Globalization of the Indian Economy: Effects on Sectoral/Regional/Employment Realignments

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Abstract

Globalization of the Indian industry received significant thrust since July 1991. It is expected that the reforms will be beneficial for growth. Few would deny that there would be transitional costs. The purpose of this paper is to estimate the changes in employment that will be required across sectors, occupation, and regions within India.

With regard to the impact on occupational characteristics of employees, our study indicates that the deepening of reforms give a boost primarily to employment of sales workers; administrative, executive and managerial workers; and service workers. Within India, we find that Northeast and Eastern region suffers maximum in terms of employment loss.

Jel. Classification Code: F13, H20, F41

Key word: CGE model, economic reforms, employment effects

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1. INTRODUCTION

Globalization of the Indian industry received significant thrust since July 1991 with the major shift in policies in the realm of taxation, prices, trade, and industrial sectors. Some of the important policies in this end have been industrial delicensing and a larger role for the private sectors, reduction and simplification in domestic and indirect tax rates, significant pruning of quantitative restriction on trade (except for consumer good imports) along with major reduction in import duties. The process of globalization is expected to have medium to longer-term impact on micro or industry level variables within India.

Such unilateral trade and domestic policy reforms in India should be taken into account in the light of the developments taking place in the rest of the world. The world trading system is currently being influenced by two simultaneously acting forces of regionalism and multilateralism. Today, the world is fast moving towards a system of trading blocks on the one hand, and on the other, the completion of the Uruguay Round and establishment of WTO have given some hope towards more freer and disciplined trading environment.

It is expected that the reforms will be beneficial for growth since they will create an incentive for resources to be allocated to activities which offer higher productivity and which are more in line with India's comparative advantage. This higher growth will in turn favor employment creation.

Few would however deny that there would be transitional costs that will have to be dealt with. Indeed one of the critical requirements for successful adaptation to a globalizing world economy is the incorporation of a strong social component into economic reform programs. This includes measures such as the training and retraining of displaced workers, redeployment schemes, and the promotion of alternative employment opportunities.

The above fact is of paramount for translating the Indian economy to the global world without significant social tension. This arises because sectors that enjoyed protection in the pre-reform period are most likely to loose their markets to the foreign competitors. Consequently, these sectors will contract giving rise to displacement of workers. Since these workers may not possess the skills that are of demand in the present world, their employment prospects in the expanding markets are not bright unless they are retrained. It may be also true that globalization will affect the Indian states or regions differently. This is a real possibility since the sectors, which are to gain from the reform process, may be contributing higher domestic product in some states. Alternatively, the industries receiving protection in the pre-reform period may have a larger presence in some states. In that situation, workers in those states may have to face a higher burden due to the globalization exercise.

To be precise, the purpose of this paper is to estimate the changes in employment that will be required across sectors, occupation, and regions within India as a result of the ongoing reform programs. These changes are expected to be costly to the workers, to the extent they find it difficult to transfer from declining to expanding sectors. No doubt, Indian government has to assist workers in this process of adjustment. For this purpose, the Indian Government has established a National Renewal Fund (NRF) which is meant to finance voluntary retirement schemes, programs for counseling, retraining and redeployment of the workers accepting voluntary retirement and area regeneration schemes for areas with high incidence of job losses. Apart from providing estimates of requirements of human resource in the globalized world economy, the study also provide policy input by giving direction (training requirement or regional impact) for better utilization of the NRF.[2] It should be noted that our estimates of sectoral employment effects and regional/occupational employment realignments are not forecasts of the employment changes that may occur due to the ongoing reform

process. The changes presented here are outcome of the domestic and trade reform scenario we have undertaken and should be understood accordingly as being relative to what would happen otherwise if these policy scenarios were not put in place.

The paper proceeds as follows. The section 2 discusses the India CGE model through which we carry out this exercise. In section 3, we outline the policy scenarios for which we estimate the employment effects, The sections 4 discusses the results on employment effects by occupation/region while section 5 summarizes the findings.

2. INDIA CGE MODEL

Our analysis of employment impacts of ongoing reform programs is based on a single country multi-sectoral CGE model for India. The advantage of using a CGE model is that it permits analysis of both economy-wide and sectoral impacts. Below, we describe briefly the distinguishing features of the model that are essential for the present paper. The interested readers may consult Chadha, Pohit, Deardorff and Stern (1998a, 1998b) for the technical details, equations, and proportionally differentiated version of the complete model.

India is modeled to produce, consume, and trade 33 tradable goods. In addition there is one non-traded sector, rail transport. Understandably, the nature of markets operating in India differs from sector to sector. Consequently, we have incorporated in our model a variety of market structures: (1) sectors under state monopolies, (2) sectors under perfect competition, (3) sectors under monopolistic competition with free entry, or (4) sectors in which prices are administered. The sectoral breakdown along with the nature of their market structures, as shown in Table 1, has been concorded from India's classification system to ISIC Rev 2.

