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Volume Title: International Comparisons of Prices and Output

Volume Author/Editor: D. J. Daly, editor

Volume Publisher: NBER

Volume ISBN: 0-870-14244-5

Volume URL: <http://www.nber.org/books/daly72-1>

Publication Date: 1972

Chapter Title: International Price Comparisons of Selected Capital Goods Industries

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Chapter URL: <http://www.nber.org/chapters/c5098>

Chapter pages in book: (p. 335 - 367)

Price and Cost Differences—  
Industries and Commodities



# International Price Comparisons of Selected Capital Goods Industries

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INTERNATIONAL BANK FOR RECONSTRUCTION  
AND DEVELOPMENT

IN the past two decades developing countries have invested an increasing proportion of their resources in new industries and the infrastructure needed to support them. Many of the new industries have been light, simple, and consumer oriented. But a significant number of less developed countries (LDC's), mostly the larger and richer ones, have established heavy, more complex capital goods industries. Both sectors of industry have been largely oriented to the domestic market, although there are some LDC's which have succeeded in sharply increasing their industrial exports, mostly of light and simple products.

The absence of export success may in itself suggest the prevalence of substantial price differentials and cast a doubt on the efficiency and competitiveness of the new industries. The question has been raised in several quarters whether, in fact, the resources spent on industrialization have been well spent or whether the LDC's could have achieved more growth—in domestic product or export earnings—by a different design of industrialization or by more emphasis on other sectors. These questions are of special relevance for the newly established capital goods industries, because:

1. Several LDC's which have not yet, or hardly, begun with heavy industrialization are appraising the case for establishing capital goods industries.

NOTE: This paper is in part based on research undertaken in the World Bank but the views expressed are those of the author and do not necessarily reflect those of the bank. The author acknowledges comments received on an earlier version of this article by Bela Balassa, Ayhan Cilingiroglu, Vinod Dubey, and Bertil Walstedt.

2. The investment outlays for capital goods industries and their related infrastructure are substantial and may impose severe strains on the country's finances, leading to inflation and eventual impairment of industrial efficiency.

3. While the growth of exports of light industrial products has in some countries been promising, a breakthrough of exports from the larger LDC's (which have invested in heavy industry and had by and large the poorer industrial export performance) will require exports from the engineering and other capital goods industries. (See [5].) When competitive, these industries can obtain the large orders that will make for substantial and sustained export growth.

Questions about international price differentials and, more broadly, the competitiveness of industry in the LDC's and the success of import substitution as a development strategy have been extensively discussed in the professional literature. There is now a growing body of empirical material, in particular on Latin American and Indian experience, which can provide guidance to policy makers in these and other countries. This study adds to the empirical findings on international price differentials prevailing in selected capital goods industries and then discusses the main explanatory factors underlying the price difference between LDC's and industrial countries.

#### THE NATURE AND LEVEL OF PRICE DIFFERENTIALS

The difference between LDC prices and prices of comparable competing supplies is maintained with the help of a wide variety of measures in the importing countries. The measures include outright prohibition, quantitative restrictions, multiple exchange rates, and restrictions on procurement for public or infrastructure projects. One particular measure, common to many LDC's, is the requirement that no import license be granted for products which are also produced locally unless it can be demonstrated that the local product does not suit the purpose of the user. The particular *form* or *technique* by which price differentials are maintained may over time affect their magnitudes, i.e., have an impact on the competitiveness of industry. In this paper the differences in prices between imported and domestic products will be called "protection." Thus, the paper disregards the

particular technique of protection, and instead focuses on the magnitude and possible economic causes of the price differentials.

It is now generally recognized that in calculating protection a distinction must be made between gross or nominal protection and net protection, i.e., protection of value added after allowing for the excess cost (over international levels) or material inputs ([1], [2], and [3]). These two measures make it possible to single out material input costs as one important cost-raising factor.

For the LDC producer let

$p$  = price of final product

$a$  = cost of imported materials

$b$  = cost of domestic materials and supplies

$c$  = value added

$p = a + b + c$  and  $p' = a' + b' + c'$ , the comparable prices and costs of a representative foreign producer, expressed in the same currency as  $p$ , etc., calculated at the applicable rate of exchange.

