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THE COST AND COMPOSITION OF INDIAN EXPORTS*

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India has a history of export promotion policies extending back into the 1950's. These policies seem to have been applied without regard to comparative advantage and this study indicates the high cost of India's disregard for economic efficiency. Using the domestic resource cost concept as the criterion for measuring relative export efficiency, the present structure of Indian exports is examined on both the sectoral and product level. The results show not only an unacceptably wide divergence in the domestic resource cost of exports on the margin – indicating a misallocation of resources in the export sector – but also an export incentive system which fails to select India's most efficient exports.

1. Introduction

Although the development literature is now replete with studies showing the high costs and dubious benefits of poorly designed and administered programs of import substitution, only recently have policies on the opposite side of the balance of trade, those employed in programs of export promotion, received the attention which they deserve.[1] For although export promotion policies are frequently seen as the antidote to overzealous import policies, export policies are prone to the same inefficiencies as the import policies they are meant to neutralize.

This study updates the existing evidence of inefficiencies in Indian export policies. The consequences of predevaluation schemes for export promotion (i.e., those before 1966) have been discussed and measured by Bhagwati (1968) and Bhagwati and Desai (1970) for a fairly broad spectrum of Indian exports. Paul and Mote (1967) have also examined some of the same issues with regard to cotton textile exports. Yet the 1966 devaluation was supposed to result in a

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[1]In referring to the recent focus of attention on export policies, one must not forget the earlier comments of Despres (1956) and the extensive discussion of Pakistan's export policies by Hufbauer (1968) and others. It is only recently, however, that export policies have become a 'current' topic.

rationalization of import and export policies and here the well-known technique of ranking industries by their domestic resource cost is employed in order to test whether the post-devaluation export policies have led to any improvements in resource allocation. The evidence suggests that post-devaluation policies are no more efficient than their predecessors.

Only the consequences of policy are treated here. The logic of the pre-devaluation policies themselves is examined by Bhagwati and Desai (1970) and Desai (1970); post-devaluation policies are examined in Staelin (1971, 1973).

The domestic resource cost (DRC) measure as used here is a social cost–benefit ratio in a form most easily applied when the shadow price of foreign exchange is unknown. DRC has been employed in previous studies of India by Bhagwati and Desai (1970) and by Krueger (1970) in her examination of the automobile ancillary industry. DRC may be defined as

$$\mathrm{DRC}_i = \mathrm{MRC}_i/\mathrm{MXE}_i, \tag{1}$$

where MRC_i is the marginal resource cost – the direct plus indirect domestic value added suitably shadow priced – of the production of one unit of good i, and MXE_i is the marginal foreign exchange – the F.O.B. earnings less the value of the direct and indirect imported inputs – resulting from its export. The controversy surrounding the most appropriate methods for obtaining DRC estimates will not be reproduced here, nor will the disputes over the relevance of DRC measurements in general equilibrium. The reader is referred to the ample literature on both topics.[2]

In this study it is assumed that the domestic resources consumed in all domestically produced inputs which are used directly or indirectly in the production of an export are properly part of the marginal resource cost of that export. In the jargon of much of the literature referred to above, this means that all domestically produced goods, including all exports other than the one being examined, are treated as non-tradables. Although this may seem somewhat paradoxical, the intention here is to measure the domestic resource cost of each export through all its domestic stages of production and thus an export industry using domestic inputs which are produced inefficiently in India will be penalized. If this were a study of the efficiency of individual industries in isolation from each other, this assumption would be inappropriate; rather, all inputs which were produced inefficiently at home but which could be imported would be treated as imports. However, this is not a study of individual industries; it is an examination of the consequences of policies which actually lead to many inputs being inefficiently produced in India and subsequently used in export produc-

[2]The various opinions concerning the proper measurement of DRC are summarized in Balassa and Schydlowsky (1972), Krueger (1972), Bruno (1972) and Staelin (1971). The more recent discussion of the relevance of effective protection and DRC type measurements in general equilibrium may be found in Bruno (1973). Other sources are also referred to in these works.

tion. Since these 'extra' costs are presently borne by Indian export industries, it seems appropriate that they be measured.

In the next two sections, the DRC of Indian exports is measured at two levels, at the sectoral level through the use of input–output techniques and on the product level by employing a more disaggregated approach.

