DETERMINANTS OF INDIA'S FOREIGN TRADE

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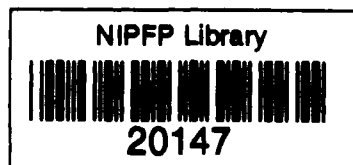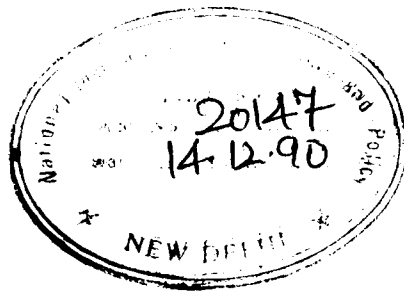
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by

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Abstract

This study first examines India's export growth stability and diversification in detail by commodity groups during the period, 1974-75 to 1988-89. Later, it seeks to analyse determinants of India's foreign trade considering factors such as price, income and effective exchange rates including export incentives and import tariffs in an econometric framework. Using the latest data available, the study provides OLS estimates of foreign trade elasticities and also a measure of the impact of exogenous import prices on domestic price for the period, 1974-75 to 1985-86. The findings suggest that India's export growth has been due largely to the growth of world income, whereas the price effect attributable to the rupee depreciation and export incentives has only been marginal. The import demand, however appears to have been considerably curtailed by the rupee depreciation and tariffs.

1. Introduction

1.1 The purpose of this paper is basically three-fold. The first objective is to examine growth trends of India's exports in the recent period and the second, to investigate if there has been export diversification (or concentration) in commodities and also by countries of destination and, the third, to analyse the underlying factors influencing India's foreign trade, i.e., whether exports have been favourably affected by increasing trends in diversification apart from other factors such as rise in world income and changes in India's export price vis-a-vis world price. And, on the imports side, this study examines the impact of exchange rate depreciation and tariffs on import volume and its repercussions on domestic prices. A traditionally held view is that diversification may help to reduce instability in export earnings. For instance, geographical diversification from West to East may provide a cushion to India's exports of textiles and clothing which have long been subjected to quantitative restrictions and protectionistic measures in the Western European countries and the USA. Similarly commodity diversification from low value-added to high value-added items would not only increase export earnings but also promote domestic employment. This paper addresses itself to these issues.

The remainder of this paper is organised as follows. In section 2, it attempts to analyse export growth trends and stability during the period, 1974-75 to 1988-89 both at the aggregate level and by countries of destination as well as at the disaggregated level of individual commodities. In section 3, it examines changes in the degree of export diversification and stability In section 4, we analyse other factors such as world income, exchange rates and export incentives that affect India's

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Table 1

India's Exports, Exchange Rates and Unit Values

Years	Rs. (million)	US $ (million)	Nominal Exchange Rate Rs/US$	Unit Value Index 1980-81=100 (Rs Terms)	($ Terms)
1974-75	33290	4171.7	7.980	64	63.4
1975-76	40420	4672.8	8.650	71	64.9
1976-77	51460	5756.2	8.940	75	66.3
1977-78	54043	6313.4	8.560	85	78.5
1978-79	57260	6974.4	8.210	85	81.9
1979-80	64180	8116.9	7.907	92	92.0
1980-81	67110	8486.3	7.908	100	100.0
1981-82	78060	8704.3	8.968	114	100.5
1982-83	88030	9107.2	9.666	122	99.8
1983-84	97710	9449.7	10.340	139	106.3
1984-85	118550	9971.4	11.889	156	103.8
1985-86	110120	8521.2	12.923	157	96.1
1986-87	125500	9821.6	12.778	NA	NA
1987-88	157490	12146.4	12.966	NA	NA
1988-89(P)	202950	14014.0	14.482	NA	NA

Source:1.Government of India, RBI, Report on Currency And Finance (Various Issues).
2.Government of India,Economic Survey,1989-90

exports and also estimate price and income elasticities of aggregate exports and imports for the period, 1974-75 to 1985-86. Finally, section 5 sums up main findings and offers policy suggestions for achieving higher export growth.

2.   Export Growth at the Aggregate Level

In the year 1988-89, India's gross export earnings amounted to Rs. 20295 crore, registering a marked increase of 28.9 per cent over the previous year. This is higher than the growth rate of 26.4 per cent achieved in 1987-88 over 1986-87. These growth rates are also higher than the average growth rate attained during the period, 1974-75 to 1986-87 of about 10.4 per cent per annum.   This growth rate has been estimated on the basis of exponential trend equation fitted to the time-series data on India's total exports at current prices in rupee terms given in Table 1.   However, in terms of U.S. dollars India's exports grew at the average rate of 6.7 per cent per annum, which was   lower than the corresponding growth rate in rupee terms during the same period.   Thus, a part of the increase in unit value realisation in this period is attributable to the falling value of Indian rupee vis-a-vis U.S. dollar.   This is also true of export growth achievement in 1986-87 to 1988-89.   Since 1986-87, however, exports increased in dollar terms as well, from US $ 1042 crore in 1986-87 to US $ 1214 crore in 1987-88 and to US $ 1401 crore in 1988-89.   The growth rate thus registered a marked increase of 10.1 per cent in 1986-87 over 1985-86.   It shot up to 16.5 per cent in 1987-88 over 1986-87, but slowed down a little to 15.6 per cent in 1988-89 over 1987-88.   During 1986-87 to   1988-89,

India's export earnings in U.S. dollars rose by an average rate of 14 per cent while in rupee terms, the average growth rate was over 20 per cent a year.

The growth rate in export volume (quantum index of exports) was around 3.6 per cent during the period, 1974-75 to 1986-87 while that of export earnings, as noted earlier, was at 10.7 per cent a year in rupee terms, and 6.7 per cent a year in dollar terms. It follows that the growth in export earnings in this period was largely due to a favourable increase in unit value realisation of exports in rupee terms. During this period, the unit value index of exports in rupee terms grew at the average rate of 7.1 per cent a year while the growth rate of unit value, measured in US dollars was however less at 3.2 per cent per annum. Unfortunately, we do not have comparable figures of export volume index or unit value index for the period, 1987-88 onwards because of which it is not possible to examine the impact of rupee exchange rate depreciation on the export volume in the recent period.

Export Growth of Individual Commodities

As can be seen from Table 2, largely manufactured goods have contributed to high export growth in 1988-89, while exports of agro-based products have either stagnated or declined (with the exception of rice and tobacco). The decline in exports of agro-based products is, possibly, the effect of drought. Exports of tea, coffee, oil- cakes, cashew kernels, fish and fish preparations, fruits and vegetables etc., all have stagnated or declined in 1987-88 in rupee terms. With the rupee depreciation in recent years, the foreign exchange contribution from these commodities seems to have decreased in 1987-88 over the previous

year. In 1988-89, however, some of these export products (fish and fish preparations etc.) showed signs of recovery. Growth of manufactured exports appears to have provided a cushion and more than offset the decline in export earnings of agricultural and allied products. The major contributors from manufactured product group were: textile fabrics, made-ups and ready-made garments together with a rise of 42 per cent in 1987-88 over 1986-87; chemicals and related products with an annual increase of 41 per cent in 1987-88 and 86.3 per cent in 1988-89; handicrafts including gems and jewellery (28 per cent in 1987-88 and 59.6 per cent in 1988-89); leather and manufactures (25 per cent in 1986-87 and about 30 per cent in 1988-89); machinery and transport equipment (26.5 per cent in 1986-87 and over 62 per cent in 1988-89) etc,.

The average growth rates of export earnings were also worked out commoditywise for the period, 1974-75 to 1986-87 by fitting an exponential trend equation to the time-series data of 55 individual commodities, at the SITC two digit level. The time-series data for these commodities and their corresponding annual average growth rates are set out in Appendix Table A.1. The results of estimated average growth rates of individual commodities reveal that, 23 commodities out of 55 exhibited very high growth rates, ranging between 10 and 40 per cent per annum during the period, 1974-75 to 1986-87, while 13 items showed an average growth rate less than 10 per cent a year, whereas exports of 13 other items stagnated, and five other commodities experienced even a decline in exports during the same period.

Table 2

India's Exports of Principal Commodities during 1986-87 to 1988-89

Value:Rs Crore
Share:Percent

Commodities	1986-87		1987-88(P)		1988-89(P)	
	VALUE	SHARE	VALUE	SHARE	VALUE	SHARE
Coffee	296.7	2.38	263.2	1.67	279.7	1.38
Tea & mate	576.8	4.62	592.4	3.76	599.0	2.95
Oil cakes	189.8	1.51	173.3	1.1	370.4	1.83
Tobacco	185.3	1.49	134.6	0.86	128.5	0.63
Cashew kernels	327.6	2.63	306.7	1.95	277.2	1.37
Spices	279	2.24	309.3	1.96	250.8	1.24
Sugar & molasses	1.4	Neg	0.8	Neg	7.0	0.03
Raw cotton	204.7	1.64	95.5	0.6	28.0	0.14
Rice	197.33	1.58	324.6	2.06	331.5	1.63
Fish & fish preparations	539	4.33	525.1	3.33	632.5	3.12
Meat & meat preparations	75.5	0.6	85.5	5.43	94.0	0.46
Fruit,veg.,& pulses	155.8	1.25	150.8	9.58	164.0	0.81
Misc.processed foods	75.5	0.6	65.9	0.42	121.0	0.60
Ores & minerals	717.2	5.76	703.3	4.47	1015.0	5.00
Mica	19.6	0.16	23.2	0.14	29.0	0.14
Iron ore	546.6	4.39	542.8	3.45	672.5	3.31
Manufactured goods						
Textile fabrics & manufactures	2178.8	17.49	3088.8	19.62	3608.0	17.78
Coir yarn manufactures	33.5	0.27	29.4	1.54	31.0	0.15
Jute manufactures	244	1.96	242.8	7.29	250.0	1.23
Leather & leather manufactures	922.4	7.4	1148.5	20.67	1490.0	7.34
Handicrafts incl. carpets	2547.6	20.46	3253.5	16.6	5194.0	25.59
Chemical & allied products	583.2	4.68	823.4	5.23	1534.0	7.56
Machinery,transport equipment & Metal manufactures	1132.7	9.09	1433	9.1	2322.0	11.44
Minerals,fuels&lubricants	417.6	3.35	656	4.6	518.0	2.55
Total incl. others	12452.4	100	15741.2	100	20295.0	100

Source: Government Of India,Economic Survey,1989-90

Some of those commodities which witnessed considerably high growth rates were: manufactures of organic chemicals, dyeing, tanning and colouring materials, medicinal and pharmaceutical products, leather and leather manufactures, non-metallic mineral manufactures, metal working machinery, general industrial machinery, office machines etc., travel goods, and scientific instruments. Goods which experienced a downward export trend include iron and steel and non-ferrous metals.

