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INDIA'S TRADE LIBERALIZATION SINCE 1991

A STATISTICAL APPRAISAL

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AND
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FOREWORD

The world economy and its constituent elements are undergoing paradigm shifts during the last decade. As many developing countries have changed their strategies from import substitution to export promotion and in the process removed barriers affecting cross border transactions of goods, services and investment, the global economy started getting increasingly integrated. The setting up of the World Trade Organization as a result of the negotiations under the Uruguay Round represents a culmination of a process which started in 1947. The world is now fortunate to have a rule-based system for conducting international trade as well as an institutional mechanism to oversee that the rules as laid down are scrupulously followed by both major and marginal players.

India has embarked on the economic reforms process since 1991 with a primary focus on liberalization of the external trade regime. During the last five years, substantive policy initiatives have been initiated which brought down the peak rate of customs duty from 300 to 50 per cent, removed the licensing requirements on 90 per cent of India's imports and carried out substantial procedural simplification.

This paper attempts to study empirically three asspects of external trade:

(i) It makes an attempt to quantify the extent of change in the international component of India's economy. It is found that by taking the Export-GDP ratio as the indicator, the Indian economy has internationalized substantially. The increase is more pronounced if only the tradable sector is taken into account.

(ii) Simultaneous removal of controls on exports and imports should result in specialization of those products in which the country enjoys a competitive advantage. This also

implies a more pronounced shift in favour of imports of those product-groups where the competitive advantage is absent. Whether these shifts are actually taking place can be found out by estimating Net Export Specialization Indices at a more or less homogeneous product category level. Results confirm this hypothesis.

(iii) The largest segment of world trade now comprises intra-industry trade. As the import controls are removed and domestic preferences are allowed to influence trade pattern, it is expected that the level of intra-industry trade will increase. The empirical results broadly support the hypothesis. However, more comprehensive analysis is required to come to a very definite conclusion.

Policy making requires a scientific foundation which can come only out of painstaking empirical research. IIFT considers such studies to be of crucial importance. We hope that everybody having an interest in trade policy will find this study useful.

Dr. P.L. SANJEEV REDDY
DIRECTOR GENERAL

New Delhi
December 1996

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and *Bimal K. Panda*

The Context

INDIA'S economic reforms process started with the liberalization measures in India's external sector. The measures covered broadly the following:

- removal of quantitative restrictions on bulk of imports;
- reduction in the level of tariffs on a large number of imports, including special provisions for preferential duty regime on imports for export production;
- removal of product-specific export incentives coupled with a two-stage devaluation of the Indian rupee;
- use of exchange rate as the general instrument for export promotion and import management;
- removal of some minor administrative measures such as minimum price restrictions on some exports; and
- streamlining of the procedural regime designed to reduce transaction costs.

The overall impact of these measures is supposed to remove the anti-export bias in the policy regime, create an environment which will promote export of those products in which the country enjoys competitive advantage and promote only efficient import substitution.

This paper presents the results of some statistical analyses to quantify the impact of these policy measures.

Internationalization of the Economy

The internationalization of the economy as measured by trade as percentage of GDP has increased substantially since 1991. In 1991-92, the share was 15.6 per cent which increased to 18.7 per cent in 1993-94. However, the increase was mostly in exports as percentage of GDP which rose by about 50 per cent while for imports, the relevant figure is only 2.5 per cent. The break in the trend rate for exports as percentage of GDP becomes more evident if a longer time period is concerned. India's reforms process really started in 1985. So, for analysis in this paper, this year has been taken as the benchmark (Table 1). It is evident that export as percentage of GDP is on a growth path.

TABLE 1

EXPORTS AS PERCENTAGE OF GDP

Year	At current prices	At constant prices[1]
1984-85	5.63	4.99
1985-86	4.66	4.42
1986-87	4.81	4.61
1987-88	5.32	5.11
1988-89	5.74	5.02
1989-90	6.77	5.38
1990-91	6.81	5.69
1991-92	7.98	6.04
1992-93	8.55	6.09
1993-94	9.86	7.22
1994-95	9.69	7.23

[1]At 1980-81 constant prices.

Source: *Economic Survey 1991-92* and *1995-96.*

It is important to see what is happening when data are converted on constant prices. This is because the price trends for the exportables can be different from that of the gross GDP deflator. For statistical analysis, the data on GDP factor cost at constant prices were taken from the *Economic Survey.* Current rupee values of exports were converted into constant prices by using the unit value indices of DGCI&S, with base changed to 1980-81 to make the data comparable to GDP data. The results

are in Table 1. The trend is confirmed on the basis of constant prices.

