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EFFECTIVE RATES OF ASSISTANCE (ERAs) IN BANGLADESH

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Effective Rates of Assistance (ERAs) in Bangladesh

1. Introduction

The effective rate of assistance (ERA) employed in this study is an extension of the effective rate of protection (ERP). The essence of ERP is that piecemeal treatment of policies may give misleading results. Thus, protection to product viewed independently of protection to inputs may not reflect the true effective assistance enjoyed by an industry. In the same way, a partial view of trade assistance to the neglect of domestic assistance to an industry may reflect a misleading role of assistance. Specifically, the 1980s' liberalization policies in almost all countries of the world have reduced the ERP to a partial measure in both theory and practice. For on the policy (injection) side, trade liberalization viewed indepenently of domestic liberalization may give a highly distorted picture of overall, net assistance to an industry. On the results' side, a study of exports only may not reflect the real picture of the full impact of a policy on the performance of an economy, unless the effects on output, employment, investment, productivity, and other objective variables in the domestic sphere are also taken account of.

A combination of trade and domestic policies entails the calculation of net incidence of all policies, whether they

protect the domestic industry from foreign competitors/ substitutes or one domestic sector against another domestic sector. Furthermore, once ERP is extended to include domestic policies, the assistance to primary inputs becomes as relevant as that to material inputs to which ERP is conventionally limited. The ERA estimated in this study is, thus, a much more inclusive and relevant measure than the ERP that has been extensively employed for policy analysis during the past quarter of a century.

Another concept that ought also to be clarified at the outset is liberalization. Liberalization is a movement from regulated economy with high tariffs, subsidies, controls, quantity restrictions, public ownership and the like, towards competitive environment, freer enterprise, simplification of procedures, and, in most cases, has been accompanied by an increasing degree of privatization/denationalization. The essence of liberalization is a movement toward competition and reduction in price distortions. By implication, it is a reduction in ERP and ERAs. If liberalization of imports and denationalization, for instance, result in higher ERAs, it may imply increased price distortions, and consequently lower efficiency levels. The competitiveness of the economy may further deteriorate, despite liberalization and denationalization, if public enterprises in a mixed economy continue practices of arbitary fixation of wages and are given favorable treatment in bilateral trade agreements, or private

monopolies are created in place of public monopolies, or i restrictions are withdrawn but implementation remains stereotyped, and so forth. Therefore, if liberalization causes higher ERAs and increased price distortions, the intended benefits of liberalization may not materialize. Then it is not liberalization per se that is to blame, but policies that fail to introduce liberalization in spirit and substance.

The ERAs serve two purposes in this paper. (1) They are informative and useful by themselves, as they reveal the overall assistance or net incidence provided different industries by government policies. The calculated effective incidence may be substantially different from nominal or intended incidence. (2) They serve a further purpose as a summary variable to gauge the impacts, incentive, or disincentive of policies on the performance of industries with disparate effective rates of assistance. For instance, the New Industrial Policy, 1982, provided 26 different concessions to investment in industry in general, about a dozen concessions for exports, about the same number of concessions for small industries, 3 concessions for dispersion of industries, and several other procedural and regulatory provisions to promote industrialization. Several incentives are supplementary and pyramiding, e.g., tax holidays, accelerated depreciation, and similar investment incentives whose impacts are unidentifiable from one another. Some offset the effects of others, e.g., protection to product simultaneously with tariff on inputs. To try to capture the separate effects of

individual policies on the objective variables is like trying to estimate the effects of myriads of forces that econometricians conventionally impound in the error term. As an alternative illustration, the ERA provides a summary index of different industrial policies, just as the Gini coefficient provides a summary index of various income distribution facets. It is a remarkable variable, a delight of econometricians. We prepared it for scores of products and industries for 14 years.

2. The Data Base

The estimates are based on the following main sets of data:

1. Data on fiscal and monetary incentives, including quasi-taxes and quasi-subsidies in the form of price and quantity controls and regulations. These data were obtained mainly from NBR documents, supplemented from standard sources.

2. Input-output data and cost structure.--The input-output data and cost structures were drawn from 3 alternative sources:

   a) The TIP cost strucrture for one cross-section, mostly for 1983-84 or later year, for about 3-score, highly disaggregated (upto 8-9-digit) products

   b) The cost structure from the CMI micro tapes for two benchmark years, 1975-76 and 1983-84, mostly at the 4-to-5-digit industry level, for a total of 78 products (some of them overlapping TIP products)

c) The input-output data from the national I-O table, for 47 industries (a few of them the same as in CMI). These statistics pertain to the year 1976-77.

3. Price-data.--For this analysis, two sets of prices, among others, are needed: (1) border prices for tradable goods and shadow prices for nontraded goods and factors and (2) observed domestic market prices. Price data were drawn from three sources:

a) Observed local and border prices by TIP for one year. The TIP Project had generated these prices by factory and store visits. Unfortunately, the TIP reported mainly the calculated ERPs, but scarcely the background data on costs and prices.

b) Domestic market prices: annual data from CMI, 1974-75 through 1983-84 for 78 major products, 3 major raw materials for each of the 78 products, cost weights for the raw matrials, and either unit prices or cost weights for chemicals and packing material.

c) Border prices from the Foreign Trade Statistics of Bangladesh. Each annual volume contains data for 3 years. One of the vexing tasks of this study turned out to be the matching of traded products from Trade Statistics and the domestic market products from the CMI. The exercise produced data only for a few matching products.

3. The ERA Vs. the ERP

Common weaknesses of the ERA and the ERP

As is commonly known, several of the simplifying assumptions of the ERP are questionable. Yet the analyses based on ERPs have been very productive and have served to derive useful policy implications for the past two decades. But in general the same assumptions are used for the ERA as for the ERP, for instance, the treatment of excise taxes and domestic subsidies is identical in both. Since all policies are converted into quasi-taxes and quasi-subsidies, the assumptions relating to supply and demand curves are the same in the two formulas.

The extension of ERAs from trade policy to the entire set of policies, from the usual single cross-section to time series, and from one (manufacturing) sector to all sectors, of the economy is subject to certain weaknesses, additional to those relating to the ERP. These are caused mainly because trade classification differs from standard industrial classification. For instance, for several products, "observed" prices could not be generated. For some others, "border" prices were not available. Some of the devices used to circumvent these problems are discussed in Appendix A where the ERA relation is derived. Here we will use a very brief, simplified notation to conceptualize the same

relation.

Suppose we had data on both assisted value added (AVA) and unassisted value added (UVA). Then by definition,

$$ERA = (AVA - UVA)/UVA \quad (1)$$

When both "border" and "observed" prices are available, the calculation of ERAs does not really require data on protection and related policies, such as taxes, tariffs, subsidies, bans, and similar assistance, which for short we will simply call "subsidies." It would still be relevant and useful, however, to trace higher and lower values of ERAs to two sets of factors: (1) "subsidies," and (2) market forces, such as the degree of competition, the magnitudes of smuggling, price-fixing practices by monopolies, quality differences, scarcity premia, and so forth, which for short we would denote as "market factors." Since the main focus of the whole exercise is to gauge the impact of policies, one would like to relate ERAs to "subsidies," for which data are invariably available.

Now suppose that AVA and "subsidies" were but UVA was not available. Then we can calculate ERA as follows:

$$ERA = [(AVA-AVA(1-\text{"subsidies"})]/[AVA(1-\text{"subsidies"})], \quad (2)$$

and vice versa if UVA was but AVA was not available, namely,

$$ERA = [UVA(1 + \text{"subsidies"}) - UVA]/UVA, \quad (3)$$

If we also know about "market factors," we could obtain the realized measure of ERA. Unfortunately, unpublishd "market factors" are difficult to recover for past years. In the situation, we have resorted to both (2) and (3), whichever was

practicable. We call them statutory ERAs. The main weakness of statutory ERAs is that they assume away variations on prices resulting from "market factors." For policy analysis, however, it is the statutory ERAs rather than realized ERAs, that are relevant. There are several reasons. (1) They represent the ultimate policy variables, whose impact we want to assess, rather than intermediate endogenous variables, such as observed ERPs, whose causes and effects both will have to be estimated to assess the impact of policies. Stated alternatively, we are more interested in estimating or solving the policy model (the reduced form) than the strutural model. (2) They are informative inasmuch as they reflect the "intended" effects of policies. (3) Their historical evolution over the past 13 years has its own interest. It is useful for intersectoral analysis. (4) Some of the critical impacts of policies may emerge directly from statutory ERAs and not realized ERAs, for instance the excess capacity and initial investment. Other impacts pass through realized ERAs as an intermediate variable and through them impact output and future investment. The initial injection is from statutory ERAs.

(5) In the policy model, a la Tinbergen, endogenous variables other than the objectives of policies became "irrelevant" [Tinbergen, 1956, Ch.3, esp. p.53]. In the flow chart of Fig. 2, the interweening endogenous variable, RERA, is irrelevant as it is neither an instrument of policy nor the objective of policy.

4. Empirical Results

ERAs were calculated for 2 alternative sets of industries: (1) About hundred products from about five-dozen 4-digit industries from 1973 through 1988. These are reported for 1988 in Table 1. (2) For the 47 sectors of the national input-output table. These are given for 1975 through 1988 in Table 2. A summarized aggregation at the overall economy and ovrall manufacturing industry level is given in Table 3.

It may be seen from Tables 1 and 2 but more epigramatically from Table 3 and Fig. 2 that the levels of ERAs jumped up by approximately 30 percent after the NIP82. This is a very significant change. The liberalization of 1982 brought more effective assistance to industry than before. Among the reasons, three may be underlined:

(1) Tariffs Liberalization and simplication of imports of raw materials and other intermediate goods at the same time when protection of final industrial products was increased. Thus, customsduties increased significantly, as may be seen from Tables 1-4 and Figs. 3a-k. The change seems to have resulted from the government's desire to promote private investment and industrial production.

(2) WES premium The WES premium rose from one percent in 1982-88 to 13 percent in 1984-85, as may be seen in Table 5.

3. DFI loans and debt default

When credit is taken and defaulted or remains overdue indefinitely, the borrower gains not only in terms of zero rate of interest but also exemption from amortization. To remain on the conservative side, however, we only treated rate of interest as subsidy on defaulted loans. The bulge in overdues, and consequently subsidy on capital, came after 1982 as may be seen from Table 5.

The series of ERAs, debt overdues, the WES rate, and some other policies experienced a downturn after 1986, perhaps as a result of RIP86. One would expect the negative impact of high ERAs to wane after that, other things being equal. But we do not have enough data yet to verify that.

Finally, it should be noted that trade liberalization is supposed to have introduced simplification and facilitation of the import of raw materials and industrial inputs. This is what industrialists demand. For instance, one of the main proposals of the representatives of 33 trade bodies and industrial associations in the Sixth Meeting of the Consultative Committee on Industry under the chairmanship of Vice President Maudud Ahmed on May 11, 1990, was "exemption of duties and taxes." Insofar as tariff on their products are concerned, they are all for it.

The end result of these various policy changes, for all practical purposes, was a deliberalization rather than actual liberalization insofar as Bangladesh's industry is concerned.

A second result from micro-level calculat ions (some of which are reported in Table 1) is that the export group of products receive moderate ERAs, whereas the import substitution group of products enjoy many times higher ERAs.

A majority of the ERA's calculated here lie between 200 percent to 600 percent. The range extends from minus 7.3 percent for coal tar to 2513 percent for stainless-steel safety razor bladses. That means that for every taka of unassisted value added by the manufacturers of stainless-steel safety razor blades, the government through various subsidies to it and taxes on competing and substitute products enables this industry to earn Taka 24 more. From this result, it does not follow that the rate of return to investment in razor blades is so exhorbitantly high. The ERA is high because unassisted value added is not enough even to meet the payroll. The unassisted return to capital, indeed, is negative.

The case of safety razor blades is even more intriguing than it appears. In 1988, the tariff duty on razors and safety razor blades was halved from 100 percent to 50 percent, but not on stainless-steel safety razor blades, which remained intact at 100 percent. In 1984-85, the excise tax on stainless-steel razor blades was reduced from 20 percent to 10 percent. In 1989, a further assistance was given to stainless-steel safety razor blades in the form of a reduction of excise duty from 10 percent to 5 percent. These changes were made when the ERA on the latter was as high as 2512 percent. There are numerous very high-cost indusries that are kept alive by high assistance and

supporting regulations.

Various taxes and other measures that bear upon stainless-steel safety razor blades are given below for recent years:

Year (1)	Customs Duty (2)	Sales Tax (3)	Development Surcharge (4)	WES Premium (5)	Scarcity Premium (6)	Excise Tax (7)
83	100	20	5	1	8.3	20
84	100	20	5	9	8.3	20
85	100	20	5	13	8.3	10
86	100	20	4.5	10	8.3	10
87	100	20	4.5	8	8.3	10
88	100	20	7.5	7	8.3	10

Other heavily assisted products include bicycles, brushes of alltype, cigarettes, cinema projectors, cotton shirting finished, cotton vests, cotton ydarn count 40, sugar, paper, cow leather, fountain pen, guava jelly, iron and steel rod, pencils, pineapple juice, polyester suiting, grey fabric, refinery soyabean oil, rubber sponge, sodium silicate, and tomato ketchup.