Direction of Trade

During the three years 1986-87 to 1988-89, about 70 per cent of India's export earnings came from only 16 countries. Nine of these belong to the OECD group, four to the Middle-East and three to the Soviet bloc, as shown in Table 3. Of them, the USA was the leading country with a share of about 19 per cent in our total exports, followed by the USSR with a share ranging between 12 and 15 per cent, Japan with about 11 per cent and the remaining 13 countries accounting for an export share of less than 6 per cent each.

Table 3

India's Exports To Principal Countries
During 1986-87 to 1988-89

Value:Rs Crore
Share:Percent

Countries	1986-87		1987-88(P)		1988-89(P)		Annual Average of Growth Rate during 1986-87 to 1988-89	Annual Average of Growth Rate during 1974-75 to 1986-87
	Value	Share	Value	Share	Value	Share		
OECD								
Belgium	342.5	2.75	484.4	3.08	886.0	4.37	60.84	12.26
France	271.3	2.17	375.2	2.38	432.0	2.13	26.19	6.50
FRG	733.2	5.88	1061.2	6.74	1237.0	6.10	29.89	13.79
Netherlands	225.8	1.81	282.5	1.79	404.0	1.99	33.76	5.25
UK	700.1	5.62	1033.4	6.56	1165.0	5.74	29.00	5.80
Canada	136.8	1.69	170.4	1.08	197.0	0.97	20.00	10.68
USA	2331.7	18.72	2907.6	18.47	3736.0	18.41	26.58	14.65
Australia	146.1	1.17	181.1	1.15	266.0	1.31	34.93	8.00
Japan	1333.1	10.71	1614.9	10.26	2162.0	10.65	27.35	10.96
OPEC								
Iran	47.4	0.38	138.6	0.88	89.0	0.44	Neg	-7.85
Iraq	18.4	0.15	17.3	0.11	53.0	0.26	69.72	-5.78
Kuwait	92.7	0.74	105.7	0.67	155.0	0.76	29.31	5.87
Saudi Arabia	213.6	1.72	295.9	1.88	326.0	1.61	23.54	14.82
Soviet Block								
GDR	87.7	0.7	106.3	0.67	183.0	0.90	44.45	10.05
Romania	80.3	0.6	69	0.43	38.0	0.19	-31.21	NA
USSR	1867.2	14.99	1971.5	12.52	2609.0	12.86	18.21	16.45
Total of above	8627.9	69.8	10815	71.23	13938.0	68.68	-	-
Grand Total incl. others	12452.4	100	15741.2	100	20295.0	100.00	27.66	10.42

Source: Government Of India,Economic Survey,1989-90

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On the other hand, a smaller portion of our export trade
(30 per cent) appears to be widely diversified across 40 odd
countries as given in Appendix Table A.2. Export growth of these
countries are given in the last column. These estimates were
obtained from exponential trend equations fitted to the export
data at current prices in rupee terms for the period 1974-75 to
1986-87. From this column, it is easy to see that the export
growth rates were considerably high and favourable (between 10
and 20 per cent) for as many as 14 countries. In many of these
countries there seems to be large export potential for Indian
products. These countries are: Austria, China, Denmark, GDR,
Ghana, Hong Kong, Nepal, Singapore, Spain, Sri Lanka and
Switzerland. Exports grew at a rate less than 10 per cent per
annum in respect of 17 countries, stagnated in the case of 17
other countries, and showed even downward trends for 8 countries.
These details are given in Appendix Table A.2.

3. Export Diversification and Stability

The relationship between export diversification and
stability of foreign exchange earnings of a country has since
long received the attention of both empirical and theoretical
researchers. Conventional wisdom suggests that commodity
diversification helps to insure against instability of export
earnings. Conversely, it was held that countries whose exports
are relatively concentrated in a few commodities experience
instability in their export growth. But, a number of empirical
studies conducted on LDC exports found no evidence to this view.
On the contrary, these studies revealed that lack of export
diversification does not cause instability in export growth
mainly because (a) countries having relatively high commodity

concentration in exports often tend to specialise on such products whose export proceeds are relatively stable; (b) growth instability at the aggregate level of exports is partly due to a wide dispersion in the degree of instability of export proceeds of individual commodities and (c) export proceeds of individual commodities often tend to move in phase (see the empirical studies by Coppock (1962), Michaely (1962), Massell (1964), Macbean (1966) and more recently, Macbean and Nguyen (1980) and Turner and Lambert (1981)).

Export concentration (or diversification) is measured by what is known as Michaely index, which is given by

$$C_t = (\sum_{i=1}^{m} w^2_{it})^{1/2} \qquad (1)$$

where $w_{it} = X_{it}/X_t$ and X_{it} is the value of ith commodity exported and X_t is the total value of all commodities $(i=1,2,...,m)$ in period t. Alternatively, C_t may be interpreted as an index of geographical concentration in which case, X_{it} and X_t represent the value of exports to i^{th} country and total exports in period t respectively. The value of $1-C_t$ provides a measure for the degree of export diversification in period t. It should, however, be distinguished that, this index is only a proxy for measuring the effect of 'export diversification effort' as observed in the actual diversification that took place in exports, rather than a variable that reflects the extent of efforts and strategies initiated for diversifying exports.

The index of instability in export growth of an ith commodity is measured by I_i, defined as variance of u_{it},

where $U_{it} = (X_{it} - \hat{X}_{it})/\hat{X}_{it}$ and $\hat{X}_{it}$ \qquad (2)

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is the trend value of exports of ith commodity in period 't'. In other words, the index of instability is given by the variance of the percentage deviation of actual value of exports from its trend value in period t. Similarly, the instability index of total export proceeds is computed using the same formula. It is important to note that Michaely index of concentration (c_t) and the index of instability (I_i) are mathematically related to each other, as derived by Macbean and Nguyen (1980) and Turner and Lambert (1981)[1]. This relationship was further examined by Das and Pant (1986). In the Indian context, this index was used earlier by Wadhva and Sharma (1975) to examine the issue of export diversification and growth of engineering goods during the period 1951-75, while recently Das and Pant (1986) deployed it to investigate empirically the relationship between commodity concentration and growth instability of India's exports at the one digit level of SITC codes for the two periods, 1950-51 to 1966-67 and 1967-68 to 1980-81. In this study we have computed the export concentration (or diversification) indices at one-and two-digit levels of SITC codes of commodities as well as by countries of destination for the period, 1974-75 to 1986-87. We have also calculated the index of instability of export earnings,

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1. Denoting the variance of total export proceeds by I and the variance of exports of ith commodity by Ii, as given before Macbean and Nguyen (1980,p.356) derived that

$$I^2 = \sum_{i=1}^{m} W_i^2 I_i,$$ and thus the Michaely's index

of concentration, given by $C^2 = \sum_{i=1}^{m} W_i^2$, is closely related to

the instability in total export earnings.

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productwise and countrywise for the same period. Before we consider the estimated results of diversification indices, it may be convenient to examine the export performance of principal commodities that comprised over 70 per cent of total exports during the same period, This may provide insights into the future perspectives for exports.

Table 4 shows that there have been only 17 commodity groups at the SITC two digit level which accounted for over 78 per cent of total export trade in this period. In 1974-75 and 1980-81 their total export share was as high as 85 per cent, whereas it declined to 78 per cent in 1986-87. Comparing their total share in 1974-75 and 1986-87, it appears that there has been some diversification to other commodity groups during this period.It also reveals that export instabilities are noticeable in some engineering goods. Exports of non-ferrous metals (SITC 67) and iron and steel (SITC 68) experienced a decline and also have high ranks of instability by as much as 28 and 44 respectively. Higher ranks indicate that export earnings from these groups were highly unstable during the period in question. Similarly, exports of manufactures of metal (SITC 69) stagnated with their export shares falling during the period, 1974-75 to 1986-87. Thus, diversification might have taken place by a shift from these groups to other products such as electrical machinery, appliances and parts (SITC 77) which have more stable export earnings (see Appendix Table A.3).

Table 4

Export Shares, Growth Rates And Export Stability Of Principal Commodities By SITC codes, 1974-75 To 1986-87

SITC code	Commodities	Export Shares (Percent)			Average Growth Rates 1974-75 To 1986-87 (%)	Rank Of Export Stability [a]
		1974-75	1980-81	1986-87		
1	2	3	4	5	6	7
65	textiles yarn,fabrics,made-up articles&related products	18.71	15.20	11.31	7.36	1
07	coffee,tea,cocoa,spices&manu.	10.25	11.20	9.26	9.39	9
06	sugar,sugar preparations &honey	10.21	9.63	0.16	-17.62	43
28	metalliferrous ores& metal scrap	5.93	5.13	4.91	9.30	2
61	leather,leather manu,n.e.s.&dressed furskins	4.35	5.02	5.87	11.97	8
84	articles of apparel&clothing accessories	4.16	8.43	11.2	18.00	6
05	vegetables & fruits	4.09	3.27	4.21	11.57	4
66	non-metallic mineral manufactures	3.72	9.63	16.36	21.53	16
29	crude animal&veg. materials	3.51	2.23	1.73	7.48	7
08	feeding stuff for animals	3.11	2.27	1.81	3.43	14
71	power generating mach.&equip.	2.75	1.12	0.67	-1.48	17
68	non-ferrous metals	2.72	0.23	0.19	-6.49	44
67	iron& steel	2.66	1.04	0.45	-10.78	28
12	tobacco&tobacco manufactures	2.41	2.10	1.49	7.98	12
69	manufactures of metal	2.08	2.77	1.33	5.90	19
03	fish crustaceans,molluses &preparations	1.95	3.17	4.25	14.63	11
89	misc. manu. articles	1.95	2.83	2.76	10.07	36
	Total Share	85	85	78	-	

For example Rank 1 for textiles group (SITC 65) implies that export earnings from this group showed highest stability among all groups considered. For ranks of other groups, see Table A.3.

