sector. It confers on the state the power to regulate labor-management relations where, the state assumes the role of the arbiter in lieu of a bargained relationship. With the state occupying the center stage in this tripartite dispute settlement mechanism, the legal framework of industrial relations inhibits the growth of voluntary relationship between workers and their employers, and fosters dependence on the state. Moreover, the

inclusion of the state in dispute settlement mechanisms has unnecessarily complicated bargaining processes since the state's position on disputes must take into account political considerations and the state itself is the dominant employer in the organized sector (employing 19 million of almost 27 million employees), so that it is hardly a neutral participant. This act also has no provision for procedures to determine the representative union in what would normally be a single bargaining unit. With employers under no legal obligation to bargain with unions, this means that there are no built-in incentives for either party to engage in collective bargaining.

Due to the pressures from trade unions, the IDA itself was amended in 1976 and 1982. According to the 1976 amendment of the IDA, any firm employing 300 more workers requires permission from the government before laying off or retrenching its workers. The 1982 amendment of the IDA made this provision applicable to all firms employing 100 more workers. These populist amendments led to further employment inflexibility since government permission to lay off workers was seldom forthcoming.[xv] The amendments also stipulated that an employer had to give three weeks' notice in writing to the worker of any change in his working conditions. The worker, of course, has the right to object to these changes, making industrial disputes more likely.

The Industrial Employment (Standing Orders) Act sets the rights and obligations of employees and employers relating to classification of employees, shift work, hours of work, entry and exit, attendance, stoppage of work, leave and holidays, punishments for misconduct, suspension or dismissal, separation on retirement, grievances, redress procedures, and so on. This is mandatory in industrial establishments employing 100 or more employees. Standing Orders regulate job security by specifying classification of employee categories; they regulate income security through provisions on computation of

payments for hours worked and leave; and they regulate employment security through restrictions on punitive terminations and prescribed procedures for taking disciplinary action in cases of misconduct. The overall effect is that the employers are left with very little nonnegotiated authority to transfer workers from one job to another or from one location to another.

To summarize, the net effect of these acts (and amendments) is that effective mechanisms for employers to flexibly adjust labor requirements to changing technological or market conditions is lacking. These acts have led to economic inefficiencies in a number of ways. First, they have resulted in undesirable automation where employers prefer to buy machines than employ workers. This, in turn, has reduced employment opportunities by pushing workers into the unorganized sector. For instance, in the decade of the 1980s, the annual rate of growth in the organized sector was 1.58 percent, contrasted with 2.73 percent in the unorganized sector. Second, there is a growing trend in most industries to reduce permanent employment and to use contract, temporary, and casual workers. Third, it has led to subcontracting certain operations to small firms, thereby introducing economic inefficiency by sacrificing scale economies (Datta Chaudhuri, 1996). It has also led to a higher incidence of disputes and strikes not just compared to developed countries but also with respect to neighboring South Asian countries (Anant, 2000). For example, in 1990, while Pakistan and Sri Lanka had 99 and 116 lockouts/strikes, the number for India was 1825[xvi].

Since the 1980s, decentralized bargaining and independent trade unionism have become more important. The number of plant-based independent and unaffiliated trade unions has risen, which may have caused a decline in the power of centralized affiliated unions, especially in the private sector (Bhattacherjee, 1999).

Labor Market Rigidity

India's labor market is ranked 45th for degree of labor market flexibility in the GCR 1998. Rigidities include rigidities in the deployment of human resources, in work practices, and in wages. Various studies suggest that such rigidities constrain the effective redeployment of labor during the process of adjustment to changes in demand and technology, and more importantly, act as a disincentive toward future employment creation (see for example, Fallon and Lucas, 1993).

While India is a labor surplus economy, wages are often set at above market clearing levels, especially in the organized sector. The downward pressure on wages is mitigated by labor market imperfections such as the presence of monopsonistic trade unions and minimum wages guaranteed by law. These conditions apply especially to the public sector — government employees are mostly unionized, assured of lifetime employment, and face very little risk of being fired. The government fixes minimum wages for workers in the unorganized sector as well. However, statutory minimum wages have been largely ineffective in influencing wages in unorganized sectors due to weak enforcement, irregular revisions, and lack of proper indexation to cost of living.

In terms of union density, India fares badly compared to other developing countries: union membership as a percentage of nonagricultural labor dropped from 6.6 percent in 1985 to 5.5 percent in 1995 (the corresponding figures for Argentina, Brazil, and Mexico were 23.4, 32, and 31 percent respectively). Despite the low union density, India loses more days per year as a result of strikes than almost any other country (Bhattacherjee, 1999). Until 1989, industrial conflicts occurred mainly in the private sector in terms of disputes, work days, and wages lost and lost production. Since 1990,

however, industrial disputes in the public sector have risen sharply, especially in banking, insurance, and transportation.

