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ECONOMIC PROTECTION AND RESOURCE FLOWS IN THE PHILIPPINES

By

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Introduction

This paper analyzes the country's structure of industrial economic protection based on the combined impact of tariffs, percentage taxes, specific taxes and subsidies. It further examines whether or not this protective structure affects resource flows among industries within the country. The basis for analyzing the structure of protection is the effective protection rate (EPR) framework which has increasingly been accepted in the economic literature as being more appropriate than the nominal rate in measuring economic protection.[1] Estimates of EPR covering the entire Philippine economy show very wide divergence of protection among 124 sectors, implying some serious resource misallocations, if the EPR is any indication of the offsetting advantage of economic protection to a relatively inefficient industry. The strength of this implication rests on the extent to which industrial EPR ranking indicates the directions of resource allocation among industries.

The theory of effective protection predicts an allocative effect from the structure of protection on the country's resources. Sectors which are more protected than others gain in terms of increased value added as compared to their value added without protection. This permits higher profits in the protected sectors, encouraging

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[1] A comprehensive treatment of effective protection rate theory is presented in Grubel and Johnson (ed.), (12).

them to use more resources, and enabling them to draw resources away from other sectors by offering, if necessary, higher factor prices than other sectors. The structure of protection as indicated by the EPR estimates therefore implies a certain pattern of resource flows among sectors in the protected domestic markets. If sectoral rank, from highest to lowest EPR, represents the relative advantage and disadvantage provided by the structure of protection to sectors, then certain patterns of sectoral resource flows can be indicated. This study appears to confirm the presence of EPR resource allocative effects and the importance of the EPR as a policy instrument in changing the structure of import substitution and resource flows in the economy.

Methodology of Estimation[2]

Let V_j be the unprotected value added per unit j and V_j' be the protected value added per unit j, expressed in free trade values,

$$V_j = (1 - \sum_i a_{ij}) \quad (1)$$

$$V_j' = (1 + T_j) - \sum_i a_{ij} (1 + T_i) \quad (2)$$

where:
product price is taken as unity,

a_{ij} : the value of material input i used per unit of output j,

T_j and T_i: the proportions by which domestic market prices of the output and input, respectively, exceed world market prices due to tariffs and other protective instruments.

The effective protection rate, E_j, is

$$E_j = \frac{V_j' - V_j}{V_j} \quad (3)$$

$$= \frac{[(1 + T_j) - \sum_i a_{ij} (1 + T_i) - (1 - \sum_i a_{ij})]}{(1 - \sum_i a_{ij})} \quad (4)$$

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[2]A more detailed discussion of the estimation methodology is in Chapter 2 of Tan (23), *The Structure of Protection and Resource Flows in the Philippines*, and in Tan (24).

$$\frac{T_j - \sum_i a_{ij} T_i}{1 - \sum_i a_{ij}}$$

Expressed in protected values,

$$E'_j = \frac{V'_j - V_j}{V_j} = \frac{V'_j}{V_j} - 1$$

$$= \frac{1 - \sum_i a'_{ij}}{\left(\frac{1}{1 + T_j} - \sum_i a'_{ij} \frac{1}{1 + T_i}\right)} - 1 \qquad (6)$$

where E'_j, the EPR, is estimated in terms of the protected coefficients a'_{ij}, the protected value added $1 - \sum_i a'_{ij}$, and the unprotected value added $\left(\frac{1}{1 + T_j} - \sum_i a'_{ij} \frac{1}{1 + T_i}\right)$, derived by deflating the value of output, and the values of material inputs per unit of output, each by the relevant T.

The estimation of the EPR in the study uses equation 6 which infers the free-trade coefficients from the observed input-output coefficients. This approach recognizes the nonavailability of free-trade input coefficients in a world characterized by heavy protectionism, as well as the difficulties involved in using any set of input coefficients from either the developed or developing countries, or some combinations of the two even in a free-trade situation.

The implicit rates, of protection on output, T_j, and on input, T_i, used in equation 6 are estimated for importables by

$$T_j = (1 + t_j)\ [1 + f_j\ (1 + m_j)] - 1 \qquad (7)$$

where t_j is j's tariff rate and f_j is its percentage tax rate increased by a percentage markup, m_j, which applies to its imports. If the importable is subject to a specific tax, the implicit rate of protection

is estimated by

$$T_j = (1 + t_j + f_j) - 1 \qquad (8)$$

where f_j is the specific tax rate.

For exportables,

$$T_x = dv - t_x \qquad ((9)$$

where d is the percentage tax on the domestically produced exportable product, v is the proportion of domestic output which is not previously subjected to percentage taxes, and t_x is the export tax. Since exports are not subject to percentage tax, dv will be passed on to domestic buyers, creating a margin of domestic price over f.o.b. export price. An export tax has the opposite effect.