Products in all the tradable sectors are assumed to be characterized by some degree of product differentiation. In nine of the sectors where markets are taken to be perfectly

[2] The work is immensely motivated by the pioneering work of Stern, Deardorff and Brown (1992) who have

competitive, as well as in the cases of four state monopoly sectors and three administered price manufacturing sectors, products are differentiated by country of origin, i.e. whether from India or rest-of-world (ROW). In the monopolistically competitive industries, products are differentiated by firm. India is assumed to be a small country so that the world prices of various tradable goods are exogenous.

We assume that there are two factors of production (labor and capital) in the non-agricultural sectors except in the case of four agricultural sectors where land is also considered as an additional factors of production. Capital and labor are assumed to be perfectly mobile across sectors, except that all capital is assumed to be immobile into and out of state monopoly sectors. Land usage in agriculture is also assumed to be substitutable across four agricultural sectors.

India's merchandise imports are subject to tariffs and non-tariff barriers (NTBs). NTBs are incorporated by endogenously solving for the ad valorem tariff equivalent rate that would hold import within each product category covered by NTBs at a predetermined level. An ad valorem tariff variable in each product category is then an average of this NTB tariff equivalent rate and the nominal tariff rate, using the NTB coverage ratio to weight the NTB tariff equivalent. Tariff rates are aggregated according to the sectors specified in Table 1.

Like any other model, the present model incorporates several important assumptions that are either built into the model or are implemented into the model for the present analysis. These need to be borne in mind during the analysis of results to be reported below.

Fixed Supply of Primary Factors: The aggregate supplies of labor, capital, and agricultural land are assumed to remain fixed in the analysis. This does not mean that changes in these factors of production will not occur during the reform process, but only that they are assumed

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done a similar exercise for analyzing the impact of the formation of NAFTA on US economy.

to be unchanged so as to abstract from macroeconomic forces and to focus on the inter-sectoral allocation of resources.

Full Employment of Resources: It is assumed that there is full employment of resources in the economy. In other words, returns to land, capital (in sectors across which it is mobile), and labor are determined to equate factor demand to the exogenous supply of each factor. This assumption is made because overall employment, say labor, is determined by macroeconomic forces and policies that are not contained in the model. Here, the focus instead is on the composition of employment across sector as determined by the microeconomic interactions of supply and demand with the domestic and trade reforms.

Balanced Trade: The analysis assumes that trade remains balanced or more accurately that any initial trade imbalance for India remains constant as trade is liberalized. The assumption basically captures the reality of flexible exchange rate. This is also a way of abstracting from the macroeconomic forces and policies that are the main determinants of trade imbalances.

Equilibrium in Goods Markets: Total demand must equal total supply in all sectors. Of course, the sectors in which prices are administered, equilibrium is attained through endogenously determined tax/subsidy rate.

The reference year of the model is 1989-90. In order to investigate sectoral employment effects of the unilateral trade liberalization, it has been assumed that the existing bilateral tariffs will be reduced and NTBs on trade will be partially relaxed during the period (1989-90 to 1998-99) under study. The domestic policy inputs include reduction in other net indirect taxes (indirect taxes net of custom duty and subsidies) and changes in administered prices in the regulated sectors.

Our model requires estimates of various types of elasticity measures, viz. demand elasticities of exports and imports and elasticities of substitution between factors of production and between varieties of goods. Similar to other CGE models, most of our

estimates are based on the published literature, although we have estimated elasticities of substitution between labor and capital in various sectors in Chadha, Pohit, and Bina (1995).

When policy changes are introduced into the model, the method of solution yields percentage changes in sectoral employment and other variables of interest in India. Multiplying the percentage changes by the actual levels of sectoral employment given in the database yields the absolute employment changes, positive or negative, that might result from India's unilateral trade and domestic policy reforms.

It should be noted that the results of the India model report only the level of employment in the various sectors. For the present purpose, we have devised a scheme of decomposing these employment changes to employment by occupation or states. This is implemented by using supplementary data on the distribution of India's employment across industries, occupations, and states. In the process, we are able to provide estimate of how the trade or domestic reform in India will alter patterns of employment not only across industries but also across occupation or region. Thus the present exercise will throw light on the composition of human resource requirement (across occupations/regions) in India in view of the globalization of the economy.

Of course, our estimates depend on an assumed constancy of the distribution of employment across occupations and regions. Consequently, our results are subject to some degree of error. Nevertheless, this breakdown may be useful in indicating the changes in composition of employment across states/sectors/occupations that may arise due to the globalization of the Indian economy. These estimates of employment effects may be used in identifying the most serious adjustment problem that Indian workers may face in the coming years. Moreover, it provides the direction in which the dislocated workers need to be trained for minimizing their adjustment.

3. THE POLICY SCENARIOS

Our estimate of employment changes across regions, occupations and sectors within Indian economy due to the unilateral reform measures are based on the policy scenarios reported in Chadha, Pohit, Deardorff, and Stern (1998a, 1998b). We have selected from the above paper only three scenarios for breaking down the employment effects. The policy scenarios are as follows:

Scenario 1: This scenario focuses on the effects of trade liberalization on the economy while retaining the product markets imperfection. In other words, none of the aspects of domestic policy reforms have taken place. As far as trade liberalization is considered, our computational analysis includes reduction in tariffs and NTBs on imports and exports. We refer to this as "administered version" of the model.