Out of 86 products for which ERAs were computed, products which suffer from negative ERA, meaning, among other regulations, higher taxes or quasi-taxes on direct and indirect inputs of these industries than those on the product supply by competitors. These are: coal tar, country spirit, metal almirahs, phenyl, spectacle frames, and tubes and iron pipes.

From the ERAs of the I-0 Table we find that, on the whole, agriculture enjoys much lower assistance than the nonagricultural

sectors. Within agriculture, the highest effective rate of assistance emerges for livestock (62 percent). It is followed by "other crops" (ERA=51 percent). Tea with an ERA of minus 1 percent, fisheries with 3 percent, and jute with an ERA of 9 percent get the lowest protection among all agricultural products.

In the case of jute products the result is understandable, as Bangladesh has a monopoly power over jute and grows it at the lowest cost in the world. The negative assistance to tea begs questions, in that, even though the country enjoys the collaboration of expert multinationals, the quality and productivity of its tea in Sylhet plantations loses in competition with high quality tea from India, Srilanka, and China.

The other sectors with relatively lower ERA are jute textiles, fertilizer, pharmaceuticals, machinery, and nontraded electricity and gas. Services are, on the whole, less assisted than manufacturers, as expected.

The sectors enjoying high assistance are sugar (with ERA = 1.40, meaning that for every taka of value added by the sugar industry the government enables it to capture Taka 1.40 more), tobacco products (ERA=2.50), paper (ERA=1.04), leather (ERA=1.70), metal products (ERA=1.52), and wood products (ERA=2.06). Results for other products may be read from the table.

5. Conclusions

A conclusion that emerges from these calculations is that the assistance provided different I-O industries varies a lot from negative (of -0.24) for jute textiles to as high as 2.50 for tobacco products. That enjoyed by different micro products varies from -0.95 ERA1 for metal almirahs to +25.12 for safety razor blades for the year 1988. Have the highly assisted sectors reaped scale economies (under the infant-industry argument) and attained low-cost output? There is little evidence to that effect. Some already protected industry is sick and is asking for more protection and assistance in general. A prima facie conclusion, according to our results and verification, is that there is probably little economic case for continuing to protect and assist old industries at the current high rates. A more scientific test of the assistance policies will, however, be presented in Paper No. 7, where we carry out a stochastic estimation of the impact of ERAs on employment, investment, output, and output per unit of input. Among them, the stated four growth indices should reflect some light on whether or not industrial policies have played any role in attaining the intended objectives.

Table 1.--ERAs, 1988[a]

Product name	Code	ERA1	AVA-UVA
Urea	3514	0.1387	0.01
Aluminium ware	3809		1.712
Bangles	3569		1.221
Beverages	3134	1.490	0.542
Bicycle	3846	8.528	1.185
Bitumen	3528	1.648	0.755
Black tea	3126	-0.042	-0.066
Brush all types	3949	11.060	1.723
Ceramic tableware	3612	3.840	0.755
CGI sheet	3711		0.244
Cigarettes	3141	4.828	2.462
Cinema projector	3832	5.279	1.191
Coal tar	3528	-0.940	-0.009
Combs	3569		1.486
Cotton shirting finished	3201	5.070	0.674
Cotton shirting grey	3201		3.304
Cotton vests	3213	6.205	2.320
Cotton yarn count 20	3201	1.432	0.448
Cotton yarn count 32	3201	2.251	0.445
Cotton yarn count 40	3201	4.327	0.441
Cotton yarn count 60	3201	2.040	0.515
Cotton yarn count 80	3201	2.790	0.515
Country spirit	3131	-0.188	-0.221
Cow leather	3231	11.143	0.812
Crushed bones	3942	2.260	0.731
Cycle tube	3551	2.039	0.548
G.I. Pipe	3719		0.615
Dry cell batteries	3836		0.310
Enamel paint	3521	1.346	0.811
Fine qlty 60x80 cot. lungi	3206	1.537	0.762
Fine qlty 60x80 cot. saree	3206	1.618	0.7451
Firebricks	3695		0.512
Flour	3118	0.130	0.010
Fountain pen	3937	11.380	1.078
Glass sheet	3622	1.23	0.3095
Glass tumbler	3622		1.615
Guava jellies	3113	3.614	1.229
Hand pump	3712	1.307	0.733
Hard board	3314		1.915
Hydrogeneated oil (veg.ghee)	3115	1.119	0.366
Insulated cable electric	3834		0.863
Iron and steel rod	3713	7.186	0.234
Leather sandal and shoe	3241	2.705	1.195
Looking mirror	3622		1.038
Match box	3525	1.944	0.711
Men's shrt for exp bond wr	3221	0.138	0.042
Metal almirah	3804	-0.955	-0.482

Table 1--Contd.

M.S. billet	3711		-0.082
M.S.plate (heavy)	3711		0.272
M.S.plate (thin)	3711		0.134
Nails	3808		-0.569
Newsprint	23411	2.313	0.862
Oil cooker single	3807		1.441
Oil seed crushing machine	3829	1.546	0.462
Paper	3411		0.886
Paper board	3412	1.435	0.791
Pencil	3936	7.320	0.803
Phenyle	3515	-0.318	0.131
Pineapple juice	3113	5.747	1.047
Plast goods & accessories	3569		0.375
Plastic footwear	3516		1.062
Plastic pipe	3516	2.215	0.564
Polyesters shirting fab fnshd	3204	1.676	0.802
Polyester shirting fab grey	3204	1.391	0.817
Polyester suiting fab fnshd	3204	2.076	0.756
Polyester suiting fab grey	3204	3.868	0.644
Pulp (SPPM)	3411		0.754
Refined soyabean oil	3116	11.290	0.250
Rice huller	3825		0.275
Rubber sponge	3559	5.151	1.840
Safety razor blade	3803	25.120	0.769
Sewing machine	3827	1.001	0.420
Shipbreaking (scaap)	3711		0.011
Sodium silicate	3519	4.033	0.726
Spectacle frame	3862	-0.561	-0.119
Sugar	3123	2.982	1.182
Tomato ketchup	3113	3.737	1.225
Tubes & pipes of iron	3719	-0.434	0.0283
Umbrella	3938		0.945
Washing soap	3523		0.945
Wet blue leather	3231	1.694	0.233
Wooden bed	3321		1.697

[a]The different measures of calculated effective assistance are defined below:

ERP = Effective rate of protection, conventional measure

ERA1 = Effective rate of aswsistance normalized by overall value added, the measure used for subsequent analysis

ERA2 = Effective rate of assistance normalized by value added by capital

AVE = Assisted value added

UVA = Unassisted value added.

Table 2.—ERAs by I-O industries

Supplying sectors	ERAI 75	ERAI 76	ERAI 77	ERAI 78
1 Rice	0.146256	0.146599	0.146016	0.146624
2 Wheat	0.143970	0.144311	0.144022	0.144463
3 Jute	0.090131	0.090548	0.089903	0.090528
4 Cotton	0.339695	0.216042	0.260044	0.215978
5 Tea	-0.01397	-0.01448	-0.01579	-0.01475
6 Other Crops	0.477053	0.499662	0.498477	0.510536
7 Livestock	0.523457	0.590226	0.589656	0.623232
8 Fisheries	-0.02920	-0.03037	-0.03201	-0.03132
9 Forestry	0.217063	0.218813	0.216744	0.218809
10 Sugar	0.024922	0.037754	0.039574	0.048572
11 Edible Oil	0.710746	0.544688	0.543127	0.565281
12 Salt	0.337248	0.337500	0.336969	0.337498
13 Tobacco Products	1.322913	1.937063	1.931996	1.941706
14 Other Food	0.708823	0.797930	0.792838	0.798210
15 Cotton Yarn	0.616553	0.866837	0.628126	0.624843
16 Cloth: Mill made	0.844286	0.426623	0.239784	0.380939
17 Cloth: Handloom	0.536657	0.591595	0.511659	0.521086
18 Jute Textile	-0.20918	-0.20903	-0.20380	-0.20256
19 Paper	1.152033	1.194625	1.163576	1.187473
20 Leather	0.853126	0.889000	0.887149	0.928923
21 Fertilizer	-0.04295	-0.04303	-0.04443	-0.04240
22 Pharmaceutical	-0.02765	-0.02479	-0.02685	-0.00744
23 Other Chemicals	0.148016	0.164034	0.177253	0.194682
24 Cement	0.215216	-0.03530	0.005132	0.055358
25 Basic Metals	0.561030	0.560047	0.585105	0.621555
26 Metal Products	1.033010	1.180783	1.195356	1.127807
27 Machinery	-0.33896	-0.40049	-0.41032	-0.40284
28 Transport Equipment	0.730742	0.668369	0.659537	0.683043
29 Wood.	1.515183	1.557713	1.556042	1.579777
30 Misc. Industries	0.842048	0.848670	0.829592	0.927489
31 Urban Housebuilding	-0.43739	0.181745	-0.53935	0.200584
32 Rural Housebuilding	0.660439	0.703517	0.711987	0.710148
33 Non.Residential Bldg.	-0.43506	0.180015	-0.53549	0.195907
34 Construction:Elec & Gas	-0.35844	0.224313	-0.49392	0.240413
35 Construction: Transport	-0.42323	0.234471	-0.47594	0.249141
36 Other Construction	-0.28968	0.422290	-0.30527	0.436664
37 Petroleum Product	0.125713	0.126926	0.125222	0.127073
38 Electricity	-0.15670	-0.14975	-0.16313	-0.14995
39 Gas	-0.16287	-0.15687	-0.16547	-0.15685
40 Transport Service	0.207372	0.209319	0.205768	0.208504
41 Trade Service	0.221610	0.223318	0.221207	0.223225
42 Housing Service	0.222176	0.235862	0.219124	0.235499
43 Health	0.148256	0.149336	0.142166	0.146604
44 Education	0.015784	0.018595	0.014067	0.018137
45 Public Administration	0.111735	0.116401	0.105697	0.113984
46 Banking & Insurance	0.196111	0.199464	0.194237	0.198978
47 Other Services	0.022606	0.022391	0.022259	0.022275

Table 2—Continued

Supplying sectors	ERAI 79	ERAI 81	ERAI 83	ERAI 85	ERAI 87
Rice	0.140219	0.140278	0.145905	0.137449	0.140827
Wheat	0.143669	0.144125	0.143020	0.134983	0.138979
Jute	0.089908	0.090058	0.089549	0.081931	0.084966
Cotton	0.215276	0.215406	0.192319	0.194066	0.286521
Tea	-0.01876	-0.01882	-0.02151	-0.00528	-0.00371
Other Crops	0.509361	0.509517	0.487052	0.454610	0.360506
Livestock	0.606656	0.468803	0.428491	0.357337	0.344067
Fisheries	-0.03433	-0.03262	-0.03734	-0.03275	-0.03021
Forestry	0.218124	0.218550	0.217704	0.218852	0.219260
Sugar	0.032670	0.085756	0.128766	0.130010	0.392773
Edible Oil	0.553609	0.520528	0.491395	0.442318	0.546462
Salt	0.340083	0.340245	0.339887	0.340479	0.341195
Tobacco Products	1.926973	1.906988	1.868557	1.716369	1.831614
Other Food	0.620310	0.664285	0.579009	0.556052	0.626860
Cotton Yarn	0.622935	0.641875	0.583125	0.582504	0.478989
Cloth: Mill made	0.939584	0.726637	0.702388	0.755061	0.586198
Cloth: Handloom	0.513129	0.655193	0.798886	0.794631	0.385065
Jute Textile	-0.20458	-0.20388	-0.20483	-0.22564	-0.22391
Paper	1.169811	1.129995	1.033371	1.024431	0.799783
Leather	0.922607	0.921334	1.315411	1.283361	1.648337
Fertilizer	-0.04470	-0.04607	-0.04825	-0.04529	-0.03804
Pharmaceutical	-0.03319	-0.12479	0.064663	-0.12487	-0.08663
Other Chemicals	0.257340	0.304060	0.334490	0.353525	0.532560
Cement	0.048361	0.074924	0.103679	0.054429	-0.02801
Basic Metals	0.619992	0.618824	0.522436	0.697343	0.863502
Metal Products	1.119453	1.151450	1.049162	1.121792	1.396222
Machinery	-0.41131	-0.40404	-0.43631	-0.34218	-0.36232
Transport Equipment	0.669362	0.572968	0.545421	0.670363	0.744358
Wood	1.567893	1.568339	1.540547	1.740888	2.000060
Misc. Industries	0.755968	0.766117	0.755709	0.597630	0.788865
Urban Housebuilding	0.199567	0.201482	0.162678	0.252565	0.247277
Rural Housebuilding	0.689146	0.701289	0.646954	0.696290	0.845344
Non.Residential Bldg.	0.193610	0.197183	0.153681	0.242230	0.245587
Construction:Elec & Gas	0.254379	0.276387	0.243419	0.393889	0.398506
Construction: Transport	0.242261	0.249761	0.197029	0.266524	0.273702
Other Construction	0.436911	0.437901	0.400730	0.407961	0.409996
Petroleum Product	0.109799	0.110257	0.127775	0.133345	0.129588
Electricity	-0.15338	-0.15219	-0.15701	-0.14956	-0.14640
Gas	-0.15730	-0.15703	-0.15773	-0.15482	-0.15441
Transport Service	0.201401	0.202745	0.205677	0.210375	0.211846
Trade Service	0.222443	0.222710	0.220722	0.222048	0.222028
Housing Service	0.233692	0.234699	0.230950	0.236834	0.243174
Health	0.139710	0.137635	0.134298	0.143906	0.145518
Education	0.017174	0.017261	0.015668	0.017435	0.017580
Public Administration	0.110055	0.111498	0.105564	0.113995	0.115459
Banking & Insurance	0.197069	0.196146	0.194877	0.198137	0.198524
Other Services	0.021987	0.021951	0.021698	0.022003	0.022279