Gross protection is

$$T_1 = (a + b + c)/(a' + b' + c') - 1.$$

Protection, assuming imported inputs at international prices, is

$$T_2 = (a' + b + c)/(a' + b' + c') - 1.$$

Net protection is

$$T_3 = (a' + b' + c)/(a' + b' + c') - 1.$$

It will be noted that net protection is similar to "effective" protection  $T_4$ , a measure which has recently been widely used (e.g., [4]):

$$T_4 = (c/c') - 1 = (p'/c')T_3$$

When either  $T_3$  or  $T_4$  is negative, but  $T_1$  is positive, the industry can be export-competitive if appropriate allowance is made for excess input costs.

The domestic resource cost per unit of foreign exchange saved, a concept used by Bruno [3], is defined as  $(b + c)/(p' - a)$ .

The differences of the first three measures of protection, all expressed as a proportion of the foreign price of the finished product, are:

$T_1 - T_2 = T_a$  and  $T_2 - T_3 = T_b$ , where  $T_a = (a - a')/p'$  measures the excess of the cost of the import component of materials over international levels (i.e., the prices paid by a representative foreign producer). This excess may be caused by duties or other taxes or by imperfections in international prices or because purchases by LDC producers are on a smaller scale than those of their competitors.  $T_b = (b - b')/p'$  measures the excess of prices of domestically produced material and supply inputs over comparable prices paid by producers in developed countries.

In testing the competitiveness of LDC capital goods industries one would like to have calculations for a wide range of individual products at different times and in different countries. Such results cannot be expected for some time, especially since these price data are not included in regular statistical series. Instead, one has to resort to a comparison of fairly broad aggregates which may cover up points relevant to certain policy decisions. An alternative would be comparisons over time even if these are possible for only few products. This paper presents price calculations for thirty products in four countries as of approximately the same time (1966).

Table 1 presents the observations of  $a$ ,  $b$ ,  $a/p$ ,  $b/p$ , and the four measures of protection for products of the automotive, heavy electrical, and mechanical equipment industries in Argentina, Brazil, Mexico and Pakistan.<sup>1</sup>

Comparisons have been made between LDC prices of finished products and components and those prevailing in industrial countries (converted to a c.i.f.—cost, insurance, and freight—import basis). For the automotive industry, the comparison was between prices of home plants and/or international manufacturers and their subsidiaries. For the other industries, comparisons were made with import prices of finished products in the LDC's and material input prices of representative producers in the industrial countries (again often parent companies).

The data presented should be interpreted with care, considering in particular that:

<sup>1</sup> This section draws on findings from field visits undertaken by Jack Baranson, Ayhan Cilingiroglu, and José Datas-Panero, of the IBRD staff. Most of these will be presented in more detail in [7] and [8].

1. Price data from both developed countries and LDC's change over time. Most of the data presented here are based on information obtained in 1966.

2. The coverage is limited and uneven.

3. Firms may quote different prices for the same or nearly the same equipment, depending on their particular relations with the customer or country. Price indications may vary with the source of the information, e.g., as obtained from bid analysis or company interviews.

4. In practice, selection of a price for the purpose of comparison must allow for many factors, including delivery time, financing terms, quality, performance, maintenance costs, etc.

Subject to these reservations one may draw the following general conclusions:

1. The excess material costs account for a significant part of gross protection.

2. The protection rates, either gross or net ( $T_1$  or  $T_3$ ) show considerable variation within individual countries.

3. Eliminating the excess material costs reduces the extent of variation: the  $T_3$  series has a smaller standard deviation (35.3) than the  $T_1$  series (46.0).

4. Among the countries included, industry in Argentina has the highest protection rates, both net and gross.

The effect of commonly recognized cost-raising factors on the variation in protection rates is less obvious and straightforward. The next section discusses these factors in the light of the data and the experience obtained in collecting the data and discussing them with the firms concerned.

#### MAJOR COST-RAISING FACTORS

##### *Start-up Costs*

In its early years an industrial firm is bound to incur special costs associated with getting established. These costs include training of the production workers and of the technical, administrative, and supervisory force and management; expenses associated with the start-up of a new plant; the build-up of production volume to capacity level and