Scenario 2: This scenario considers the implication of the trade liberalization on the economy under the assumption that domestic reforms have already taken place. To be precise, we incorporate the following aspects of domestic reforms in this scenario: (a) opening state monopolies to private competition; (b) abolishing administered prices in all the sectors; (c) mobility of domestic capital across all sectors.[3] We refer to this as "market version" of the model.

Scenario 3: This simulation analyzes the "market version" of the model along with reduction in subsidies (through increasing net indirect taxes) in the agricultural sectors, fertilizer and electricity, gas and water supply and also cut in excise duties (through reducing net indirect taxes) on the remaining sectors of the Indian economy.[4]

Till now, nothing has been told regarding the estimate of tariff/NTBs for the base year. Nor do we have discussed regarding the extent of their changes in our policy scenarios. A

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[3] While implementing these domestic policy changes, we assume that fertilizer, petroleum products, and iron and steel now operate under monopolistic competition while the rest operates under perfect competition.

[4] We have assumed a uniform 10% cut for all sectors.

true estimate of NTBs for India is an immense job by itself given the complex nature of trade regime that existed towards the end of the 1980s. In Tables 2a, we have provided our rough estimates of import tariffs for the base year. Tables 2a-2b display also for these policy scenarios the level of reduction in tariff/NTBs on import/export at our sectoral levels.[5] The extent of their reduction is mostly guided by our assumption regarding the deepening of the trade policy reforms by the year 1998-99. While these estimates are not based on any actual declared numbers, we have tried to incorporate the implicit intentions in various policy announcements whereby the imports of agricultural and consumer goods are likely to remain more restricted than those of intermediate and capital goods as well as services. Similarly, we incorporate in our estimates government's stated policy of expanding exports of agricultural goods at a slower rate compared to other sectors.

4. COMPUTATIONAL RESULTS

The gains from the liberalization scenarios under study and the consequential employment changes reported here, should be read with caution. We have abstracted from the effects of the macroeconomic forces and policies and are not able to capture the effects of dynamic changes in efficiency and economic growth. We have also not analyzed the effects of likely inflow of foreign direct investment during the period under analysis. Thus the reported gains and the employment changes are the result of reduction only in tariff and non-tariff barriers on trade along with rationalization of structure of net indirect taxes and subsidies. Further, we have also not been able to model the benefits to the Indian economy as a result of the reduction in tariff and non-tariff barriers by the countries of ROW under the Uruguay Round obligations.

[5] As noted earlier, we assume that existing NTBs on trade are partially relaxed so as to permit a specified per cent increase in the imports/exports that had been constrained. This is implemented in the model by increasing level of imports/exports that were under some kind of quantitative restriction for the sectors subject to import/export NTB. Handling NTBs in such a manner is not altogether satisfactory, but our rationale is that the existing NTBs are unlikely to be completely eliminated by 1998-99.

Before we discuss the employment effects of the scenarios, let us briefly state the impacts on other variables of interest for India. These have already been discussed in Chadha, Pohit, Deardorff and Stern (1998a, 1998b). We reiterate these since employment changes are the outcome of impacts on other variables, viz. growth, output, and returns to factors, in the liberalization scenarios under study.

It may be observed from Table 3 that the economy gains in GDP (as a proxy for welfare) when trade policy reforms are undertaken. The gains in GDP increase significantly when the economy undertakes such reforms under the 'market' version of the model. As Table 3 indicates, the effect on GDP increases from 2.00 per cent under the 'administered version' to more than 5 per cent under the 'market version' of the model. Note that the gains to the economy are accompanied with higher real returns to all the factors of production. Also, the data in Table 3 indicates that terms of trade between agriculture and manufacturing shifts in favor of agriculture in all three scenarios. In a sense, this validates the hypothesis of Gulati and Chadha (1995) that the tariff reductions and deregulation in the industrial sector are expected to change the terms of trade between agriculture and industry in favor of agriculture.

Table 4 reports the percent change in industry and number of firm for our Scenarios 2 and 3. As the table indicates, the highest increase in output occurs in scenario 3 in clothing followed closely by leather products.[6] The next highest output gaining sectors in this scenario are: footwear; non-metallic mineral products; and glass products. The major output losing sectors include: non-ferrous metals; non-electrical machinery; and mining and quarrying followed by moderate output losing sectors which include: paper products; fertilizer; iron and steel. The low output losing sectors include: metal products; electrical machinery; transport equipment; and other transport, storage, and communications services.

[6] The results of scenario 1 follow a similar trend.

The output of cereals declines while that of the rest of agriculture increases. The overall agricultural output, however, registers a positive growth. Moreover, we find from Table 4, that output expansion in twenty two of the manufacturing sectors in these scenarios is accompanied with economy of scale in production.

4.1 EMPLOYMENT EFFECTS

The employment effects, for Scenarios 1-3 are shown in percentages and absolute terms in Table 5. It may be observed that the employment effects in percent, positive as well as negative, are large in five out of the thirty-four sectors. It is also generally true from the results that the employment effects get magnified when the domestic policy reforms accompany trade policy reforms.