But the interesting point is that the quantum of increase is much less in terms of constant prices. While exports as percentage of GDP increased by 75.1 per cent during 1985-1994 period in current prices, the increase was only 44.7 per cent in constant prices.

This difference obviously is due to the fact that export prices of unit value index (UVI) rose at a rate higher than that of wholesale price index (WPI). The relevant data are in Table 2, Col. III, which gives the ratio of UVI to WPI. As it can be seen that while the ratio was constant between 1984-85 and 1987-88, the ratio started increasing since 1988-89. This is rather difficult to explain because if exports were to increase, export prices should in fact rise at a rate lower than domestic prices. One explanation obviously is the continuous depreciation of the Indian rupee. So long as the rupee depreciates and the pass-through is not complete, it will get reflected in higher unit value realization in rupee terms. Another explanation, not mutually exclusive, is that the higher unit price realization can be partially due to over invoicing of exports. But again for 1994-95, it experienced a marginal decrease.

TABLE 2

UVI, WPI AND THE RATIO

Year	UVI	WPI	UVI/WPI
1984-85	156.5	120.1	1.30
1985-86	157.4	125.4	1.25
1986-87	165.3	132.7	1.25
1987-88	180.2	143.6	1.25
1988-89	214.0	154.3	1.39
1989-90	254.9	165.7	1.54
1990-91	269.6	182.7	1.48
1991-92	340.6	207.8	1.64
1992-93	388.5	228.7	1.70
1993-94	412.9	247.8	1.67
1994-95	455.9	274.7	1.66

Source: WPI is from the *Economic Survey 1995-96* and UVI calculated with changed base from the same source.

Another interesting point would be to consider what proportion of a country's output that is potentially exportable is being actually exported and whether there is any trend in that ratio? This redefining is necessary because a large part of the GDP is not really exportable and, therefore, export as percentage of GDP underestimates the importance of exports for the tradable sector. The data reveal that the importance of exports for the tradable sector is almost triple of what the average figure suggests and the importance is increasing (Table 3).

TABLE 3

EXPORTS AS PERCENTAGE OF TRADABLE SECTOR
(AT CURRENT PRICES)

1984-85	12.82
1985-86	9.09
1986-87	10.74
1987-88	10.72
1988-89	11.28
1989-90	13.39
1990-91	13.54
1991-92	15.90
1992-93	17.04

Note : Tradable sector is defined as (primary + secondary) - (forestry & logging, construction, electricity, gas & water supply).

Source : *Economic Survey 1991-92* and *1995-96*, and RBI, *Report on Currency and Finance, 1987-88, 1991-92* and *1993-94*.

A comparison with the USA reveals that this is more or less in line with that country's record. Data for 1994 show that export as percentage of GDP measured in constant 1987 prices was 12 per cent. This figure rises to 24 per cent, if calculated with reference to the tradable sector.

Impact of Trade Liberalization

Removal of export and import barriers should result in expansion in both. However, the country should improve its net export position in those sectors where it enjoys competitive advantage. In this section, we have tried to look at two things: on one hand we have tried to find out the position of our trade sector in the post-reforms period. For that, we have used Net Export

Specialization Indices. On the other hand, we have tried to judge to what extent foreign trade has been liberalized. To analyze that, we have studied the behaviour of India's intra-industry trade.

Net Export Specialization Index. Net Export Specialization Index (NESI) is defined as current value of exports minus current value of imports/exports plus imports. We constructed the indices for 1990-91 and 1994-95 at the two-digit HS code level.

Out of 98 two-digit HS codes, the NESI is positive for 56 and negative for 42 in 1990-91. The corresponding figures for 1994-95 are 58 and 40. The change, therefore, has been marginal. However, if the inter-temporal changes are considered irrespective of signs, we find that there has been a substantial movement. Fifty product-groups improved their NESIs while 11 product-groups maintained theirs (within a variation of 2 per cent). Only 37 product-groups experienced a decline. The major product-groups, recording either a sharp rise or fall in their respective NESIs, are shown in Tables 4 and 5 (See details in Annexure 1).

TABLE 4

PRODUCT-GROUPS SUBSTANTIALLY IMPROVING NESI

HS code	Product description
04	Dairy products
11	Products of milling industry
12	Cereal preparations
25	Salt, sulphur, stones, lime, cement, etc.
30	Pharmaceuticals
36	Explosives
54	Manmade filaments
69	Ceramic products
71	Pearls, precious stones
72	Iron and steel
87	Road vehicles and parts
91	Clocks, watches and spare parts
96	Misc. manufactured articles

Source: DGCI&S, Calcutta and the NESI calculation (Annexure 1).