The incentives available to firms registered with the Board of Investments (BOI) under R.A. 5186 and R.A. 6135 are specified into the EPR measure by taking as the subsidy rate of an industry, s_j, the total of tax exemptions, tax deductions, and tax credits granted to BOI-registered firms in that industry as a proportion of industry output.

Including the subsidy effect of the tax incentives availed of by BOI-registered firms increases the implicit rate of protection in a manner similar in effect to the tariff rate.[3] This affects equation (7) which is rewritten as

$$T_j = (1 + t_j)\,[1 + f_j(1 + m_j)] + s_j - 1 \qquad (10)$$

or, if sales taxes are specific taxes, it is

$$T_j = (1 + t_j + f_j + s_j) - 1 \qquad (11)$$

The subsidy effect is therefore equivalent to a positive tariff on j which is added to the computed T_j based on the tariff and indirect

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[3]It is possible that subsidies other than those provided by BOI are available to firms, such as accessibility to low interest and long-term loans.

tax rates. The higher T_j inclusive of s_j would increase the EPR estimates of j. The ranking of industries by EPRs would then be based on the three protective instruments: tariffs, indirect taxes, and BOI subsidies.

Effective Rates and Resource Flows

EPR Implications on Resource Flows

The EPR estimates for 124 sectors of the 1974 Philippine input-output table are presented in Table 1. These rates differ substantially among sectors, suggesting the magnitude of costs or the economic benefits foregone in allowing the efficiency levels, as indicated by the incentives required by its industries to operate and survive, to vary widely across industries. In general, three elements of bias are apparent from the structure of effective protection as shown in Tables 2 and 3. First is the bias in favor of manufacturing over the other sectors; second, the penalty given to exports, both within manufacturing and nonmanufacturing industries; and, third, the bias in favor of the finishing stages of producing consumption goods over intermediate goods and especially over capital goods.

The 1974 EPR estimates in Table 1 present a wide variation in effective protection rates across sectors, ranging from −49 to above 200 per cent. The ranks and implications for resource movement of these rates could be made based on the 124 sectoral product categories. However, more meaningful implications of the structure of effective rates can be derived from the broader sectoral classification of Table 3. Therefore, this classification is used to highlight analytically the relationship between effective rates and certain sectoral characteristics often used as norms in designing tariff, tax, and subsidy structures for national development.

From Table 4, the agriculture and primary sectors appear to have received much less relative advantage from protection than the manufacturing sectors. The ratio of 5 to 1 in favor of manufacturing suggests that the protective structure might have encouraged resources to flow more into manufacturing than into the nonmanufacturing sectors. Moreover, resources are not likely to have been encouraged to flow into the traditional nonmanufacturing export sectors such as banana, pineapple, coconut, abaca, logging, iron ore and copper ore mining, and chromite mining.

TABLE 1

Effective Protection Rates: 1974
(In per cent)

I-O No.	Sector	EPR
3	Bananas	-6
4	Citrus	70
5	Pineapple	-3
11	Coffee	50
12	Cacao	6
14	Coconut including copra (in farms)	-6
15	Abaca	-6
16	Ramie and other fiber crops	8
17	Tobacco (native and virginia)	21
25	Commercial fishing, ocean, and offshore	116
29	Logging	-10
32	Iron ore mining	-13
33	Copper ore mining	-4
34	Chromite Mining	-13
35	Other metallic mining	2
38	Other nonmetallic mining and quarrying	16
39	Slaughtering and poultry dressing	128
40	Meat products, canned	5
41	Meat products, uncanned	68
42	Evaporated and condensed milk	5
44	Butter, cheese, and other dairy products	52
45	Fruit and vegetable products, canned	80
46	Other preserved fruits and vegetables	19
47	Fish canning	-24
48	Other fish and seafood products	76
49	Rice milling	-49
50	Corn milling	-46
51	Flour milling, cereal and flour-blended	1,148
52	Bakery products	3,371
53	Sugar milling and refining	-12
54	Candy and chewing gum products	519
55	Cocoa and chocolate products	1,750
56	Processed coffee	36
57	Desiccated coconut products	-10
59	Starch and starch by-products	650
60	Macaroni, spaghetti and noodles	78
61	Vegetable lard and margarine	*

TABLE I (Continued)

Effective Protection Rates: 1974
(In per cent)