2. Sectoral estimates of resource costs of exports

The DRC of Indian exports is first examined through the use of input–output analysis. The DRC of each sector is computed as the quotient of the respective elements of the vectors MRC and MXE:

$$\mathrm{MRC} = (R_K K_h + R_L L_h + R_V V_h)(I-A)^{-1},$$

$$\mathrm{MXE} = S_x - (S_m M + K_m + V_m)(I-A)^{-1}. \qquad (2)$$

MRC is a vector of the shadow priced, direct-plus-indirect marginal resource costs per rupee of output, and MXE is a vector of the marginal net foreign exchange earnings per rupee of export, the rupee of export and output being measured at domestic prices. The R_j are scalers indicating the ratios of the shadow to the market prices of capital (K), labor (L), and other value added (V). K, L, and V are vectors of factor input coefficients measuring the value of each factor input per unit value of output, all at domestic prices; the subscripts m and h refer respectively to the imported and domestic components of each source of value added. M is a matrix of direct import contents (measured at domestic prices) and S_x and S_m are vectors of the F.O.B./domestic price ratios of export sectors and the C.I.F./domestic price ratios of import sectors respectively. Finally, A is an input–output coefficients matrix at domestic producers' prices. Export supply and demand elasticities are assumed infinite.

The input–output table employed is based on a seventy-seven sector flow table compiled by the Indian Statistical Institute (ISI) (1966) for the years 1964/5, and published by the Indian Planning Commission. Forty-two sectors in the ISI table were identified as export sectors, twenty-three were identified as import sectors and the remainder were treated as non-tradable. The criteria by which different sectors were allocated to each group is discussed fully in Staelin (1971). It should be noted that ten sectors of the ISI table are heterogeneous enough to be judged both import and export sectors in the sense that while exports are made by each sector, a large proportion of the total supply of goods in each sector is imported. These ten sectors were effectively disaggregated, each into two sectors: one an import sector and the other an export sector. The sources of all data are indicated in the appendix and detailed in Staelin (1971).

The DRC of the twenty-eight export sectors calculated for various shadow-prices of capital, labor, other value added are summarized in table 1.

Table 1

Export sectors ranked by DRC under various shadow prices and steel sources, and by direct import content (DRC in rupees per U.S. dollar).[a]

	Direct import content (%)[c]	Overall rank	Steel imported						Steel domestic	
			$R_K = 1, R_L = 1, R_V = 1$		$R_K = 1.5, R_L = 0.5, R_V = 0.5$		$R_K = 1.5, R_L = -$[b], $R_V = 0.5$		$R_K = 1.5, R_L = 0.5. R_V = 0.5$	
			DRC	Overall rank	DRC	Overall rank	DRC	Overall rank	DRC	Overall rank
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Silk textiles	45	33	4.76	1	2.74	1	3.99	5	2.74	1
Rayon fabrics	5	12	6.15	2	3.66	8	3.67	2	3.66	8
Cigarettes & cigars	10	19	6.28	3	3.46	3	4.18	8	3.45	3
Leather	54	37	6.44	4	3.60	5	4.20	9	3.60	5
Other tobacco prod.	2	4	6.44	4	3.43	2	4.63	15	3.43	2
Proc. cashewnuts	67	41	6.55	6	3.46	3	5.33	21	3.46	4
Wool yarn	57	39	6.56	7	3.63	6	3.63	1	3.63	6
Bidi	3	8	6.62	8	3.63	6	4.57	14	3.63	6
Jute textiles	57	39	6.68	9	3.71	9	3.71	3	3.70	9
Iron ore	1	1	6.77	10	4.23	18	4.23	10	4.23	18
Other rubber prod.	26	29	6.86	11	3.88	14	3.89	4	3.86	13
Rubber footwear	25	28	6.87	12	3.80	12	5.46	23	3.80	12
Plantations, incl. tea and coffee	4	10	7.27	13	3.76	10	5.40	22	3.76	10
Other textiles	6	14	7.31	14	4.09	16	4.12	6	4.08	16
Cotton textiles	3	8	7.39	15	4.10	17	4.12	6	4.10	17
Tobacco	2	4	7.45	16	3.86	13	5.65	25	3.86	13
Timber	1	2	7.46	17	3.76	10	6.63	29	3.76	10