Table 5 indicates that the largest decline in per cent employment (in the range of 25-30 per cent) occurs in Scenario 3 in the sectors non-ferrous metals, non-electrical machinery, and mining and quarrying. Smaller declines in employment occur in: paper products, fertilizers, iron and steel (between 10 per cent to 12 per cent); metal products, electrical machinery, transport equipment, printing and publishing, and other transport, storage and communication services (between 3-6 per cent). However, there is prospect of (moderate to large) increase in employment in labor intensive sectors (textiles, clothing, leather products, footwear, rubber products, non-metallic products, and glass products) which experiences output expansion in all these scenarios.

It is not only important to look at percentage employment effects but also at the absolute changes in employment since the latter indicates the number of workers that may have to move from one sector to other. These absolute changes are reported in Table 5 for each scenario. Total for the entire economy is also reported, but is zero under the assumption that aggregate employment is held fixed. For ease of exposition, we have also produced in Table 6 the positive and negative employment effects for each of these simulations.

It is evident from Table 6 that the greatest expansion in employment occurs in textile; non-metallic mineral products; rest of agriculture; clothing; leather products; and wholesale and retail trade. The large negative employment effects are concentrated in: other cereals; non-electrical machinery; mining and quarrying; paddy, and wheat.

A comparison of results of Scenarios 1 versus Scenario 2/3 reveals that the sectors such as: paper products; and fertilizer, registering positive employment growth under administered version (Scenario 1) experience negative employment when trade liberalization is accompanied with domestic reform.

It is clear from the above analysis that the sectoral employment effects are large in absolute numbers. However, in interpreting these results, one should bear in mind that the assumption used in the scenarios that the trade and domestic reforms takes place all at once. If one have to take into account more realistically the likelihood that the domestic reform would be phased over a decade or more, the resulting changes in the sectoral employment, measured on an annual basis would be considerable small. Lastly the sectoral of employment effects are conditioned of our estimate of initial NTBs and their extent of reduction. To the extent, they deviate from the value, our employment effects are over/under estimated.

4.2 EMPLOYMENT EFFECTS BY OCCUPATION

The above discussion is extremely useful in quantifying the sectoral employment effects of the ongoing reform programs. This is only one part of the story. The other important part of the story for policy purpose is to quantify the occupational characteristics of the concerned laborers. Below, we do the same by devising a scheme for decomposing the employment changes from our model to major occupational groups.

For this purpose, we have used information from the "General Economic Tables" of Census of India. It reports distribution of main workers by industrial activities (seven in all) and occupational categories (ten in all) for the census year. For clarity of observation, we

have aggregated for use in our model, the ten occupational categories into six of them as follows:

1. Professional, technical and related workers
2. Administrative, executive and managerial workers
3. Clerical and related workers
4. Sales workers
5. Service workers
6. Farmers, fisherman and related workers; production and related workers; transport equipment operators and laborers; and workers not classified by occupation (rest)

The corresponding industries are the following:

1. Agriculture
2. Manufacturing
3. Mining and quarrying
4. Construction Trade and commerce
5. Trade and commerce
6. Transport, storage and communication services
7. Other services

We have already noted that our model provides estimate of employment effects for the 34 sectors. However, as information in Census of India is limited to the above seven industrial activities, we have aggregated our sectoral employment effects to these industrial activities for analyzing the occupational impacts of our policy scenarios. As noted earlier, the Census data provides us with the occupational percentages of each of these seven industrial sectors. Multiplying the sectoral employment changes by these percentages, we obtained occupations that experience increase in employment and those that will experience decline.

Table 7 portrays the positive and negative occupational changes by sectors for each of our policy scenarios. As this table shows, employment of administrative/executive and managerial workers; and sales workers increase in all three scenarios.

The pattern of employment changes of professional/technical and related workers across the scenarios displays a striking feature. When trade liberalization is alone undertaken, their employment declines by 23948 (Scenario 1). The decline continues when domestic reforms accompany trade reforms. However, the deepening of reforms (domestic/trade) with the rationalization of tax/subsidy rates, lead to marginal increase in employment of this category.

The similar trend is observed for clerical workers, although the deepening of economic reforms lead to substantial increase in their employment. Employment of service workers increase in Scenario 1 declines in Scenario 2 and again increases in Scenario 3. Note also that the category "rest of workers" (comprising unskilled laborers and agricultural related workers) decrease in all the scenarios.

To sum up, deepening of reforms give a boost to employment of sales workers; administrative, executive and managerial workers; and service workers. However, there is practically no increase of high skilled workers like professional, technical, etc.

4.3 EMPLOYMENT EFFECTS BY REGIONS

We have also broken down our sectoral employment effects by states in addition to occupation. For this purpose, we have used the distribution of main workers (reported in C.M.I.E) classified by Indian states into industries (seven namely agriculture; manufacturing, mining, and quarrying; construction; trade and commerce; transport, storage and communication; and other services) for the year 1991. Multiplying sectoral employment changes for each scenario by the share of each state in all-India employment for the corresponding sector, we compute the impact at state level by sector for our scenario.