Intra-Industry Trade. As a country's economy gets liberalized, trade among the industries can be expected to increase. The underlying reason is that with liberalization the restriction on

imports and exports gets deteriorated and, hence, the country can simultaneously export and import products of the same industry. Before going into the details of the behaviour of India's intra-industry trade, let us briefly discuss what actually intra-industry trade means.

TABLE 5

PRODUCT-GROUPS WITH SUBSTANTIAL REDUCTION IN NESI

HS Code	Product description
17	Sugar and preparations
18	Cocoa and preparations
22	Beverages, spirits and vinegar
34	Soaps and other singular preparations
55	Manmade staple fibres
58	Special woven fabrics
59	Impregnated, coated & laminated textile fabrics
76	Aluminium and articles

Source: As in Table 4.

Intra-industry trade can be defined as simultaneous export and import of products belonging to the same industry. This in turn implies that a country participating in trade, specializes not in the whole industry but in specific segments of an industry. In recent years, it has been found that maximum growth in cross-border trade has been in the domain of intra-industry trade. That this happens to be a more common development is clear from the evidence that despite massive growth in world trade, not many industries appear to have totally disappeared in any country. There is, however, some evidence of partial relocation of some industries in more cost competitive economies.

Trade models are normally concerned with the impact of trade on inter-industry specialization. Both classical and neo-classical theories try to explain how trade can result in a country's specialization in industries in which it enjoys comparative advantage. It is evident that trade-induced inter-industry specialization results in spatial relocation of industries. If the movement is towards complete specialization, there will be an increased dissimilarity between a country's export and import basket.

On the other hand, intra-industry trade can be perceived to cause less adjustment problem. Since intra-industry trade reflects narrow specialization than the broad ones, trade will necessitate a shift of resources within the industry and not across industries, as in the case of inter-industry trade. Problems relating to large-scale unemployment and redeployment of retrenched labour are therefore of lesser magnitude when trade takes the form of intra-industry transactions.

Since intra-industry is based on the product differentiations and increasing returns to scale and not on different factor proportions, it does not result in changes in factor prices. Therefore, the income distributional problems also do not arise. A high level of intra-industry trade will indicate that trade is most taking place among countries which are more or less similarly endowed, whereas a low level will indicate that bulk of the trade is taking place among countries with divergent factor endowment.

The level of intra-industry trade of a country can change over time. The important variables causing such a change are:

(a) *The Degree of Product Differentiation.* If a country's production structure gets more biased towards those industrial sectors, which are characterized by product differentiation, the level of intra-industry trade will rise.

(b) *The Level of FDI.* Foreign direct investment (FDI) can be both complementary or substitute to trade. If a country is getting FDI which is complementary to trade, the level of intra-industry trade will go up.

(c) *Removal/Reduction of Trade Barriers.* Though across the board, changes in tariff barriers are not expected to have any differential impact on intra-industry trade as opposed to inter-industry trade, the tariff dispersion can have an impact. If the variance of tariff rates gets lower, there will be a positive impact on intra-industry trade.

Intra-industry can be quantified in many ways. The most commonly used is the formulation by Grubel and Lloyd.

$$B_i = \frac{(X_i+M_i) - |X_i-M_i|}{(X_i+M_i)} \times 100$$

where X = Exports
M = Imports
i = Product category

The index will vary between 0 and 100. If the B_i is closer to 100, it means intra-industry trade is very important for that product-group. Conversely, if B_i tends towards zero, greater is the importance of inter-industry trade.

If intra-industry trade index is calculated at a low level of disaggregation, then it gives rise to aggregation bias. This bias arises when products which are essentially different are grouped together. That is, products whose input requirements or factor intensities are different, and thus cannot be regarded as being part of the output of the same industry which gets included into the same product-group. In that case the problem arises if the sub-groups have opposite trade balances. The reason is that, the overall trade imbalance will not appear to be large in that case and the measure will suggest a higher level of intra-industry trade than the actual level. This is known to be the opposite sign effect. To tackle this problem, Grubel and Lloyd proposed another formula. The formula is given by

$$C_i = 1-[(\Sigma|X_{ik}-M_{ik}|) \ / \ \{\Sigma(X_{ik}+M_{ik})\}]$$

where i represents the product-group
k represents 1 to n sub-groups under i.

To obtain the average level of intra-industry trade for a country, the formula proposed by Grubel and Lloyd is the calculation of a weighted mean, using the relative size of exports and imports of a particular product-group as weights. The formula is given by

$$B_j = [\{\Sigma B_i (X_i+M_i)\} \ / \ \{\Sigma(X_i+M_i)\}] \times 100$$

where j represents the country
i represents the product-groups; i=1...n.