Table 2—Continued

Supplying sectors	ERA1 84	ERA1 85	ERA1 86	ERA1 87	ERA1 88
Rice	0.125252	0.090684	0.083593	0.085832	0.085825
Wheat	0.123173	0.087722	0.080674	0.083005	0.083075
Jute	0.070840	0.039430	0.038118	0.040150	0.040166
Cotton	0.266480	0.220282	0.218441	0.094745	0.094302
Tea	-0.00329	-0.00353	-0.00275	-0.00068	-0.00052
Other Crops	0.363861	0.333327	0.321409	0.313782	0.324273
Livestock	0.435003	0.456163	0.484727	0.470466	0.499666
Fisheries	-0.02969	-0.03012	-0.03012	-0.02786	-0.02604
Forestry	0.219364	0.219222	0.219336	0.218325	0.218219
Sugar	1.381721	1.025515	1.371522	1.372402	1.399821
Edible Oil	0.600298	0.350742	0.382234	0.623342	0.654936
Salt	0.341359	0.341097	0.343024	0.343297	0.343254
Tobacco Products	2.287558	2.428346	2.574347	2.490429	2.503578
Other Food	0.602146	0.573220	0.519129	0.535685	0.565563
Cotton Yarn	0.462180	0.415480	0.588563	0.464901	0.467247
Cloth: Mill made	0.862736	0.824832	0.819228	0.127532	0.433843
Cloth: Handloom	0.525441	0.793224	0.800258	0.328776	0.338338
Jute Textile	-0.23051	-0.24778	-0.24830	-0.24678	-0.24717
Paper	0.833527	0.846225	0.839107	0.817851	1.040123
Leather	1.684777	1.676477	1.656656	1.649857	1.695409
Fertilizer	-0.03851	-0.04059	-0.04148	-0.03907	-0.03814
Pharmaceutical	-0.15075	-0.13136	-0.21431	-0.21014	-0.18922
Other Chemicals	0.594016	0.586627	0.562538	0.540573	0.496190
Cement	0.027964	0.069951	0.006535	0.009170	0.041965
Basic Metals	0.975125	0.952942	0.686016	0.773556	0.630601
Metal Products	1.559062	1.517348	1.495274	1.485912	1.515267
Machinery	-0.31842	-0.33430	-0.33003	-0.32266	-0.31970
Transport Equipment	0.844725	0.871656	0.856618	0.712574	0.704828
Wood	2.042707	2.063411	2.042423	2.032177	2.058466
Misc. Industries	0.820231	0.894267	0.869328	0.885375	0.930174
Urban Housebuilding	0.349208	0.345143	0.346921	0.310349	0.325005
Rural Housebuilding	0.927405	0.918560	0.851959	0.867739	0.854569
Non.Residential Bldg.	0.351119	0.345939	0.352431	0.315217	0.334289
Construction:Elec & Gas	0.527395	0.502354	0.513879	0.463744	0.481302
Construction: Transport	0.373272	0.373147	0.377158	0.339292	0.357482
Other Construction	0.503624	0.511525	0.512717	0.470592	0.484923
Petroleum Product	0.130503	0.129964	0.126566	0.202147	0.208437
Electricity	-0.14356	-0.14480	-0.14283	-0.17648	-0.18039
Gas	-0.15367	-0.15419	-0.15404	-0.15380	-0.15383
Transport Service	0.210812	0.210508	0.210577	0.214224	0.214328
Trade Service	0.222003	0.221752	0.221781	0.222229	0.222316
Housing Service	0.242170	0.241170	0.238708	0.242367	0.241526
Health	0.143821	0.143162	0.141802	0.146466	0.148677
Education	0.017758	0.017660	0.017675	0.018399	0.018736
Public Administration	0.115906	0.115011	0.115054	0.118097	0.119840
Banking & Insurance	0.198111	0.198128	0.197665	0.199037	0.199478
Other Services	0.022330	0.022292	0.022271	0.022482	0.022614

Table 3.--Mean ERPs and ERAs for 21 manufacturing industries of the I-O table, for 1986-87

ERP or ERA	Year	Index of ERP or ERA
ERP	75	0.800395
ERP	76	0.862929
ERP	77	0.829689
ERP	78	0.854720
ERP	79	0.824610
ERP	80	0.864649
ERP	81	0.920902
ERP	82	0.908983
ERP	83	0.912091
ERP	84	1.097078
ERP	85	1.153771
ERP	86	1.170995
ERP	87	1.038604
ERP	88	1.061590
ERA1	75	0.627321
ERA1	76	0.688227
ERA1	77	0.655632
ERA1	78	0.680090
ERA1	79	0.649941
ERA1	80	0.689960
ERA1	81	0.745770
ERA1	82	0.745770
ERA1	83	0.734935
ERA1	84	0.913295
ERA1	85	0.955114
ERA1	86	0.972010
ERA1	87	0.839498
ERA2	88	0.862518

Table 4.-- NRAs for inputs of industries accord. to I-O table.

	NRA			
	1981-82	1982-83	1983-84	1984-85
Sugar	0.187	0.445	1.535	1.151
Edi oil	0.407	0.5	0.56	0.383
Salt	1.78	1.78	1.78	1.78
Tobacco	4.11	4.055	5.095	5.115
Cot yarn	0.606	0.49	0.49	0.49
Cloth mil	2.06	1.8	1.95	1.95
Jute tex	0	0	0	0
Paper	1.53	1.38	1.42	1.44
Leather	1.56	1.84	1.88	1.9
Fertilr	0	0	0	0
Pharmcls	0.307	0.331	0.34	0.358
Othr Che	1.54	1.54	1.61	1.62
Cement	0.495	0.375	0.455	0.495
Bas Metls	0.74	0.92	0.98	1.01
Metl prod	1.39	1.69	1.82	1.78
Machinry	0.24	0.25	0.25	0.25
Trspt eqp	1.08	0.94	1.11	1.15
Wood	1.844	2.089	2.129	2.149
Misc ind	1.69	1.87	1.4	1.96

NRA = nominal rate of assistance.

Table 5.-- WES premium

	WES/Official Exchange Rate
1982-83	1.0136
1983-84	1.0889
1984-85	1.1316
1985-86	1.0956
1986-87	1.0800
1987-88	1.0543
Aug., 1988-89	1.0198

Table 6.-- Debt overdues

Year	Agricultural Sector		Industrial Sector BSRS and BSB only
	Amount of Overdue Debt	Overdues as % of Total Debt	
	(Tk. billion)	(%)	(Tk. billion)
1980-81	1.88	56.0	1.33
1981-82	2.32	51.1	1.95
1982-83	3.34	51.5	2.98
1983-84	4.75	58.1	4.13
1984-85	7.22	58.3	5.93
1985-86	9.31	61.5	7.31
1986-87	17.68	74.4	8.15
1987-88	16.1	59.4	8.50

Source Cols 1 and 2: HIID, WP #6, Table 3. Original source: World Bank, A Program for Financial Sector Reform (1987), Table 6.3. Col. 3:

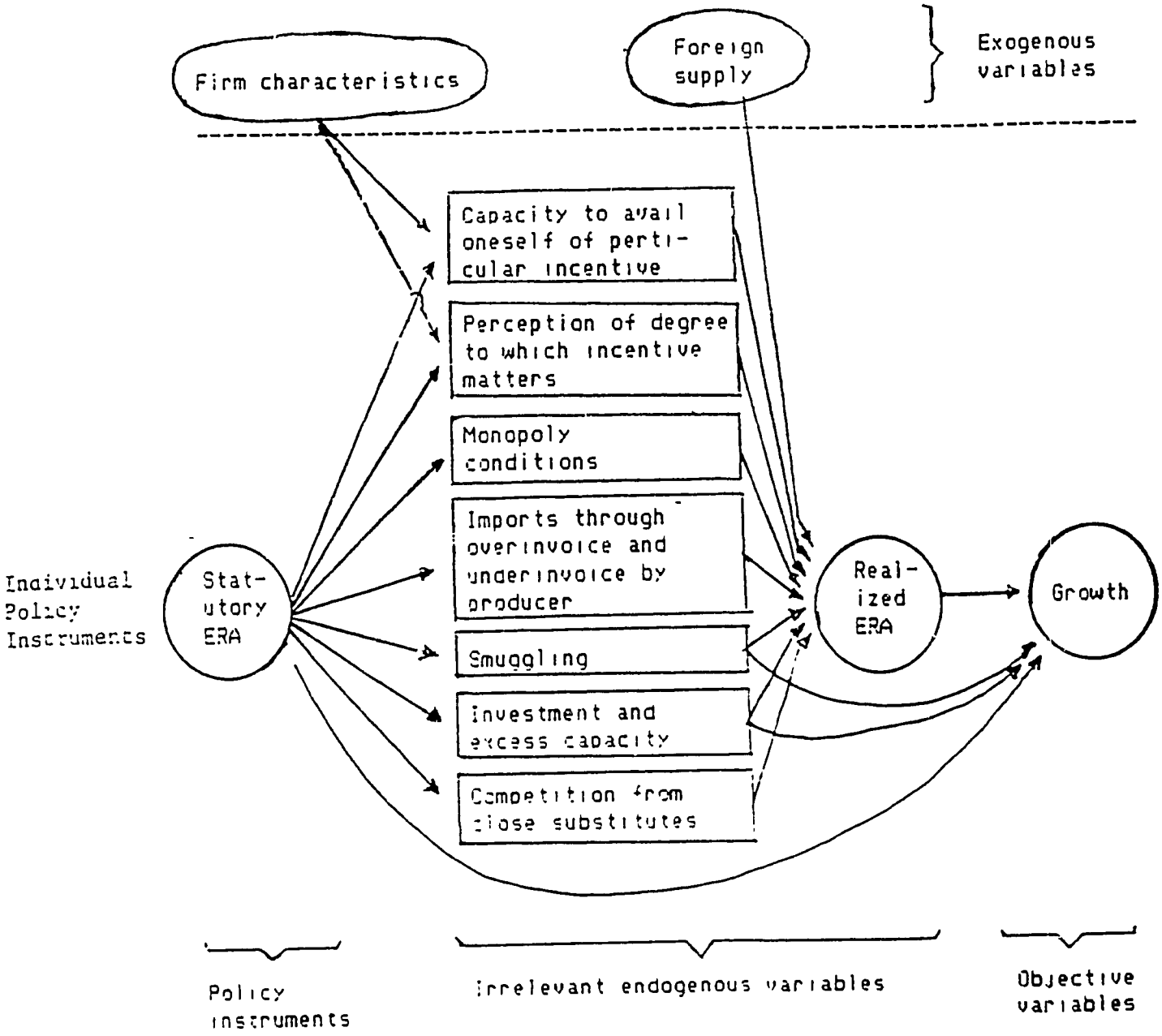


Fig. 1.--Flow chart relating SERA, the effects of firm and industry characteristics, RERA, and objectives of policies