As Table 10 shows, even in recent years there is no significant downward trend in work days lost due to industrial disputes, and that strikes as a proportion of disputes have remained remarkably stable around 70 percent for the last three decades. In recent years, while the proportion of work days lost due to strikes[xvii] has declined and the proportion due to lockouts has risen, this may reflect restructuring and closure of sick companies rather than rising labor flexibility.

<Table 10 about here>

India lacks a universal unemployment insurance scheme, so that family and traditional institutions are the main providers of social support. This in turn contributes to further rigidities in labor markets, as attempts to lay off workers are strongly opposed. While employer liability legislation requires severance or retrenchment payments on termination of employment, only a small minority of the working population — that is, those from larger companies in the formal sector — are effectively covered. In an economy where state-sponsored social security is virtually nonexistent and where "good jobs" are rare, employment security in the organized segment is of obvious value. The issue is not simply one of removing rigidities, it is also one of simultaneously ensuring the economic and social security of the workers. While labor market flexibility will facilitate readjustment and restructuring, it must be accompanied by some kind of insurance and social security to the vast unorganized labor force in the country as well. Employment provided under the Jawahar Rozgar Yojana — a form of unemployment

benefit where the government provides employment through labor-intensive infrastructure projects — is a step in this direction.

Labor Market Outcomes and Trade Liberalization in the Manufacturing Sector

Traditionally, economists have relied on the neoclassical Hecksher-Ohlin (H-O) model for predicting the effects of trade liberalization on labor markets. The model predicts that when a labor-abundant country (whose imports are traditionally capital-intensive) opens up to trade (or reduces the barriers to free trade) we should observe an increase in the relative price of the labor-intensive good, an increase in the real return to labor, and a reallocation of factors of production to labor-intensive tradable goods. However, several caveats need to be kept in mind since the H-O model relies on a series of restrictive assumptions to derive this prediction: constant returns to scale in production, competitive labor and goods markets, full mobility of factors within each country, and an inelastic supply of labor and capital.

The H-O model is best interpreted as a long-run rather than a short-run prediction. In the short run, even labor may be regarded as immobile as workers may have to acquire skills, undergo training, and undertake costly job searches before they move to the expanding labor-intensive sector. In the short run, we may be in a Ricardo-Viner world where labor (especially skilled labor) is sector-specific and immobile. In such a scenario, a reduction in trade restrictions will serve to reduce the real return to labor. Alternatively, even if labor is mobile, the presence of unemployment, for instance, may result in an increase in the employment of the abundant factor following easing of trade restrictions but may not translate to an increase in real wages. Unionization of the labor force, minimum wage legislation, and other government-mandated labor regulations may also

impede the frictionless clearing of labor markets and contribute to the stickiness of wages. However, such caveats do not deny the potential of trade liberalization to benefit labor — they may merely serve to postpone such benefits. In India's case, while all these effects may be present, the concomitant liberalization of foreign direct investment and import of technology may serve to raise employment and wages.[xviii] Which effect dominates — the rigidities in labor markets or the additions to capital stock — and whether ample time has elapsed for the economy to efficiently reallocate its resources remains an empirical question.

In this section, I present some preliminary results that relate labor market outcomes in the manufacturing sector (in terms of real wages per worker and employment) to the trade liberalization experience of India. Unfortunately, industry-level data on India is very sparse, especially on direct measures of trade restrictions. For instance, tariff rates from UNCTAD are available for only three years: 1990, 1992, and 1997. Traditionally, researchers have used trade flows as a proportion of GDP (trade intensity) as an alternative measure of openness. However, it is often difficult to disentangle the effects of trade liberalization from other domestic policy choices — after all, many countries that liberalize trade often simultaneously embark on other domestic reforms that can also have sizable labor market effects, as is the case for India. Without adequately controlling for other policies, one risks confounding the effects of trade liberalization with other structural reforms. Second, there may be severe endogeneity problems — unobserved demand shocks may not be orthogonal to trade intensity so that OLS estimates may be biased and inconsistent. This requires instrumental variable estimation and identification of good instruments that are orthogonal to labor market outcomes. Such instruments are difficult to find for a one-country cross-industry study.