But there is one problem with B_j; it makes no allowance for any imbalance in a country's total trade. For a country having a large

trade imbalance, B_j will get biased downwards and the true extent of intra-industry trade will, thus, be underestimated. To tackle this problem, Grubel and Lloyd proposed an alternative formula:

$$C_j = \frac{\Sigma (X_i+M_i) - \Sigma |X_i-M_i|}{\Sigma (X_i+M_i) - |\Sigma X_i-\Sigma M_i|} \times 100$$

the subscripts having the same meaning.

We have used these Grubel-Lloyd formulae to measure the intra-industry trade indices for India. In the first step, we have calculated the indices using the product-group at one-digit level. We find that in 1990-91 the average intra-industry trade for India was 54.01 and it increased to 57.73 in 1994-95. That is, India's intra-industry trade has increased in the post-liberalization period. But the corresponding figures using the adjusted formula are 63.00 and 60.31 respectively – a downward movement of the level of intra-industry trade. But the differences between B_j and C_j are not large, revealing the fact that India's trade imbalance is not that large to affect the estimates (Table 6). Detailed description and calculation are given in Annexure 2.

TABLE 6

Level		1990-91	1991-92
1. DGT HS Code	B_j	54.01	57.73
	C_j	63.002	60.31
2. DGT HS Code	B_j	33.9	37.48
	C_j	39.54	39.15

Note : The calculations are based on product-groups at one-digit HS code level and then two-digit HS code level.

Source : DGCI&S, Calcutta. (Calculation based on DGCI&S data).

Looking at the intra-industry trade indices of the product-groups, we find the level of intra-industry trade to be quite high. Moreover, the level has increased in the post-liberalization period. Out of ten product-groups, the indices have improved for seven (Annexure 2).

The exercise has been carried out at the one-digit (HS code) level and, hence, the presence of aggregation bias is inevitable.

To judge the extent of aggregation bias, we have calculated the indices using the formula proposed by Grubel and Lloyd.

Using this formula, we do find the presence of aggregation bias for all the product-groups. In fact for some groups, the aggregation bias is very high. Here also we find that the intra-industry trade indices have improved for seven product-groups out of ten. But the product-groups for which the indices have decreased using the ordinary formula are not the ones which have experienced the same using the adjusted formula. A close scrutiny shows that the product-groups for which the behaviour of the index is not same are mostly the ones which have an aggregation bias.

It is not very wise to calculate intra-industry trade at the one-digit level because such an exercise develops an aggregation bias. The normal trend is to calculate the intra-industry trade at a higher level of disaggregation, for example at four or even five-digit level. The underlying reason has been discussed earlier. That is, at the one-digit level product sub-groups not belonging to the same industry get included within the same group resulting in aggregation bias, that is inter-industry trade gets showed up as intra-industry trade. But, calculating intra-industry trade at a higher level of disaggregation is extremely time consuming. Moreover, product-groups defined at that level of SITC may not be economically meaningful. Product with the same factor intensities may appear in different product-groups and, thus, some level of intra-industry trade may show up as inter-industry trade. Regrouping data into more meaningful product-groups is possible, but that also involves considerable amount of work.

So, we have calculated India's intra-industry trade at the two-digit (HS code) level. Results reveal that India's intra-industry trade index improved from 33.90 in 1990-91 to 37.48 in 1994-95, using the original formula. The corresponding figures using the adjusted formula are 39.54 and 39.15, that is, the intra-industry trade level has decreased (Table 6). The trends are the same as the ones seen in case of one-digit level (Annexure 3).

The intra-industry trade indices for the product-groups improved for 64 out of 98 product-groups (two-digit HS code). In

1990-91, there was not a single product-group with IIT index of 75 and above. In 1994-95, the number became 18. Thus going by the enough statistical evidence it is viewed that trade liberalization measures have influenced intra-industry trade flows (Annexure 3).

Though there is ambiguity in the behaviour of India's intra-industry trade, the overall picture projects that the level of India's intra-industry trade has gone up. There may be a number of reasons behind this. The income level of the country has gone up over the years. The increased affluence enables the producers to adopt product differentiation as a marketing device. This, coupled with the trade liberalization policies, is expected to influence the growth of intra-industry trade. Moreover, India is a member of the regional trading bloc, SAPTA. The member countries are gradually liberalizing their economies to increase trade in the South Asian region. India's trade with SAARC members is increasing, though marginally over the last few years. This may also have an impact on the intra-industry trade level. The increased intra-industry trade reveals the maturity of the Indian industry required to participate in global trade based on sub-sectoral efficiency. This fact generates confidence that even with lower trade barriers, the Indian industry would be able to compete in the world market.