For examining the export growth and stability simultaneously all the commodity groups (at the SITC-2 digit level) were arranged by their growth rates and the degree of stability during the overall period, 1974-75 to 1986-87. As can be seen from Table 5 and Appendix Table A.4, there have been only a few commodity groups (about 10 in number) which exhibited highly stable growth rates up to 20 percent a year on the average during the period in question. Five of these groups, namely, vegetables and fruits (SITC-05); crude fertilizers and minerals (SITC-27); dyeing, tanning and colouring materials (53), leather & leather manufactures (61); and articles of apparel & clothing accessories (84), have showed growth rates ranging between 10 and 20 percent a year on an average. Their total export share also increased from over 16 percent per annum during period, 1974-75 to 1980-81 to about 19 percent per annum during the later period, 1981-82 to 1986-87. In contrast the other five groups dominated by traditional categories namely, coffee, tea, cocoa and spices (SITC-07); metalliferous ores & metal scrap (28); crude animal & vegetable materials (29); textile yarn, fabrics and made-ups (65) and electrical machinery and appliances (77) have shown highly stable, but lower growth rates, below 10 percent a year on an average. Their combined share in the total value of exports declined from 35.4 percent a year in the earlier period, 1974-75 to 1980-81 to 28.7 percent a year in the later period, 1981-82 to 1986-87. As can be seen from Table 5, a few commodity groups, however, experienced stable and higher growth rates between 20 and 40 percent a year with their share increased in the recent period. These groups were: non-metallic mineral manufactures (gems &

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jewellery, handicrafts(SITC-66)and medicinal and pharmaceutical
products(54) whose combined share in total exports has gone up from
9 to 14 percent in the recent period, 1981-87.

As against this, many commodities suffered growth fluctuations
and showed instability in their growth trends. It may be a matter
of serious concern for policy makers because their export share in
total has also been considerable around 26 percent (see the two
categories, namely, ´less stable´ and ´highly unstable´at the end
of Table 5). A majority of them belong to the engineering industry,
rubber industry, plastics, paper and textile fibres industries. It
thus appears, in the overall, that India´s export composition is
skewed in favour of labour intensive primary commodities, but with
their share in total declining over time. Exports of manufactures
other than those belonging to the engineering industry and certain
chemicals and plastics etc. seem to be gaining greater share and
stability in the recent period. It is therefore prudent and urgent
to reverse these trends by identifying factors causing instability
in exports of engineering products and others and by adopting
suitable remedial measures.

It is conceivable that an exporter tends to diversify whenever
he receives some signals of instability of export earnings from the
on-going export activity. Also, a boom in the world market for a
commodity may induce new entrepreneurs enter export business while
it influences those already exporting less lucrative items to
diversify their efforts into that commodity for which there is
increased demand. For example, consider the world market boom for
ready-made garments (SITC 84) in the pre-1970s to which India
responded rather late in the 1970s. Thus, the export share of this
group accelerated from 4 per cent in 1974-75 to over 11.2 per cent

Table 5

Export Growth, Stability and Shares,
1974-75 to 1986-87

(Percent)

Average Growth Rates during 1974 to 87 (Ranges)	Degree of Stability	Average Share of Commodity Groups in Total Exports during	
		Period I 1974-81	Period II 1981-87
Neg. - 0	Highly Stable*	Nil	Nil
	Stable	1.73	0.81
	Less Stable	0.17	0.17
	Highly Unstable	10.39	1.58
0 - 10	Highly Stable	35.43	28.72
	Stable	10.68	8.08
	Less Stable	1.85	1.21
	Highly Unstable	1.33	0.71
10 - 20	Highly Stable	16.74	18.97
	Stable	3.25	3.78
	Less Stable	8.34	6.23
	Highly Unstable	1.42	1.41
20 - 40	Highly Stable	Nil	Nil
	Stable	9.03	13.92
	Less Stable	2.89	4.64
	Highly Unstable	0.06	0.19
Above 40	Highly Stable	Nil	Nil
	Stable	Nil	Nil
	Less Stable	Nil	Nil
	Highly Unstable	0.36	9.64
All Groups Above **	Highly Stable	52.17	47.69
	Stable	24.69	26.59
	Less Stable	13.25	12.25
	Highly Unstable	13.20	13.53
	Total	103.31	100.06

Note : * Commodities were classified "Highly Stable" if their rank of stability ranged between 1 and 10, "Stable" if their rank ranged between 11 and 20, "Less Stable" if ranged between 21 and 40, and "Highly Unstable" if their rank ranged above 40. For details of the Stability index used, refer to the text. For list of commodities, see Appendix A.3.

** The export shares of commodity groups need not add up to 100 as they are annual averages over time.

in 1986-87 with an average annual growth rate of 18 per cent during this period. This growth performance was achieved despite uncertainties in world demand for textile products owing to quantitative restrictions that have been in operation under aegis of the Multifibre Arrangement (MFA), governed by GATT. Various studies were conducted in this area particularly with regard to India's exports of textiles and clothing (see, Wadhva (1985), Keesing and Wolf (1981)). It was found that quota restrictions cause distortions in free trade, limiting price competition among exporting countries within their quota levels. One advantage of MFA envisaged for India or any other small exporting country is that demand for its exports is ensured to the extent of limits prescribed by importing countries. It is also worth noting that quota restrictions create a tendency on the part of exporter to increase the price of the commodity. This is mainly due to scarcity premia that arise in the trading of quotas for exports of that commodity (see Narayana (1985)). This in turn helps to increase export revenue. However, to tide over problems of market demand in quota countries the policy to promote export diversification to important non-quota countries, viz., Japan, the USSR etc., should pay off in the long run and it would sustain the high growth rate achieved so far by this commodity group (See for instance Indira Rajaraman (1990)).

To understand the extent of geographical diversification of exports, Table 3 sets out details of export shares of principal countries that have accounted for about 70 per cent of India's exports. The corresponding average growth rates of exports are also provided for these countries during the period, 1974-75 to 1986-87. Ranks of export instability were computed for all countries (56) to which India exported during this period and are given in Appendix Table A.5.

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As can be seen in Table 6, 29 out of 56 countries accounted for a bulk of our exports (85 per cent in 1974-75 and 1986-87). Most important of them have been the USSR, the USA, Japan and the UK which accounted for about half of India's total exports in 1988-89. Of these four, exports to the USSR grew more rapidly at an average rate of 16.5 per cent a year than the USA and Japan which also registered a high growth rate of 14.6 and 11 per cent respectively, while exports to the UK grew slower at 5.8 per cent during the same period, 1974-75 to 1986-87. Furthermore, growth of exports to these four countries has been relatively stable.

While only four countries accounted for more than half of the India's total exports, the remaining half was diversified across 51 odd countries in 1986-87. Growth rates of exports to six countries were found to be relatively high and stable (rank less than or equal to 10) viz., Federal Republic of Germany, Australia, Nepal, Singapore, German Democratic Republic and Malaysia. The export share of these six countries adds up to 13 per cent in 1986-87. Thus, it is found that over 63 per cent of India's total exports is accounted for only by 10 countries, with relatively stable and high growth rates during the period 1974-75 to 1986-87.

The troublesome spots seem to lie with those countries where India's exports stagnated or even declined, showing greater instability of export earnings during this period. The finding of this study shows that some of these were: Iran, Iraq, Saudi Arabia, Nigeria and Indonesia. Understandably, the export demand for Indian products fluctuated in almost all these countries partly due to unfavourable political environment prevailing in some of them (viz., Iran, Iraq and Nigeria), which resulted in export losses, largely from the discontinuation of joint ventures and turnkey

Table 6

Export Shares, Growth Rates And Export Stability of Principal Countries,1974-75 to 1986-87

(Percent)

Sr. No.	COUNTRIES	Export Shares In Total			Average Growth Rates: 1974-75 to 1986-87	Rank Of Export Stability*
		1974-75	1980-81	1986-87		
	1	2	3	4	5	6
1	USSR	12.66	18.27	15.51	16.45	5
2	USA	11.24	11.08	19.36	14.65	2
3	UK	9.36	5.88	5.81	5.80	9
4	Japan	8.90	8.91	11.08	10.96	1
5	Iran	6.45	1.84	0.39	-7.85	20
6	Federal Republic of Germany	3.18	5.73	6.09	13.79	10
7	France	2.57	2.19	2.24	6.50	12
8	Poland	2.31	1.03	1.01	0.41	23
9	Iraq	2.16	0.77	0.15	-5.80	29
10	Netherlands	2.15	2.27	1.87	5.25	19
11	Sudan	2.00	0.58	0.07	-11.31	26
12	Australia	1.84	1.37	1.21	8.00	4
13	Czechoslovakia	1.81	0.82	0.61	4.49	17
14	Belgium	1.58	2.15	2.84	12.26	27
15	Egypt Arab Republic	1.58	1.28	0.67	3.20	13
16	Italy	1.57	2.26	2.58	10.89	14
17	Indonesia	1.53	0.77	0.19	-7.69	36
18	Canada	1.32	0.93	1.14	10.68	11
19	Nepal	1.27	1.16	0.86	9.57	8
20	Bangladesh	1.27	1.12	1.36	7.45	25
21	Kuwait	1.15	1.45	0.77	5.87	24
22	Singapore	1.11	1.62	1.79	15.09	6
23	Saudi Arabia	1.07	2.46	1.78	14.82	18
24	German Democratic Republic	1.04	0.73	0.73	10.05	7
25	Malaysia	0.88	0.76	0.71	9.13	3
26	Hongkong	0.84	2.11	3.40	18.81	16
27	Srilanka	0.81	1.20	0.72	10.93	33
28	Nigeria	0.66	0.80	0.28	2.38	38
29	New Zealand	0.62	0.28	0.17	2.00	22
	Total Share	84.94	81.81	85.41		

Note : * For example, Rank 1 for Japan implies that exports to Japan have shown highest stability among 56 countries considered. For details of ranks of other Countries see Table A 5.

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projects during the early 1980s. Exports to Belgium, Netherlands and New Zealand were also found fluctuating as they showed higher instability in export earnings in the same period. It thus appears necessary to reverse these declining trends which seem possible only by concerted governmental efforts viz. by adopting suitable bilateral treaties with them and by promoting trade fairs and buyer-seller meets targetted at these countries.

Yet another disquieting feature is that, except for the USSR, export shares of the Soviet bloc countries were found to be declining over time. For instance for Poland, the export share in total declined from 2.31 per cent in 1974-75 to 0.57 per cent in 1985-86, for Czechoslovakia from 1.81 to 0.64 per cent and for other countries in this group the export shares were much smaller.