I–O No.	Sector	EPR
62	Prepared feeds for animals and fowls	35
63	Flavoring extracts	7
64	Miscellaneous food manufactures, n.e.c.[1/]	156
65	Distilled, rectified, and blended liquors	394
66	Wines	113
67	Brewery and malt products	69
69	Cigarettes	18,758
70	Cigars, chewing, and smoking tobacco	-21
71	Leaf tobacco processing	*
72	Textile mill products	78
73	Knitting mill products	-4
74	Cordage, twine, and net industries	-2
75	Carpets, rugs, and linoleum including mats	43
76	Other textile products	36
77	Footwear, except rubber and plastic	18
79	Ready-made clothing	-26
80	Manufacture of embroidered products	-41
81	Other made-up textile goods	1
82	Lumber	16
83	Plywood and veneer plants	5
84	Doors, windows, and other millworks	-2
85	Other wood, cane and cork products	0
86	Furniture and fixtures	0
87	Pulp, paper, and paperboard manufacturing	38
88	Paper products	195
89	Paper and paperboard containers	181
90	Miscellaneous converted paper products, n.e.c.[1/]	478
92	Books and pamphlets	19
95	Tanning and leather finishing	145
96	Leather products except footwear apparel	-27
97	Rubber footwear	454
98	Tires and inner tubes manufacturing and retreading	323
99	Other rubber and related products	21
100	Compressed and liquefied gas	17
101	Basic industrial chemicals	-7
102	Fertilizer and lime	41
103	Coconut oil	-5

TABLE I (Continued)

Effective Protection Rates: 1974
(In per cent)

I–O No.	Sector	EPR
104	Other oils and fats	- 28
105	Paints, varnishes, and related compounds	221
106	Plastic materials	56
107	Medicinal and pharmaceutical preparations	9
108	Cosmetics and toilet preparations	*
109	Soap and other washing and cleaning compounds	175
110	Insecticides, germicides, and agricultural chemicals	17
111	Other chemical products	35
112	Petroleum refineries	21
113	Other products of petroleum and coal	16
114	Structural clay products	-11
115	Structural concrete products	110
116	Glass and glass products	45
117	Pottery china and earthenware	31
118	Hydraulic cement	-36
119	Other nonmetallic mineral products	26
120	Basic ferrous metal products	27
121	Basic nonferrous metal industries	0
122	Metal cans, boxes, and containers	110
123	Cutlery, handtools, and general hardware	34
124	Structural metal products	95
125	Stamped, coated, and engraved metal products	38
126	Fabricated wire products	14
127	Heating apparatus, lighting, etc.	85
128	Other fabricated metal products	79
129	Agricultural machinery and equipment	14
130	Other special industry machinery and equipment	4
131	General industry machinery and equipment	7
132	Office computing and accounting machines	27
133	Electrical distribution and control apparatus	18
134	Other electrical industrial machinery and equipment	30
135	Communication equipment	31
136	Batteries	73
137	Electrical lamps and fixtures	27
138	Electrical wires and wiring devices	51
139	Household radio, TV sets, phonos, and supplies	204
140	Refrigeration and air-conditioning equipment	195

TABLE I (Continued)

Effective Protection Rates: 1974
(In per cent)

I–O No.	Sector	EPR
141	Other household electrical appliances and wares	103
142	Shipbuilding and repairing	26
143	Motor vehicles, manufactured/assembled	127
144	Motor vehicles, engine bodies and parts	23
146	Motorcycles, bicycles and parts	52
147	Other transport equipment, n.e.c.[1]	9
148	Jewelry, silverware, and related articles	133
149	Musical instruments	61
150	Fabricated plastic products	194
151	Measuring, controlling, scientific equipment	12
152	Medical orthopedic and surgical supplies	9
153	Photographic and optical goods	30
154	Sport equipment and supplies	93
155	Pen, pencil, office and artist's supplies	68
156	Toys, dolls, parlor games excluding plastic	72
157	Miscellaneous manufactures, n.e.c.[1]	91

[1] n.e.c. means not elsewhere classified.

*EPR cannot be calculated for the sector because its derived international value added is negative.

TABLE 2

Average Effective Protection Rates According to Major Industry Group
(In per cent)

Industry Group	E P R
Agriculture and Primary	9
Manufacturing	44
Exports	4
Nonexportable	61
Import, competing	37
Import, noncompeting	148
Overall Average	36

TABLE 3

Average Effective Protection Rates According to End Use (In per cent)

Industry Group	1965[a/]	1974
Consumption goods	70	77
Intermediate goods	27	23
Inputs into construction	55	16
Capital goods	16	18
Total manufacturing	51	44

[a/] Estimates in J. Power and G. Sicat, *"The Philippines: Industrialization and Trade Policies"* (London, New York and Kuala Lumpur: Oxford University Press, 1971).

TABLE 4

Effective Protection Rates According to Sectoral Origin (Agriculture/Primary = 100)

Sector	EPR
Agriculture and primary	100
Manufacturing	489
All Sectors	400

Classified by their relative position in the production process, manufacturing sectors exhibit an interesting pattern of resource flows which may have accompanied the structure of effective rates among these sectors. Final consumption goods appear to have been favored in view of its 4 to 1 predominance over intermediate goods, capital goods, and inputs into construction (see Table 5). Among the three other categories, the movement of resources would be towards the intermediate products and away from the capital goods and inputs into construction. There are, however, some intermediate products with higher EPR than consumption goods, implying greater inflow of resources into these sectors. Notable examples of these include flour milling, leaf tobacco processing, paper and paperboard

containers, tanning and leather finishing, plastic materials, and metal cans, boxes, and containers.