BIBLIOGRAPHY

1. Aquino, A., "Intra-Industry Trade and Inter-Industry Specialization as Concurrent Sources of International Trade in Manufactures", 1978.

2. Agmon, T., "Direct Investment and Intra-Industry Trade: Substitutes or Complements?" in H. Giersh (ed.), *On Economics of Intra-Industry Trade* (Tubingen: J.C.B. Mohr).

3. Balassa B., "Intra-Industry Trade and Integration of Developing Countries in World Trade" in H. Giersh (ed.), *On The Economics of Intra-Industry Trade* (Tubingen: J.C.B. Mohr), 1979.

4. Balassa, B., "Determinants of Intra-Industry Specialization in USA" (Oxford Economic Papers, No. 38), 1986.

5. Bergstend, J.H., "Measurements and Determinants of Intra-Industry International Trade" in P.K.M. Thakaran (ed.), Intra-Industry Trade (Amsterdam, North Holland), 1983.

6. Caves, R.E., "Intra-Industry Trade and Market Structure in the Industrial Countries" (Oxford Economic Papers), July 1981.

7. Erzan, R. and Caird, S., "Intra-Industry Trade of Developing Countries and Some Policy Issues", Institute of International Economic Studies, University of Stockholm (Seminar Paper No. 289), August 1984.

8. Falvey, R.E., "Commercial Policy and Intra-Industry Trade", *Journal of International Economics*, 1981.

9. Gray, H.P., "Intra-Industry Trade: The Effects of Different Levels of Data Aggregation", in H. Giersh (ed.),*On Economics of Intra-Industry Trade* (Tubingen: J.C.B. Mohr), 1979.

ANNEXURE 1

NET EXPORT SPECIALIZATION INDICES

HS code	Description of items	Net export specialization index (1990-91)	Net export specialization index (1994-95)
01	Live animals	-61.08	-8.47
02	Meat and edible meat offal	99.98	100.00
03	Fish and crustaceans, molluscs and other aquatic invertebrates	100.00	99.82
04	Dairy produce: birds' eggs; natural honey; edible products of animal origin, n.e.s.	8.90	19.43
05	Products of animal origin, n.e.s. or included	90.55	72.43
06	Live trees & other plants; bulbs; roots & the like; cut flowers & ornamental foliage	97.61	47.36
07	Edible vegetables and certain roots and tubers	-56.83	-22.45
08	Edible fruits & nuts: peel of citrus fruit or melons	38.91	20.73
09	Coffee, tea, mate & spices	97.31	96.48
10	Cereals	77.82	98.56
11	Products of the milling industry: malt; starches; inutin; wheat gluten	28.20	70.09
12	Oilseeds & oleaginous fruits; misc. grains, seeds & fruits, industrial or medical plants; etc.	88.98	82.65
13	Lac; gums; resins & other vegetable soaps & extracts	48.13	63.46
14	Vegetable planting materials, vegetable products, n.e.s. or included	98.14	90.56
15	Animal or vegetable fats & oils & their cleavage products, animal or vegetable waxes	-61.22	-27.57
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	98.18	85.56
17	Sugar and sugar confectionery	40.64	-94.08
18	Cocoa and cocoa preparations	100.00	19.34
19	Preparations of cereals, flour, starch, or milk; pastry cooks' products	-69.30	-8.26

HS code	Description of items	Net export specialization index (1990-91)	Net export specialization index (1994-95)
20	Preparations of vegetables, fruit, nuts or other parts of plants	99.64	98.39
21	Miscellaneous edible preparations	41.73	-8.19
22	Beverages, spirits and vinegar	52.81	25.25
23	Residues and waste from the food industries; prepared animal fodder	98.37	84.83
24	Tobacco and manufactured tobacco substitutes	98.70	92.75
25	Salt; sulphur; earths and stone; plastering material, lime and cement	-42.62	-10.41
26	Ores slag and ash	70.56	46.72
27	Mineral fuel; mineral oils & products; bituminous substances; mineral waxes	-85.11	-86.01
28	Inorganic chemicals; compounds of precious metals, of rare-earth metals; of radio-active elements	-47.27	-65.35
29	Organic chemicals	-55.66	-42.68
30	Pharmaceutical products	46.29	75.75
31	Fertilizers	-99.96	-94.25
32	Dyeing, tanning and colouring material	43.05	46.29
33	Essential oils and resinoids; cosmetic and other similar preparations	55.82	71.70
34	Soap & other similar preparations; polishes & creams; candles and the like, dental waxes & preparations	43.61	3.70
35	Albuminoidal substances; modified starches; glues enzymes	-84.40	-50.61
36	Explosives; matches; certain combustible preparations	39.79	87.37
37	Photographic or cinematographic goods	-82.71	-82.31
38	Miscellaneous chemical products	-36.89	-16.25
39	Plastics and articles thereof	-77.94	-27.77
40	Rubber and articles thereof	-13.70	24.18
41	Raw hides and skins (other than furskins and leather)	61.71	52.84
42	Articles of leather, saddlery harness and animal gut	99.72	99.65
43	Furskins and artificial fur, manufactures thereof	-47.73	-99.96