Vegetable oil & cakes	3	8	7.59	18	3.90	15	5.49	24	3.90	15
Perfumes & cosmetics	15	22	7.61	19	4.27	20	4.92	19	4.25	19
Paper & paper products	18	23	7.78	20	4.69	25	4.88	17	4.68	26
Paints & varnishes	21	25	7.81	21	4.35	22	4.47	12	4.30	22
Soap & glycerine	33	30	7.82	22	4.29	21	4.92	18	4.27	21
Wool textiles	2	4	8.00	23	4.26	19	4.26	11	4.26	20
Cotton yarn	53	8	8.01	24	4.46	23	4.48	13	4.46	23
Leather footwear	4	10	8.24	25	4.50	24	6.38	28	4.50	24
Drugs & pharmaceuticals	8	17	8.50	26	4.69	25	4.87	16	4.67	25
Chinaware & pottery	6	14	8.51	27	4.87	27	6.22	26	4.87	27
Glass & glassware	12	20	8.63	28	5.03	28	5.15	20	5.02	28
Matches	13	21	9.89	29	5.35	29	7.49	34	5.35	29
Ceramics & bricks	5	12	11.12	30	6.15	31	6.25	27	6.14	33
Wood prod. incl. plywood	2	4	11.22	31	5.79	30	6.84	30	5.78	31
Cement	8	17	11.42	32	6.88	32	6.89	31	6.80	34
Dyestuffs	18	23	12.18	33	6.90	33	6.94	32	6.85	35
Non-electrical equip.	42	31	12.50	34	7.11	34	7.28	33	5.56	30
Plastics	23	26	13.22	35	7.79	36	7.85	36	7.51	37
Tires and tubes	43	32	13.61	36	7.53	35	7.55	35	7.33	36
Misc. chemicals	23	26	14.18	37	8.60	37	8.74	37	8.48	39
Sugar	8	17	19.45	38	10.61	38	14.51	41	10.61	41
Electrical equip.	57	39	20.86	39	11.56	39	11.64	38	8.63	40
Metal products	70	42	21.98	40	11.80	40	11.82	39	5.97	32
Transportation equip.	53	35	24.12	41	14.17	41	14.35	40	8.19	38
Man-made fibers	49	34	26.69	42	16.68	42	16.72	42	16.40	42

[a]Calculated as explained in the text.
[b]In the mining and manufacturing sectors $R_L = 0.5$; in all other sectors $R_L = 1.0$.
[c]As a proportion of the export price.

The shadow price ratios (R_K, R_L and R_V) were first set equal to unity and the resulting rankings are given in column 3. The most striking, although not unexpected result is the high domestic resource cost of India's non-traditional export sectors relative to all its export sectors. While the median DRC for the forty-two sectors studied is Rs. 7.82 per U.S. dollar, the median for the eighteen non-traditional sectors[3] is Rs. 11.80 per dollar, ranging from a low of Rs. 6.15 for rayon fabrics to Rs. 26.69 for man-made fibers.[4] The engineering goods sectors, i.e., electrical equipment, non-electrical equipment, transportation equipment and metal products, have an even higher median DRC of Rs. 21.42 per dollar.

The absolute median domestic resource cost is, of course, not meaningful in the present context. Rather, it is the wide *range* of DRC's which is alarming. The ratio of the highest to the lowest DRC is 5.6; the median DRC of the non-traditional sectors is 1.6 times the median DRC of the traditional sectors. Obviously the composition of Indian exports needs some attention unless the wide differences among exports can be explained on other grounds.

One common criterion used by the Government of India in ranking export industries is the proportion of domestic value added in manufacture. The government apparently wishes to maximize domestic value added – to minimize import contents – in order to maximize per *unit* export earnings. This is not in itself a rational policy – the maximization of earnings per unit of resources expended, not per unit of output, is the proper goal – and the two criteria can yield quite different results as shown in column 2 of table 1. The Spearman's rank correlation coefficient (S^2) between the two rankings is only 0.28.

An alternative criterion for the ranking of industries is their relative export and domestic prices, i.e., their F.O.B./domestic price ratios. The correspondence between these two measures is a good deal closer than it was for import contents; the S^2 for the two rankings is 0.85. Still, the correspondence is far from perfect. For instance, the rayon fabrics sector ranks second in DRC but only sixteenth in its F.O.B./domestic price ratio. In the next section, where the goods studied are more homogeneous, the correspondence between DRC and F.O.B./domestic price ratios deteriorates.