Accordingly, I will use net exports as a proportion of total trade in industry i defined as

$$\text{Net Trade Ratio} = (X_i - M_i) / (X_i + M_i)$$

to examine trade and labor market linkages.[xix] Here X_i and M_i refer export and import values in industry i, respectively. The ratio provides a measure of comparative advantage in that industry. Following trade liberalization, one expects net exports to increase in sectors where India has a comparative advantage. The advantage of this measure is that (following Ravenga, 1992) we can find an instrument that is correlated with this measure but not with industry employment and wages. The instrument that satisfies this requirement is a weighted average of the nominal exchange rates of countries that constitute India's trading partners. As weights I use the share of each foreign country's goods in total Indian net exports for that particular industry category. This variable is highly correlated with net exports but to the extent that it is primarily determined by macroeconomic factors, it is likely to be orthogonal to the unobservable components of industry wage variation. Since the trade intensity measure is the sum of exports and imports relative to GDP, this instrument will not (and is not) correlated with it. A second indirect measure of trade restrictions that I will use is the import penetration ratio defined as M_i / Q_i, imports in sector i as a proportion of total output.

Therefore, using pooled time series data on industry level employment and wages, I estimate reduced form equations for wages and employment. I perform this analysis for both levels of employment and wages as well as for annual growth rates of employment and wages.

Data Sources

I examine annual data for 28 industry groups (at the three-digit ISIC level) for the time period 1989–1998. Annual data on employment and wages are obtained from the UNIDO Industrial Statistics Database. The number of employees is used to measure employment, and wage rates are derived by dividing the annual wage bill in each sector by the number of employees. I also use data on fixed capital formation from the same data source. This enables us to test the factor price insensitivity theorem underlying the H-O model: that changes in factor supplies will not affect factor prices. If the underlying model were a specific-factor model then we would expect capital formation to raise both employment and wages.

The data on tariff rates— a direct measure of trade restrictions — is obtained from UNCTAD, which, as mentioned earlier, are available for only three years. Data on net exports are obtained form the UNIDO database. All variables are expressed in constant 1995 rupees. Nominal exchange rates for the construction of the instrument are obtained from the IFS database. Finally, I use industry-specific fixed effect dummies to control for unobserved sectoral variation and a period dummy that takes the value 1 in the post-reform era (1993–1998) and 0 otherwise.

Results

Table 11 presents results for the real wage rate and the employment level. The first two columns show the estimates of a fixed-effects model with industry-specific fixed effects while the last two columns instrument net exports by the trade weighted nominal exchange rate for each sector. The first two columns show that sectors experiencing an increase in net exports also experienced a significant decline in wage rates but a significant increase in employment levels. Moreover, greater fixed capital formation in

any sector over time raised both employment and wages. Finally, I also find evidence for a significant period effect: the level of real wages and employment rose significantly in the post-reform period. However, these estimates are suspect because of the severe endogeneity problems underlying the net export measure.

<Table 11 about here>

From the last two columns, IV estimates of the coefficient on net exports are no longer significant.[xx] In other words, we cannot assert that sectors that witnessed an increase in net exports over time also experienced any significant improvements in wages and/or employment. However, I still find evidence for a period effect: all sectors in the post-1992 period experienced a significant increase in wage rates and employment. Wages and employment also increased more rapidly in sectors characterized by rapid capital formation. Each of the models as a whole is significant at the 5 percent level and the R^2 is fairly high in the wage regressions (0.47 and 0.58) but fairly low in the employment regressions (0.01 and 0.02).

Table 12 presents similar estimates, except that the both dependent and independent variables are expressed in first differences of logs so that I focus upon the growth of wage rate and employment level. Consistent with the tests mentioned in section 4, I do not find any significant acceleration in either the growth of wages or the growth of employment in the post-reform period. While the first two columns seem to indicate that sectors experiencing faster growth in net exports also experienced slower growth in wages but faster growth in employment, this result is not robust to instrumentation of net

exports. While the sign on the net export coefficient remains negative, I do not find evidence for any significant effect.[xxi]

<Table 12 about here>

In Table 13, I present results where I use import penetration as an indirect measure of trade restrictions. The first two columns suggest that sectors experiencing an increase in import penetration experienced an increase in both wages and employment, though only the former is statistically significant. However, our IV estimates reverse this finding — while employment seems to have increased significantly in sectors with greater import penetration, there is no such evidence for wage rates. In addition, I again find evidence that wages and employment increased in sectors with greater capital formation and that the post-1992 period saw a significant increase in both wage rates and employment levels across all sectors.

<Table 13 about here>

Finally, in Table 14, I use a direct measure of trade restrictions: tariff rate, which is a preferred measure even though data is available for only three years. Even though the number of observations is only 84, I do find evidence that sectors with lower levels of tariffs have higher employment levels and higher growth rates[xxii] of employment. I also find that while the level of wages is not affected by trade restrictions, the growth rate of wage per employee is negatively associated with tariff protection. There is also evidence that greater capital formation induces increases in wage rates, as well as increases

employment levels and growth rates. However, in these regressions our results mainly have a cross-sectional flavor since on the time dimension I only have three observations for the levels and two for the growth.