HS code	Description of items	Net export specialization index (1990-91)	Net export specialization index (1994-95)
44	Wood & articles of wood; wood charcoal	-89.33	-67.45
45	Cork & articles of cork	-88.84	-82.89
46	Manufactures of plating material; basketware & wickerwork	96.71	99.83
47	Pulp of wood or of other material; waste and scrap of paper or paperboard	-99.96	-99.68
48	Paper and paperboard; articles of paper pulp of paper and paperboard	-89.66	-55.86
49	Printed books & other products of printing industry	-57.13	-37.80
50	Silk	25.71	1.22
51	Wool, fine or coarse animal hair	-89.86	-45.10
52	Cotton	95.29	80.76
53	Other vegetable textile fibres; paper yarn and fabrics	74.82	53.69
54	Man-made filaments	14.22	46.49
55	Man-made staple fibres	28.77	3.27
56	Wedding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof	-26.26	-0.14
57	Carpets and other textile floor coverings	100.00	99.85
58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery	60.21	32.19
59	Impregnated, costed & laminated textile fabrics; textile articles for industrial use	-8.04	-23.04
60	Knitted or crocheted fabrics	77.94	87.39
61	Articles of apparel and clothing accessories, knitted or crocheted	99.83	99.68
62	Articles of apparel and clothing accessories, not knitted or crocheted	99.99	99.96
63	Other made-up textile articles; sets; worn textile articels; rags	81.72	85.32
64	Footwear, gaiters and the like; parts of such articles	94.95	92.72
65	Headgear and parts thereof	99.10	94.37
66	Umbrellas, walking & seat sticks; whips riding crops and parts thereof	-93.66	-80.37
67	Prepared feathers & down with articles, artificial flowers; articles of human hair	98.12	94.91

HS code	Description of items	Net export specialization index (1990-91)	Net export specialization index (1994-95)
68	Articles of stone plaster, cement asbestos, mica or similar material	42.92	75.70
69	Ceramic products	-46.73	0.52
70	Glass & glassware	-50.23	-12.22
71	Pearls, precious or semi-precious stones/ metals and articles thereof; imitation jewellery & coin	16.57	31.18
72	Iron & steel	-75.34	-38.47
73	Articles of iron & steel	-13.53	14.37
74	Copper & articles thereof	-86.86	-77.17
75	Nickel & articles thereof	-97.91	-96.40
76	Aluminium & articles thereof	15.69	-6.37
78	Lead & articles thereof	-94.59	-82.27
79	Zinc & articles thereof	-99.22	-65.44
80	Tin & articles thereof	-74.21	-77.79
81	Other base metals; cements; articles thereof	-97.31	-88.25
82	Tools and their parts of base metal	31.46	28.85
83	Miscellaneous articles of base metal	41.33	56.91
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	-55.12	-60.67
85	Electrical machinery, equipment & parts thereof; sounds & TV recorders and reproducers & parts thereof	-54.44	-44.95
86	Railway/tramway locomotive, truck, etc; equipment and parts thereof	-27.93	20.43
87	Road vehicles and parts	4.00	42.51
88	Aircraft, spacecraft and parts	-96.15	-97.84
89	Ship boat & floating structure	-76.42	-73.94
90	Optical, measuring, medical & similar instruments & parts thereof	-77.07	-77.76
91	Clocks and watches and spare parts	-84.25	20.46
92	Musical instruments; parts and accessories	85.13	75.53
93	Arms and ammunition; parts and accessories thereof	26.81	57.72
94	Furniture, bedding and allied articles, lighting fittings; illuminated articles etc.	37.22	40.36
95	Toys, games & sports requisites; parts and accessories thereof	73.34	75.49

HS code	Description of items	Net export specialization index (1990-91)	Net export specialization index (1994-95)
96	Miscellaneous manufactured articles	2.37	33.30
97	Works of art, collectors' pieces and antiques	96.98	82.89
98	Project goods; some special uses	-94.74	-97.72
99	Miscellaneous goods	57.39	77.55

Source: Calculations based on DGCI&S data.