However, for compactness of reporting, we have aggregated the states into the following major regions (based on location):

1. North-Eastern (N.E.) region (Assam, Manipur, Nagaland, Tripura, Mizoram, Meghalaya, and Arunachal Pradesh);
2. Eastern region (West Bengal, Orissa, Bihar, and Sikkim);
3. Western region (Goa, Gujarat, Maharashtra, and Rajasthan);
4. Southern region (Kerala, Tamilnadu, Karnataka, and Andra Pradesh);
5. Northern region (Delhi, Chandigarh, Punjab, Haryana, Himachal Pradesh, and Jammu and Kashmir);
6. Uttar Pradesh (UP), and Madhya Pradesh (MP).

We have dropped the five remaining Union Territories (viz. Andaman, Daman and Diu, Dadra and Nagar, Lakshadeep, and Pndicherry) from our decomposition exercise.

Coming to the regional employment effects, Table 8 indicates a net increase in employment opportunities in the relatively poor states when trade reforms are only implemented.[7] However, domestic reforms accompanied with trade liberalization lead to a decline in the same states. At the regional level, this means that the decline is contained in the Eastern region and UP and MP. For the Eastern region, the sectors with contraction of employment are basically the agriculture and the mining and quarrying sectors. However, the decline is primarily originating from agriculture in UP and MP.

The prospect of the Northeast states seems really bad; it faces declining employment opportunities in all three scenarios. The sectors like agriculture, mining, and quarrying mainly suffer in this case.

[7] The CMIE classifies states into three categories, (1) rich States, (2) developing States, and, (3) poor States based on their average per capita incomes. According to this classification, Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh are the poor states while rich States are the following: Haryana, Maharashtra, and Punjab. We have also followed the same definition.

It is also evident from Table 8 that within each of above regions, there are always increases in employment in some of the sectors like manufacturing, trade and commerce and construction (for scenario 2 only).

The trade and domestic reform seem to open employment opportunities primarily in Western region, followed closely by Southern, and Northern region. The benefiting sectors in these regions are expectedly manufacturing, construction and trade and commerce.

5. CONCLUSIONS

The purpose of this paper is to estimate the changes in employment that will be required across sectors, occupation, and regions within India as a result of the ongoing reform programs. These changes are expected to be costly to the workers, to the extent they find it difficult to transfer from declining to expanding sectors.

We find that the greatest expansion in employment occurs in textile; non-metallic mineral products; rest of agriculture; clothing; leather products; and wholesale and retail trade. The large negative employment effects are concentrated in: other cereals; non-electrical machinery; mining and quarrying; paddy, and wheat. With regard to the impact on occupational characteristics of the employees, our study indicates that the deepening of reforms give a boost primarily to employment of sales workers; administrative, executive and managerial workers; and service workers. However, there is practically no increase of high skilled workers like professional, technical, etc. This essentially means that the displaced workers need to be trained in these directions. An examination of the regional employment effects indicates that the attention should be focussed more on Northeast and Eastern region to minimize the social cost of globalization of the Indian economy.

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TABLE 1. Sectoral Breakdown of India CGE Model

S.No	*Sectors*	*ISIC Code*	*Market Structure*	*Price Regime*
1	PADDY	1A	Perfect Competition	Administered
2	WHEAT	1B	Perfect Competition	Administered
3	OTHER CEREALS	1C	Perfect Competition	Free
4	REST OF AGRICULTURE	1D	Perfect Competition	Free
5	FOOD, BEVERAGE & TOBACCO	310	Monopolistic Competition	Free
6	TEXTILES	321	Monopolistic Competition	Free
7	CLOTHING	322	Monopolistic Competition	Free
8	LEATHER PRODUCTS	323	Monopolistic Competition	Free
9	FOOTWEAR	324	Monopolistic Competition	Free
10	WOOD PRODUCTS	331	Monopolistic Competition	Free
11	FURNITURE FIXTURES	332	Monopolistic Competition	Free
12	PAPER PRODUCTS	341	Monopolistic Competition	Administered
13	PRINTING & PUBLISHING	342	Monopolistic Competition	Free
14	FERTILIZER	35A	Monopolistic Competition	Administered
15	OTHER CHEMICALS	35B	Monopolistic Competition	Free
16	PETROLEUM PRODUCTS	35C	State Monopoly	Free
17	RUBBER PRODUCTS	355	Monopolistic Competition	Free
18	NON-METALLIC MINERAL.PRODUCTS	36A	Monopolistic Competition	Administered
19	GLASS PRODUCTS	362	Monopolistic Competition	Administered
20	IRON & STEEL	371	State Monopoly	Free
21	NON-FERROUS METAL	372	Monopolistic Competition	Free
22	METAL PRODUCTS	381	Monopolistic Competition	Free
23	NON-ELECTRICAL MACHINERY	382	Monopolistic Competition	Free
24	ELECTRICAL MACHINERY	383	Monopolistic Competition	Free
25	TRANSPORT EQUIPMENTS	384	Monopolistic Competition	Free
26	MISC. MANUFACTURING	38A	Monopolistic Competition	Free
27	MINING & QUARRYING	2	State Monopoly	Free
28	ELECTRICITY, GAS & WATER	4	State Monopoly	Free
29	CONSTRUCTION	5	Perfect Competition	Free
30	WHOLESALE & RETAIL TRADE	6	Perfect Competition	Free
31	RAIL TRANSPORT	7A	State Monopoly	Administered
32	OTHER TRANSPORT, STORAGE &C	7B	Perfect Competition	Free
33	FINANCE, INSURANCE & REAL ESTATE	8	Perfect Competition	Free
34	COMM., SOCIAL & PERSONAL SERVICE	9	Perfect Competition	Free