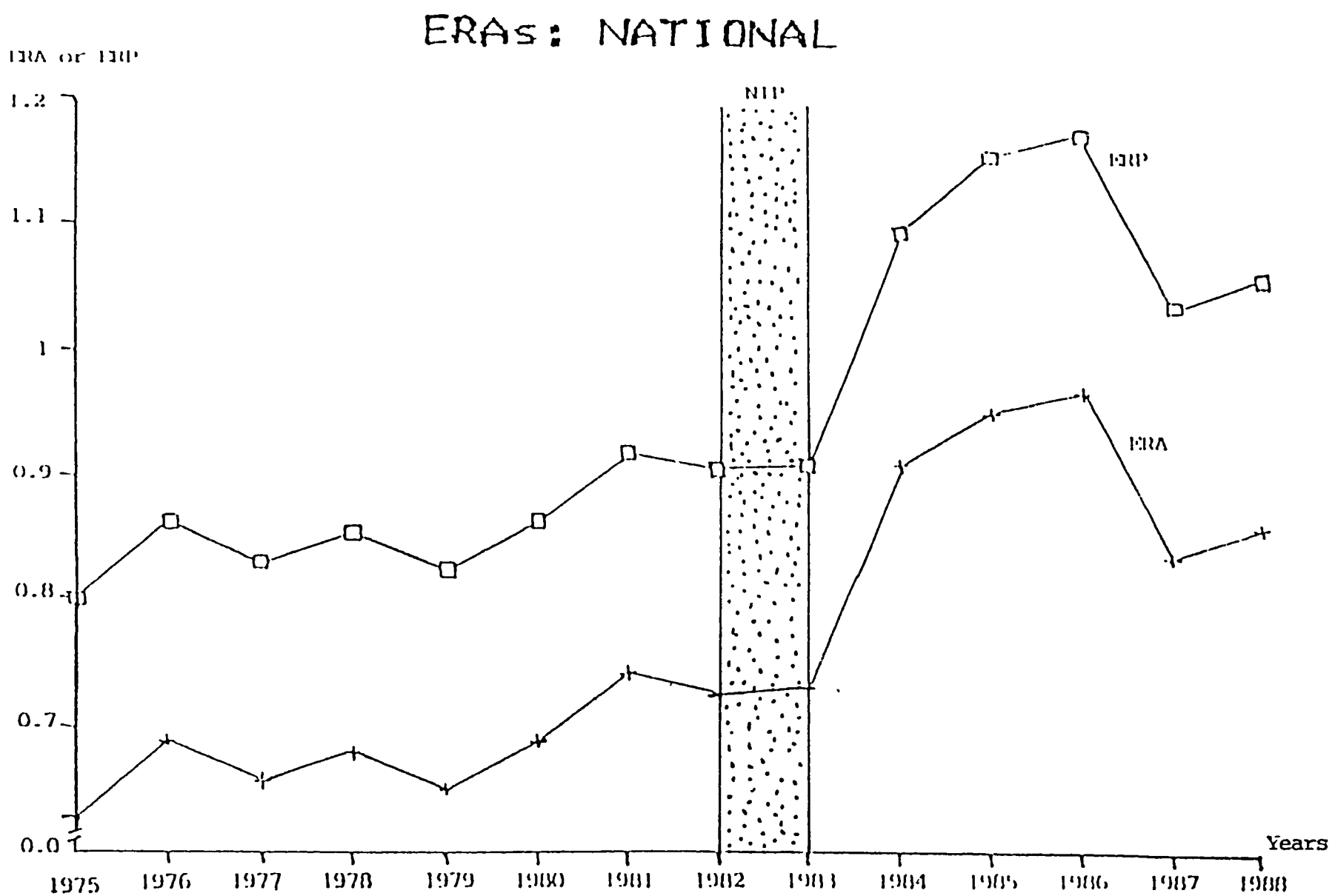


Fig. .—ERPs and ERAs for 21 manufacturing industries of the I-O Table, 1974-75 through 1987-88.

Source: Table .