The behavior of the DRC rankings under various shadow price assumptions was examined in order to test their sensitivity. In virtually all cases, the degree of sensitivity was quite low. For instance, it is often argued that the low shadow price of labor in many LDC's – versus its high market price – justifies the introduction and protection of high-cost manufacturing industries in LDC economies. By extension, the argument has been used to justify the heavy sub-

[3]The non-tradition sectors include: electrical equipment, non-electrical equipment, transportation equipment, metal products, cement, man-made fibers, rayon fibers, ceramics, glass, tires, other rubber products, paper, plastics, dyestuffs, paints and varnishes, drugs and pharmaceuticals, perfumes and cosmetics, and miscellaneous chemicals.

[4]Man-made fibers include all non-cellulose fibers such as nylon and dacron.

sidization of high-cost manufactured exports. Yet unless the shadow pricing of labor brings the resource cost of manufactured exports below the cost of existing exports, they should still be considered as *relatively* inefficient. For India, this is demonstrated in column 5 of table 1 where labor was given a shadow price ratio of 0.5. In addition, capital was given a shadow price ratio of 1.5 in order to reflect its relatively high social cost and other value added was assigned a shadow price ratio of 0.5 in order to reflect the low social cost of possibly large excess profits and rents earned in protected domestic markets. Although it would be preferable to apply separate shadow price ratios to the profits of each sector the lack of data precludes any meaningful effort in this direction. This exercise then captures only the impact of a uniform rate of 'excess' profits in all sectors.

Under these shadow prices the ranking of industries is virtually unchanged from the original ranking in column 3. The rank correlation between the original and the 'fully' shadow priced rankings is 0.96 – most of the change in rankings is explained by shifts in only three sectors, iron ore, plantations, and rayon fabrics – and the ratio between the median traditional export and the median non-traditional export grows from 1.6 to 1.8.

Finally, it might be argued that the above analysis unduly penalizes the non-traditional sectors since wages are apt to be more inflated in the industrial sectors than in the traditional sectors. Although there are several reasons for believing this not to be the case, the shadow price ratio of labor in the agricultural, rural and service sectors was set equal to unity while that for labor in the manufacturing and mining sectors was set at 0.5 (column 7 of table 1).

The ratio of the median DRC for non-traditional versus traditional exports does fall from 1.8 to 1.5 and there is a moderate change in sectoral rankings; the S^2 between these and the previous rankings is 0.64. Yet the change in rankings occurs predominantly in the middle tertile of the rank. Of the eleven non-traditional sectors originally in the bottom tertile, ten remain there, and no new non-traditional sectors move into the top tertile. The new shadow price ratios then seem to indicate no major change in the choice among sectors.

Up to this point, the analysis has assumed that steel is imported at a relatively high foreign exchange cost.[5] The effect is to penalize all steel consuming sectors, especially the poorly-ranked engineering goods sectors. Since India does plan on expanding future domestic steel output, it is interesting to see what would be the domestic resource cost of India's exports if steel were to become a non-traded good (the export of steel is highly unlikely due largely to high transportation costs).

[5] Imported steel is relatively expensive at C.I.F. prices in India, approximately forty-three percent *over* the controlled domestic price. However, the results of the model are not sensitive to this figure, just as they are not very sensitive to the source of steel. If steel were imported at a lower C.I.F. price, equal to the domestic price, the change in rankings would be marginal. The rank correlation between rankings based on the use of high-cost imported steel and those based on the use of low-cost imported steel is 0.99.

The ranking of industries when steel is considered a domestic input is given in column 9. The relative ranking of the engineering goods sectors, in particular non-electrical equipment and metal products, is improved, but they still remain in the lowest third of the list. The rank correlation between rankings with imported steel and those with domestic steel is 0.98.

3. Estimates of resource costs of engineering exports

The results of the previous section demonstrate the large divergence in the domestic resource costs among India's export sectors. This section analyzes in more detail fifty-eight exported products produced within the engineering goods sectors alone.