<Table 14 about here>

To summarize, support for the neoclassical H-O model is very weak. First, factor price insensitivity is violated — wages are sensitive to changes in capital stock. Second, when I use net exports as a proxy for openness, I fail to find any significant impact of net exports on either wages or employment. Third, sectors with greater import penetration exhibit a significant increase in employment levels but not in wage rates. Only the cross-section dominated results in Table 14 suggest that industries with higher levels of trade restrictions have lower growth in wages, lower employment levels, and lower growth rates of employment.

Concluding Remarks

This paper takes a first step toward examining linkages between international trade and labor markets in India. The Hecksher-Ohlin theory predicts that with greater openness to international trade, India's labor-intensive manufactures and exports should expand and the abundant factor (unskilled labor) should benefit from the movement towards free trade. I examine whether there is support for such a prediction in the context of the trade liberalization undertaken since 1991.

The chapter begins by providing an overview of Indian economic policy since 1947, summarize the trends in the external sector and labor markets, and focuses on the changes in trade policies and labor regulations since 1991. Next, it provides an overview

of the structural and institutional characteristics of India's labor market, with particular attention to the existing rigidities in labor markets.

Focusing on the registered manufacturing sector, I fail to find any significant relationship between net exports and real wages. There is some evidence that sectors that witnessed a greater decline in trade restrictions also experienced a rise in growth of wages, in employment levels, and growth rates of employment. I also find that across sectors, the post-reform period witnessed a significant improvement in wages and employment; however, we cannot attribute this to trade liberalization. One reason for this could be the rigidities in labor markets impeding mobility of labor to expanding sectors. However, the lack of sectoral level data on labor market rigidities means that the analysis in the previous section could not explicitly account for these rigidities. As better data become available, the role of labor market distortions and rigidities can be explicitly incorporated to further our understanding of the effects of trade liberalization on labor market outcomes. This, in turn, can suggest the best ways of overcoming and mitigating such rigidities.

A second reason for my findings could be that the labor supply in labor is fairly elastic due to the presence of unemployment and disguised employment[xxiii] so that the trade liberalization has affected employment (as I find) but not real wages. These findings are suggestive at best, given data limitations, and merit further investigation. Finally, labor market regulations seem to have created certain rigidities in the Indian labor markets, especially in the organized sector. Therefore, I conclude here by suggesting some possible labor market reforms that could, could in principle, overcome some of the existing rigidities.

- There should be a match between labor laws that are legislated and the ability of the state to enforce them. For example, the Minimum Wage Act for the unorganized sector has been totally beyond the capacity for implementation.
- Partnership rather than antagonism between labor and management should be encouraged through an incentive system. For example, the bonus system provides a linkage between wages and profitability: it creates an incentive for labor to help increase productivity while at the same time providing flexibility to the management when profitability declines.
- While flexibility in the hiring and firing of workers is desirable, the costs of such decisions should not be disproportionately borne by workers. These costs can be mitigated through social insurance schemes that give basic minimum protection to all those in need of assistance. Rather than relying solely on the state, provision of such social services can be opened to private institutions and non-governmental organizations as well.
- In the public sector, uniform norms of labor use for all enterprises do not allow individual enterprises to seek efficiency in their use of labor and other inputs. These enterprises can operate in a market environment only if their management has greater control over their own commercial activities.
- Labor market flexibility can be improved by educating the labor force, encouraging vocational training, and providing them with retraining facilities. These can also improve worker productivity by adding to human capital.

The absence of safety nets may make total reform of the labor market extremely difficult, as social costs associated with restructuring (and the accompanying job losses) may be substantial and therefore politically unsustainable. However, such adverse

consequences may only be short-term in nature — as the economy goes through a period of structural adjustment, and as labor acquires new skills and moves from contracting to expanding sectors (where India has a comparative advantage), it is likely to be better off in the long run.

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Table 1. The External Sector of India — Some Indicators