To assess the degree of export diversification, we have also computed diversification indices by using the Michaely index as given earlier. These are given in Table 7 for products with SITC codes both at 1 and 2 digit levels and also by country of destination for the period 1974-75 to 1986-87. As mentioned earlier, Das and Pant (1987) also worked out commodity-wise indices for the period 1957-80 at a more aggregated level of one digit SITC codes. Comparing the respective indices at different levels of commodity aggregation for the relevant years, one can notice that the indices computed at one digit level are smaller in magnitude than at two digit level, mostly due to higher level of aggregation considered. But more importantly, as shown in Table 8, the diversification indices computed at higher level of aggregation (one digit SITC code) revealed a significant positive time trend over the long period, 1957-80. However, if we consider different sub-periods such as upto 1966 (before the rupee devaluation and

after),no significant trend was found in diversification during the initial period 1957-66, whereas in the later period, 1967-80, the indices showed a significant positive trend. Thus, based on their calculation one may conclude that there was statistical evidence for an increase in commodity diversification during the post-devaluation period, 1967-80. Considering the period 1974-75 to 1986-87, we have also found that there has been a positive time trend in commodity diversification only at one-digit level; however it is not significant. Also no significant trend was noticed in the country diversification of our exports, inspite of various promotional measures and bilateral agreements that were undertaken by the Government with a host of countries in the last decade. It therefore indicates that much remains to be done to promote our export diversification which may accelerate growth in the long run.

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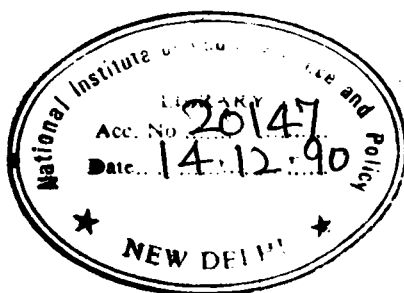
Table 7

Export Diversification Indices, 1974-75 to 1986-87

Year	Index of Commodity Diversification * (ID)		Index of Country Diversification * (ID)
	at 2-digit SITC Level	at 1-digit SITC Level	
1974-75	72.85	50.30	76.22
1975-76	74.65	50.37	75.56
1976-77	75.28	49.14	79.30
1977-78	70.76	47.39	76.07
1978-79	71.81	46.14	77.29
1979-80	71.72	47.84	76.96
1980-81	74.25	52.90	74.31
1981-82	75.68	54.43	75.76
1982-83	74.27	57.17	78.21
1983-84	72.55	56.53	76.89
1984-85	72.42	56.50	74.21
1985-86	73.35	54.14	70.64
1986-87	72.58	52.65	67.71

Note: Computed by using the formula given in Section 3
      of the text

4. A Foreign Trade Model for India

India's Exchange Rate Movements and Foreign Trade

We first consider the movement of key variables, namely, the rupee exchange rate vis-a-vis the US dollar and India's trade balance during the 1980s (see Tables 9 and 10). The trade balance is shown in dollar currency in Table 10. It has always been in deficit throughout the 1980s. It declined from US $ 7546 million in 1980-81 to US $ 5653 million in 1984-85 and then suddenly shot up to the all time peak level of US $ 7835 million in 1985-86. The spurt in deficit can be attributed to the import liberalisation policy initiated in that year Later on, the deficit gradually 'declined to US $ 5129 million in 1988-89.

The rupee depreciation was faster during the first half of the 1980s than in the latter half. It thus increased from 7.908 in 1980-81 to 11.889 in 1984-85 which works out to over 50 per cent depreciation in 5 years, or say, 10 per cent a year on an average. The gradual improvement in trade deficit during the first half of the 1980s might have resulted from the depreciation of the rupee in this period. Between 1985-86 and 1988-89, it slowly increased from 12.235 to 14.451, that is, over 18 per cent in 4 years or about 4.5 per cent a year. But, the rapid decline in deficit during the latter half of the decade seems to be due to factors other than the slow increase in the nominal exchange rate in that period, such as export incentives and import tariffs.

Table 9
India's Exports, Exchange Rates and Unit Values

Years	Rs. (million)	US $ (million)	Nominal Exchange Rate Rs/US$	Unit Value Index 1980-81=100	
				(Rs Terms)	($ Terms)
1974-75	33290	4171 7	7.980	64	63.4
1975-76	40420	4672.8	8.650	71	64.9
1976-77	51460	5756.2	8.940	75	66.3
1977-78	54043	6313.4	8.560	85	78.5
1978-79	57260	6974.4	8.210	85	81.9
1979-80	64180	8116.9	7.907	92	92.0
1980-81	67110	8486.3	7.908	100	100.0
1981-82	78060	8704.3	8.968	114	100.5
1982-83	88030	9107.2	9.666	122	99.8
1983-84	97710	9449.7	10.340	139	106.3
1984-85	118550	9971.4	11.889	156	103.8
1985-86	110120	8521.2	12.923	157	96.1
1986-87	125500	9821.6	12.778	NA	NA
1987-88	157490	12146.4	12.966	NA	NA
1988-89(P)	202950	14014.0	14.482	NA	NA

Source: 1. Government of India, RBI, Report on Currency And Finance (Various Issues).
2. Government of India, Economic Survey, 1989-90

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As shown in Table 10, 1985-86 witnessed a turnaround in India's foreign trade with the announcement of import liberalisation policies. In this year, while the import bill increased by over 10 per cent over the previous year, export earnings fell, surprisingly by about 6 per cent. The result was a huge trade deficit. Exports fell in 1985-86. However, with a 10 per cent increase in export incentives and a mild depreciation of 2.5 per cent in the same year, exports registered a marked growth by more than 10 per cent in the next year, 1986-87. It thus seems that there is a lag effect of incentives on exports. The growth rate of import bill in dollar terms was also restrained by 2.5 per cent and even turned negative to -2.6 per cent in 1987-88. However, in 1988-89, it increased by 11 per cent over the previous year, while exports showed a higher growth of 15.6 per cent resulting in the decline of deficit to US $ 5129 million. On the whole, during the 1980s, the effective exchange rate for imports accelerated more than that for exports mainly because of increasing rate of import tariffs (see Figure 1). Particularly after 1984-85, the attempts to liberalise imports by shifting a number of tariff items from 'restricted and banned' lists to open general license (OGL) were, however, moderated through an increasing levy of import duties. Thus, in the latter half of the 1980s, the effective exchange rate for imports depreciated faster than that for exports and it appears to be an important factor for restricting the import growth. However, it is worth noting that tax exemption of export profits, granted recently also seems to have been partly responsible for a rapid rise in exports.

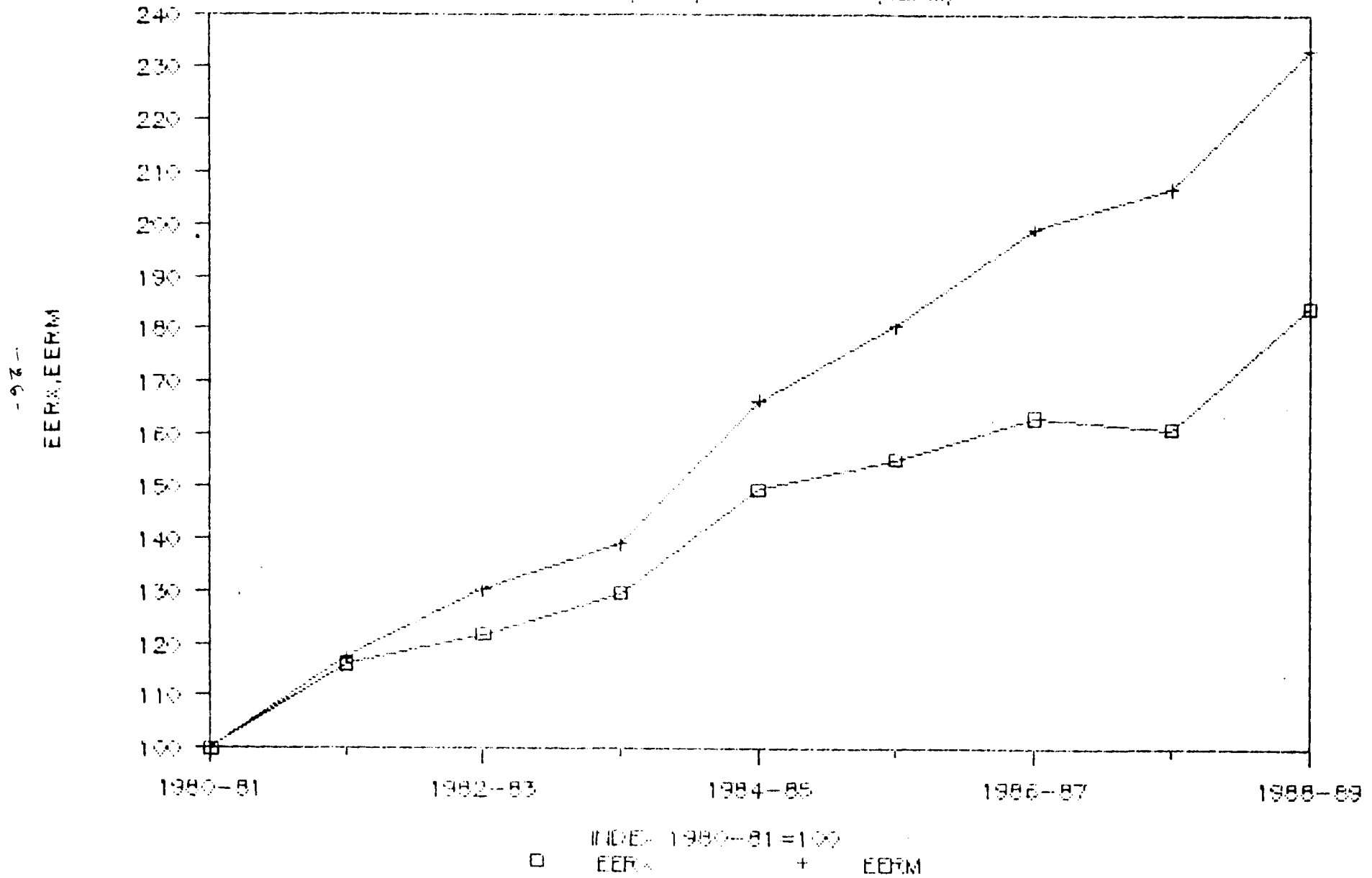# EFFECTIVE EXCHANGE RATES
FOR EXPORTS(EERX) AND IMPORTS(EERM)