TABLE 1  
International Price Comparisons of Selected Products

Country and Product	Material and Supplies as % of Final Price <sup>a</sup>			Import Com- ponent [col. (3) as % of (1)]			Ratios: Do- mestic to Inter- national Price <sup>c</sup>			Protection (% of foreign price) <sup>d</sup>			Domestic Resource Cost (per unit of foreign exchange saved) (11)
	Total (1)	Do- mestic (2)	Im- ported (3)	(1)	(4)	(5)	Do- mestic Mate- rials (6)	Im- ported Mate- rials (7)	Gross (8)	Inputs at Inter- national Prices (9)	Net <sup>e</sup> (10)		
												(1)	
Small truck <sup>a</sup>													
Argentina	61	49	12	19.7	2.34	2.43	2.43	2.43	80	67	17	31	1.74
Brazil	57	53	4	7.0	1.54	2.25	2.25	2.25	28	25	2	3	1.26
Mexico	71	39	32	45.1	2.66	2.03	2.03	2.03	52	27	-10	-18	1.36
Small truck <sup>b</sup>													
Argentina	74	62	12	16.2	3.48	2.50	2.50	2.50	104	90	-1	-2	1.99
Brazil	72	68	4	5.6	2.32	2.50	2.50	2.50	50	46.5	-11	-20	1.48
Mexico	75	43	32	42.7	2.23	2.00	2.00	2.00	30	10	-20	-38	1.07
Mechanical industry													
Argentina													
Diesel engine 225/280 HP	37	22	15	40.5	2.43	1.09	1.09	1.09	99	97	71	132	2.35
Diesel engine 410/685 HP	40	22	18	45.0	3.30	1.12	1.12	1.12	133	129	93	200	3.07
Tractor deca A-55	47	42	5	10.6	3.44	1.11	1.11	1.11	207	205	114	233	3.38
Mexico													
Excavator	45	25	20	44.0	1.30	1.09	1.09	1.09	21	19	12	22	1.25
Crusher	28	8	20	71.4	1.32	1.07	1.07	1.07	24	22	20	28	1.29
Road Roller	41	24	17	41.5	1.57	1.11	1.11	1.11	43	41	29	50	1.52
Motor Grader	49	23	26	53.1	1.40	1.11	1.11	1.11	26	23	15	30	1.33
Boiler	40	24	16	40.0	1.40	1.11	1.11	1.11	40	38	28	51	1.48

Heavy electrical equipment											
Argentina: generators											
	39.0	15.3	23.7	61.0	2.13	1.49	150.0	131.0	112.0	260.0	4.95
2,109 KVA	33.5	15.3	18.6	55.0	1.68	1.42	81.0	71.0	59.8	100.0	1.83
Brazil											
Transformer 33 MVA 220/88 KV	51.8	12.6	39.2	75.7	1.28	1.64	17.0	-2.0	-5.9	-9.9	1.5
Generator 42 MVA 13.8 KV 100 rpm	45.9	11.6	34.3	74.9	1.38	1.09	46.0	42.0	36.5	77.0	2.0
Motor 700 HP 6.9 KV	19.3	12.5	6.8	35.2	1.65	1.00	50.0	50.0	42.0	44.0	1.6
Generator 1,500 KVA 380 V 900 rpm	50.3	25.7	24.6	48.8	1.56	1.37	6.1	-1.5	-11.3	-20.4	1.1
Mexico											
Transformer											
25/33 MVA 161/69 KV	80.6	40.2	40.4	50.1	1.61	1.16	20.0	13.0	-5.0	-17.6	1.38
12.5 MVA 115/6.9 KV	79.5	34.1	45.4	57.0	1.53	1.20	-10.0	-17.0	-27.6	-59.9	0.83
40/55 MVA 115/66/13.8 KV	80.9	25.7	55.2	68.4	1.30	1.34	40.0	20.0	11.1	78.4	2.77
92 MVA 230/13.2 KV	77.4	22.0	55.4	71.6	1.68	1.22	28.1	15.0	4.0	16.4	1.97
Switch panel 2,400 V 3-phase	78.9	29.2	49.7	63.1	1.25	1.39	25.0	16.0	8.6	43.2	2.06
Motor control panel 480 V 3-phase	73.9	60.3	13.6	19.5	1.47	1.08	45.0	45.0	17.3	54.3	1.56
Distribution table 2 sections	79.1	19.9	59.2	74.8	1.96	1.32	45.0	24.0	9.8	47.8	4.19
Current transformer	17.1	13.0	4.1	56.3	1.38	1.00	40.0	40.0	35.0	43.1	1.57
Pakistan											
Motor 20 HP 380/220 V	64.9	23.2	41.7	64.3	2.17	1.34	71.0	52.0	29.0	92.0	3.3
Transformer											
25 KVA 11/0.4 KV	46.6	26.8	19.8	42.4	2.48	1.15	48.8	45.0	21.2	36.0	1.81
50 KVA 11/0.4 KV	53.2	21.6	31.6	59.3	1.93	1.18	77.7	68.0	50.0	148.2	2.7

Note: The definitions of columns 7-11 are discussed in the text.