Fig.30--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

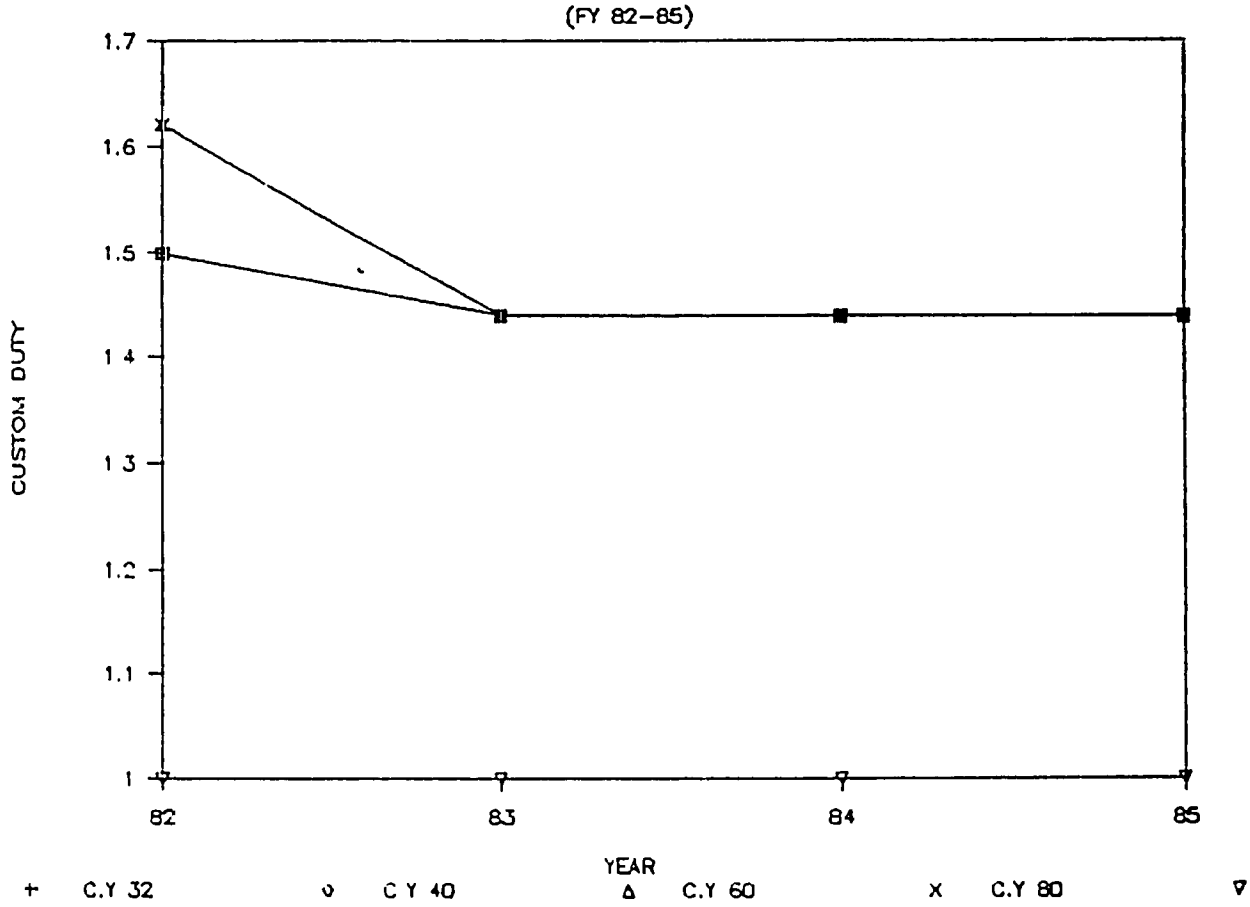


Fig.3b--CUSTOM DUTY ON PRODUCTS BY YEAR

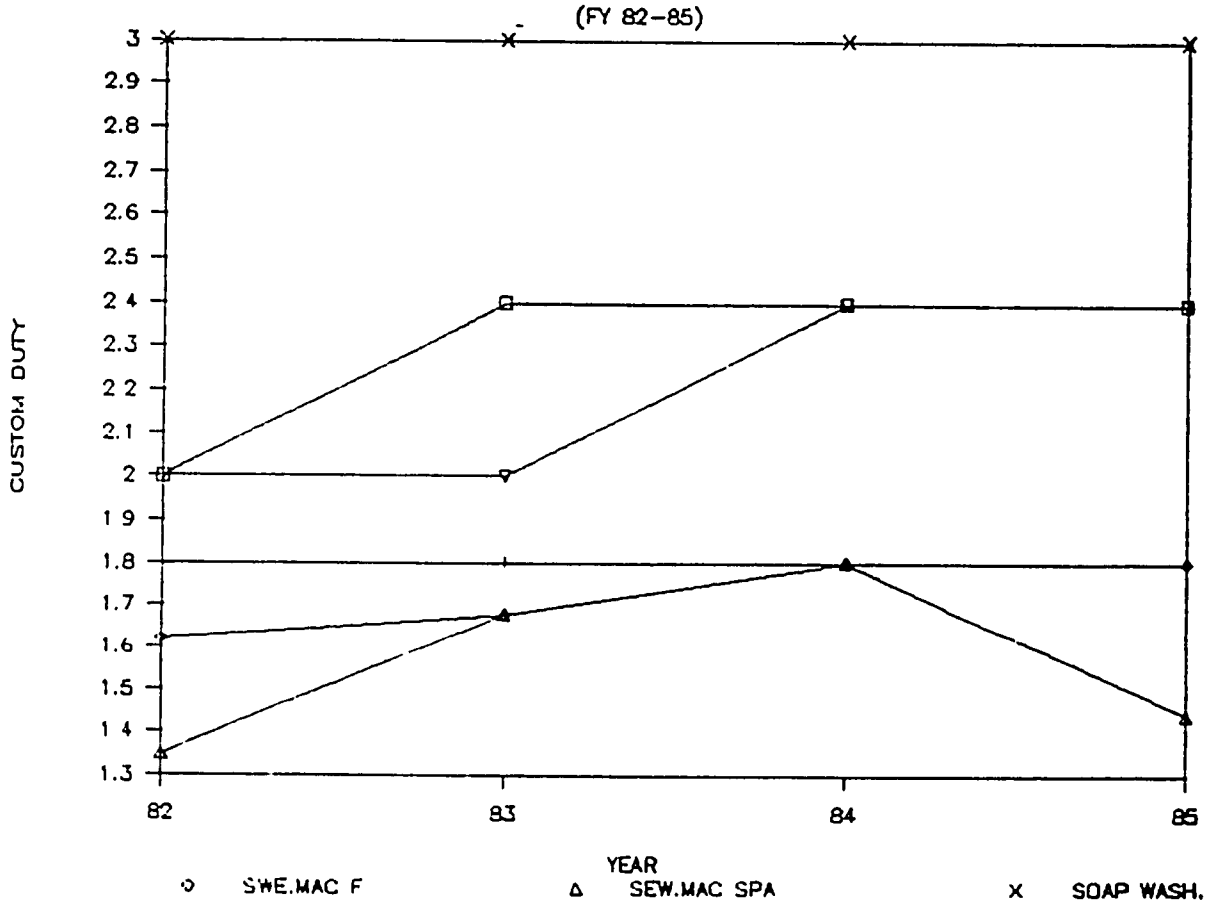


Fig.3C--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

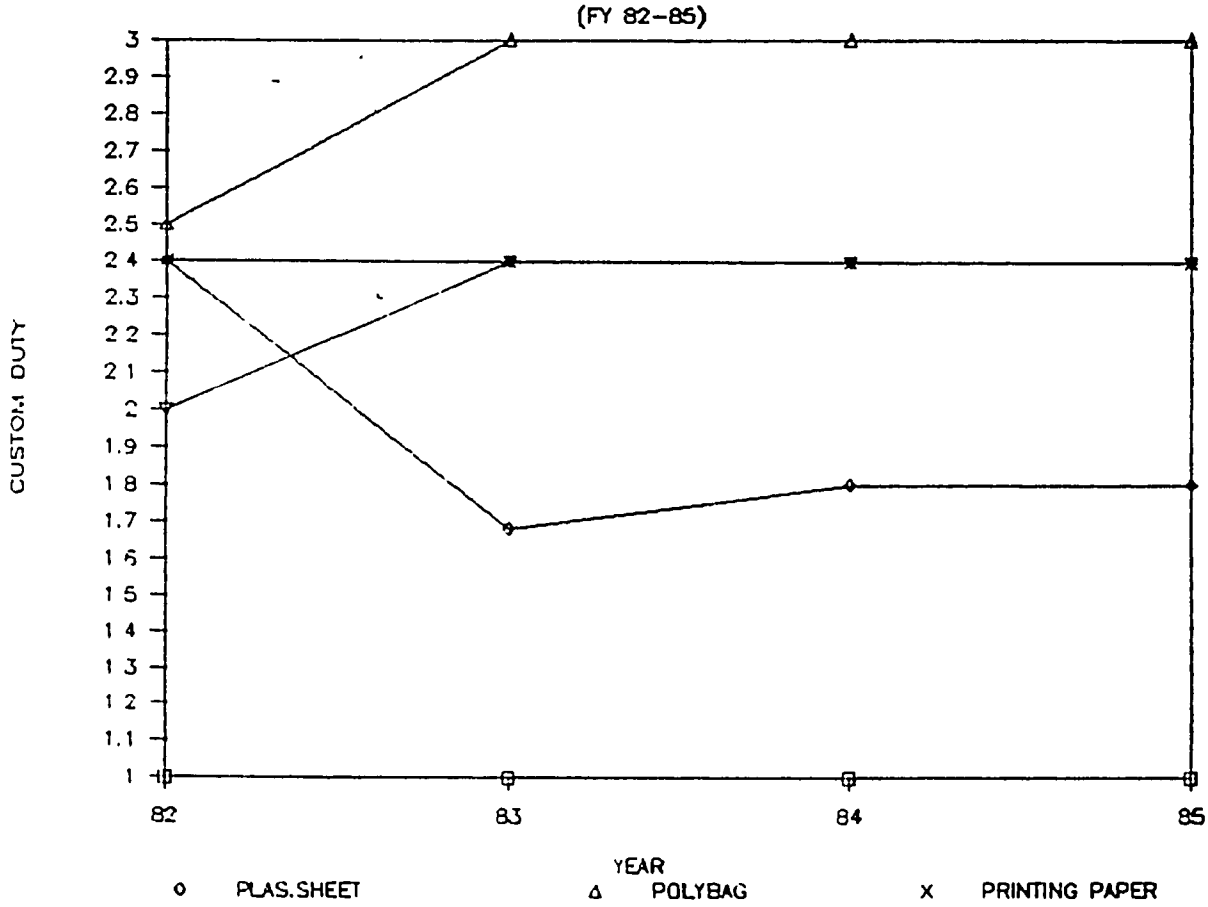


Fig.3d--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

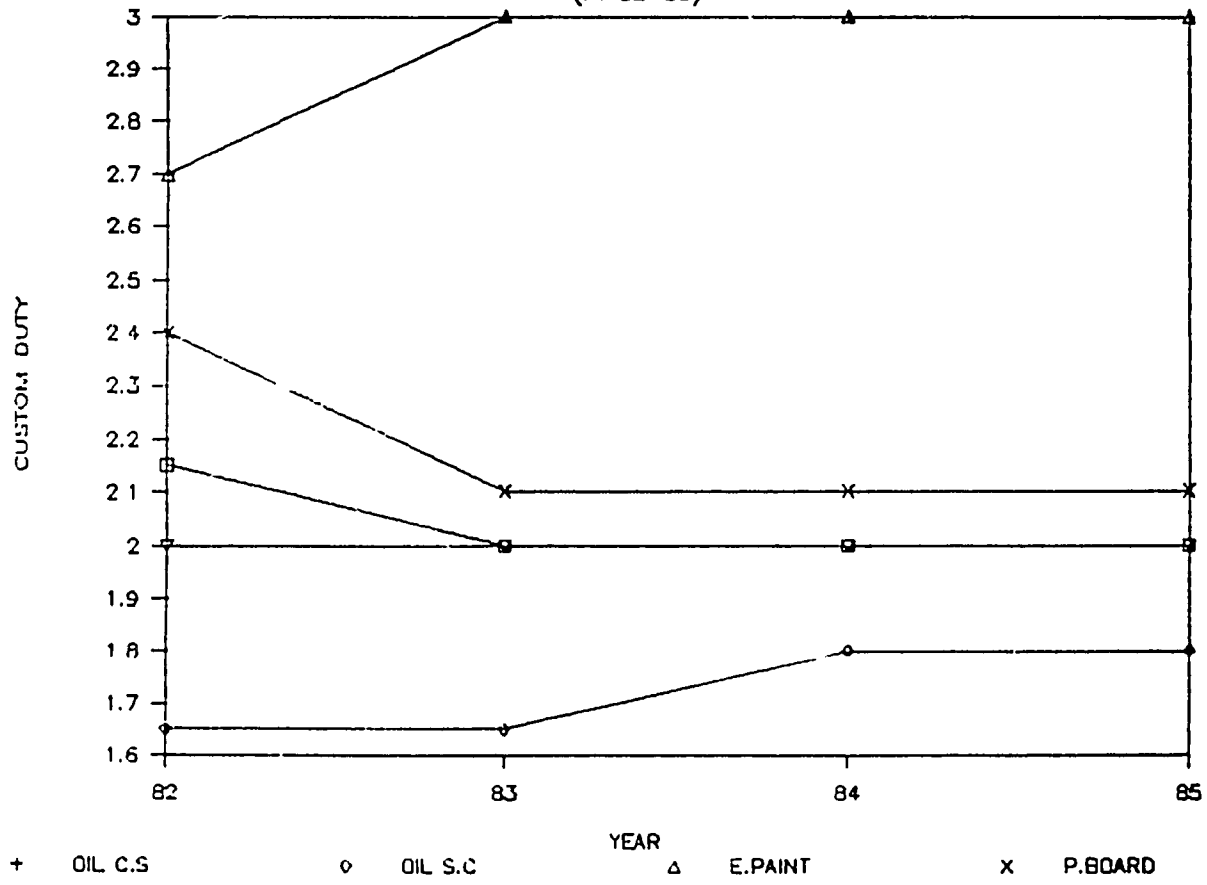


Fig. 3e—CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82–85)

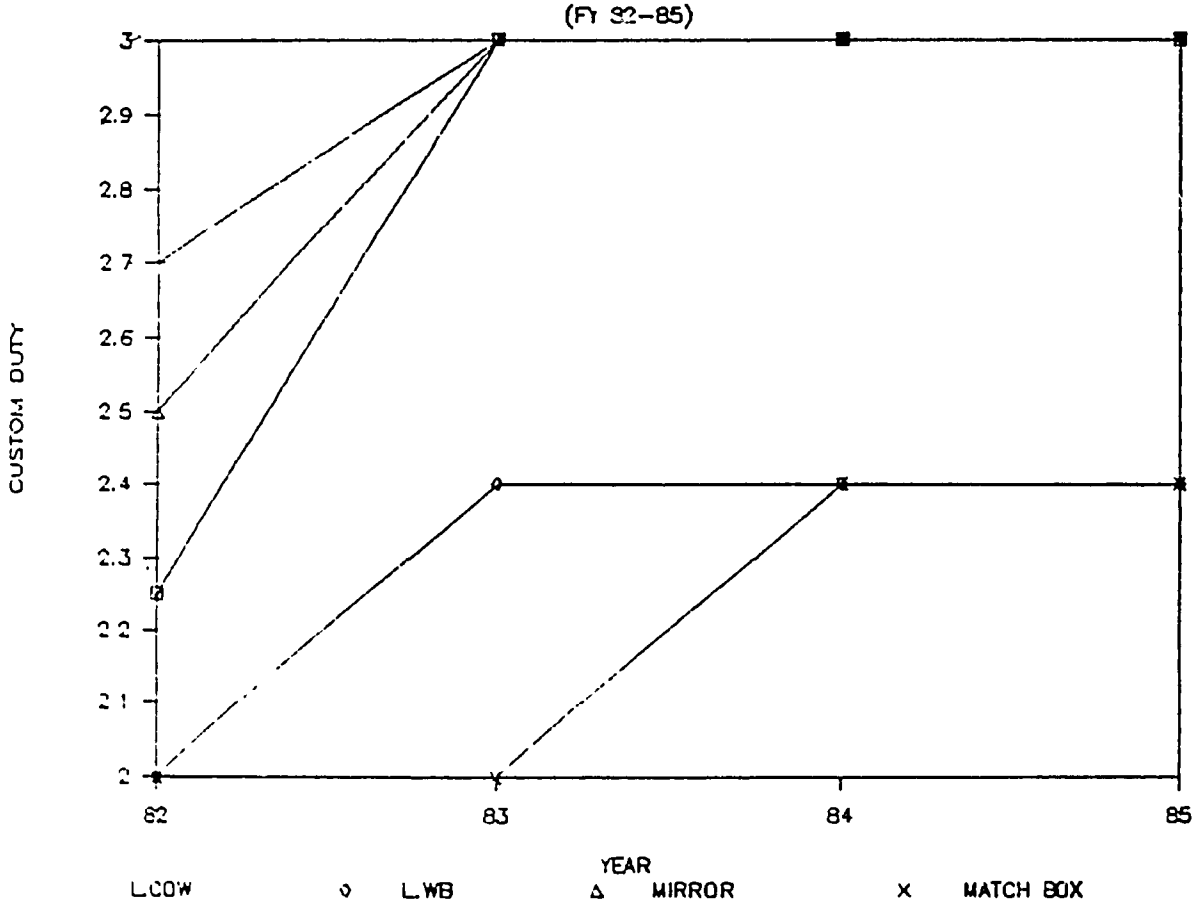


Fig.3f--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

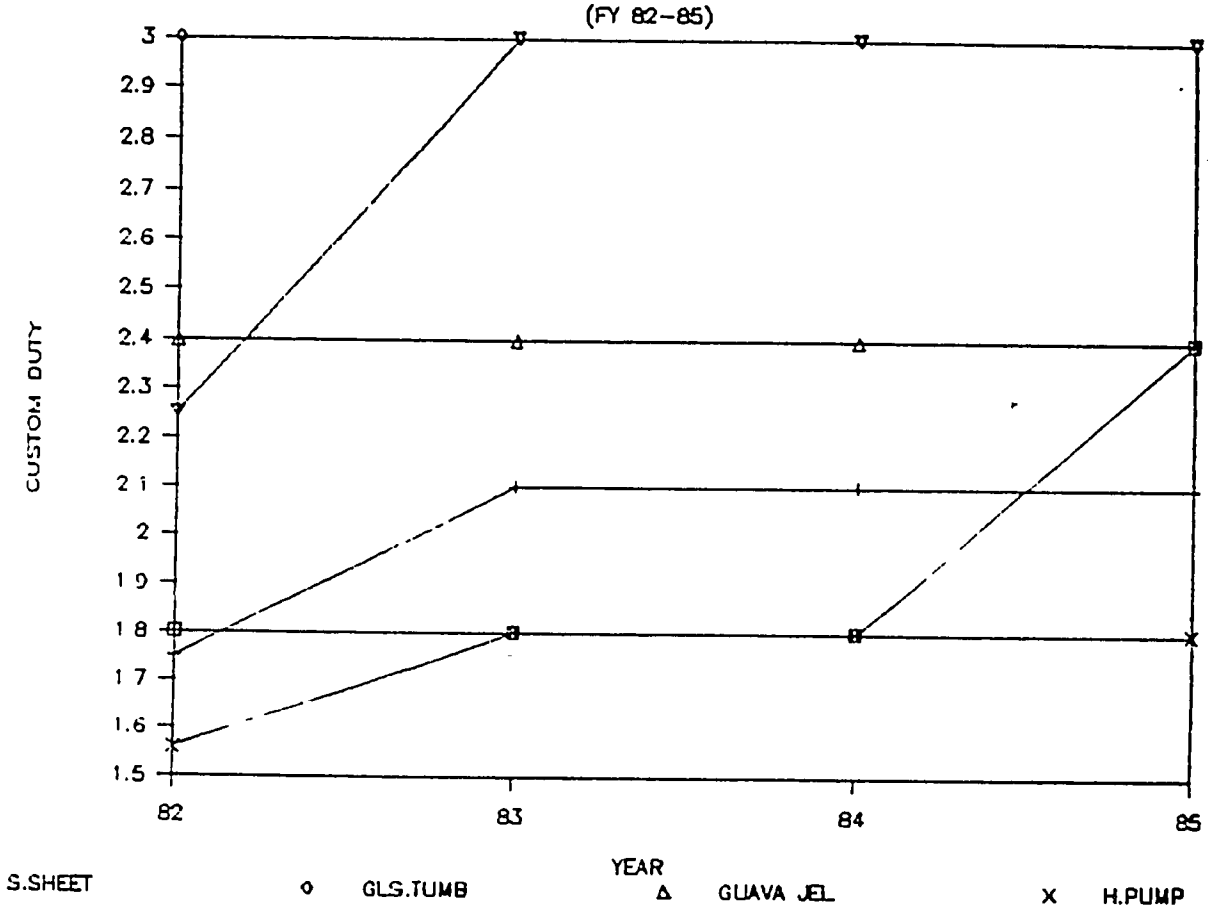


Fig. 3g--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

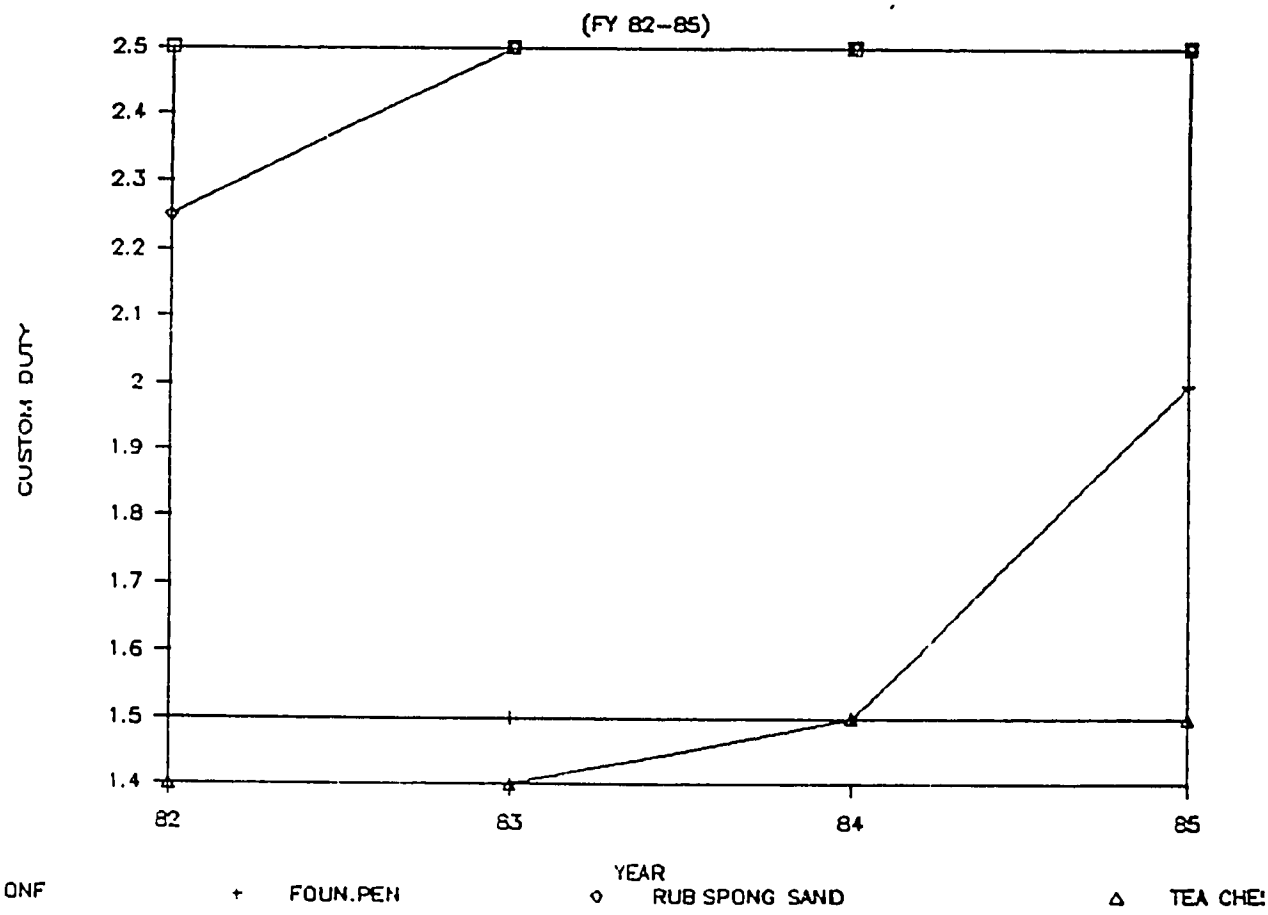


Fig. 3h --CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82–85)