TABLE 2a. Base Year Import Tariff Rates and Proposed Reduction

Sectors	*Import Weight*	*Import Weighted Average*	
		1989-90	*1998-99*
Agricultural Products	0.03	46	15
Coal, crude oil, natural gas	0.16	54	25
Other mineral products	0.03	20	10
Consumer goods	0.07	89	50
Intermediate goods	0.47	103	30
Capital goods	0.24	91	30
Import weighted average		87	25

TABLE 2b. Proposed Reduction in NTBs on Trade

Sectors	*% Increase in Constrained Imports by 1998-99*	*% Increase in Constrained Exports by 1998-99*
Agri. products	25	50
Consumer goods	50	75
Intermediate goods	85	75
Capital goods	85	75
Services	85	75

TABLE 3. Overall Changes from Unilateral Liberalization

	Trade Reforms (Administered Version)	*Trade and Domestic Policy Reforms (Market Version)*	*Trade and Domestic Policy Reforms and Indirect Tax Rationalization*
GDP	2.01	5.00	5.15
RETURNS			
Land	2.24	4.57	4.64
Labor	2.58	4.70	5.16
Capital	2.36	4.64	5.53
Currency Depreciation	29.57	26.63	26.33
Terms of Trade (Agr. vs. Mfg.)	3.2	6.10	7.10

Note: All numbers are in per cent change

TABLE 4: Changes in Output, Number of firms, and the Scale Effect

SN	Sectors	Trade and Domestic Policy Reforms Market Version			Trade reforms & Domestic Policy Reforms and IT rationalization		
		Simulation 2			Simulation 3		
		Output	No. of Firms	Scale Effect	Output	No. of Firms	Scale Effect
1.	Paddy	-1.1			-1.5		
2.	Wheat	-1.4			-2.0		
3.	Other Cereals	-1.7			-1.9		
4.	Rest of Agriculture	1.7			1.6		
5.	Food, Beverages & Tobacco	1.5	0.9	0.6	1.5	0.3	1.2
6.	Textiles	17.3	14.3	3.0	17.3	13.5	3.8
7.	Clothing	130.4	125.8	4.6	127.2	122.1	5.1
8.	Leather Products	103.5	98.9	4.6	102.3	97.0	5.3
9.	Footwear	69.4	60.4	9.0	68.8	59.1	9.7
10.	Wood products	2.2	2.1	0.1	2.8	2.3	0.5
11.	Furniture Fixtures	-1.1	-2.0	0.9	-0.9	-2.4	1.5
12.	Paper Products	-11.2	-13.3	2.1	-10.6	-13.8	3.2
13.	Printing & Publishing	-1.6	-2.9	1.3	-1.2	-3.7	2.4
14.	Fertilizer	-10.8	-15.0	4.3	-11.0	-16.2	5.1
15.	Other Chemicals	-1.0	-3.9	3.0	0.0	-4.7	4.8
16.	Petroleum Products	8.3	2.5	4.3	9.9	0.7	9.3
17.	Rubber Products	17.9	15.0	6.0	19.0	14.3	4.7
18.	Non-Metallic Min. Products	61.2	56.9	1.2	61.2	55.9	5.3
19.	Glass Products	67.9	61.9	2.6	68.6	61.1	7.5
20.	Iron & Steel	-11.0	-12.1	0.3	-9.2	-12.3	3.1
21.	Non-Ferrous Metal	-32.5	-35.1	0.8	-29.2	-33.8	4.6
22.	Metal Products	-6.4	-6.7	1.1	-5.0	-7.0	2.0
23.	Non-Electrical Machinery	-30.6	-31.4	0.3	-27.6	-30.2	2.6
24.	Electrical Machinery	-5.8	-6.9	1.1	-3.9	-7.1	3.2
25.	Transport Equipments	-4.7	-5.9	1.2	-3.3	-6.3	3.0
26.	Misc. Manufacturing	3.9	2.2	1.6	5.2	1.5	3.8
27.	Mining & Quarrying	-25.9			-24.5		
28.	Electricity, Gas & Water	2.3			2.7		
29.	Construction	0.7			1.4		
30.	Wholesale & Retail Trade	2.4			2.5		
31.	Rail Transport	0.4			1.1		
32.	Other Transport, Storage & Com.	-3.2			-2.5		
33.	Finance, Insurance & Real Estate	-0.9			-0.9		
34.	Comm. Social & Personal Service	-0.4			-0.2		