<sup>a</sup> Supplies include electricity, fuel, lubricants, office supplies, and rent.

<sup>b</sup> Including indirect, i.e., import component of domestic inputs and depreciation unless otherwise specified.

<sup>c</sup> Domestic prices include taxes unless otherwise indicated.

<sup>d</sup> International price (c.i.f., port of entry, unless otherwise indicated).

<sup>e</sup> I.e., assuming all material and supply inputs are valued at international prices.

<sup>f</sup> Defined as percentage premium of value added of domestic industry over that of representative international manufacturer.

<sup>g</sup> Foreign prices f.o.b. Foreign and domestic prices excluding indirect taxes.

<sup>h</sup> Prices c.i.f., and including indirect taxes.

adaptation of the production process to local conditions; the opening up of supplier industries.

After an initial in-training period for labor, management, and plant, a firm producing heavy equipment will gradually upgrade the size and quality of its product—at least part of this process may be regarded as a starting up of the plant.

In the LDC's start-up costs will tend to be higher and they may extend over a longer period of time than in advanced industrial nations. In some cases start-up costs may exceed the cost of fixed plant. The starting-up period cannot be defined with precision. It will vary with countries, industries, and even firms.

An argument can be made for treating start-up cost separately in calculating the cost of the industrial investment. Since much of this cost will be peculiar to the conditions in the LDC, it may also be argued that it should be treated somehow without being expressed in the price paid by final users or in the price used for comparison with import prices. Rarely, the start-up cost can be written off by the parent firm. Part or all of the cost may be absorbed by the LDC government, for example, in the form of an outright subsidy, exemption from taxes, a participation in equity, or a loan on concessionary terms. If no special arrangements are made, the start-up costs will increase the product's price during the early years of the firm: the protection in those years may be substantial.

The impact of start-up costs are difficult to trace in the data. Most of the firms presented are in the latter part of the start-up period, having been in production at least three or four years. Most of them are also receiving special financing to cover at least part of the start-up costs, e.g., tax holidays (e.g., Mexico) or financing at subsidized interest rates (e.g., Brazil). No comparative analysis was made of the arrangements for financing start-up cost. A substantial part was probably absorbed by the parent company which, however, will expect a return on its investment in later years.

Apparently Brazilian truck manufacturers received domestic inputs at better prices than their counterparts in Argentina or Mexico. The former were further ahead in the start-up period. In Hirschman's terminology there was more backward linkage in Brazil. The cost of establishing backward linkage is part of the start-up cost. Hirschman

[6] discusses some deep-seated social reasons for limited backward linkages, whose impact may stretch well beyond any reasonable start-up period and will keep input costs high. Additional reasons why input costs may be high will be discussed next.

*Cost of Material Inputs*

An important determinant of input costs ( $T_a + T_b$ ) may be the relative importance of the import component, since imports are often cheaper than domestic products. Even so, imported materials may be expensive when compared with prices paid by competing industries in developed countries. At times the smaller LDC firms may have to pay for smaller lots than their much larger counterparts in the industrial countries. International firms may control the price of their inputs and charge prices for industrial components which appear high when compared with the cost of the final product of which they are a part. The premium thus charged may be higher as the imported components are reduced.<sup>2</sup> At the same time, material cost will go up as domestic producers switch to domestic supplies. In some industries the cost differential rises sharply as the domestic content begins to include the more complex components. The size of the domestic component will vary with the availability of local raw materials and components but in many cases is pushed up regardless of cost consideration by government requirements. Thus, the excess of LDC prices over imports may be directly related to the size of the domestic component.

The relatively high cost of materials inputs in the truck industry makes for a sharp difference between gross and net protection. In some cases the latter is negative, suggesting that the industry can be competitive on export markets. In the production of trucks domestic costs become especially high after the import component falls below 35 per cent, both because of the deletion allowance and the excess costs of engine, driveline, and sheet metal, especially in Argentina.<sup>3</sup>

A striking feature is the high cost of imported inputs in the electrical equipment industry, caused by high ex-duty prices paid for raw material inputs (e.g., electrolytic copper).

It is conceivable that the high cost of inputs ( $T_a + T_b$ ) turns a low

<sup>2</sup> In the trade the premium takes the form of a "deletion allowance."