Series Name	1980	1985	1990	1995	1997
Imports of goods and services (% of GDP)	9.32	8.38	9.76	14.07	14.09
Exports of goods and services (% of GDP)	6.04	5.51	7.14	10.90	10.72
Trade (% of GDP)	15.37	13.89	16.89	24.97	24.81
Current account balance (% of GDP)	–1.32	–1.96	–2.52	–1.85	–1.31
Gross international reserves (includes gold, current US$ billion)	12.01	9.49	5.64	22.86	28.39
Foreign direct investment, net inflows (% of GDP)	0.04	0.05	0.05	0.59	0.85
Share in world merchandise trade	0.59	0.67	0.62	0.69	0.75
Merchandise exports (current US$ billion)	8.30	9.46	18.29	31.24	35.70
Merchandise imports (current US$ billion)	13.95	15.08	23.44	37.96	45.73
Share in world merchandise exports	0.44	0.51	0.54	0.62	0.65
Share in world merchandise imports	0.74	0.82	0.7	0.77	0.85
Manufactures exports (% of merchandise exports)	59	58	71	74	74
Manufactures imports (% of merchandise imports)	39	54	51	54	55
Food exports (% of merchandise exports)	28	25	16	19	18
Food imports (% of merchandise imports)	9	8	3	4	6
Agricultural raw materials exports (% of merchandise exports)	5	3	4	1	2
Agricultural raw materials imports (% of merchandise imports)	2	3	4	4	4
Fuel imports (% of merchandise imports)	45	26	27	24	25
Fuel exports (% of merchandise exports)	0	6	3	2	1
Ores and metals exports (% of merchandise exports)	7	8	5	3	3
Ores and metals imports (% of merchandise imports)	6	7	8	7	6
Commercial service exports (current US$ billion)	2.86	3.27	4.61	6.76	8.93
Commercial service imports (current US$ billion)	2.92	3.82	5.94	10.06	12.28
Share in world commercial service exports	0.79	0.86	0.59	0.57	0.68
Share in world commercial service imports	0.74	0.96	0.73	0.84	0.95

Source: World Bank, 2000

Table 2. Tariff Structure of the Indian Economy (1990–2000)

	1990/91	1993/94	1995/96	1996/97	1997/98	1998/99	1999/2000
Average unweighted							
Agriculture	113	43	27	26	26	30	29
Mining	100	70	30	26	25	29	27
Manufacturing	126	73	42	40	36	41	40
Whole economy	125	71	41	39	35	40	40
Std. deviation of tariff	41	30	19	19	15	15	14
Maximum tariff rate	355	85	50	52	45	40	38.5
Import weighted tariff[a]	87	47	25	22	20	30	30

a: Weighted by 1992/93 import values
Source: Rajan and Sen (2001)

Table 3. Tariff Rates in Manufacturing

Industry	1990	1992	1997	1999
Food products	85.15	47.47	28.32	31.47
Beverages	190.71	181.9	124.76	116.67
Tobacco	100	65	40	40
Textiles	93.88	62.08	38.05	38.36
Wearing apparel, except footwear	99.84	64.98	39.88	39.92
Leather products	82.13	55.32	19.36	29.79
Footwear, except rubber or plastic	100	65	40	40
Wood products, except furniture	64.57	60.11	30.21	33.19
Furniture, except metal	100	65	40	40
Paper and products	90.48	58.45	23.47	31.94
Printing and publishing	59.26	24.07	20.74	22.96
Industrial chemicals	77.09	63.43	29.07	33.99
Other chemicals	82.75	58.9	31.6	35.3
Petroleum refineries	49.78	48.7	30	33.26
Misc. petroleum and coal products	70	53.75	27.5	28.75
Rubber products	95	63.37	39.26	40
Plastic products	100.69	64.9	31.67	35.2
Pottery, china, earthenware	85.71	65	37.14	37.86
Glass and products	93.03	64.1	39.34	39.26
Other nonmetallic mineral products	84.75	62.85	38.42	38.04
Iron and steel	84.55	64.77	28.55	33.97
Nonferrous metals	73.93	58.28	26.25	30.82
Fabricated metal products	75	59.87	29.83	32.54
Machinery, except electrical	78.06	48.7	22.95	26.89
Machinery electric	81.95	57.73	31.29	31.48
Transport equipment	62.76	52.72	31.12	35.61
Professional and scientific equipment	73.63	57.99	28.47	30.61
Other manufactured products	102.51	57.99	34.56	35.03

Source: UNCTAD

Table 4. Employment Distribution in India (1977–1994)

(*Percentage distribution*)

Category	1977–78	1983	1987–88	1993–94
Aggregate economy	100	100	100	100
	(242.6)	(266.7)	(291.9)	(337.9)
Self-employment	56.5	54.2	53.2	51.7
Regular wage employment	15.3	15.3	16.0	15.1
Organized sector	8.7	9.0	8.8	8.1
Unorganized sector	6.6	6.3	7.2	7.0
Casual wage employment	28.2	30.5	30.8	33.2
Agriculture	100	100	100	100
	(167.8)	(177.0)	(182.2)	(207.8)
Self-employment	54.8	52.1	51.1	49.0
Regular wage employment	4.6	3.8	3.6	1.7
Organized sector	0.7	0.7	0.8	0.7
Unorganized sector	3.9	3.1	2.8	1.0
Casual wage employment	33.8	36.2	26.8	41.6
Industry	100	100	100	100
	(31.9)	(38.2)	(47.1)	(53.0)
Self-employment		40.6		35.7
Regular wage employment	26.0	28.8		28.9
Organized sector		24.1	20.2	18.3
Unorganized sector		4.7		10.6
Casual wage employment		30.6		35.4
Services	100	100	100	100
	(42.9)	(51.5)	(62.6)	(77.1)
Self-employment		42.9		46.9
Regular wage employment	27.3	43.9		42.7
Organized sector		26.4	23.6	21.1
Unorganized sector		17.5		21.6
Casual wage employment		11.9		9.0