EERX,EERM

- 26 -

FIGURE I

INDEX 1980-81 = 100
□ EERX   + EERM

Table 10
Import Tariff and Exchange Rates, 1980-81 to 1988-89

Years	Value of Imports	Nominal Exchange Rates	Customs Duty Revenue	Effective Exchange Rate for Imports		Imports (M)		Trade Balance (S Million) (X-M)
	(Rs. Cr)	(Rs/US$)	(Rs. Cr)	Import Tariffs % of CIF	Rate Rs/US$	$ Million	% change	
1980-81	12544	7. 908	3408. 20	27. 17	10. 06	15862	NA	-7546
1981-82	13887	8. 968	4388. 29	31. 60	11. 80	15484	-2. 38	-6825
1982-83	14913	9. 666	5317. 98	35. 66	13. 11	15428	-0. 36	-5976
1983-84	16039	10. 340	5656. 96	35. 27	13. 99	15512	0. 54	-5678
1984-85	18680	11. 889	7675. 61	41. 09	16. 77	15713	1. 30	-5653
1985-86	21164	12. 235	10256.07	48. 46	18. 16	17298	10.09	-7835
1986-87	22668	12. 778	12875. 42	56. 80	20. 04	17740	2. 56	-7320
1987-88	22399	12. 966	13533.48	60. 42	20. 80	17275	-2. 62	-5135
1988-89	27693	14. 451	17308. 13	62. 50	23. 48	19163	10. 93	-5129
As on Sept. 1989		16. 711						

Note : * Effective Exchange Rate for Imports= Nominal Exchange Rate(1+import tariff/100)

Sources:Government of India ,Economic Survey 1988-89; and RBI,Report on Currency and Finance,

    Vol II various issues)

Specification

Specification issues in trade modelling are predicated on the nature of goods for which export demand and supply behaviour is hypothesised. In the case of manufactured goods it is assumed that traded goods are not perfect substitutes for each other and accordingly the "law of one price" may not hold good across countries (after due allowance made for transportation and arbitrage costs involved in trading ,see Goldstein and Khan, 1985, pp. 1045). Thus, export prices of similar products differ across countries (measured in the same currency units) and demand for a country's products abroad is hypothesised to be negatively related to its own price of exports vis-a-vis its competitor's price (other foreign suppliers) in international markets. Export demand is also expected to increase (or decrease) with growth (or fall) in the real income of foreign consumers.

On the other hand, export products may or may not be perfect substitutes for similar products consumed within the country. If export production is characterised by different technologies used or scale of operation, export price of a country may be different from domestic price. Otherwise, the `law of one price´ prevails as between exports and domestic products, i.e., export products and domestic products are perfect substitutes for each other and thus domestic prices do not differ from export prices of similar products. However, if there are government incentives for exports, price received by exporters may be higher than the price received from domestic sales of similar products. In a recent paper, Ali (1987, p. 154) examined the supply behaviour of India's

exports during the period, 1967 to 1980. The export price used
by him is comprised of the unit value index of exports plus the
government incentives. As against this, in the trade mode
considered below, we have hypothesised that the rupee price
received for exports and the corresponding domestic price
inclusive of excise duties do not differ from each other except
for export incentives. In other words, the domestic wholesale
price and the unit value index of exports do not differ from each
other. As usual, government incentives include:import licenses
and premia on their transfer to other producers, cash assistance
for exporters and duty drawback of customs and excise duties on
inputs used in export production (see Table 9 for details).
Exporting is necessitated by the fact that quality production
depends on imported inputs . Given the domestic price, export
incentives and exchange rate the dollar price of exports was
derived by deflating the producer price (WPI) by the effective
exchange rate for exports (EERX), which takes into account both
the nominal exchange rate and export incentives. As will be
seen, EERX is defined formally, by ER (I+S), where ER is the
nominal exchange rate of rupee per US dollar and S, the average
rate of export incentives. To distinguish it from the export
price used by Ali, it may be mentioned that in Ali´s paper, the
supply price of exports differs from the respective domestic
price not only due to export incentives and exchange rate
fluctuation, but also because of other factors influencing the
domestic pressure of demand. Here the domestic factors
influencing exports through price are captured separately in the
domestic price equation, as shown below in equation (3). In the
international markets, however we have assumed that India´s

export price in dollar terms may be different from its
competitors'export price. Thus their relative price enters as
an argument in the function determining India's export demand.
The trade model given below consists of three behavioural
equations, the first regarding the foreign demand for Indian
products abroad, the second for India's import demand for foreign
products and the third explaining the behaviour of domestic
prices in India, given the domestic demand.

1) $XQI = f(\dfrac{WPI/EERX}{XPW} , RYW, EDCT, EDCM)$

2) $MQI = f(WPI, EERM, MPI, RGDPI)$

3) $WPI = f(MPI, EERM, RGDPI, DOIL)$

Export Demand

The volume of exports (XQI) is hypothesised to be favourably
affected by an increase in the world real income (RYW) and the
degree of export diversification to different countries of
destination (EDCT) and by commodities (EDCM). Further, export
demand is likely to increase with a decrease in the dollar price
of India's exports (WPI/EERX) relative to the world price of
exports (XPW). That is if Indian products become more
competitive vis-a-vis foreign ones, the export demand for India
will increase. In other words, a priori the price elasticity of
export demand is negative, while the income elasticity of export
demand is positive. Symbolically, equation (1) represents the

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export demand for India. Notice that there are two important external variables in this function (RYW and XPW) which are beyond the government's control. Government policies for export promotion can, however, influence export price. Most important of them are the exchange rate (ER)(measured in Rupees per US dollar) and export incentive rate (S). By increasing ER or S or both, our products can be made cheaper in the export markets. India's export price and domestic price are closely related to each other by the following equation:

$$XPI = WPI/ER. \ (1+S) \quad = WPI/EERX$$

That is export competitiveness can be improved by appropriate measures that reduce pressure on the domestic price (WPI) or by the rupee depreciation or by increasing the export incentives or by a judicious policy-mix of these variables. As will be seen below, a reduction in WPI will also help to make import substitution policies more effective since this will encourage importers to switch expenditures away from imports to domestic products. For assessing the order of magnitude of the effect of various policy options on export demand, it is necessary to estimate the associated elasticities.

Import Demand

Import demand (MQI) by India is hypothesised to be an increasing function of the domestic real income (RGDPI) and the domestic price of import substitutes and a decreasing function of the import price (MPI). Thus, import demand increases when domestic income increases in real terms. Government can also make imports costlier in rupee terms by increasing tariffs (t_m) or the nominal exchange rate (ER), i.e., more rupees have to be

spent for importing one dollar worth of product. The effective exchange rate for imports is given by, EERM = ER.(1+t_m). In principle, the rupee value of any foreign currency, say, US dollar is not the one indicated by the official nominal exchange rate because of other factors, like import tariffs or export subsidies etc. The economic effects of rupee depreciation or appreciation are therefore seen after adjusting the nominal exchange rate for tariffs, subsidies and other government interventions, viz, transferability provisions of import licenses by original allottees to the other agents in the economy. In the case of exports, as discussed earlier EERX has been chosen to be an appropriate variable to reflect such exchange rate effects and in the case of imports, EERM seeks to represent the effects of exchange rate and tariffs on imports. Thus, the volume of imports is likely to decrease with a rise in effective exchange rate for imports. More importantly, imports can also be made costlier than domestic substitutes if the price of the latter is reduced. By doing so, expenditure will be switched away from imports to domestic substitutes. Thus, if WPI decreases more than MPI, import demand also decreases and accordingly, the sign of the coefficient of WPI in equation (2) is expected to be positive. Symbolically, the import demand function is given by equation (2).

Domestic Prices

Domestic prices are hypothesised to be an increasing function of the foreign price of imports (MPI), effective exchange rate for imports (EERM) and aggregate output (RGDPI). To incorporate the impact of external disturbance, such as world oil-price shocks, a dummy variable (DOIL) has been included in the price equation (3). It has been assumed that there are supply bottlenecks in the economy due to shortage of capital and power, etc. and thus prices are supply-determined, given the aggregate demand.

Price Interaction and Comparative Statics

Price behaviour is explained in Figure 2. To begin with, the equilibrium values of domestic price and output are shown at A, the point of intersection of the aggregate demand curve (AD) and the aggregate supply curve (AS). The demand curve is drawn horizontal which implies that there is no deficiency of aggregate demand at a given price. Supply curve is drawn upward sloping because whenever excess demand exists it can only be cleared at a higher price. The need to export arises mainly due to the requirement of imported inputs for production and also because of government policies which tie up import licenses with export performance.

The demand curve for India's exports is given by XD, which is downward sloping with reference to India's export price vis-a-vis the world price of similar products (both measured in the same currency units) for given world income and the degree of export diversification. The dollar price of India's exports is thus determined by the rupee exchange rate export incentives and the level of domestic price of tradables, whereas, the world price of exports is assumed to be determined exogenously. When Indian