<sup>3</sup> Cf. [7].

net protection ( $T_3$ ) into a high gross protection ( $T_1$ ). As noted, this appears to be the case with the truck industry. But in a larger number of cases both  $T_1$  and  $T_3$  are high (or low) at the same time, or—put in another way—net protection and high input costs go together. The data suggest a high correlation between  $T_3$  and  $T_1$  and between  $T_3$  and  $(T_a + T_b)$ .<sup>4</sup> It would seem that, in intercountry comparisons, singling out input cost as a cost-raising factor in a way begs the question. One suspects that in some situations the factors causing net protection to be high also operate on input costs. These factors might be volume of production, or exchange rate policy and the general level of protection, which are taken up next.

#### *Volume of Production*

Economies of scale, important for several products, are hard to come by in the relatively small markets of most LDC's. In many lines there are few plant and product designs which will make for efficient operations at low volumes. Export growth, a crucial way of widening markets, is often handicapped by excessive domestic orientation of industry. A comparison of the electrical equipment industries of Austria and Argentina is telling. Although these industries have markets of similar size in these countries, Austria exports two-thirds of the output of its industry but Argentina exports none. None of the firms from which data are presented exported to any significant extent.

The structure of the industry may further limit the volume of production of individual firms. In fact, some countries have far too many firms, all of them too small for efficiency. They began by providing home producers with heavy protection. Then they sought to obtain competition by permitting several firms under the protection umbrella. The final result has often been high production cost and low capacity utilization. An almost classic example is the Argentine automobile industry, in which there are 13 manufacturers producing 68 models.

Related to economies of scale is the better capacity of larger firms to adopt and assimilate advanced technology.

<sup>4</sup> The correlation coefficient between the  $T_3$  and  $(T_a + T_b)$  series is  $R = .7018$ ; that between  $T_1$  and  $T_3$  is  $.922$ . While these are based on intercountry comparisons, it is noteworthy that Lewis and Guisinger found that for Pakistan a ranking based on gross protection would provide a reasonable approximation for one based on effective protection (cf. [10]).

It is well known that economies of scale are different for different products. Least affected are the more complex products that are made to specific order, such as heavy electric generators. Transformers are another example of a product which may have modest economies of scale. Because of the variety of products covered in the data, it is not possible to pin-point precisely the impact of volume.

In several industries the cost of fixed plant per unit of product was relatively low. Improvement in capacity utilization, frequently low, would reduce the capital cost. However, for many products this factor was outweighed by the impact of high (domestic and imported) material cost.

*Exchange Rate Policy*

The importance of appropriate exchange rate policy has been discussed extensively in the literature. From the viewpoint of making industrial products export-viable, it is the basic export rate of exchange which counts. Thus, the maintenance of an overvalued rate does not promote favorable cost competitiveness. This situation has tended to prevail in some LDC's which have emphasized heavy industrialization, either because overvaluation was pursued as a matter of industrialization policy (see, e.g., [7]), or the exchange rate lagged behind inflationary price increases which accompanied the industrialization efforts.

The exchange rate must, of course, be considered in conjunction with prevailing charges and subsidies on imports and exports. The general level of protection will depend on the level at which the exchange rate is fixed. In some cases the basic rate of exchange may be accompanied by surcharges or uniform duties applicable to broad import categories, while the basic rate applies to most exports. Such practices are not equivalent to maintaining a more depreciated basic rate and doing without some or all of the surcharge. In the former case the basic rate is lower and works as a penalty on exports. LDC's producing capital goods would be especially adversely affected, since in their present phase of development they are able to diversify by increasing exports of new products, both manufactured and agricultural, which may be particularly sensitive to a more favorable exchange rate.

A higher level of general protection may itself be a cause of industrial inefficiency. Protection, especially when exercised through quanti-

tative controls, will shield industry from outside competition and give it an inward orientation. This may be reflected in the structure of industry, small production volumes, high profits, tardiness in adopting new techniques, etc.

Among countries considered, Argentina clearly had an overvalued basic rate at the time the data was collected. Subsequently, in 1967, it devalued by 41 per cent. This factor accounts for a substantial part of the high protection rates observed in Argentina. In Brazil, exchange rate policy was to adjust the rate to domestic price changes, but the policy was implemented stepwise (about every twelve months), while inflation proceeded at 25 to 40 per cent per annum; consequently, the "realism" of the exchange rate was bound to erode even in a period of months. On the other hand, as part of Brazil's stabilization efforts manufacturers attempted to keep their own prices stable even though the general trend was upward.