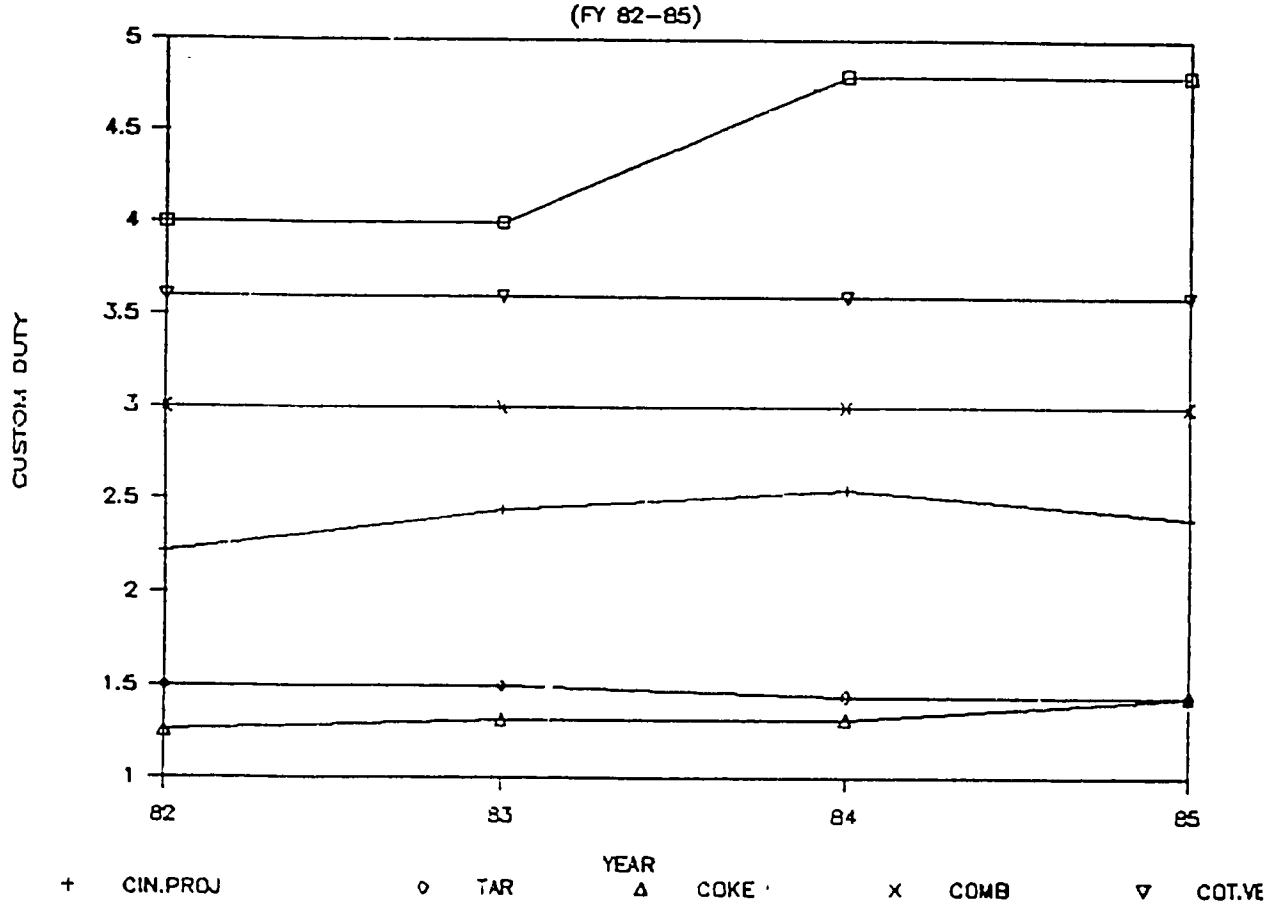


Fig. 3i --CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82–85)

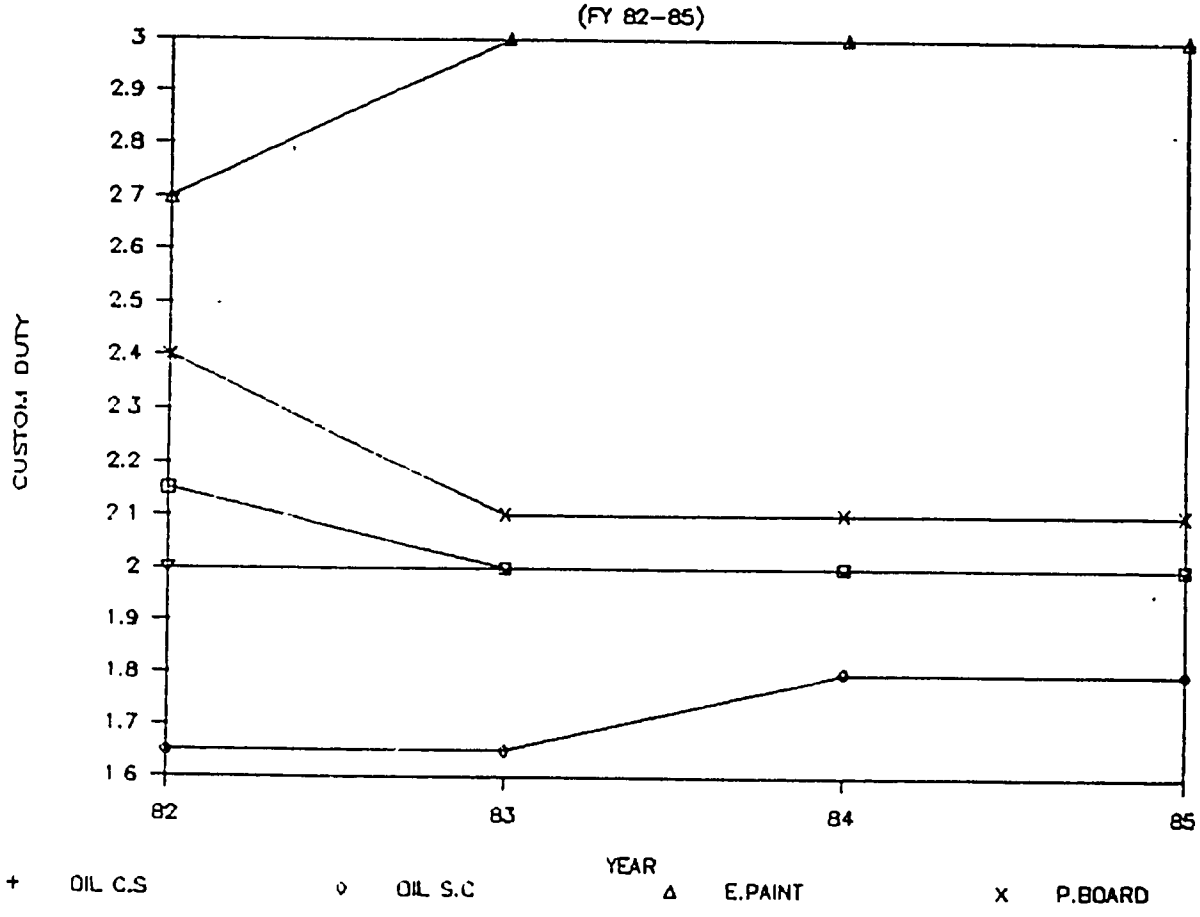


Fig. 3j--CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82-85)

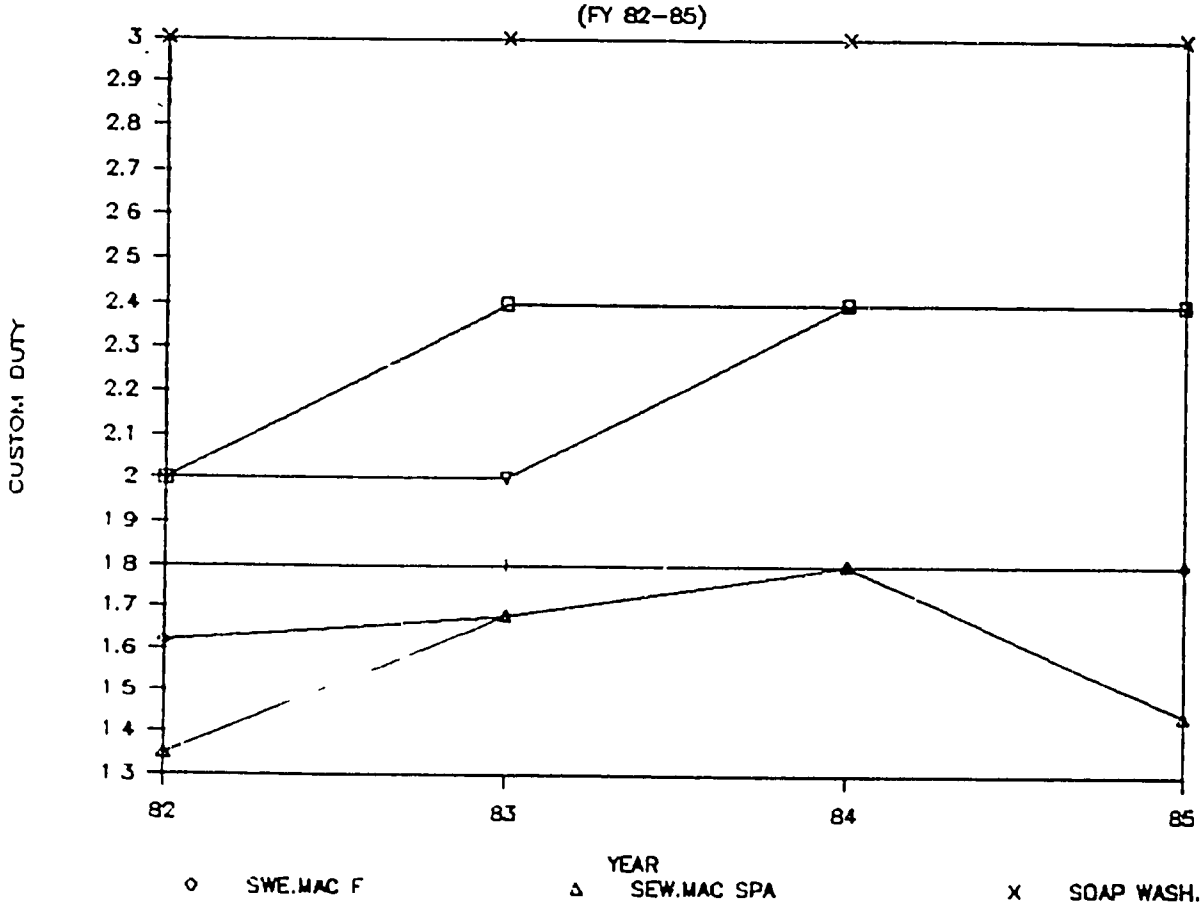
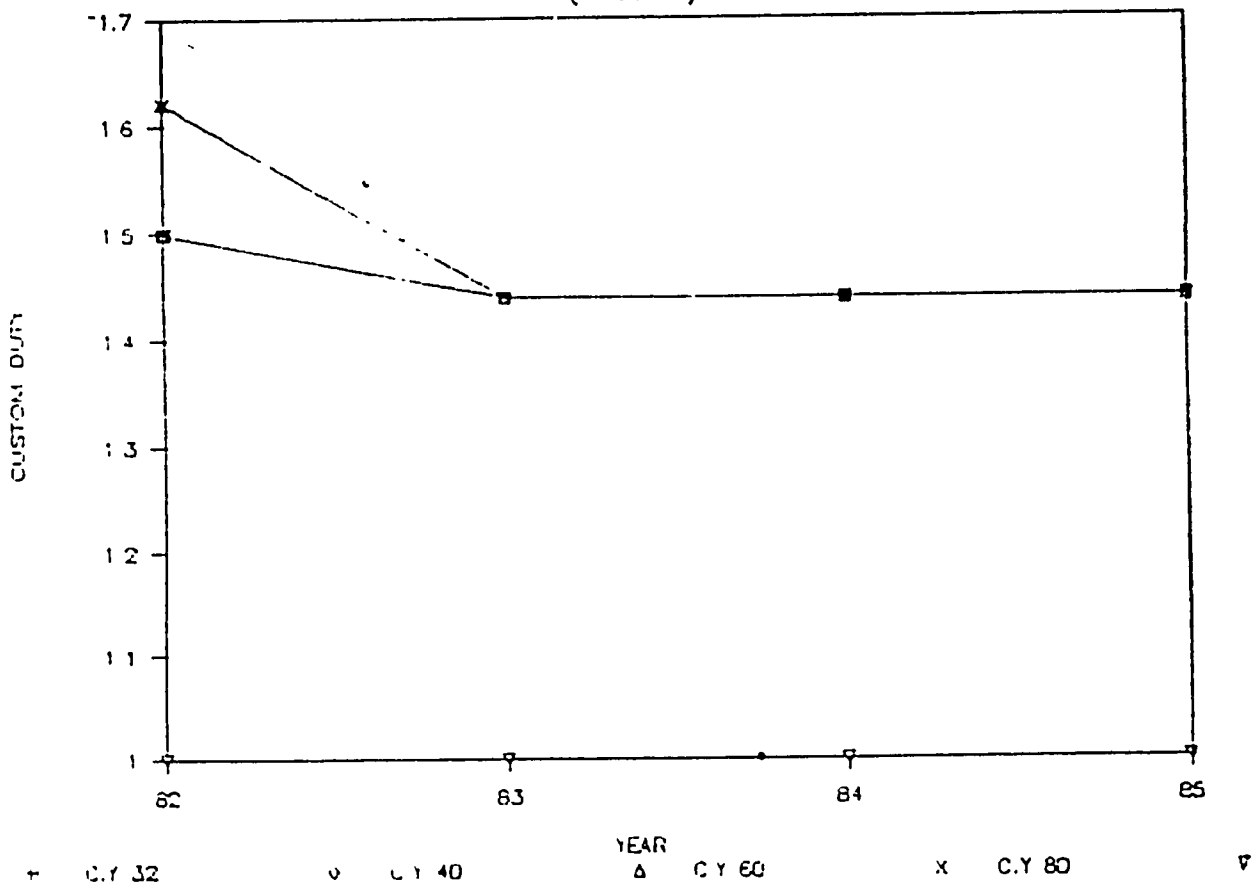