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Figure 2

Exchange Rate Determination and Increase
In Export Demand and Output

XPI= WPI/EERX
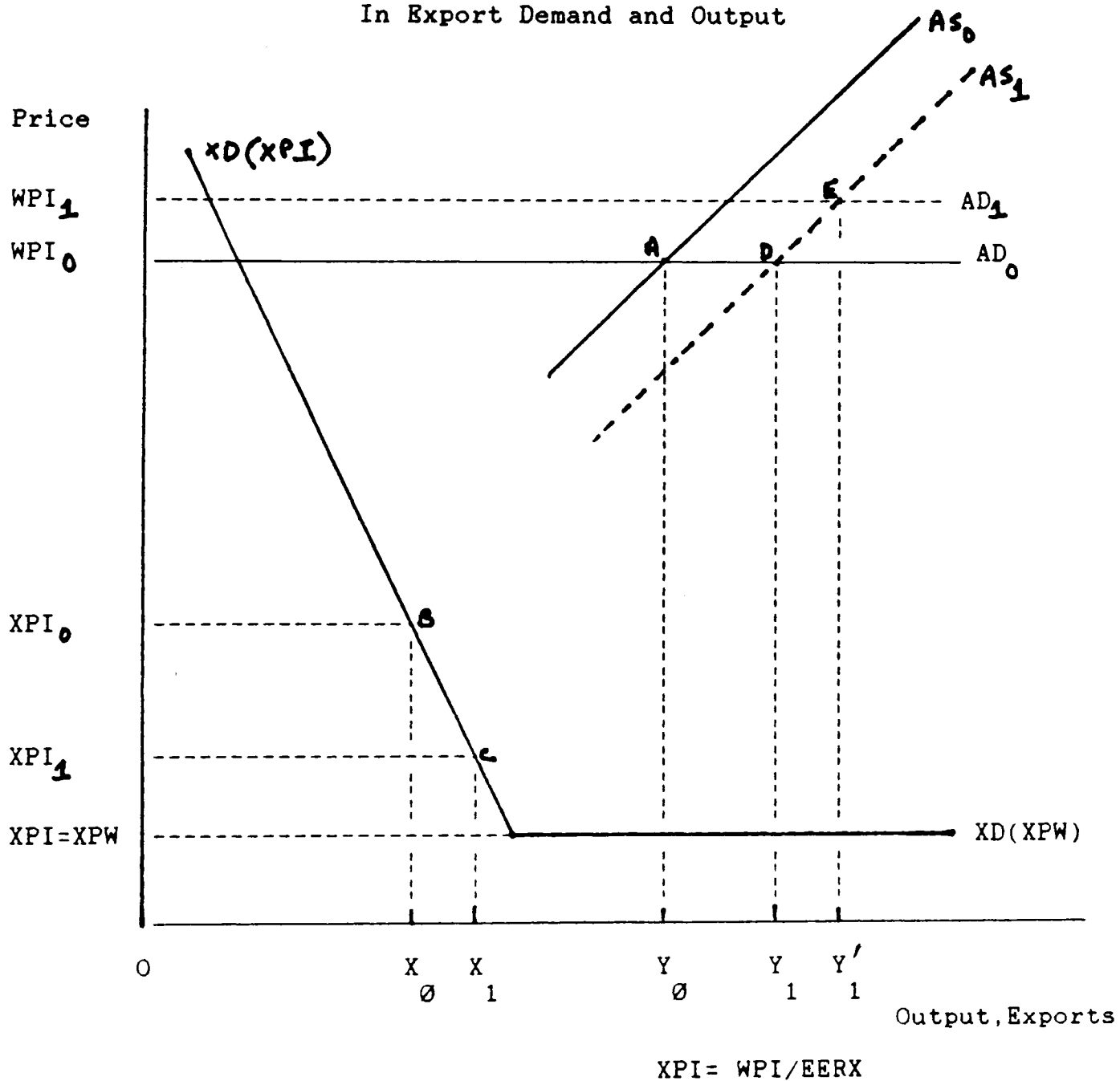
price matches with the world price, (that is, the relative price is unity) export demand for India is only affected by non-price factors like export diversification efforts and world income,which tend to shift the export demand curve. Then the price elasticity may be assumed to be infinitely large or XD curve would be flatter at the world price (small country assumption). Ali (1987) used the small country assumption and estimated the supply price elasticity of India's exports. Given the equilibrium value of domestic price of tradables at the point A and the effective exchange rate, the dollar price of India's exports is determined,say at B. Note that the export price is determined recursively, but not jointly, once the domestic price is given determined by the intersection of the aggregate demand and supply curves,such as at the point A. Thus, in the short-run, if India's exports are desired to be increased, government may either devalue the rupee or increase export subsidies or both, or restrict the domestic price from rising, so that export price would decline in dollar terms, say, from B to C along the export demand curve, XD. The additional export demand, $X_0 X_1$ cannot however be met unless aggregate supply increases, perhaps by autonomous increase in power and other essential inputs, etc.

Table 11

Estimated OLS Results of Export Demand, Import Demand and Domestic Price Equations, 1974-75 to 1985-86.

Independent Variables	Export Volume XQI	Import Volume MQI	Domestic Price WPI
(in Logs)		(in Logarithms)	
CONSTANT	-7.484 (-4.280)*	-5.980 (-6.264)*	-5.360 (-4.433)*
(WPI/EERX)/PXW	-0.529 (-3.640)*	-	-
RYW	1.228 (7.816)*	-	-
EDCT	1.240 (3.626)*	-	-
EDCM	0.281 (1.591)	-	-
RGDPI	-	1.450 (7.190)*	0.660 (2.080)**
MPI	-	-0.550 (-4.238)*	0.820 (4.350)*
EERM	-	-1.206 (8.106)*	0.640 (2.750)*
DOIL	-	-	0.160 (3.320)*
WPI	-	1.190 (9.104)*	-
Statistics			
R-Square	0.980	0.994	0.974
F(4,7)	87.400	310.200	64.900
D.W.	2.362	2.560	2.320

Notes: Figures in parentheses are T-values.

* denotes significance at 5% level.

** denotes significance at 10% level.

See Annexure 1 for notations.

The AS curve thus shifts to the right to AS_1, intersecting AD_0 at the point D, where output is Y_1 (higher than Y_0), for given domestic demand, AD_0 and increased export demand, $X_0 X_1$. However, devaluation exerts an immediate pressure on domestic prices through higher import prices, particularly when imports constitute mainly intermediate and capital goods. Thus it raises price from WPI_0 to WPI_1. Also possible will be a switch in expenditure from imports to domestic goods depending on the extent of their relative price changes. Accordingly, the aggregate demand curve may also shift upward from AD_0 to AD_1 and the new equilibrium output is determined at a higher price at the point E, where AS_1 intersects AD_1. At this point, the level of output is Y'_1, which is still higher than Y_1. Thus, if aggregate supply could adjust to the increased demand, which is induced partly by import substitution and partly by additional export demand due to devaluation, such an exchange rate policy would be expansionary in the long run, inspite of initial rise in domestic prices. But, it is a moot question whether supply adjusts to demand instantaneously in the short-run.

Estimation

Note that in our model, equations 1-3 form a recursive system. Assuming that domestic demand is given, domestic price is estimated by equation (3), in which no explicit feedback effect of exports is considered, whereas, the effect of world price of imports or effective exchange rate for imports on domestic price is reflected. Similarly, import volume is determined under the assumption that the world supply of imports is infinitely elastic. Thus, given the import and domestic prices, domestic supply conditions warrant demand for imports.

In the export demand equation, export price is treated to be exogenous which is derived from the predetermined domestic price, as well as exchange rate and export incentive rate. Unbiased estimates of export demand, import demand and domestic price can therefore be obtained by applying the method of Ordinary Least Squares (OLS) to each equation in the model. We have used time-series data for the period, 1974-75 to 1985-86 and derived the OLS estimates. It should be mentioned that volume and unit value indices of India's exports and imports are not available for the subsequent period (see Annexure 1 for data sources).

Results

The OLS results of estimated model are given in Table 11. It is seen that the statistical fits of all three equations are reasonably good, for, more than 98 per cent of variations in the dependent variables have been explained satisfactorily by relevant factors considered in the model. Moreover, almost all parameter coefficients are estimated to be statistically significant at the 5 per cent level and bear appropriate signs. Also, there does not seem to be any auto-correlation problem as can be seen from the values of Durbin-Watson(D.W.)statistic. As all variables have been expressed in logarithmic terms, the estimated coefficients give respective average elasticities .

Considering the export equation, we find that India's export demand is price inelastic (-0.529), but elastic to world income (1.228) and geographical diversification (1.240) as measured by Michaely's index (EDCT). However, export demand was not found to be sensitive to commodity diversification (EDCM), which is also not statistically significant. An important finding of this

study is that a major portion of growth in export volume was due to the growth in world income, whereas, the favourable effect, much expected of the rupee depreciation or increasing government incentives for exports seemed to have been neutralised by the domestic price rise. As can be seen from Table 12, the volume growth of India's exports was only 3.7 per cent during the period 1974-75 to 1985-86 Of this growth, as much as 3.46 per cent has been accounted for by the growth in real income of developed countries (growth rate of world income was 2.82 per cent p.a. and the income elasticity of India's export demand was 1.228). The degree of export diversification by India has not been found to be encouraging during the period of study and its contribution to export growth was even negative at -0.51 per cent. It is therefore important that efforts must be intensified to promote export spread over different markets in order to achieve higher export growth in real terms. On the price front, the study has found that the rupee depreciation or export incentives have not been effective to increase exports mainly due to increase in domestic prices. As is evident, India's export price in dollar terms witnessed an increase of 2.91 per cent a year, despite an effective depreciation of 4.15 per cent p.a inclusive of export incentives during the sample period. The price competitiveness of India's exports has thus suffered due largely to domestic price increase by 7.06 per cent during the same period. Hence the real export growth attributable to price competitiveness was only marginal around 0.61 per cent per year.

On the imports side, as Table 11 shows the factors contributing to the import growth. These are mainly: the domestic real income with demand elasticity as high as 1.45, the domestic price with elasticity 1.19 and the effective exchange rate for imports, the elasticity of which was estimated to be

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-1.206. Their contributions to the volume growth of imports are given in Table 12. It is seen that imports had experienced a volume growth of 8.98 per cent a year on an average during the period,1974-75 to 1985-86. Much of this growth was found to be due to a rise of 4.43 per cent in domestic real income and an increase of 7.06 per cent in domestic prices. Since the associated elasticities of import demand were estimated to be 1.454 and 1.193 respectively, their respective contributions to the import growth work out to be as high as 6.44 and 8.42 per cent. But, since the rupee depreciation together with rising tariffs witnessed a growth rate of 4.87 per cent a year, the import demand was curtailed considerably by as much as 5.87 per cent. An important finding is that import prices have almost remained stable in dollar terms, while domestic prices witnessed an increasing trend, probably contributing to a lesser degree of import substitution. Moreover, as most of our imports are required for production, increasing tariffs and the rupee depreciation seem to have pushed up the landed cost of inputs and, therefore, resulted in higher domestic prices. Since the domestic price effect has dominated over other influences, it seems appropriate to consider a policy mix of these variables that restrain domestic prices in general.