Source: Nagaraj (2002) in turn adapted from Ghose (1999). Note: Figures in parenthesis refer to absolute numbers in millions.

Table 5. Growth of Real Wages in Industry

	Increase in employees' annual wages (%)	
	1974–75 to 1981–82	1981–82 to 1988–89
Industrial enterprises with 10–99 workers	3.59	1.07
Industrial enterprises with 100 or more workers	2.61	4.44
Public ltd. companies	2.75	3.29
Public corporations	2.88	6.46

Source: Sen and Ghosh, 1993

Table 6. Employment Elasticities in Major Sectors

Industry groups	1977–78 over 1972–73	1983 over 1977–78	1987–88 over 1983
Agriculture	0.66	0.49	0.36
Mining	0.95	0.67	0.85
Manufacturing	0.55	0.42	0.26
Construction	0.35	1	1
Electricity, gas, and water supply	1	0.74	0.48
Transport, storage, and comm.	0.76	0.92	0.35
Services	0.8	0.99	0.42
Total	0.61	0.55	0.38

Source: Papola (1994)

Table 7. Employment Growth Rate in Organized Sector

Industry groups	Public sector: 1980–81 to 1990–91	Private sector: 1980–81 to 1990–91
Agriculture	2.3	0.7
Mining	1.4	–3.2
Manufacturing	1.8	–0.5
Construction	0.4	–0.4
Electricity, gas, and water supply	3.1	1
Transport, storage, and comm.	0.9	–1.7
Services	2.1	1.9
Total	1.9	0.2

Source: Agarwala and Khan (2002)

Table 8. Share of Wages in Value Added

Industry	1980	1985	1990	1993	1998
Food products*	0.54	0.41	0.41	0.35	0.35
Beverages	0.32	0.36	0.28	0.26	0.22
Tobacco	0.55	0.55	0.34	0.32	0.33
Textiles*	0.60	0.69	0.51	0.46	0.52
Wearing apparel, except footwear*	0.54	0.46	0.26	0.17	0.24
Leather products	0.52	0.54	0.33	0.31	0.30
Footwear, except rubber or plastic*	0.72	0.64	0.47	0.25	0.42
Wood products, except furniture	0.46	0.48	0.37	0.37	0.40
Furniture, except metal*	0.74	0.91	0.72	0.63	0.62
Paper and products	0.47	0.61	0.34	0.39	0.26
Printing and publishing*	0.61	0.66	0.66	0.37	0.46
Industrial chemicals*	0.44	0.36	0.31	0.19	0.13
Other chemicals*	0.35	0.40	0.33	0.26	0.25
Petroleum refineries*	0.14	0.16	0.07	0.06	0.09
Misc. petroleum and coal products*	0.25	0.34	0.43	0.21	0.24
Rubber products	0.53	0.31	0.30	0.32	0.32
Plastic products	0.38	0.31	0.29	0.27	0.28
Pottery, china, earthenware*	0.53	0.91	0.60	0.52	0.36
Glass and products	0.57	0.48	0.50	0.45	0.33
Other nonmetallic mineral products*	0.48	0.35	0.28	0.33	0.22
Iron and steel	0.50	0.46	0.35	0.34	0.33
Nonferrous metals	0.99	0.79	0.36	0.36	0.27
Fabricated metal products*	0.47	0.50	0.47	0.39	0.34
Machinery, except electrical	0.47	0.45	0.43	0.41	0.33
Machinery electric	0.45	0.49	0.37	0.37	0.31
Transport equipment	0.63	0.64	0.51	0.55	0.40
Professional & scientific equipment	0.54	0.47	0.46	0.44	0.33
Other manufactured products*	0.44	0.22	0.50	0.15	0.33

*Industries where share of wages in value added declined more than 10 percent after 1992

Table 9. Growth Rates in Unregistered Manufacturing *(percentage change over the previous period)*

Year	Establishments	Employment
1978–79		
1984–85	15.1	12.8
1989–90	3.9	–0.8
1994–95	–9.5	–1.3

Source: Nagaraj (2002) in turn adapted from Lalitha (1999)

Table 10. Industrial Conflicts (1970–1995)