The model employed is that of eq. (3). Direct-plus-indirect resource cost, the numerator of eq. (3), consists of the use of primary factors plus the extra resource costs of exports over domestic production,

$$\mathrm{DRC}_i = \frac{R_L a'_{Li} + R_K a'_{Ki} + R_V a'_{Vi} + R_E A'_{Ei}}{s_{xi} - \sum_m a'_{mi} s_m}; \tag{3}$$

a'_{Li}, a'_{Ki}, and a'_{Vi} are the values of the direct-plus-indirect inputs of domestic labor, capital and other value added, respectively, into a unit value of good i measured at domestic prices. A'_{Ei} is the direct input of the extra costs of exports. These extra costs of exports over and above the cost of domestic sales include such things as extra transport, packing and inspection costs. Each component of the domestic resource cost is assigned a shadow price ratio (R). In the denominator, a'_{mi} is the direct-plus-indirect input of import m (measured at domestic prices) per unit value of i, $s_m = P_{wm}/P_{hm}$, $s_{xi} = P_{wi}/P_{hi}$ and P_w and P_h are world (C.I.F. for imports and F.O.B. for exports) and domestic prices respectively. Again, the sources of data are given in the appendix.

The domestic resource cost calculated for each export with all shadow price ratios equal to unity is given in table 2.[6] When the sample is ranked by DRC and divided into tertiles, the median DRC for the top tertile is Rs. 11.03 while that for the bottom tertile is Rs. 29.25, a ratio of 2.7. The ratio of the highest non-negative DRC to that of the lowest is 14.8. It is interesting to note that the lowest DRC product, stainless steel dissecting sets, has a high total import content. Import content is a poor guide to resource cost as shown in column 3 of table 2; the rank correlation between rankings based on direct-plus-indirect import content and those based on DRC is only 0.47. The F.O.B./domestic price ratio (column 1) is only a slightly better proxy for DRC on the product level; the rank correlation between rankings by the two measures is 0.65.

[6] Note that one export, gas mantles, has a negative domestic resource cost. For every \$1.00 of domestic resources engaged in the export of gas mantles, India *loses* \$0.10 of foreign exchange. The very high import content of gas mantles which leads to the negative DRC value is derived from figures given by the manufacturer.

As in the sectoral analysis, shadow pricing the domestic resource cost of earning foreign exchange does not essentially alter the results. Shadow price ratios of 0.5 were assigned to labor and other value added, 1.5 to capital and 0.54 to the extra costs of exports[7] (table 2, column 7), yet the variation in DRC is not significantly reduced. The ratio of the medians of the highest and lowest tertiles is 2.6 and the rank correlation between rankings before and after shadow pricing is 0.95. Only a few products, spring steel flats, refrigerators, steel tube furniture, steel wool and bibcocks, experience a significant change in rank.

As before, the consequence of the domestic economy supplying all the steel consumed in exports was examined. All factor coefficients were recalculated assuming that steel previously imported as a direct input was now taken from domestic sources, i.e., steel was treated as a non-tradable good. The new domestic costs of foreign exchange are given in table 2, column 9. They show a significant reduction in the DRC of the higher cost items and a consequent fall of the highest to lowest tertile ratio to 2.0. However, the rank correlation between the rankings using domestic and imported steel is 0.91, indicating no major change in rankings.[8]

Finally, value added was shadow priced as before in calculating the DRC measures with domestic steel and the results are given in column 11. Rankings are once more quite insensitive to shadow pricing; the S^2 between columns 9 and 11 is 0.96.

The insensitivity of rankings to shadow price changes throughout this and the previous section may, at least in the Indian case, be due in part to the large differences in the F.O.B./domestic price ratios among both products and sectors. Although the correlations between DRC and the F.O.B./domestic price ratios are far from perfect and cannot therefore be the whole story, it is quite possible that for goods more comparable in F.O.B./domestic price ratios and more divergent in factor composition, the impact of factor pricing would be more significant.

4. Conclusion

The results of section 2 yield a clear interpretation. The Government of India is paying a relatively high price for foreign exchange in pushing for the export of non-traditional products. The median cost of the foreign exchange earned through the export of non-traditional products is fully 1.6 times that of foreign

[7]The shadow price ratio for the extra costs of export was derived by assuming that the extra costs of export contained factors in the same proportions as the 'average' intermediate input referred to in the appendix and then weighting the shadow price ratios of labor, capital and other value added by these proportions.