Fig. 3k --CUSTOM DUTY ON PRODUCTS BY YEAR

(FY 82–85)



APPENDIX A

THE RELATION USED FOR THE EFFECTIVE RATE OF ASSISTANCE (ERA, z_j)

1. <u>Largely nonagricultural sectors</u>

$$z_j = (1+t_j+t_{mj}+q_j)/(d_j)(1+t_{ej}) - \sum_i a_{ij}\,[(1+t_i+t_{mi}-w_i+q_i)(X_m/X)_{ij} - (t_{ei}-s_i)(1-X_m/X_{ij})/d_i] - a_{kj}\,[1+rt^*_{kj}(K_m/K)_j - r^*_j(K_b/K)_j - (h+h')] - a_{nj}(1+t_n-s_n)_j \;/\; v_j \qquad \text{(A1)}$$

Variables are defined below:

t = Import tariffs, included also are development surcharge and import license fee, i.e., $t_j = t_{cj}+t_{ds,j}+t_{if,j}$ where t_{cj} = customs duty; t_{ds} = development surcharge, and $t_{if,j}$ = import license fee.

t_m = rate of sales tax on imports.

t_e = Excise tax. Includes domestic sales tax in the 1970s.

s = Subsidy for early 1980s. In the case of domestically purchased tradeable and also nontradeable inputs for the year 1983, the terms $(t_{ei}-s_i)$ are calculated directly from the domestic to border price ratio minus one. For other years actual values of t_e and s were employed. Note that s_i includes the subsidy implicit in price controls, procurement price, etc. Concessional rental of farm machinery, debt overdues, and interest subsidy are included for capital in the third term a_{kj} of B1.

a_{ij} = Input-output coefficients, input i per unit of output j.

a_{kj} = Input of capital, k, per unit of output j. Same as v_{kj}.

a_{nj} = Input of labor, n, per unit of output j; same as v_{nj}.

d = Quality premium, measured as the ratio of the domestic price of imported commodity net of customs duties, etc., to that of domestically produced commodity. For example, if domestic cotton is 20-percent inferior to imported cotton, the price of the latter will be 20 percent higher, and d = 1.20.

q = Scarcity markup resulting from quantity restrictions. Preferred series from TIP Reports, which are net of the WES premium. For those industries for which the TIP Project did not estimate q, we used the estimates made by A. R. Bhuiyan, Planning Commission (which are gross of the WES premium), by subtracting the WES premium from the reported estimates. For the remaining products, q was ignored.

w = WES premium, i.e., $\frac{WES-e}{e} - 1$, where e stands for official exchange rate.

X_m/X = Ratio of imported raw material to total domestic use.

K_m/K = Ratio of imported machinery to total capital of the industry concerned.

K_b/K = Ratio of borrowed capital to total.

t_n, s_n = Pertain to provident fund (t_n) and training of labor by BSCIC (s_n), and similar taxes and subsidies. In actual calculations, (t_n-s) term was jointly estimated as being the ratio of market wage to shadow wage.

y = XPB concession used for exports only

$\bar{r}$ = Market rate of interest.

r = Concessional rate of interest.

r = Real rate of return, assumed to equal 0.10.

r^* = $(\bar{r} - r)$, i.e., subsidy to borrowed capital.

t_k^* = A subsidy on imported machinery, measured from the standard duty of 20%.

All starred variables are subsidies. In particular, t_k^*, r^*, h, h', and s are subsidies.

It may be noted that:

Price and quantity controls, including farm support prices and quantity bans were duly treated by translating them into quasi-taxes or quasi-subsidies.

Debt overdues were treated as grants to overall capital.

Subsidy to farm machinery, fertilizer, HYV seeds, irrigation and water control assistance were duly taken account of. Products with negative value added were not normalized by v_j, and were appropriately treated.

The ERAs are largely statutory.

<u>The h and h'</u>

Income tax rebate ranging from 20% to 60% is available for export sales of nontraditional items, depending upon certain conditions. As such h applies only to export protection. Other tax exemptions are much more general. In fact, there are so many tax-exemptions, one pyramiding over or multiplicating another,

that a tax payer is not likely to be able to take full advantage of all. Tax holidays, accelerated depreciation, investment allowances are largely of alternative or duplicating type. Exemptions (partial or full) from tax on royalty, technical assistance fee, capital gains, dividend tax, interest income, expenditure on foreign travel, and so forth, are cumulative. These incentives cannot be precisely accounted for on the basis of statutory rates alone. Actual measures of related variables are necessary. In the absence of that, we simply pick up a representative exemption by way of completing the relation, namely, tax holidays (for 5 years in the case of developed areas).

The averaging at the 4-digit and the I-O industry level was done simply by weighting (by their output weights) the products for which ERAs were computed. These were used as proxies for the industry concerned. Though nothing better than that was possible, the resulting averages are weak as between industries. Their changes over time however, have no such weakness.

For the benefits of those who may like to see the relationship between the ERA and the nominal rate of protection (NRP), the following regression for the rates for 1983-84, is given:

$$ERA1 = \underset{(3.03)}{.14} - \underset{(0.53)}{2.7}NRP; \; R^2 = .309. \qquad (A2)$$

It may be seen that the regression coefficient of ERA with respect to NRP is positive. A reduction in NRA will ordinarily lead to a decline in ERA.

The NRA is correlated with no thinkable variable other than

(positively) the share of wage bill in gross output, suggesting that politicians perhaps feel obligated to protect those industries with large number of workers whose jobs will otherwise be jeopardized. Let it be clearly understood that an effective-assistance to an industry implies subsidy to its primary inputs, whose cost is borne by the society's rich and poor, whether via bearing the incidence of indirect taxes or through a reduced increase in per capita income due to lower rate of economic growth.

2. Agricultural sector

In the preceding section, almost all relevant industrial and tradse policies were analyzed. Very few of them can be assigned directly to agriculture. Major discriminatory assistance in the domestic economy is between the agricultural sector and the industry. A handy cost structure for the entire economy is the national I-O table.

An advantage of using the I-O table for the present purpose is that, by virtue of the availability of the inverse matrix, effective rates of assistance can be calculated by taking into consideration both direct and indirect effects of policies. The preceding estimates of this study, as those of most ERPs of the world, are partial that is, they calculate only the direct effects of policies.

A deficiency of the Bangladesh I-0 table that should be noted in that it was prepared in domestic prices and it does not have a_{ij}'s for primary factors. That is, it lacks valued-added rows (call them a_{vj}'s). For the present purpose, these were generated for the 21 manufacturing industries of the I-0 table from the CMI raw data. For the rest of the industries, analyzed values of 50-50 share in value-added by labor and capital were assumed. Since the a_{vj}'s serve as weights, for obtaining mean values of various tax/subsidy incidences in Relation (1), and since the tax/subsidy values are generally much higher than the values of a_{ij}'s, an error in the assumed value-added weights is not likely to vitiate the measures of the effective rates of assistance inordinately.

Among the policies which discriminate between agricultural and nonagricultural sectors, the following are identified for the agricultural sector:

1) Price and quantity control policy, specifically food procurement price policy for rice and wheat.

2) Debt overdues

3) Subsidies to

   a) Farm machinery

   b) Fertilizer

   c) HYV seeds

   d) Irrigation (water control: drainage, flood, etc.)

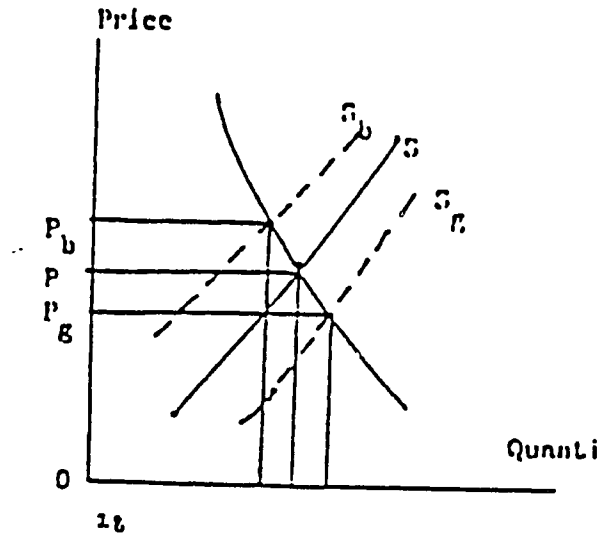
   e) Other

The methodology of quantifying these policies is briefly explained below.

1. <u>Calculation of the tax-incidence equivalent of foodgrain procurement policy</u>

In Bangladesh, agricultural price control at growers' level takes the form of procurement price and not support (floor) price. Its main role is to manage foodgrain stocks, rather than stabilize prices or guarantee prices to farmers. Procurement prices are not even announced before planting.

As a result of the nature of procurement price, in four of the five favorable crop years in the past 12 years, market prices were lower than procurement prices. In unfavorable weather years, on the other hand, stocks were replenished by imports. The underlying theoretical interpretation is sketched in the adjacent figure, where



S, S_b, and S_g, indicate domestic food supply during normal, bad, and good-harvest years, respectively. In Bangladesh, procurement price has generally lain between P and P_b during bad harvest years and between P and P_g during good-harvest years. The policy has, thus, deprived growers of reaping the gains from high price during short supply and has allowed the market price to fall to unremunerative levels during good-crop years, as against the support price, which would put a floor, so market price will not be allowed to fall below, say P. It may go up. In the absence of support price, a shortfall of price from P_b in bad years and from P in good years is translated here in terms of implicit tax on agricultural supply. The estimates of the tax equivalent of the indicated procurement policy are given in the last line of Table 1. The calculations are explained in the footnotes to the table.

2. Credit subsidy to agriculture and debt overdues

Being largely a sector of small producers, being located in general in less-and-least-developed areas, being the user predomenantly of indigenous inputs, and being a priority sector, agriculture seems to deserve to pay the same concessional interest rates that apply to industry with similar characteristics. Instead, it pays a mean rate of 16 percent against 10% to 13% by industry (see World Bank, Report, Dec. 17, 1987, Table 2.5). Not only that, the small sector and the agricultural sector are estimated to depend for roughly 50 percent of their credit from the informal sector, where the prevalent rate of interest is widely documented to be 120 percent.

The estimated default or overdue rate of agricultural loans is given in Table 2. The tax (+) and subsidy (-) estimates (τ) resulting from the stated conditions work out as follows:

$$\tau = s_1K_b(r^{**} - r) + s_2K_b(r^{*}-r) \quad + \quad s_2K_b(-d)(r'), \quad s_1+s_2 = 1$$

$$[.5K_b(1.20-.16) + .5K_b(.14-.16)] - .5K_b(.594)(.14)$$

$$.52K_b - .042K_b = 0.478$$

$$= .028K - .0023K = .0257$$

$$= .0257 \text{ per unit } K, \tag{A3}$$

where s_1(=0.5) is the share of institutional credit at the relevant market rates of interest, s_2 the share of institutional loans, d the default rate, r' the debt service snapped up, and K_b borrowed capital. The value $r^{**} = 1.20$ signifies the informal-sector interest rate paid by the agricultural sector and

r^* the interest rate on institutional loans. The rate of return on overdue debt is treated as annual grant, on which a rate of return, r', of 14% is assumed, being equivalent to the rate of interest of 14% received on fixed deposits. The figure d = .594 is the overdue rate of agricultural loans in 1987 (see Table 2). The resulting implicit tax rate is 0.4780 for 1987. Similarly calculated effective tax rates from 1980 through 1987 are given in Col. 5 of Table 2.