TABLE 5. Sectoral Employment Effects

SN Sectors	ISIC Code	Scenario 1		Scenario 2		Scenario 3	
		Percent	Millions	Percent	Millions	Percent	Millions
1 Paddy	1A	-0.3	-0.1	-1.0	-0.5	-1.5	-0.7
2 Wheat	1B	-0.8	-0.3	-1.4	-0.5	-2.0	-0.8
3 Other Cereals	1C	-1.2	-0.6	-1.7	-0.9	-1.9	-1.0
4 Rest of Agriculture	1D	1.5	0.7	1.8	0.9	1.6	0.8
5. Food, Beverages & Tobacco	310	1.3	0.1	1.0	0.1	1.0	0.1
6. Textiles	321	10.1	0.7	16.5	1.1	16.4	1.1
7. Clothing	322	51.1	0.2	127.1	0.6	124.1	0.6
8. Leather Products	323	62.3	0.1	102.1	0.2	101.0	0.2
9. Footwear	324	38.2	0.1	67.8	0.1	67.2	0.1
10. Wood Products	331	0.9	0.0	1.8	0.0	2.5	0.0
11. Furniture Fixtures	332	-1.2	-0.0	-1.7	-0.0	-1.7	-0.0
12. Paper Products	341	0.5	0.0	-12.3	-0.1	-11.6	-0.1
13. Printing & Publishing	342	-2.0	-0.0	-2.6	-0.0	-2.6	-0.0
14. Fertilizer	35A	0.2	0.0	-12.0	-0.1	-12.2	-0.1
15. Other Chemicals	35B	-3.2	-0.1	-2.0	-0.0	-1.1	-0.0
16. Petroleum Products	35C	22.8	0.1	5.7	0.0	7.4	0.0
17. Rubber Products	355	12.8	0.1	16.7	0.1	17.8	0.1
18. Non-Metallic Mineral Products	36A	33.4	0.6	59.8	1.1	59.9	1.1
19. Glass Products	362	36.1	0.1	65.8	0.2	66.3	0.2
20. Iron & Steel	371	-49.0	-0.9	-11.8	-0.2	-10.1	-0.2
21. Non-Ferrous Metal	372	-2.1	-0.0	-33.6	-0.3	-30.3	-0.2
22. Metal Products	381	-6.3	-0.1	-7.1	-0.1	-6.0	-0.1
23. Non-Electrical Machinery	382	-28.1	-0.6	-31.4	-0.7	-28.8	-0.6
24. Electrical Machinery	383	-6.4	-0.1	-6.5	-0.1	-4.7	-0.1
25. Transport Equipments	384	-4.7	-0.1	-5.1	-0.1	-3.9	-0.1
26. Misc. Manufacturing	38A	1.5	0.0	3.1	0.0	4.3	0.0
27. Mining & Quarrying	2	15.1	0.4	-26.8	-0.6	-25.2	-0.6
28. Electricity, Gas & Water	4	5.0	0.1	1.0	0.0	1.8	0.0
29. Construction	5	-0.1	-0.0	0.4	0.0	1.2	0.1
30. Wholesale & Retail Trade	6	1.1	0.3	1.1	0.2	1.6	0.4
31. Rail Transport	7A	0.2	0.0	0.3	0.0	1.1	0.0
32. Other Transport, Storage & C	7B	-4.3	-0.3	-4.1	-0.3	-3.1	-0.2
33. Finance, Insurance & Real Estate	8	-1.0	-0.0	-1.9	-0.0	-1.6	-0.0
34. Comm., Social & Personal Service	9	-0.5	-0.1	-0.5	-0.1	-0.2	-0.1

TABLE 6. Employment Effects

SECTOR	Scenario 1	Scenario 2	Scenario 3
POSITIVE EMPLOYMENT			
Textiles	662500	1082834	1081926
Non-Metallic Min. products	590653	1058664	1060713
Rest of Agriculture	746416	880265	790993
Clothing	241302	600124	585577
Leather Products	147053	241003	238440
Wholesale & Retail Trade	250632	234797	360477
Glass Products	95769	174747	176120
Footwear	78898	139945	138785
Rubber Products	64289	83727	89188
Food., Beverages .& Tobacco	93715	72767	76463
Misc. Manufacturing	13903	28921	28921
Petroleum Products	60442	15002	15002
Electricity, Gas & Water	55934	10819	10819
Wood Products	2930	5893	5893
Rail Transport	4419	5844	5844
NEGATIVE EMPLOYMENT			
Furniture fixtures	368	514	502
Printing & Publishing	12982	17175	16965
Other Chemicals	64059	38733	20972
Finance, Insurance & Real Estate	23893	48268	39984
Metal Products	64700	73600	62000
Electrical Machinery	107200	108500	79400
Comm, Social & Personal Service	135200	131900	59100
Transport Equipments	130213	139021	106176
Iron & Steel	940384	226031	193915
Other Transport, ETC	279856	266196	200799
Non-Ferrous Metal	16930	267528	241727
Paddy	129238	517613	743534
Wheat	64059	536965	760200
Mining & Quarrying	23893	632860	594123
Non-Electrical Machinery	64700	675988	620794
Other Cereals	107200	867579	981960
POSITIVE/NEGATIVE EMPLOYMENT			
Fertilizer	1100	-52900	-53900
Paper Products	3400	-76200	-71600