To look into factors that affect domestic prices, we turn to the last column of Table 11. It indicates that, ceteris paribus, domestic prices will increase by 0.64 per cent with a one per cent rise in the nominal exchange rate or import tariffs, and by 0.66 per cent with a one per cent rise in the domestic real income. An important finding is that the supply price elasticity of Indian products has been found to be high at 1.51,as can be derived from the inverse of the estimated coefficient of the output variable (RGDPI) in the price equation. It reflects upon

the increasing cost of production and suppliers' willingness to produce only at higher prices. Hence, it is important that production bottlenecks like power and essential inputs such as steel, etc.,are removed by conscious government efforts. Otherwise, aggregate supply may not increase enough to contain the upward pressure on domestic price. In addition, it seems judicious to reduce the level of tariffs (their present average level is 65 per cent of CIF value) because the rupee depreciation itself can be expected to bring about the desired effect of reducing imports. Although tariff reduction may reduce customs revenue in the short-run, it will ease the pressure on domestic prices and may, in turn, improve the price competitiveness of exports as well. Of the 7.06 per cent growth experienced by domestic prices, as much as 3.14 per cent was fuelled by increasing tariffs and the rupee depreciation, while over 2.9 per cent of growth was due to increase in the domestic real income. The growth contribution of foreign price of imports was almost negligible, since import prices in dollar terms were stable during the period of investigation (see Table 12).

5. Summary and Conclusions
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India s export earnings witnessed a marked increase in the recent period both in rupee and dollar terms. The export growth was as high as 27 per cent a year in rupee terms and about 20 per cent a year in dollar terms, on an average during the period, 1986-87 to 1988-89. This is clearly seen to be almost double the respective annual average growth rate achieved in the earlier period 1974-75 to 1986-87. Secondly, the growth rates were slightly lower in dollar terms than in rupee terms due to the

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rupee depreciation. Thirdly, it seems that exports grew more rapidly in the general currency area than in the rupee area (Soviet Bloc) during the recent period.

As regards export composition, the commodity groups which have considerably high share in total exports and exhibited greater stability and growth were: leather and leather manufactures, handicrafts including gems and jewellery, articles of apparel and clothing, machinery and transport equipment etc,. All of them have witnessed higher export growth rates during the recent period than before. Exports of some agro-based commodities such as coffee, tea, cocoa, spices meat and meat preparations have, however, declined during this period. Furthermore, there has been stability in export earnings of some of these important commodity groups during this period.

As against this, exports of many commodities belonging to engineering industry, rubber industry, plastics, paper and textile fibres industries suffered growth fluctuations and showed instability in their growth trends, which may cause concern because their export share in total has also been considerable around 26 percent. Other manufactured products seem to be gaining greater share over time and showed stability. It is therefore urgent and prudent to concentrate our efforts to examine the factors responsible for instability in exports of engineering products and others so as to smoothen the inflow of foreign exchange earnings and accelerate the export growth in the future.

As for exports by country of destination, it is observed that exports grew appreciably higher to the USA, Japan, the UK, France, and West Germany, while exports to the USSR have decreased in the recent period than before. On the other hand, exports to Asian developing countries witnessed a spurt in growth. Countrywise detailed analysis has indicated that, although no significant trend is noticeable in geographical diversification, export earnings from important developed countries were relatively stable during this period, 1974-75 to 1986-87. It is therefore,suggested that if government incentives are tied to promote diversification to new and potentially important products and markets, it is likely to generate higher and relatively more stable export growth in the future.

In this study a trade model has been estimated for India using data for the period 1974-75 to 1985-86, in order to explain variations in India´s exports and imports as well as domestic prices. The estimated model shows that during the period in question, the rupee depreciation coupled with export incentives have had a marginal effect on the price competitiveness of India´s exports, largely because their favourable effect was neutralised to a considerable extent by the domestic price rise. It should be pointed out that a major limitation of our model is that it has not considered lags into account. The effect of the rupee depreciation on exports may not be seen instantaneously. Exchange rate effects on the domestic price can however, be presumed to be immediate since, its effects through imports and increased tariffs are felt by the producers instantaneously. Our model has been estimated with a presupposition that exchange rate efects are instantaneous. The

study has also revealed that growth in world demand in general and India's export diversification efforts in particular will play a crucial role to increase exports in the future.

Variations in India's imports were explained by factors such as domestic real income, the effective exchange rate for imports and import prices. An important finding is that demand for India's imports has been highly sensitive to the rupee depreciation and import tariffs and therefore the recent rupee depreciation seems to have curbed the import demand successfully. But, increasing tariffs have also resulted in the domestic price rise as estimated in our model. Domestic prices have been found to be sensitive (elasticity, 0.64) to the rupee depreciation and rising import tariffs. The supply price elasticity has also been found to be high at 1.51. It is therefore concluded that the rupee depreciation may further fuel the price rise unless production bottlenecks are removed and the supply position is improved.

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Notations used and Data Sources

1. **DOIL** = Dummy variable to represent world oil price shock.

2. **EDCM** = Michaely index of export diversification by commodities at one-digit level of SITC code for exports, given by [Σ Xi X)0].5 where Xi (i=1,....m) is the value of the i-th commodity exported and Y is the total exports of India.

3. **EDCT** = Michaely index of export diversification by country of destination, given by the same formula as above, but now the subscript i refers to the country of destination.

4. **EERM** = Effective exchange rate for imports defined by ER(1+tm) where ER = Nominal exchange rate of Indian rupee per US dollar tm=Average rate of customs duty as a proportion of CIF value of imports.

5. **EERX** = Effective exchange rate for exports defined by ER(1+S) where S = Average rate of export incentives as a proportion of FOB value of exports.

6. **MPI** = Index of India's import prices in US dollars,1978-79=100.,RBI Report on Currency and Finance,Vol II(RCF)

7. **XPW** = Unit value index of exports of industrial countries.1978=100, International Financial Statistics.(IFS) (Annual Issues)

8. **RGDPI** = India's gdp at 1980 prices.(IFS)

9. **RYW** = Index of world income at1980 prices.(IFS)

10. **WPI** = Wholesale price index in India.1978-79=100,**RBI,RCF**.

11. **XQI,MQI** = Quantum Index of India's exports and imports,respectively,
RBI,RCF

Table A.1
Commodity Composition of India's Export and Growth Rates By SITC Codes,1974-75 To 1986-87

Rs crore

SITC code	Commodities	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	Average Growth Rates during 1974-75 to 1986-87 (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
01	Meat & meat preparations	5	11	18	25	33	41	56	80	81	72	83	74	77	23.00
03	Fish crustaceans,molluscs &preparations	65	126	178	171	221	249	213	280	364	359	381	409	529	14.63
04	Cereals &cereal preparations	25	19	18	64	127	206	242	386	230	125	200	256	246	24.70
05	Vegetables & fruits	136	133	158	197	145	182	220	288	299	291	363	399	524	11.57
06	Sugar,sugar preparations &honey	340	475	150	21	136	150	41	64	67	175	56	17	20	-17.62
07	Coffee,tea,cocoa,spices&manu.	341	376	481	903	634	681	752	643	655	619	1185	1178	1153	9.39
08	Feeding stuff for animals	104	107	257	157	140	168	152	155	166	204	172	154	235	3.43
09	Misc. edible product&preparations	3	7	4	7	6	7	10	14	13	13	15	13	17	13.40
12	Tobacco&tobacco manufactures	80	93	97	117	116	114	141	235	246	178	178	170	185	7.98
22	Oil seeds &oleaginous fruit	29	82	71	4	12	27	60	36	46	40	47	24	32	1.48
24	Cork &wood	9	13	19	21	15	12	4	3	2	1	1	1	1	-24.99
26	Textiles fibres&their wastes	45	64	52	10	27	91	184	60	124	182	73	75	216	13.56
27	Crude fertilizers&crude minerals	33	31	42	48	51	60	68	73	76	75	109	110	107	11.33
28	Metalliferous ores& metal scrap	197	265	298	268	278	333	344	385	417	433	530	676	611	9.30
29	Crude animal&veg. materials	117	87	107	129	128	142	150	216	151	159	241	229	216	7.48
32	Coal,coke&briquettes	7	17	14	12	6	2	3	4	5	2	5	10	59	0.54
33	Petroleum,petr.products&related materials	14	20	18	16	14	21	25	221	1235	1588	1818	645	411	56.24
42	Fixed veg.oils fats&waxes	34	36	49	21	14	42	15	17	25	36	55	47	30	1.31
43	Animal&veg.oils&fats processed&waxes of animals or veg. origin	1	1	2	4	4	10	4	2	1	12	2	1	1	-0.60
51	Organic chemicals	8	8	11	10	18	15	14	16	29	30	34	24	49	15.34
52	Inorganic chemicals	19	17	20	16	18	17	18	24	19	18	25	23	31	4.20
53	Dyeing,tanning&colouring materials	23	19	33	36	33	44	51	55	60	67	80	75	121	13.88
54	Medicinal&pharm. products	23	23	23	31	56	87	67	122	112	156	234	157	162	22.66
55	Essential oils&perfume materials,toilet,polishing&cleansing prep	16	14	19	23	20	34	72	145	116	44	73	67	78	17.68
57	Explosives&pyrotechnic products	1	1	2	2	2	1	1	1	1	1	1	1	1	-3.37
58	Artificial resins&plastic materials&cellulose esters&ethers	2	1	4	3	2	3	3	3	2	2	4	6	11	19.38
59	Chemicals materials&products	9	2	5	4	5	8	6	9	10	5	23	34	33	18.99
61	Leather,leather manu.,n.e.s.&dressed furskins	145	201	263	248	328	486	337	369	360	429	627	647	731	11.97
62	Rubber manufactures	13	11	23	22	20	21	26	35	49	41	74	53	85	18.06
63	Cork&wood manufactures	8	6	11	12	14	16	15	17	14	12	14	14	18	5.72
64	Paper,paperboard/articles	8	5	6	9	8	5	6	7	5	6	13	7	6	0.50
65	Textiles yarn,fabrics,made-up articles&related products	623	571	710	753	682	979	1020	1030	951	949	1392	1254	1408	7.36
66	Non-metallic mineral manufactures	124	187	310	610	756	568	646	811	986	1250	1197	1453	2037	21.53
67	Iron& steel	88	122	388	208	224	106	70	80	51	48	76	58	56	-10.78
68	Non-ferrous metals	91	202	178	99	115	16	16	13	26	22	18	42	24	-6.49
69	Manufactures of metal	69	83	132	163	199	204	186	221	196	196	199	150	165	5.93
71	Power generating mach.&equip.	91	111	120	50	72	61	75	93	93	63	95	70	83	1.48
72	Machinery specialised for particular inds.	6	8	10	33	48	52	60	79	70	89	123	114	145	29.17
73	Metal working machinery	6	7	17	16	23	27	27	28	33	34	36	64	71	19.17