[8]A large portion of the small divergence in rankings is due to the changed ranks of two very steel-intensive products which presently use large amounts of imported steel, steel tube furniture and taps. Excluding these two items yields a rank correlation of 0.96.

Table 2

Export products ranked by DRC under various shadow prices and steel sources, and by s_x and import content.

Item	s_x, F.O.B./domestic price ratio (%)	Rank	Total import content (%)[a]	Rank	Steel imported: DRC with $R_K = 1$, $R_L = 1$, $R_V = 1$, $R_E = 1$	Rank	Steel imported: DRC with $R_K = 1.5$, $R_L = 0.5$, $R_V = 0.5$, $R_E = 0.54$	Rank	Steel domestic: DRC with $R_K = 1$, $R_L = 1$, $R_V = 1$, $R_E = 1$	Rank	Steel domestic: DRC with $R_K = 1.5$, $R_L = 0.5$, $R_V = 0.5$, $R_E = 0.55$	Rank
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Stainless steel dissecting set	109	1	66.1	50	8.40	1	4.73	1	7.58	1	5.03	1
Lifting and pulling machine	78	7	18.2	10	9.90	2	6.15	3	9.75	5	6.08	5
Charcoal-heated iron	97	3	18.0	9	9.98	3	6.00	2	9.75	5	5.93	3
Transmission line tower	68	14	27.1	20	9.98	3	6.38	5	9.15	2	6.08	5
Road roller	74	8	30.7	26	10.20	5	6.45	7	9.83	7	6.30	8
Oil expeller	81	5	25.3	18	10.35	6	6.60	8	10.20	8	6.60	12
Knitting machine	102	2	23.2	16	10.65	7	6.23	4	10.50	12	6.23	7
Hand tools	72	10	34.3	33	10.73	8	6.38	5	9.45	3	5.70	2
Rivit (*a*)	67	17	13.6	3	10.80	9	7.05	13	10.58	13	6.98	14
Black conduit (*d*)	60	26	14.0	5	11.03	10	7.43	16	10.80	14	7.35	19
Diesel engine (*a*)	67	17	29.4	23	11.18	11	6.90	10	10.20	8	6.53	10
Bench vise (*b*)	87	4	39.0	34	11.18	11	6.60	8	9.68	4	6.08	5
Diesel engine (*b*)	69	12	30.1	24	11.33	13	6.98	11	10.28	10	6.53	10
Steel wool	74	8	8.0	1	11.70	14	8.18	21	11.48	17	8.10	24
Turbine pump	66	20	21.5	14	11.85	15	7.13	14	11.48	17	6.98	14
Black conduit (*c*)	57	29	14.4	6	12.08	16	8.10	19	11.78	21	7.95	23
Bench vise (*a*)	81	5	40.0	35	12.15	17	7.13	14	10.28	10	6.38	9
Bibcock (*b*)	72	10	31.0	27	12.23	18	6.98	11	11.85	22	6.83	13
Lockset	61	23	20.2	12	12.38	19	7.50	17	11.70	20	7.20	17
Galvanized conduit (*c*)	61	23	26.9	19	12.83	20	8.55	25	12.23	23	8.25	25
Black conduit (*b*)	55	35	14.9	7	12.90	21	8.63	27	12.60	25	8.48	27
Diesel engine (*d*)	61	23	34.1	32	13.13	22	8.10	19	11.63	19	7.35	19
Gudgeon pin	62	21	25.2	17	13.13	22	8.63	27	12.90	27	8.48	27