A comparison of the effective rate estimates of exportables[4] with nonexportables in Table 6 shows an overwhelming ratio of 1 to 15 against exportables. It may then be expected that a greater flow of resources into the nonexportable sectors has occurred in response to a protective structure clearly biased against exports. Among the exportable sectors, the direction of resource flows is likely to be away from the agricultural and primary export sectors to the manufacturing sectors since the former are penalized by nega-

TABLE 5

Effective Rates of Protection in Manufacturing By Type of Good (Inputs into Construction = 100)

Type	EPR
Intermediate	144
Capital	112
Inputs into construction	100
Consumption	481
Manufacturing	275

TABLE 6

Effective Protection Rates By Major Sectoral Group (Exportables = 100)

Sector	EPR
Exportables	100
Nonexportables	1525
Import-competing	925
Import-noncompeting	3700
All Sectors	900

[4]By definition, exportables export at least 10 per cent of domestic output while nonexportables export less than 10 per cent of domestic output.

tive protection, in contrast to the low positive protection of the manufacturing exportables. Among the nonexportable sectors more favored by the allocation of resources are flour milling, bakery products, candy and chewing gum products, starch and starch by-products, liquors, cigarettes, miscellaneous converted products, paper products, tires and inner tubes manufacturing and retreading, fabricated plastic products, paper and paperboard containers, paints, varnishes, and related compounds, and household radio, TV sets, phonos and supplies. These sectors are mostly noncompeting imports or sectors which import less than 10 per cent of their domestic supply. They are likely to dominate, in terms of effective protection, the import-competing sectors (those importing more than 10 per cent of their domestic supply) by a ratio of 4 to 1.

In general, therefore, the flow of resources in the economy will tend to support the manufacturing sectors and neglect the agricultural and primary sectors. This seems to reflect a national policy of promoting economic growth through rapid industrialization. This preference for developing the manufacturing sectors over others in developing countries is explained by the high-income elasticities and consumption demand patterns for manufacturing goods over time, as well as the relative ease of producing factors to complement labor. Much of the optimism for the growth potential of manufacturing, moreover, rests on the empirical evidence of strong interindustry linkages within this sector which can possibly extend also to the nonmanufacturing sectors of the economy (11). Ironically, it is this capacity for interindustry linkages of manufacturing which particularly highlights the perversity of the structure of effective protection and the implied direction of resource flows in the economy. As described in the foregoing, the structure of protection tends to direct the country's productive resources heavily toward the consumption goods sectors, to the detriment of sectors producing capital goods, inputs into construction, and to a lesser extent, intermediate goods. The favored status of consumption goods sectors, relative to the other sectors, tends to encourage an industrial structure promoting less interindustry linkages than would otherwise be feasible under a system where the intermediate and capital goods are more favored. Under the existing system, the flow of resources are encouraged into the production of final consumption goods. This neither results in further forward linkages nor promotes much backward linkages because of the easy entry and inexpensiveness of inputs into consumption goods, discouraging the domestic production of these types of goods. A protection structure which favors intermediate and capital goods sectors implies a greater flow of resources into these sectors, giving rise to stronger backward linkages

to the primary and agricultural sectors in the form of demand for raw materials. These are then processed for further input into consumption goods intended for domestic consumption or export.

This leads, finally, to the third kind of bias in the resource allocation implied by the effective protection rates. The extremely protected position of the consumption goods sectors has encouraged greater attention to production for the domestic market and a dearth of efforts to compete and expand in the export markets. This situation is aggravated by the bias in the country's protective structure which overwhelmingly protects nonexportables. Despite the tariff exemptions, tax incentives, and subsidies afforded to exportables in the national investment and export priorities plans implemented by the BOI, the bias against exports in the structure is hardly alleviated by these BOI incentives. These considerations seem to indicate, therefore, the need for a more determined policy to redirect national resources towards desired uses through a more consistent structure of industrial protection and incentives.

EPR Effects on Resource Allocation

Evidence on the changes in the structure of production in the economy since the 1950s confirm the implications of differential incentives associated with the structure of protection. The favored position of manufacturing in terms of protection coincides with the rapid growth of this sector in the 1950s. Manufacturing exhibited a yearly growth rate of 10.9 per cent from 1948 to 1961. This is substantially higher than those for agriculture and other nonagriculture (Table 7). Thus the composition of output shifted toward manufacturing and nonagriculture, though more toward the former than the latter sector.