ANNEXURE 2

INTRA-INDUSTRY TRADE INDEX (ONE-DIGIT LEVEL)

Code	B_i		C_i	
	1990-91	1994-95	1990-91	1994-95
0	38.81	34.43	19.97	29.89
1	72.61	89.81	29.25	25.06
2	42.98	45.28	23.35	30.16
3	72.47	88.41	33.39	45.49
4	98.61	80.15	25.74	34.1
5	33.02	42.74	23.33	37.74
6	6.92	5.84	5.28	5.49
7	85.78	91.82	65.09	66.53
8	51.03	56.52	48.07	42.49
9	34.12	42.65	16.74	13.02

Source: Calculated on the basis of DGCI&S data.

$$B_i = \frac{(X_i + M_i) - | (X_i - M_i |}{(X_i + M_i)} \times 100$$

where X = Exports
M = Imports
i = Product category

$$C_i = 1 - [(\Sigma | (X_{ik} - M_{ik} |) / (\Sigma | X_{ik} + M_{ik} |)]$$

where i represents the product group
k represents 1 to n sub-groups under i.

ANNEXURE 3

INTRA-INDUSTRY TRADE INDEX (TWO-DIGIT HS CODE LEVEL)

Code	Export 1990-91 (Rs)	Import 1990-91 (Rs)	Index 1990-91	Export 1994-95 (Rs)	Import 1994-95 (Rs)	Index 1994-95
01	4274503	17689602	38.92	26546210	31457480	91.53
02	1397208025	165620	0.024	3946047972	0	0
03	9503510401	189798	0.004	35022032567	30855442	0.176
04	45000827	37647546	91.1	466243311	314560170	80.57
05	735623403	36500492	9.455	1209837595	193426774	27.57
06	78668558	950334	2.387	308380461	110163643	52.64
07	1491063514	5416347852	43.17	3957679269	6249175970	77.55
08	5459410678	2400916076	61.09	15302318819	10047346542	79.27
09	14982986604	203967094	2.686	23409380487	419782490	3.523
10	4954771591	618035641	22.18	12761527043	92722232	1.443
11	10485900	5873162	71.8	134881785	23718624	29.91
12	2828492335	164908867	11.02	4503258504	427821731	17.35
13	1375835397	481770652	51.87	3201683989	715601591	36.54
14	337809029	3175185	1.862	442450026	21929461	9.445
15	876304847	3642602394	38.78	4976126968	8765214346	72.43
16	10616860	97336	1.817	145295715	11303762	14.44
17	387156044	163416473	59.36	700563840	22975321297	5.918
18	30945148	0	0	72496785	48997020	80.66
19	219108390	1208374071	30.7	689446169	813643914	91.74
20	297150619	542378	0.364	1067672462	8650803	1.607
21	459529810	188950650	58.27	1782800844	2100953223	91.81
22	325061915	100374013	47.19	467904318	279266267	74.75
23	6096486624	49970426	1.626	18285741547	1500402694	15.17
24	2633938602	17288756	1.304	2547527173	95767919	7.246
25	3287772354	8172601603	57.38	10037030011	12370025615	89.59
26	11679600783	2015925155	29.44	15341460314	5571363563	53.28
27	9479907459	117883584674	14.89	16098510170	214096933517	13.99
28	3071718305	8579306290	52.73	5017877251	23944675022	34.65
29	4528021238	15897652079	44.34	19976875476	49730774608	57.32
30	7675934945	2818122561	53.71	15797130161	2180152082	24.25
31	2291412	11413273656	0.04	712618510	24095058072	5.745
32	4238372786	1687413086	56.95	11981187996	4398950030	53.71
33	2803642964	794906178	44.18	4185067686	689722264	28.3
34	1599630720	628181590	56.39	1754869859	1629803042	96.3