Rivit (*b*)	67	17	44.2	37	13.20	24	7.95	18	—[b]	—[b]	—[b]	—[b]
Steel weld mesh	52	39	13.8	4	13.58	25	8.70	29	13.28	28	8.55	29
Diesel engine (*c*)	59	27	32.5	29	13.80	26	8.45	22	12.23	23	7.73	22
Spring steel flat	55	35	10.7	2	13.88	27	10.05	37	13.50	30	9.83	38
Sewing machine	56	32	20.4	13	13.88	27	8.48	22	13.35	29	8.25	25
Automobile parts	57	29	32.1	28	14.25	29	8.93	30	13.73	31	8.63	30
Taps	68	14	52.4	44	14.48	30	8.55	25	11.48	17	7.20	17
Galvanized conduit (*d*)	52	39	29.0	22	14.70	31	9.98	36	13.73	31	9.38	35
Galvanized conduit (*b*)	54	37	28.7	21	14.93	32	10.05	37	14.03	33	9.45	36
Refrigerator	61	23	42.6	36	15.23	33	8.55	25	12.75	26	7.58	21
Black conduit (*a*)	49	47	16.3	8	15.23	33	9.90	35	14.78	35	9.83	38
Trailer	49	47	19.6	11	15.38	35	9.60	34	14.40	34	9.15	32
Door lock	51	41	22.2	15	15.83	36	9.53	32	14.93	36	9.15	32
Electric fan	50	44	33.6	30	15.90	37	9.53	32	15.08	38	9.15	32
Steel tube furniture	67	17	56.1	46	16.05	38	9.30	31	11.18	15	7.05	16
Filter element	51	41	33.9	31	17.18	39	10.65	40	16.20	40	10.13	41
Capacitor (*a*)	48	49	50.4	40	17.70	40	10.43	39	16.65	42	9.98	40
Galvanized conduit (*a*)	47	50	30.6	25	17.85	41	12.00	43	16.50	41	11.18	44
Dynamo armature	55	35	50.0	39	18.60	42	10.80	41	15.83	39	9.45	36
Water fitting	54	37	60.2	48	20.10	43	11.55	42	22.35	51	10.88	42
Projector	50	44	51.6	41	20.18	44	12.68	46	18.75	45	11.93	48
Capacitor (*b*)	43	52	52.1	42	21.15	45	12.60	45	19.58	48	11.70	47
Egg beater	56	37	53.0	45	21.53	46	12.45	44	15.00	37	9.15	32
Radiator	43	52	46.0	38	24.30	47	14.18	47	19.20	46	11.55	46
Automobile axle	44	51	57.3	47	28.88	48	17.40	48	17.25	43	10.95	43
Agricultural sprayer	50	44	67.2	51	29.25	49	17.78	49	20.33	49	12.75	50
Hacksaw frame	39	56	52.1	42	30.68	50	18.23	50	18.08	44	11.18	44
Enamel wire (*a*)	68	14	81.7	54	33.75	51	20.18	51	33.75	52	20.18	53
Twist drill	39	56	60.5	49	36.08	52	21.30	52	19.20	46	11.93	48
Basin mixer	41	53	68.0	52	41.18	53	23.63	53	34.35	53	19.95	52
Enamel wire (*b*)	59	27	93.4	56	74.40	54	44.40	54	63.60	55	38.03	55
Bibcock (*a*)	28	58	79.6	53	97.50	55	56.18	55	62.85	54	36.83	54
Enamel wire (*c*)	56	32	94.5	57	98.70	56	59.03	56	79.43	56	47.85	56
Black conduit (*e*)	39	56	91.0	55	124.20	57	73.58	57	21.98	50	14.03	51
Gas mantle	50	44	108.8	58	−69.53	58	−40.73	58	−100.88	57	−59.78	57

[a]As a proportion of the export price.
[b]Rivit (*b*) was deleted as it differed from rivit (*a*) only in having its steel content imported.

exchange earned through the export of traditional products, and the relative cost is higher still when the shadow prices of factors are taken into account.

The analysis of section 2 does fail to recognize the possibly [illegible] export–demand elasticities of some of India's traditional exports. And although the pessimistic attitude toward export–demand elasticities of traditional products seems frequently to be carried too far in the less developed countries, one must still be cautious about suggesting a major export push in this area. However, it is clear that policies which actively discourage traditional exports should be avoided and those which lead to the general promotion of all non-traditional exports relative to traditional ones should be viewed with some suspicion.

On the other hand, the results in section 3 concerning individual products within the engineering goods sectors suggest that one approach the input–output results with care. In these admittedly heterogeneous sectors, the diversity in the domestic resource costs of foreign exchange is great. Although the engineering goods sectors rate poorly overall, they do contain some relatively efficient export products which might be overlooked if only sectoral analysis were employed.

Table 3
Frequency of cash assistance of various rates in each tertile of the DRC rankings of table 2.[a]

	Rates of cash assistance (%)						
Tertile ranking	NA	0	5	10	15	20	25
Least efficient tertile	1	3	0	9	3	1	1
Middle tertile	0	0	0	4	7	6	3
Most efficient tertile	1	1	0	6	5	6	1

[a]Rankings are taken from table 2 and are before shadow pricing. Cash assistance rates are taken from industry sources.