Year	Number of disputes			Number of workdays lost to disputes (thousands)		
	Strikes	Lockouts	Total	Strikes	Lockouts	Total
1970	2598	291	2889	14749	5814	20563
1971	2478	274	2752	11803	4743	16546
1972	2857	386	3243	13748	6796	20544
1973	2958	421	3370	13862	6764	20626
1974	2501	428	2929	33643	6619	40262
1975	1644	299	1943	16706	5195	21901
1976	1241	218	1459	2799	9947	12746
1977	2691	426	3117	13410	11910	25320
1978	2762	425	3187	15423	12917	28340
1979	2709	339	3048	35804	8050	43854
1980	2501	355	2856	12018	9907	21925
1981	2245	344	2589	21208	15375	36583
1982	2029	454	2483			74615
1983	1993	495	2488			46858
1984	1689	405	2094			56025
1985	1355	400	1755	11487	17753	29240
1986	1458	434	1892	18824	13925	32749
1987	1348	451	1799	14026	21332	35358
1988	1304	441	1745	12530	21417	33947
1989	1397	389	1786	10695	21968	32663
1990	1459	366	1825	10640	13446	24086
1991	1278	532	1810	12428	14000	26428
1992	1011	703	1714	15132	16127	31259
1993	914	479	1393	5615	14686	20301
1994	808	393	1201	6651	14332	20983
1995	732	334	1066	5720	10570	16290

Source Bhattacherjee (1999)

Table 11. Wage and Employment Equations (Levels), 1980–1999

	Industry-specific fixed effects		Industry-specific fixed effects; net exports instrumented	
	Log of wages	Log of employment	Log of wages	Log of employment
Net exports	–0.084***	0.176***	–0.989	–2.04
	(0.033)	(0.059)	(1.54)	(3.45)
Capital formation	0.093***	0.039**	0.15*	0.18
	(0.012)	(0.022)	(0.1)	(0.224)
Period dummy(1993–1999)	0.071***	0.225***	0.062***	0.202***
	(0.014)	(0.026)	(0.029)	(0.065)
Constant	–0.968***	11.693***	–0.887***	11.89
	(0.019)	(0.035)	(0.141)	(0.316)
No. of observations	447	447	447	447
R^2	0.58	0.01	0.48	0.02
F-statistic	61.61***	53.23***		
Wald chi-square statistic			15745.1***	366938***

Standard errors in parentheses.
***Significant at 5 percent level.
**Significant at 10 percent level.
*Significant at 15 percent level.

Table 12. Wage and Employment Equations (Growth), 1980–1999

	Industry-specific fixed effects		Industry-specific fixed effects; net exports instrumented	
	Growth of wages	Growth of employment	Growth of wages	Growth of employment
Growth of net exports	–0.074***	0.175***	–0.707	–0.765
	(0.037)	(0.046)	(5.3)	(7.22)
Growth of capital formation	0.008	–0.013	–0.003	–0.03
	(0.008)	(0.01)	(0.095)	(0.13)
Period dummy(1993–1999)	0.009	0.035	–0.001	0.02
	(0.009)	(0.011)	(0.086)	(0.117)
Constant	0.016***	0.021***	0.022	0.03
	(0.004)	(0.006)	(0.046)	(0.063)
No. of observations	418	418	418	418
R^2	0.02	0.06	0.01	0.02
F-statistic	2.46**	8.35***		
Wald chi-square statistic			16.44***	24.31***

Standard errors in parentheses.
***Significant at 5 percent level.
**Significant at 10 percent level.
*Significant at 15 percent level.

Table 13. Wage and Employment Equations (Levels), 1980–1999

	Industry-specific fixed effects		Industry-specific fixed effects; import penetration instrumented	
	Log of wages	Log of employment	Log of wages	Log of employment
Import penetration	0.029***	0.017	0.022	0.153***
	(0.01)	(0.018)	(0.023)	(0.05)
Capital formation	0.086***	0.049***	0.091***	0.141***
	(0.012)	(0.022)	(0.015)	(0.034)
Constant	0.052***	0.211***	0.036**	0.084**
	(0.016)	(0.029)	(0.022)	(0.049)
No. of observations	447	447	230	230
R^2	0.37	0.01	0.43	0.001
F-statistic	62.64***	49.65***		
Wald statistic			39749***	6300560***

Standard errors in parentheses.
***Significant at 5 percent level.
**Significant at 10 percent level.
*Significant at 15 percent level.