Code	Export 1990-91 (Rs)	Import 1990-91 (Rs)	Index 1990-91	Export 1994-95 (Rs)	Import 1994-95 (Rs)	Index 1994-95
35	27206860	321555954	15.6	186675073	569184806	49.39
36	44534909	19183471	60.21	328549334	22147651	12.63
37	184886912	1953335215	17.29	431823578	4450390456	17.69
38	1310765535	2843119580	63.11	4410887228	6122051913	83.75
39	1426568441	11506033578	22.06	11973434559	21181755295	72.23
40	2485596645	3274689473	86.3	9467720946	5780967134	75.82
41	8118581331	1922583433	38.29	12014353312	3707002039	47.16
42	9351462224	12919695	0.276	23400107937	41136616	0.351
43	5577575	15763399	52.27	41290	220991806	0.037
44	256401598	4548511528	10.67	1367391757	7034487621	32.55
45	2886624	48822256	11.16	5536478	59167137	17.11
46	1257441	21022	3.289	16841570	14160	0.168
47	878333	4579803347	0.038	10327903	6353481257	0.325
48	248673992	4560402761	10.34	2189398323	7730521088	44.14
49	350903016	1286214490	42.87	961208577	2129578168	62.2
50	2077405896	1227759774	74.29	4050308811	3952329568	98.78
51	127783261	2393673362	10.14	1646206298	4351400873	54.9
52	23728112828	571932800	4.707	53565752620	5700162848	19.24
53	2054183963	295875289	25.18	3707792317	1117103613	46.31
54	3003274905	2255367336	85.78	12302369058	4493343223	53.51
55	1402927646	776021188	71.23	5996939385	5616662182	96.73
56	105409940	180494531	73.74	620038120	621759128	99.86
57	8113682019	0	0	19138319230	13888698	0.145
58	368294822	91459276	39.79	1271718501	652349276	67.81
59	319518676	375356665	91.96	967593219	1546975773	76.96
60	1299739331	161096316	22.06	2289737782	154120577	12.61
61	10519765571	8858917	0.168	26112832737	41498268	0.317
62	29607325998	890653	0.006	76941338909	16339539	0.042
63	6184232983	622051707	18.28	17099016199	1354550598	14.68
64	9194393781	238036928	5.047	17693914064	668385664	7.28
65	33848916	153162	0.901	105632908	3060340	5.631
66	3675329	112186216	6.344	32082762	294775502	19.63
67	51130573	484147	1.876	159198146	4154884	5.087
68	825747414	329805569	57.08	5220421007	722007825	24.3
69	219515751	604609015	53.27	1169875929	1157734971	99.48

Code	Export 1990-91 (Rs)	Import 1990-91 (Rs)	Index 1990-91	Export 199[illegible]-95 (Rs)	Import 1994-95 (Rs)	Index 1994-95
70	359848571	1086201595	49.77	1824461773	2332558654	87.78
71	52521487076	37589378649	83.43	141729572423	74358427199	68.82
72	3643542760	25910900610	24.66	19421934611	43708801172	61.53
73	4979011913	6537288412	86.47	12405449425	9288650495	85.63
74	579389492	8241345956	13.14	1909826316	14824591777	22.83
75	15567832	1476641731	2.087	49927674	2725892901	3.597
76	1765280852	1286504927	84.31	5418890441	6156645938	93.63
78	19249089	691768068	5.415	83926633	863043244	17.73
79	8880082	2262030527	0.782	239549896	1146545584	34.56
80	47864839	323349774	25.79	97695106	782230198	22.21
81	8426085	616969347	2.695	87073922	1394935456	11.75
82	1578795298	823164976	68.54	3759662915	2076169833	71.15
83	584716683	242744714	58.67	2023020311	555510565	43.09
84	11532791916	39859806229	44.88	22807364641	93167701583	39.33
85	5419433641	18372538187	45.56	15608025981	41100036599	55.05
86	785010756	1393590938	72.07	783174042	517470951	79.57
87	5653245756	5218328344	96	22819868924	9205072608	57.49
88	103272400	5257970186	3.853	251171377	23004803349	2.16
89	645904793	4833270112	23.58	338814782	2261015696	26.06
90	1334370218	10306522816	22.93	2051390194	16399883856	22.24
91	44360229	519053482	15.75	771899294	509637829	79.54
92	125495747	10082045	14.87	260871787	36367918	24.47
93	4828353	2786657	73.19	12731634	3413297	42.28
94	97206599	44473937	62.78	474931913	201797764	59.64
95	609412574	93736071	26.66	1859886882	259768955	24.51
96	430973924	411009068	97.63	2246524170	1124131806	66.7
97	13055494	200000	3.018	45804670	4284592	17.11
98	689421264	25511182695	5.263	670264929	58201924976	2.277
99	4491146526	1215917476	42.61	12847654531	1624271522	22.45
Total	**324056474391***	**431928550872***		**826087228357***	**899706608024***	

$$B_i = \frac{(X_i + M_i) - |(X_i - M_i)|}{(X_i + M_i)} \times 100$$

where X = Exports
M = Imports
i = Product category. i=1,2,....., n

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OCCASIONAL PAPERS

1. Aneel Karnani, "Competing for the Indian Market: Local Firms vs. MNCs" (January 1996)
2. B. Bhattacharyya and Satinder Palaha, "Foreign Direct Investment in India: Facts and Issues" (January 1996)
3. B. Bhattacharyya and Vijaya Katti, "Regional Trade Enhancement: SAPTA and Beyond" (February 1996)
4. Satinder Palaha and H.L. Sharma, "Towards Economic Integration through Regional Trade Blocs" (April 1996)
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