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
74	Gen. ind machinery&equipment	20	24	18	38	48	48	58	96	63	69	93	72	78	13.65
75	Office mach.&automatic data processing equip.	6	5	2	2	2	1	2	2	11	18	11	21	66	23.91
76	Telecommunications&sound recording app.&equipment	7	9	10	10	8	8	8	12	16	8	7	5	12	-0.51
77	Elect.mach.app&appliances,n.e.s,&elect.parts	57	65	84	72	71	79	100	121	126	101	122	146	178	8.57
78	Road vehicles	54	67	77	105	112	133	169	189	162	137	160	152	164	8.93
79	Other transport equip.	13	17	18	11	15	39	27	23	21	16	30	33	37	7.35
81	Sanitary,plumbing,heating&lighting fixtures&fittings	3	2	3	4	3	4	5	4	6	4	4	5	2	2.61
82	Furnitures&parts thereof	3	3	5	5	5	4	5	5	6	6	6	4	3	1.83
83	Travel goods,handbags&similiar containers	4	7	6	9	14	16	18	24	29	31	43	49	71	24.88
84	Articles of apparel&clothing accessories	138	203	325	329	456	499	566	658	605	741	985	1106	1406	18.00
85	Footwear	21	22	30	24	26	34	40	36	33	34	48	50	81	8.99
87	Professional scientific&controlling instruments &apparatus	3	5	5	4	5	7	12	12	14	11	19	17	20	16.94
88	Photographic app.,equip.,supplies&optical goods	11	13	13	14	17	25	36	33	32	36	32	26	27	9.69
89	Misc. manu. articles	65	67	98	516	691	775	190	267	257	281	319	307	344	10.07
91	Postal packages not classi. acc. to kind	3	4	5	6	8	12	10	8	13	8	8	6	16	8.82
93	Special trans.&commo. not classified acc. to kind	3	5	6	14	12	13	12	7	8	16	6	5	23	6.34
	Grand Total	3329	4036	4981	5488	5726	6405	6711	7806	8803	9771	11744	10847	12452	10.51

(Rs Crore)

COUNTRIES	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	Average Growth Rates during 1974-75 to 1986-87 (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Argentina	11	4	2	24	2	3	5	3	2	2	1	1	3	-12.81
Australia	61	48	66	83	88	101	92	112	102	95	149	123	146	8.00
Austria	2	2	5	5	5	62	9	9	12	11	14	17	23	19.00
Bahrain	9	17	24	23	24	15	17	20	32	55	51	36	28	9.82
Bangladesh	42	62	55	52	53	98	75	65	37	57	93	129	164	7.45
Belgium	53	45	115	202	233	164	144	166	211	207	186	225	342	12.26
Brazil	3	2	2	1	5	3	2	1	2	1	1	3	5	-0.34
Burma	5	9	9	9	12	5	3	5	4	2	3	1	1	-16.01
Canada	44	46	50	46	49	63	62	67	56	92	135	132	137	10.68
China ,P.RP.of	2	6	17	19	26	21	24	53	12	67	19	29	9	11.93
Czechoslovakia	60	35	45	52	37	43	55	94	53	61	62	70	74	4.49
Denmark	10	12	24	19	19	29	26	29	34	32	40	38	41	11.00
Egypt Arab Rep.	53	100	91	72	60	72	86	74	84	116	105	110	81	3.20
Ethiopia	3	5	10	7	97	9	8	8	6	8	8	17	5	1.67
Federal Republic of Germany	106	117	230	245	274	379	385	351	343	375	471	513	733	13.79
German Democratic Republic	35	26	43	34	36	48	49	55	74	64	70	95	88	10.05
Ghana	2	2	2	5	4	2	8	5	11	7	20	16	4	16.45
Greece	3	8	7	8	10	11	8	15	14	12	9	10	12	7.19
Hongkong	28	44	77	86	105	103	141	128	192	217	174	210	409	18.81
Hungary	19	14	21	18	16	12	16	17	10	22	20	24	41	4.00
Indonesia	51	52	61	41	81	58	52	92	49	37	31	15	23	-7.69
Iran	215	273	146	117	93	96	123	125	74	119	134	95	47	7.85
Ireland	8	9	12	19	13	11	14	11	6	15	9	12	15	1.06
Iraq	72	64	47	51	47	61	52	85	57	56	43	34	18	-5.78
Italy	52	80	119	101	138	213	152	158	142	164	203	206	311	10.89
Japan	296	432	544	506	552	643	598	690	795	826	1061	1164	1334	10.96
Jordan	15	11	11	5	8	4	7	10	6	8	4	8	14	-.34
Kenya	15	16	20	29	36	34	33	26	19	17	28	29	32	3.19
Kuwait	38	47	117	113	120	124	97	133	129	117	116	121	93	5.87
Malaysia	29	33	30	34	45	53	51	47	55	64	71	71	85	9.13
Mauritius	6	7	11	11	15	17	12	16	12	11	14	14	21	6.49
Mexico	1	1	2	2	1	3	5	7	2	4	1	4	3	8.63
Nepal	42	51	52	59	57	63	78	78	84	108	181	102	103	9.57
Netherlands	72	82	195	137	181	220	152	110	116	195	182	158	225	5.25
New Zealand	21	13	14	14	13	23	19	21	20	17	19	16	21	2.00
Nigeria	22	37	26	29	27	30	53	72	60	40	36	20	34	2.38
Norway	4	5	12	10	8	11	9	11	10	9	11	13	17	7.55
Philippines	4	12	23	13	11	10	6	5	11	7	9	5	7	-3.94
Poland	77	88	117	66	65	44	69	47	72	74	94	62	122	0.41

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Qatar	9	10	20	18	21	16	17	25	30	22	30	22	18	6.51
Saudi Arabia	36	60	76	124	133	156	165	180	227	245	245	221	214	14.82
Singapore	37	53	59	69	80	78	109	122	194	197	191	142	216	15.09
Spain	8	10	13	9	15	21	16	25	36	39	31	28	65	16.32
Srilanka	27	23	39	55	89	128	81	51	97	108	114	81	87	10.93
Sudan	66	37	53	34	45	33	39	29	31	26	18	17	9	-11.31
Sweden	16	13	26	22	24	33	28	32	32	36	37	39	55	9.39
Switzerland	16	59	77	53	83	102	111	113	96	121	119	107	159	12.46
Syrian Arab BP	7	2	4	8	11	14	11	8	9	3	4	4	3	-2.99
Tanzania Republic	10	17	24	39	36	31	23	29	17	20	16	12	19	-1.68
Thailand	12	17	26	26	24	29	45	35	31	43	25	26	63	8.07
Trinidad & Tobago	1	3	3	3	2	2	2	2	3	6	2	2	1	-0.42
United Kingdom	312	419	212	525	531	506	395	420	457	556	670	524	700	5.80
United States of America	374	518	576	677	769	807	743	920	950	1396	1768	1974	2331	14.65
USSR	421	417	446	657	411	638	1226	1661	1558	1306	1655	2006	1868	16.45
Zambia	10	6	10	7	8	12	30	18	17	16	10	7	4	0.18
TOTAL OF ABOVE	3041	3666	4292	4836	5123	5764	5983	6839	6945	7685	9026	9363	10952	
GRAND TOTAL	3329	4036	5143	5400	5725	6416	6711	8906	9065	9072	11657	10895	12041	

Source: As for Table A.1

Stability of Export Earnings from Different Commodity Groups and Ranks

SITC code	Commodities	Index of Instability (in increasing order)	Rank of Stability
1	2	3	4
65	textiles yarn,fabrics,made-up articles&related products	0.000221	1
28	metalliferrous ores& metal scrap	0.000234	2
27	crude fertilizers&crude minerals	0.000460	3
05	vegetables & fruits	0.000479	4
77	elect.mach,app&appliances,n.e.s,&elect.parts	0.000630	5
84	articles of apparel&clothing accessories	0.000672	6
29	crude animal&veg. materials	0.000745	7
61	leather,leather manu.,n.e.s.&dressed furskins	0.000847	8
07	coffee,tea,cocoa,spices&manu.	0.000930	9
53	dyeing,tanning&colouring materials	0.001166	10
03	fish crustaceans,molluscs &preparations	0.001388	11
12	tobacco&tobacco manufactures	0.001428	12
85	footwear	0.001811	13
08	feeding stuff for animals	0.001839	14
78	road vehicles	0.001848	15
66	non-metallic mineral manufactures	0.002138	16
71	power generating mach.&equip.	0.002451	17
83	travel goods,handbags&similiar containers	0.002526	18
69	manufactures of metal	0.002918	19
52	inorganic chemicals	0.002986	20
54	medicinal&pharm. products	0.003429	21
62	rubber manufactures	0.003493	22
51	organic chemicals	0.003733	23
74	gen. ind machinery&equipment	0.004636	24
88	photographic app.,equip.,supplies&optical goods	0.005894	25
63	cork&wood manufactures	0.007108	26
73	metal working machinery	0.007216	27
67	iron& steel	0.008410	28
79	other transport equip.	0.008980	29
87	professional scientific&controlling instruments &apparatus	0.009473	30
09	misc. edible product&preparations	0.012847	31
64	paper,paperboard/articles	0.013069	32
55	essential oils&perfume materials,toilet,polishing&cleansing prep.	0.013513	33
01	meat & meat preparations	0.013672	34
72	machinery specialised for particular inds.	0.015182	35
89	misc. manu. articles	0.016304	36
42	fixed veg.oils fats&waxes	0.017036	37
04	cereals &cereal preparations	0.018955	38

1	2	3	4
76	telecommunications&sound recording app.&equipment	0.019163	39
82	furnitures & parts thereof	0.025399	40
26	textiles fibres&their wastes	0.025977	41
91	postal packages not classi. acc. to kind	0.029007	42
06	sugar,sugar preparations &honey	0.029129	43
68	non-ferrous metals	0.036923	44
22	oil seeds &oleaginous fruit	0.047464	45
81	sanitary,plumbing,heating&lightingfixtures&fittings	0.047992	46
33	petroleum,petr.products&related materials	0.051130	47
93	special trans.&commo. not classified acc. to kind	0.055667	48
59	chemicals materials&products	0.085081	49
58	artificial resins&plasticmaterials&cellulose esters&ethers	0.166930	50
32	coal,coke&briquettes	0.211066	51
24	cork &wood	0.266367	52
43	animal&veg.oils&fats processed&waxes of animals or veg. origin	1.141172	53
75	office mach.&automatic data processing equip.	1.346171	54
57	explosives&pyrotechnic products	1.533864	55
	All Commodities	0.000045	

Note: Same as in Table 4.

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