TABLE 7

Gross Value Added in Agriculture, Manufacturing, and Other Nonagricultural Activities

Sector	Percentage Share		Annual Growth Rates (Compounded) 1948-1961
	1948	1961	
Agriculture	49.1	33.6	3.8
Manufacturing	17.5	28.0	10.9
Other Nonagriculture	33.4	38.4	8.1

Source: R. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: NBER, Inc.), p. 122.

This suggests the remarkable expansion of manufacturing production which substituted for imported goods in response to the policy of protecting local industries from import competition. Baldwin's estimates of imports to gross value of output ratios in various Philippine manufacturing industries in Table 8 confirm that import substitution did occur in a wide range of industries, particularly

TABLE 8

Measurement of Import Substitution in Manufacturing, 1948, 1956, 1960, and 1968

ISIC CODE	Industry	Ratio of Value of Imports to Value of Production			
		1948-1949	1956	1960	1968
	Total Manufacturing	1.13	0.55	0.42	0.42
20	Food manufactured	0.47	0.24	0.16	0.15
21	Beverages				
22	Tobacco products				
23	Textiles	6.32	1.11	0.27	0.22
24	Footwear and other wearing apparel	0.46	0.02	0.02	0.02
25	Wood and cork products				
26	Furniture and fixtures	0.03	0.01	0.01	0.01
27	Paper and paper products	43.79	0.98	0.35	0.35
28	Printing and printed products	0.53	n.a.[1]	n.a.[1]	n.a.[1]
29	Leather and leather products	11.60	1.22	0.35	0.07
30	Rubber products	n.a.	1.65	0.07	0.11
31	Chemicals and petroleum				
32	products	8.76	0.34	0.31	0.28
33	Nonmetallic mineral products	1.73	0.22	0.15	0.12
34	Basic metal products	n.a.	10.26	2.12	0.61
35	Fabricated metal products		0.41	0.17	0.32
36	Machinery except electrical	6.98	10.26	7.65	6.76
37	Electrical machinery		2.65	0.56	0.71
38	Transportation equipment		1.12	2.66	1.01
39	Miscellaneous manufactures	44.38	0.22	0.19	0.20

[1] n. a. means not available.

Source: R. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: NBER, Inc. 1975), p. 126.

between 1948 and 1956. During this period, the ratio of imports of manufacturing to gross value of manufacturing output declined from 1.13 to 0.55. However, little further import substitution occurred between 1956 and 1960. By 1960, hardly any import substitution was evident for manufacturing.

This finding is also confirmed by Power and Sicat's estimates of the growth rates for national product, manufacturing and agriculture between 1948 and 1968 as shown in Table 9. They noted the sharp decrease in the growth rates of manufacturing and of national product after 1956 and explained that this "might . . . be attributed to declining opportunities for easy import substitution in the final processing of consumption goods."

TABLE 9

Growth Rates of National Product, Manufacturing, and Agriculture, 1948-68

(Average annual percentage changes at 1955 prices)

Period	Gross National Product	National Income	Value Added in Manufacturing	Value Added in Agriculture[1/]
1948-52	9.2	9.1	10.5	6.6
1950-60	7.9	7.8	12.3	6.2
1952-60	7.7	7.6	12.9	6.3
1956-60	4.4	4.6	6.3	3.3
1960-64	5.6	5.1	4.8	3.5
1964-68	6.1	5.3	4.7	6.9

[1/] Includes fishing and forestry.

Source: J. Power and G. Sicat, *The Philippines: Industrialization and Trade Policies* (London: Oxford University Press, 1971), p. 39.

In view of this, the presence of EPR resource allocative effects is further examined here by testing the relation of the effective protection rate with the import share in total supply among sectors. For the results to mean anything, comparability is necessary in terms of the time period covered by the variables used as indicators. The 1974 EPR estimates may be assumed to reflect the structure of industrial protection and incentives in the postwar period. No substantial change occurred in the country's tariff and tax structures since the 1950s, either in the form of public record or as a matter of public policy (3). The 1972 tariff revision was aimed principally to simplify the tariff schedules to improve the administration of customs duties. Except for a few amendments and some added provisions for

the imposition of export taxes and special duties to protect Philippine industries from international dumping, few petitions for exemptions and changes in tariff rates have been granted (18). Furthermore, a comparison of the 1974 EPR estimates with those for 1965 (19) yields the same structure of relative effective rates among sectoral groups. While tariff policy became the effective instrument of protection since 1962 with the advent of decontrol, the same protection structure it has promoted was likewise maintained by the import and exchange controls in the 1950s (19). For these reasons, the 1974 EPR estimates are reflective of the industrial incentive structure from the 1950s until 1974.

For sectoral import shares in total supply, the 1974 import-to-supply ratio (M/S) by sector is taken to measure the extent of import substitution which has taken place between 1950 and 1974. This implies a crude assumption that the import shares in total supply in 1950 were approximately the same across sectors and were very high.