Table 14. Wage and Employment Equations (Levels and Growth), 1980–1999

	Industry-specific fixed effects		Industry-specific fixed effects	
	Log of wages	Log of employment	Growth of wages	Growth of employment
Tariff rate	-0.001	-0.003***	-0.003**	-0.002***
	(0.001)	(0.001)	(0.002)	(0.001)
Capital formation	0.032*	0.075***	-0.026	0.048*
	(0.02)	(0.03)	(0.042)	(0.03)
Constant	-1.296	11.255***	0.494	-0.283
	(0.276)	(0.368)	(0.537)	(0.387)
No. of observations	84	84	56	56
R^2	0.26	0.38	0.03	0.08
F-statistic	6.96***	58.5***	3.28**	17.32***

Standard errors in parentheses.
***Significant at 5 percent level.
**Significant at 10 percent level.
*Significant at 15 percent level.

[i] Freeman and Katz have analyzed OECD countries and have found that apart from the United Kingdom and the United States the wage differentials in Australia, Canada, France, Germany, Italy, Japan, Sweden, and Spain have not changed dramatically.

[ii] While there is a relatively strong consensus that these trends are due to demand shifting from less-skilled to more-skilled sectors, there is remarkably little consensus on whether technological change or trade liberalization is responsible for this demand shift.

[iii] Recent studies to do so include Goldberg and Pavcnik (2001), who have looked at the Colombian case; Saavedra and Torero (1999), who have examined trade liberalization in Peru; and Feliciano (1994), who relates wage premiums in Mexico to trade protection measures.

[iv] Source: Economic Survey 2001–2002, Government of India.

[v] Bhagwati (1992) points to three major reasons behind the ultimate failure of India's development policy: extensive bureaucratic controls over production, investment, and trade; inward-looking trade and foreign investment policies; and conventional confines of public utilities and infrastructure. While the first two had severe adverse effects on the private sector's efficiency, the last impaired the public sector enterprises' contribution to the economy. Together, the three sets of policy decisions severely restricted what India could get out of its investments.

[vi] Despite the emergence of software exports, labor-intensive manufactures still constitute bulk of India's exports.

[vii] From 1996 to 1999 export growth rates fell substantially to below 5 percent, reflecting the slowdown in world trade and depressed commodity prices globally. However, it recovered to 19% in 2000–01.

[viii] By 2012, it is estimated that India's population will grow to 1.195 billion with the labor force rising to about 558 million (Visaria, 1996).

[ix] The organized sector includes the public sector; the private corporate sector; agriculture plantation; the factory sector, spanning manufacturing, electricity, gas, and water; and repair services (Nagaraj, 2002).

[x] This may be attributed to large government investments in higher and technical education since the 1950s.

[xi] While the continuation of labor market reforms may encourage labor market flexibility, the reforms could skew bargaining power toward management and lead to a decline in the power of organized labor, exacerbating inequality at least in the short run.

[xii] Registered manufacturing covers all manufacturing establishments registered as factories under the Indian Factories Act. Unregistered manufacturing is entirely in the unorganized sector, and covers all manufacturing establishments that are not factories.

[xiii] The state of Kerala, however, is an exception, where rates of unionization are high across both the formal and informal sectors.
[xiv] The act defines a factory as a premise employing 10 or more workers using power, or 20 or more workers without using power.
[xv] Fallon and Lucas (1993) showed how employment would have been higher in several sectors without the 1976 and 1982 amendments.
[xvi] It should be noted that despite the plethora of labor laws and regulations, various loopholes offer considerable scope for discretionary behavior. Moreover, in the past, enforcement of these laws has been poor. See Nagaraj (2002) for an analysis.
[xvii] A lockout is a temporary closure of the factory/firm by management when negotiations with workers (or their unions) fail. A strike, on the other hand, is a closure initiated by workers.
[xviii] It is also critical whether these technology improvements are neutral, labor saving, or capital saving. It should also be noted that in the standard H-O model with equal number of goods and factors, factor prices are insensitive to changes in factor endowments.
[xix] When a group of products is imported but not exported, then the index will be minus 1. The other extreme value of the index is unity where a group of product is exported but not imported. Where net exports are positive, the country may be thought of having a revealed comparative advantage in that sector.
[xx] While we do not present the first stage estimates, the weighted exchange rate is a highly significant predictor of the net export measure. Moreover, the correlation between our instrument and the wage rate and employment level is fairly low: approximately 0.18.
[xxi] We performed some other tests as well. First, we tried the trade intensity measure. The results are qualitatively the same. The coefficient on this coefficient on this variable for both wage and employment regressions is statistically insignificant. Second, we ran separate regressions for (net) exportable and (net) importable sectors, and again our results remain unaffected.
[xxii] For the growth results, we have two observations for each sector: the growth rate between 1990 and 1992 and between 1992 and 1997.
[xxiii] Unemployment rates have broadly remained constant over the last quarter century, at about 12 percent.