The total amount of outstanding credit appears in Col. 2. Since in the context of credit, agriculture is one big multiproduct industry, in which credit cannot be apportioned to constituent products or production units, each of the 9 agricultural subsectors in the I-O table is imputed the same effective tax incidence.

The values of K_b/K in Col. 6 are calculated by assuming a capital/output ratio (where capital includes land) in the agricultural sector of two. These values are needed because the relevant term for the calculation of the effective assistance to capital (K) through agricultural credit (K_b) in relation (A2) is per unit of K rather than per unit of K_b. In other words, we have data on K_b and Q, but not on K. We generate K by assuming K=2Q. The net effective tax rate on credit to agriculture, therefore, is the product of Cols. 5 and 6, which appears in Col. 7. The same rates are assumed to apply to the nonagricultural informal sector, such as the handloom industry and most units coming under BSCIC.

3. Debt overdues in nonagricultural sector

The corresponding estimates for various industries of the nonagricultural sector of the I-O table were made as follows. Total annual advances of all banks by 1-digit industries and manufacturing by 2-digit industries for the years 1973 through 1983 were taken from Sobhan (1985, No. 3, Apr. Table 2.1).

Total overdue debt by BSRS and BSB for 1983-84 is given in Sobhan [1985, No. 1, Table 4A] as Taka 5.26 billion and for 15 industries of the manufacturing sector, excluding the BSCIC sector, Taka 4.49 billion (ibid., Table 5). The manufacturing sector accounted for 54.2 percent of total advances by these two development finance institutions in its peak year 1975, the trade sector being next with 29.7% of total advances, in its peak year 1977. In 1983-84, overdue debt by Sonali Bank amounted to Taka 10.178 billion and that of Janata Taka 0.172 billion (Ibid, No.3, Tables 4.3 and 4.4). The total came to Taka 15.61 billion, of which 10.5 percent of BSB and BSRS and only 1.0 percent of Sonali Bank was repaid in cash, giving net overdue of Taka 14.46 billion in 1983-84.

Taking advances by all banks to industrial sector from Sobhan (1985, NO. 3, Table 2.1), overdues by industrial sector from Sobhan (1985, No. 1, Table 5), taking the distribution of the overdues of Sonali Bank and Janata Bank from Bangladesh, Ministry of Finance, Banking and Financial Institutions' Activities, 1987-88 (Bangladesh, 1988), we arrived at the annual estimates of effective tax/subsidy by industry for 3 years for the 1980s. The estimates of overdues by industry for the year 1983-84 are reported in Table 4, Col. 1. For calculating the effective rate of tax from all credit policies, we insert the relevant parameters into Relation (2) to obtain the following estimates:

$$\gamma_i = s_1K_b(r^{**}-r) + s_2K_b(r^{*}-r) + s_2K_b(-d_i)\ (r')$$

$$= 0.00K_b(1.20-.16) + 1.00K_b(.r^{*}_i-.16) + 1.00K_b(-d_i)\ (.14)$$

$$\gamma_i = .\ (r^{*}_i-.16)K_b - .14d_iK_b$$

$$= .7(r^{*}_i-.16)K - .098d_iK$$

$$= .7(r^{*}_i-.16) - .098d_i \text{ per unit K,} \qquad \text{(A4)}$$

where d_i stands for overdue debt ratio and r^{*}_i for rate of interest paid on institutional loans by the industry (Table 3, Col. 1). Jute and 100-percent export industries (mainly ready-made garments) paid an r^{*} of 12%.

on their institutional loans (which constituted nearly 100% of their borrowings) till 1985 and 9% since. Other industries have paid, on the average, 14% throughout the reference period. The results for the year 1983-84 appear in Table 3, Col. 2. Similar procedure was used for other years with appropriate adjustment for changes in r^*_i and d_i. For the remainder years values were extrapolated.

4. Other subsidies

Four other agricultural subsidies prepared in the context of the I-O table are given in Table 4. Their calculations are explained in the footnotes to the table. Note that the fertilizer subsidey is expressed in terms of fertilizer price, water control subsidy in terms of output price, HYV seed subsidy in terms of output price, and subsidy on rental equipment per unit of capital. Fertilizer and rental equipment subsidies are expressed in terms of their own unit prices, as their a_{ij}'s are available in the I-O table. The other two subsidy ratios are to be subtracted directly from the cost ratios.

Table 1.5—Calculation of tax/subsidy equivalence of the difference between market price and procurement price of paddy 1975-76 through 1987-88
(price: Takas/maund; Quantity: Million tons)

	1975-76	76-77	77-78	78-79	79-80	80-1	81-2	82-3	83-4	84-5	85-6	86-87	87-88
1. Price at growers' level													
Mean of Aus and Aman	97	65	83	95	122	101	128	150	162	183	166	192	
2. Procurement price													
a. Aus Paddy	74	74	84	84	85	110	115	124	135	144	165	170	
b. Aman Paddy	74	78	84	90	110	115	124	135	144	165	170	175	
c. Weighted Mean	74	77	84	94	104	114	121	132	141	159	169	174	
3. Production	12.593	11.637	13.116	12.713	13.369	15.03	14.85	15.32	15.76	16.12	16.08	16.50	
4. Imports	2.057	.777	1.871	1.254	2.782	1.061	1.275	1.844	2.056	2.60	1.19	1.87	
5. Line 1/2C for most good Harvest Years (%)	..	84	99	..	..	89	..	..	..	..	93	..	
6. Line 4/3 (%)	16.3	6.7	14.3	9.9	20.8	7.1	8.5	12.1	13.1	16.1	7.4	11.3	
7. Tax Equivalent (%)[a]	7.4	18	1	1.0	11.9	11	-.4	3.2	4.2	7.2	1	2.4	

Sources: Price at growers' level: PC, Memorandum, 1987-88, p. 109.
Procurement price: Ibid., p. 110; mean prices were calculated.
Production: World Bank, Report, March 10, 1988, Vol. II, P. 52.
Imports: PC, Memorandum, 1987-88, p. 100.

[a]For definition of tax equivalence, see the text, the figures are calculated by subtracting Line 5 from 100 for 1976-7, 1977-8, 1980-81, and 1985-6 and by subtracting 8.9 (being the mean of the same 4 years in Line 6) from the values of Line 6 for the remainder of the years of the 1980s. Note that the latter estimates imply the assumption of unity price elasticity of demand. A more realistic assumption of the demand-price elasticity will result in a steeper fall in the price of food cereals and hence a higher implicit tax rate on growers.

The assumption of unity elasticity of uncompensated demand is made for ease of calculations. It is probably on the higher side. On the other hand, the uncompensated demand elasticity of -.33 for rice in Bangladesh, as estimated in the macro model of the Planning Commission [1985, p. 6-14] is probably somewhat underestimated. (The uncompensated demand elasticities for wheat and coarse grains in the same course are -.923 and -.993.)

Table 2.--Agricultural debt overdue rate and effective tax rates resulting from different types of loans for agriculture

Year.	Total Debt Due (Taka billions)	Amount Overdue (Taka billions)	Overdue Rate (%) (d_i)	Effective Tax-Rate Equiv. of Credit Policy on Agriculture Per Unit of K_b	$\left(\frac{K_b}{K}\right)$	5x6= Effective Tax Rate Per Unit of K
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1980	3.36	1.88	56.0	.4870	.0147	.0072
81	4.52	2.31	51.1	.4905	.0175	.0086
82	6.48	3.34	51.5	.4905	.0238	.0117
83	8.17	4.75	58.1	.4798	.0242	.0116
84	12.40	7.22	58.3	.4798	.0298	.0143
85	15.15	9.31	61.5	.4745	.0352	.0167
86	23.75	17.66	74.4	.4572	.0499	.0228
87	27.1	16.1	59.4	.4780	.0536	.0256

Source: Cols. 2-3: World Bank [1987], Table 6.3. Other columns are calculated.

Col. 5:

The formula for estimating the effective tax rate based on the interest paid in formal and informal financial markets and default on bank loans is given in the text, where the calculations of different columns are also described.

Table 3.--Overdue rates and effective rates of implicit taxes(+) or subsidy (-), τ, nonagricultural sector by major industries, 1983-84

Industry Name (Code)	Overdues as Advances (d_i) (1)	All Credit Policies of Total Capital (Effective tax, τ) (2)
1. Food, beverages, and tobacco (10-14)	0.46	-.076
2. Textile and leather (15, 16, and 20)	.15	-.040
3. Wood & wood products (29)	.08	-.034
4. Paper & paper products (19)	.38	-.058
5. Jute and Allied products (18)	.16	-.040
6. Metal and Engineering (25-28)	.21	-.044
7. Non-Metallic minerals (19)	.69	-.082
8. Chemicals & Pharmaceuticals (22-24)	.28	-.050
9. Miscellaneous (30)	.29	-.051
10. Transport (35, 40)	.32	-.053
11. Trade and services (41)	.07	-.034
12. Construction (urban housing) (31)	.098	-.038

Table 4.--Effective subsidy rates for water control, HYV seeds, agricultural rental machinery, and fertilizer, 1981-82--1987-88[a]

Year	Fertilizer (in Terms of Fertilizer Gross Price)	Water Control (in Terms of Product Price)	HYV Seeds (in Terms of Product Price)	Rental Equipment and Rest (in Terms of the Price of Capital)
(1)	(2)	(3)	(4)	(5)
1977-78	.4540	..	..	..
1978-79	.4956	..	..	..
1978-80	.4155	..	..	..
1980-81	.3277	.0893	.00182	.0052
1981-82	.2767	.0811	.00181	.0052
1982-83	.1854	.0833	.00192	.0055
1983-84	.2438	.7.5	.00151	.0043
1984-85	.1444	.0414	.00075	.0019
1985-86	.0856	.0408	.00032	.0009
1986-87	..	.0423	.00041	.0012
1987-88	.0269	..	..	..

[a]The calculations of each column are explained below:

Col. 1: Fertilizer subsidy has been estimated since 1977-78 by International Food Policy Research Institute (IFPRI), Fertilizer Pricing Policy and Food Grain Production Strategy in Bangladesh, Two Volumes, data from Vol. I: Technical Report, (March 1985), Table 1, p. 68. Fertilizer consumption and price charged by BADC is available from BBS's yearbooks. The values of this column are calculated by dividing the subsidy by sum of subsidy from the IFPRI sources plus the price paid by farmers, i.e., this is the rate fo subsidy on gross of subsidy price. The figures for the years 1985-86 through 1987-88 are estimated. As of now there is no subsidy on urea but there is about 8 percent subsidy to TSP fertilizer, giving the subsidy rate on overall fertilizer of 0.0269. These rates are to be applied to those subsectors which have nonzero a_{ij}'s in the I-O table, Row 21.

Col. 2: All of water control development and irrigation expenditure is borne by government. Water rates have recently been introduced, but they are still quite low. The ADP expenditure on water control and irrigation investment, given in World Bank Report (1988, Vol.1, Table 2.1) was divided by the gross value of crops to obtain the desired estimates.

Col. 3: The annual budget of BADC for 1985-86 (actual), as reported in Bangladesh [1987-88, Vol. I] gives the following statistics for seed operations: an operating loss of Taka 2.353 million for paddy, an operating profit of Taka 4.959 million for wheat and maize, and an operating loss of Taka 11.973 million for potatoes. The budget for

Table 4--Contd.

1987-88 (estimates) shows an operating profit of Taka 0.935 million, Taka -10.174 million, nd Taka -0.154 million, respectively, for the three crops. Subject to further clarification from BADC, the budget does not seem to have included the cost of "production of needs within the firm." Accordingly, the cost of production of that part of needs was imputed by assuming the unit sale price as the unit production cost. The resulting losses were treated as subsidy. These came to Taka 104 million for 1985-86 and Take 101 million for 1987-88.

The estimates of accurued subsidy to BADC were obtained from its office files. For the years from 1976-77 through 1987-88, these values in millions of takas are: 89, 1162, 1124, 1205, 1017, 1149, 1335, 1318, 687, 354, 573, and 413 (est). Using the ratio of the subsidy to HYV seeds to the overall accrued subsidy to BADC for 85-86 and 87-88, we extrapolated the estimates for 1980-81 through 1986-87. In this column, these estimates are expressed as ratios of the gross value of crop production, as seeds are are a within-sector input.

Col. 4: The rate of subsidy on rental equipment for agriculture ranged between 85% (for low-lift pumps, LLPs) to 98% (for deep tubewells, DTWs) in 1981 and marginally lower from 73% (for LLPs) to 85% (for DTWs) in 1987. The rate of subsidy on sales of machinery, which started in recent years has been 30-40% for LLPs and 50-70% for DTWs. (World Bank, 1988, Vol. I, Table 2.1 and p.44).

Instead of using these rates, however, and pending additional information from BADC, we simply allocated all the remainder "accrued subsidy" of the BADC budget to machinery. Since the a_{ij}'s for machinery are available, the renulting absolute amounts of subsidy were expressed in terms of agricultural capital stock, as discussed earlier, i.e., by assuming K as twice the value of gross output.

In summary, since the a_{ij}'s for fertilizer and machinery are available, the values of this table are defined as follows: Col. as a ratio of fertilizer price; Cols. 1 and 3 as ratios of output price; and Col. 4 per unit of capital.