TABLE 7. Employment Effects by Occupation Groups

SCENARIO 1	Profess. Techn. & related workers	Administr., Executive & Managerial Workers	Clerical Workers	Sales Workers	Service Workers	Rest	Total
SECTORS							
Agriculture	-133	-2	-254	-90	-133	-328779	-329392
Manufacturing	1495	2108	3758	978	1276	105364	114979
Mining & Quarrying	5846	5568	17538	835	8908	317084	355779
Construction	-461	-886	-666	-18	-249	-11119	-13399
Trade & Commerce	5876	13301	22097	174994	26192	8173	250632
Transport, Storage & Com.	-3686	-4944	-61668	-854	-6877	-197409	-275437
Other Services	-32885	-4209	-19044	-448	-25271	-21305	-103161
Total	-23948	10935	-38238	175397	3846	-127991	
SCENARIO 2							
SECTORS							
Agriculture	-422	-7	-803	-286	-422	-1039952	-1041892
Manufacturing	23763	33501	59735	15551	20275	1674675	1827499
Mining & Quarrying	-10399	-9904	-31197	-1486	-15846	-564028	-632860
Construction	1451	2789	2097	57	782	350000	42177
Trade & Commerce	5505	12460	20701	163937	24537	7656	234797
Transport, Storage & Com.	-3484	-4673	-58290	-807	-6500	-186597	-260353
Other Services	-53990	-6910	-31265	-735	-41489	-34977	-169368
Total	-37576	27256	-39024	176231	-18663	-108223	
SCENARIO 3							
SECTORS							
Agriculture	-687	-11	-1307	-465	-687	-1691508	-1694663
Manufacturing	26624	37534	66926	17423	22716	1876282	2047505
Mining & Quarrying	-9763	-9298	-29288	-1395	-14876	-529504	-594123
Construction	4861	9343	7026	190	2621	117239	141279
Trade & Commerce	8451	19130	31781	251689	37671	11755	36-477
Transport, Storage & Com.	-2432	-3263	-40699	-564	-4539	-130284	-181781
Other Services	-25086	-3211	-14527	-342	-19277	-16252	-78695
Total	1969	50224	19913	266537	23629	-362272	

TABLE 8: Employment Effects by Regions and Sectors

Scenario 1	Agricul.	Manuf.	Mining	Construc.	Trade & Commerce	Transport	Others	Total
N.E. Region	-12941	1680	8737	-442	2083	-7832	-4836	-13550
Eastern Region	-69072	3453	118864	-1559	44710	-47441	-18314	30641
Western Region	-64135	29789	67661	-3498	57174	-70697	-21200	-4907
Southern Region	-87113	51782	104177	-3458	85211	-96962	-38874	-14736
Northern Region	-10827	8458	3861	-532	22232	-21264	-6637	-4710
UP & MP	-84822	19667	52016	-3865	38896	-30833	-13166	-22157
Rel. Rich States	-43292	21427	24789	-2613	43628	-53143	-17157	-26362
Rel. Poor States	-150878	30699	167222	-3597	73168	-69976	-36404	10235
All India	-329392	114979	355779	-13399	250632	-275437	-103161	
Scenario 2								
N. E. Region	-40932	26707	-15541	1392	1951	-7403	-7939	-41765
Eastern Region	-218479	54880	-211435	4908	41885	-44842	-30068	-403151
Western Region	-202862	473463	-120355	11010	53561	-66825	-34806	113186
Southern Region	-275721	823062	-185314	10971	79829	-91653	-63822	297352
Northern Region	-34245	134428	-6867	1674	20827	-20100	-10897	84820
UP & MP	-268298	312583	-92525	12167	36439	-29191	-21615	-50441
Rel. Rich States	-136937	340565	-44094	8225	40871	-50233	-28167	130230
Rel. Poor States	-477237	487932	-297455	11322	68545	-66143	-59767	-332803
All India	-1040537	1825123	-632037	42177	234492	-260014	-169147	
Scenario 3								
N.E. Region	-66577	29922	-14590	4664	2996	-5169	-3679	-52433
Eastern Region	-355364	61487	-198493	16440	64306	-31309	-13971	-456904
Western Region	-329963	530462	-112989	36881	82231	-46658	-16172	143792
Southern Region	-448469	922147	-173970	36748	122556	-63993	-29655	365364
Northern Region	-55701	150612	-6447	5607	31975	-14034	-5063	106949
UP & MP	-436396	350213	-86862	40755	55944	-20382	-10043	-106771
Rel. Rich States	-222733	381564	-41395	27552	62748	-35073	-13088	159575
Rel. Poor States	-776243	546673	-279248	37926	105235	-46182	-27770	-439609
All India	-1692470	2044843	-594123	141095	360008	-181545	-78583	