To determine the relationship of the effective protection rates with the import share in supply for various sectors, linear regression equations were fitted between the 1974 EPR estimates and the M/S ratios for these sectors. Since the relationship of the extent of protection accorded to industries and their inducement for import substitution is to be examined, the relevant sectors for observation exclude the exportable sectors, where the inducement for import substitution is expected to depend more on external factors such as growth of foreign demand and favorable export prices than on domestic incentives. Excluding the exportables eliminates most of the primary and agricultural sectors because of their heavy export orientation. The actual correlation is therefore done on 47 manufacturing nonexportable sectors.

The results for the import share in total supply show significant negative correlation with the effective protection rate. This implies that higher EPRs induce industries to increase the share of domestic production in supply. This supports the importance of protection in the Philippines where policy has sought, for the last two decades, to institute import substitution as an industrialization strategy. Indeed, protection for import substitution has been the principal vehicle for stimulating domestic production.

The EPR's significant influence on the extent of import substitution among sectors notwithstanding, it is possible that nonpolicy related variables, which reflect sectoral comparative costs and pro-

ductivities, are just as significant. In addition to the EPR, which may have constituted the government's explicit policy of sectoral priorities for more than two decades, it would therefore be useful to know the influence of nonpolicy factors on the sectoral variance in the extent of import substitution. As proxy for the nonpolicy variables, two alternative indicators are used. The first consists of such indicators of partial factor productivity as value added per unit of labor and value added per unit of capital with value added corrected for the effect of protection. The second is the 1974 sectoral domestic resource cost (DRC) estimates made on the basis of the 1974 I-O sectoral classification (6). The DRC measure, valued at accounting (shadow) prices, represents the amount of domestic resources used per unit of foreign exchange earned or saved from the production of a tradable good, indicating relative comparative advantage of industries (7), (15, pp. 466 — 480).

In determining the effects of the EPR and the nonpolicy variables as determinants of the share of imports in total supply, various combinations of the effective protection rate, domestic resource cost, labor productivity and capital productivity as the explanatory variables were tried. In all the specifications of the regression model from 1 through 8, where the EPR is an explanatory variable (Table 10), only the EPR coefficient is significant while the computed t values (figures in parenthesis) of the coefficients of the other variables are not statistically different from zero. Moreover, there is not much difference in the explained variance in the import share in total supply, R^2 which is approximately 44 per cent. The regression results imply that the import substitution equation is a simple functional relationship between the import share in supply and the EPR. The estimate of the equation is

$$M/S = .48 - 0.23\ EPR$$

which says that, on the average, a sector with zero EPR would have a 48 per cent import share in total supply and that a 10 percentage point increase in EPR would subtract 2.3 per cent from the share of imports in total supply.

This relationship implies the EPR's predominance in influencing sectoral differences in import share in supply. It is expected therefore, that resource allocation through import substitution among sectors has been more in accordance with relative incentives among sectors, as affected by a policy variable such as the EPR, than nonpolicy factors such as comparative costs and labor productivity among sectors. This further confirms the EPR's effectiveness

TABLE 10

Import Substitution Equations
(dependent variable: M/S)

n	A	X_1	X_2	X_3	X_4	R^2
1	0.48	−0.255 (−5.40)	0.337 (0.57)	−0.061 (−0.63)	0.006 (0.19)	0.447
2	0.48	−0.254 (−5.46)	0.337 (0.58)	−0.050 (−0.64)		0.446
3	0.46	−0.247 (−5.45)	0.382 (0.66)		−0.005 (−0.20)	
4	0.51	−0.244 (−5.65)		−0.068 (−0.71)	0.006 (0.19)	0.443
5	0.45	−0.246 (−5.54)	0.392 (0.69)			0.441
6	0.51	−0.244 (−5.71)		−0.057 (−0.74)		0.442
7	0.49	−0.234 −5.75)			−0.006 (−0.26)	0.436
8	0.48	−0.232 (−5.89)				0.435

M/S means import-to-supply ratio
A means constant
X_1 means per cent effective protection rate
X_2 means domestic resource cost
X_3 means labor productivity
X_4 means capital productivity

as a policy instrument in effecting changes in the structure of resource flows and import substitution in the economy.[5]

Table 11 shows that the import share in total supply by sectoral group classified by end use follows inversely the structure of EPR; import shares are lowest for consumption goods and highest for

[5]That the EPR is more relevant than the nominal rate in bringing out the structure of protection and in explaining resource flows is further emphasized by the no correlation result obtained between the nominal rate and the import share in supply.