Yet the overall implications of this study for export policy seem clear: the cost to the economy of foreign exchange earned through different exports varies widely and policy makers must pay far more attention to the composition of exports if exports are to serve their foremost role of saving resources for growth and development. In particular, if Indian policy makers are going to continue to discriminate among exports in their promotion of them, they must do so on a far more careful basis than is now employed.[9] Presently, when the levels of

[9]Policies which discriminate among exports need not necessarily treat each export individually. Indeed, 'general' policies, such as uniform export subsidies, also discriminate among exports in that different exports are affected differently according to their export prices and costs. Either type of policy must be designed to promote the most efficient exports whether through specific administrative choice or the general economic forces which operate through the market. General policies, however, are apt to be the most effective for administrative and other reasons.

Cash Assistance – a direct export subsidy which is admittedly only a very partial measure of the total subsidy given to exports in India – are plotted against the rankings of the goods surveyed in section 3, there is only a barely discernible positive relationship between the rate of subsidy and the efficiency of the export, as seen in tables 3 and 4.

Such a rationalization of export policies will require a major change in India's attitude toward exports, an attitude which is characterized by a statement made in a study of exports for the National Council of Applied Economic Research (1969, p. 23), 'the real need is that we should match our prices with international prices, irrespective of our cost of production'.

Table 4
Frequency of additional cash assistance rates in each tertile of the DRC rankings of table 2.[a]

	Rates of additional cash assistance (%)		
Tertile ranking	5	7½	10
Least efficient tertile	2	2	0
Middle tertile	9	1	0
Most efficient tertile	7	0	0

[a]Rankings are taken from table 2 and are before shadow pricing. Cash assistance rates are taken from industry sources.

Appendix

The input–output analysis of section 2 required some modification of the original data. The value added portion of the input–output table of the Indian Statistical Institute (ISI) (1966) distinguishes only two primary factors, capital and 'other value added'. In order to shadow price labor, other value added was subdivided into a labor component and a residual – the latter consisting mostly of profits and rents and hereafter referred to as other (than capital and labor) value added – using labor coefficients derived from Government of India (1963, 1965) In addition, the indirect taxes on inputs which are included in the producer's prices used in the ISI table were systematically removed. Finally, it was assumed that half of capital was imported and that all of labor and other value added was domestic.

The ISI table employs as an input residual the sector 'other inputs'. These inputs were broken down into imports, capital, labor and other value added by calculating the direct-plus-indirect import, capital, labor and other value added requirements of India's 'typical' intermediate input. This typical intermediate input is a weighted average of all ISI domestic intermediate goods sectors, using as weights the total intermediate usage of each sector as given in the ISI table itself.

The S_x and S_m vectors were constructed by using, where possible, the actual

F.O.B./domestic purchasers' price ratios for exports, and the actual C.I.F./domestic purchasers' price ratios for imports. Where the necessary price data was not available on the import side, nominal tariffs were used instead of actual price differentials, understating the S_m to the extent that quotas and other forms of licensing themselves raise domestic prices.

In section 3, the direct-plus-indirect factor content of each export was calculated as follows: the total value of each export at domestic prices was divided into (1) direct factor content using factor input data from the Government of India (1965); (2) direct import content using in general the import replenishment figures given by the Government of India (1969), but in some cases figures from industry sources; (3) indirect tax incidence on direct inputs using drawback figures supplied by industry sources; and (4) domestic intermediate inputs as a residual. Domestic intermediate inputs were then subdivided into steel, the most important input for engineering goods, and other inputs. The factor content of domestic steel was calculated by (1) taking direct factor contents from the Government of India (1963, 1965), (2) determining the direct factor contents of the major domestic inputs into steel from the same source, (3) calculating the indirect taxes on these inputs, (4) identifying imported inputs into steel and into steel's domestic inputs, and (5) allocating the residual to other inputs. Sales taxes were assumed to apply at the rate of five percent while Central Excise taxes were taken from government sources. Finally, the factor contents and other components of the residual, other inputs, were assumed to be those of the 'typical intermediate input' referred to above. It was assumed (for lack of better data) that all extra costs of export were domestic. The s_{xi} were gathered from confidential industry sources.

Further details may be had in Staelin (1971) or directly from the author.

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