TABLE 11

Average EPRs and Import Shares in Total Supply in Manufacturing, 1974

Sectoral Group	Effective Rate (Per cent)	Rank High to low	Import Share (Per cent)	Rank Low to High
Intermediate Inputs	23	2	9.68	1
Capital goods	18	3	76.92	4
Inputs into Construction	16	4	25.02	3
Consumption goods	77	1	10.35	2

capital goods. Intermediate goods and inputs into construction have import shares in between the two extreme categories. As induced by the EPR structure, therefore, resources have moved relatively toward greater import substitution or lower M/S in consumption goods sectors and higher M/S in capital goods sectors and, to a lesser extent, also in intermediate goods sectors. This has resulted in a structure of domestic production where most of the consumption goods sectors have already exhausted their import substitution possibilities as reflected by the less than 10 per cent import ratios. In contrast, the capital goods sectors reflect the reverse situation. Over two decades of industrialization, heavily dominated by an EPR structure described above, have indeed succeeded in directing the flow of resources and the structure of domestic production away from backward linkage import substitution and from export expansion. The declining opportunities for easy import substitution in the final processing of consumption goods, together with the protective structure's bias against further import substitution in the capital and intermediate goods sector as well as against production for exports, may help explain the constraint since the 1960s on manufacturing growth.

EPR and Characteristics of Industries

It has been shown earlier that the structure of EPR and the directions of resource flows it implies are distinctly related to the pattern of industrial import substitution. Relatively higher EPRs have encouraged resources into certain industries by inducing them to increase the domestic output share. High EPRs are therefore associated with low import shares among industries, an inference

which is useful for designing tariff and incentive policies. Similar useful inferences may be made concerning the relationship of the structure of EPR and resource flows with other industrial characteristics. For this purpose, several characteristics of industries pertaining to domestic resource cost, factor productivity, capital and labor intensity, foreign exchange dependence, and export orientation have been examined for correlation with the 1974 EPR estimates for 77 sectors. The results are shown in Table 12.

TABLE 12

Rank Correlation Results for EPR and Industrial Characteristics

Industrial Characteristics	R	T-Value
Domestic resource cost	0.640	5.59[a]
Capital productivity	−0.341	−2.44[b]
Labor productivity	−0.579	−4.77[a]
Capital-labor ratio	−0.090	−0.78
Foreign exchange intensity	0.234	2.08[c]
Export orientation	−0.557	−5.81[a]

[a] Significant at 1 per cent level
[b] Significant at 5 per cent level
[c] Significant at 10 per cent level

Domestic Resource Cost and Factor Productivity. A significant policy concern, especially among developing countries, is the efficiency with which resources are allocated among various sectors of the economy. Since the object is to maximize allocative efficiency, economic choices are presented in terms of the opportunity or social costs of domestic resources in their alternative uses. An increasingly accepted measure of the opportunity or social costs of domestic resources in their various uses is the domestic resource cost (DRC) which has been used widely in several countries, notably in Israel, for planning purposes (7). As measured, the DRC, valued at accounting (shadow) prices, indicates the costs, in terms of the amount of domestic resources used per unit of foreign exchange saved or earned, of producing a tradable good (7), (15, pp. 466-480). A sector or industry is considered to have comparative advantage or disadvantage depending on whether its DRC is less or greater than the shadow price of foreign exchange. A ranking of sectors according to their DRC yields the sectoral comparative advantage or disadvantage or the relative efficiency or inefficiency of the economy in a range of sectors.

In the Philippines, sectoral DRCs in manufacturing were first estimated and studied for 1969 (5) and later compared with the more recent DRC estimates for 1974 (6). These studies show a wide variation in sectoral DRCs implying the tendency to misallocate resources among competing uses. Other measures which also indicate sectoral efficiency are such indices of partial factor productivity as labor productivity and capital productivity. Labor productivity is represented by the ratio of value added to the number of workers employed in a sector, while capital productivity is represented by the ratio of value added to the replacement value of capital in a sector. In both measures, value added is corrected for the effect of protection by using the estimates of international value added derived from deflating domestic value added by the implicit protection rates for outputs and inputs of sectors. The capital and labor productivity indices in this study are derived from the 1974 I-O Transactions Table, Annual Survey of Manufactures (ASM) basic data and the estimates of international value added as well as of the replacement value of capital.[6]

A presumed relationship between effective rates and industrial efficiency stems from a dynamic aspect of protection — the element of reduced competitive pressure facing an industry when protection is present (13, pp. 134-155), (22, p. 300), (21). Performance in terms of efficiency may vary according to the extent of protection an industry enjoys. Therefore, the lower industrial efficiency accompanying high industrial protection can be considered as a cost in addition to the usual allocative costs of protection resulting from distortions in relative prices. Relating protection to the efficiencies of protected industries seems to be valid in the light of some evidence that very large magnitudes of production inefficiencies are attributable to the absence of enough environmental pressures for firms to reduce costs (16, pp. 392-415).

Table 12 shows a significant positive correlation between EPR and DRC. It appears that industries with higher DRCs are associated with correspondingly higher EPRs. Therefore, it seems plausible that effective protection may have been offered in degrees which tend to offset the differences in comparative advantage among industries.

This finding of greater protection related with higher DRCs across industries is consistent with the significant negative correlations of the EPR with labor productivity and capital productivity,

[6] Estimates in Power (20).

also shown in Table 12. These results imply that the protection system gives relatively more incentives to the industries with lower labor and capital productivities. Thus, it seems that the system of protection has served to misallocate resources from the more efficient sectors to the less efficient ones by artificially raising the profitability rates of the latter industry group through protection.

Capital and Labor Intensity. In view of the national concern to promote industries using resources in proportions suited to the domestic factor-price ratios, it would likewise be interesting to know the relationship of the EPR with capital intensity and labor intensity across sectors. Capital intensities measured by capital-labor ratios (K/L) have been shown empirically to vary across industries (1, pp. 225-250) although the structure of industrial capital-labor ratios are closely similar among countries (14). Capital-labor ratios for Philippine manufacturing have been estimated for 1974 as the value of replacement capital per worker for the Input-Output sectoral classification for that year and have been shown to vary across sectors. The EPR is not significantly associated with K/L or L/K. Apparently, the system of protection is not biased in favor of its scarce resource capital or its abundant resource labor, by not providing relatively higher EPRs either to labor-intensive industries or to capital-intensive industries. This indicates that the protection system has not served to promote any bias in the factor intensity of protected industries. Apparently, the policy to promote labor-intensive industries for employment generation has been sought in other policy areas outside the protection system.

Import Dependence. The intensity of foreign exchange use of industries through the imported direct inputs per unit of output would give useful information on the foreign exchange use of producing sectors and how these are related with the EPR. It would be useful to know whether or not the country's protection system has relatively favored the more import-dependent and foreign exchange-using sectors over those which use relatively more of domestic resources. The foreign exchange intensity of an industry is calculated as the ratio of imported direct inputs to output, derived from the 1974 Input-Output Transactions Table.

Effective protection rates appear to be positively correlated with the foreign exchange intensity of industries. Higher EPRs are associated with greater amounts of foreign exchange used for imported inputs. It seems that protection, as implemented, has not reflected a bias for the less foreign exchange-using industries. Instead, it has tended to favor the more foreign exchange-intensive industries. This

finding indicates that the system of protection runs counter to the recognized need of conserving foreign exchange. Thus, not only is the system of protection biased against the earning of foreign exchange through the penalty imposed on exports, it is likewise biased in favor of the relatively heavy users of foreign exchange.

Export Orientation. Export orientation is another industrial characteristic considered important in formulating policies related to investment and resource allocation. The dual functions of generating output and employment with practically unlimited market possibilities, as well as providing needed foreign exchange, underly the priority given to exports, particularly of manufactures, in the national development strategy. The measure used for export orientation is the ratio of exports to output.

Results show a significant negative correlation between export orientation and the EPR. The more export-oriented industries actually receive relatively lower and even negative EPR. Despite the indications for greater efficiency in terms of scale economies, specialization and market competition in industries with higher export-output ratios, these industries, rather than the more domestic market-oriented industries, have been relatively penalized by the protection system. Even if the taxation on inputs were fully eliminated by the system of "drawbacks", exports would still be receiving zero protection from the tariff and tax system. Moreover, if the 28 per cent overvaluation of the currency is applied on exports, this amounts to a 28 per cent tax on export. Benefits to exports, in terms of BOI subsidies in the national investment and priorities plans which are heavily directed toward export-oriented industries, are too minimal to offset the general penalty on exports imposed by the system of protection.

Concluding Remarks

The pervasive influence of protection on the allocation of resources, as discussed above, stresses its importance as an instrument of industrial policy. Some disturbing implications, however, are indicated about the directions protection has taken based on evidence regarding the relationship between the level of protection and certain characteristics of industries. Particularly important for its implications on the growth of national output is the finding that the relatively more inefficient and high-cost industries are also the more highly protected industries. Apparently, the system of protection may have served to misallocate resources from the more efficient

sectors to the less efficient ones by artificially raising the profitability rates of the less efficient sectors through protection. In the light of the national concern to promote industries utilizing resources in proportions suited to the domestic-price ratios, it is quite an interesting finding that the protection system is neutral as regards the factor intensity of industries. Not providing higher protection either to labor-intensive industries or to capital-intensive industries, the protection system has not served the policy of promoting labor-intensive industries to generate employment. Considering the country's balance of payments problems, another important implication is that the protection system runs counter to the recognized need for conserving foreign exchange by showing a bias for the foreign exchange-intensive industries. Ironically, too, the more export-oriented industries are given lower and even negative protection relative to the more domestic market-oriented industries. Thus, not only is the system of protection biased in favor of the relatively heavy users of foreign exchange, it is likewise biased against the earning of foreign exchange through the penalty it imposes on exports. These implications suggest a reexamination of the country's system of protection and its use in the overall scheme of industrial policies.

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