#### *Other Factors*

The impact of the factors enumerated thus far must be seen against the background of others which may have affected the observations to some extent.

Besides exchange rates and protection, LDC policies may influence costs through the impact of inflation and demand stability. LDC governments must often take measures to moderate the pace of expansion. These measures, affecting public expenditure or credit extension, impinge heavily on the demand for capital goods. LDC industries, confining their sales to the home market, are not able to offset domestic fluctuations with larger exports. Capital goods industries in the LDC's have probably been subject to more severe fluctuations than their counterparts in industrial countries. These fluctuations have aggravated the problem of excess capacity.

High protection rates (as defined in this paper) may be associated with (or cause) high profits per unit of product. There was some evidence of this in the cost breakdown underlying the data presented.

The cost of capital (per unit of output) varied greatly from country to country or product to product. It will depend on the capital intensiveness of the production process. The real interest rate in LDC's is, of course, at least as high as in developed countries. The amount of

working capital required may be high in the LDC's because of the absence of a dependable raw material supply (both domestic and imported); its costs may be high particularly if the manufacturer—squeezed by inflation, with costs rising faster than finished product prices—must rely on outside financing. Furthermore, financing of finished products, indispensable for capital equipment sales, may be more expensive than in developed countries, if facilities for such financing exist at all.

The cost per worker of supervisory and production staff is generally below that in industrialized countries. But this advantage may be offset by higher labor requirements, so labor costs per unit of output may be close to or above those in industrial countries.<sup>5</sup> The share of wages (and sometimes also profits) in total costs may rise in the inflationary process—this may account for the relatively high nonmaterial component of the Argentine products on which observations were made.

It has not been possible to make a comparison of the share of wages in the total cost. The data available often pertain to firms which in turn have greatly different product mixes.

The LDC cost of selling and distribution (per unit of output) also is usually above (sometimes double) that in industrial countries.

#### CONCLUDING REMARKS

The price differential between LDC's and industrial countries is influenced by many factors. These factors or combinations of them apply in widely varying intensities. Consequently, there are wide differences in price differentials for individual products among coun-

<sup>5</sup> For example, following are data on direct labor requirements of three Brazilian items shown in Table 1 (cf. [8]).

	Man-hours Required in		
	Brazil (1)	Industrial Countries (2)	(1) ÷ (2)
Diesel generator, 1,500 KVA; 900 rpm	1,850	600	3.1
Transformer, 300 KVA; 220/88 KV	9,880	4,100	2.4
Water-wheel generator, 42 MVA; 13,820 V	28,000	16,000	1.75



tries or for various products in individual countries. No hard and fast rules seem to exist whereby countries or industries can be classified as to their competitiveness in the manufacture of capital goods.

Any new firm or industry must incur special costs in getting established. Most of these costs are commonly associated with *infant industries*: the training of labor and management, the working-in of the plant and adaptation of the production process to local conditions, opening of supplier and marketing channels, development of supplier industries, etc. In LDC's these costs are bound to be higher and may be stretched over a longer period than in industrial countries with whose products the LDC firm must compete. Unless special provisions are made to finance start-up costs, they will be reflected in the final price; the price differential between local and imported products will then often be substantial. The level and duration of start-up costs vary with the individual firm, industry, and country.

After an initial starting-up period the costs of establishing the industry will be eliminated or at least greatly reduced. The prices of the final product will become more in line with import prices. However, inherent in the basic conditions or prevailing policies of many LDC's are several factors which may work to keep their prices well above comparable import prices.

These factors fall into two broad categories. The first are those which may be influenced by appropriate changes in *government policy*, e.g., exchange rate adjustment, diminished reliance on direct controls, moderation in domestic content requirements, stabilization of public procurement and investment credit. Secondly, there are factors—associated with the hard-core infant-economy argument—which will change only as the economy becomes more developed: scarcity of skills, management, and capital; high cost of services, supplies, and material inputs; high-risk factors; lagging technology; low production volumes. There will be a gray area between these two categories, which may be narrowed by government policies, but which will also be affected by the attitude or actions of industry itself and the progress made in establishing the basic conditions for modern industry. A further consideration is the increasing efficiency of some industries in developed countries, reflected in falling prices during the past five to ten years.

As the start-up period is completed, infant-economy factors will tend

to outweigh the factors associated with a particular infant industry. Moreover, factors considered *internal* to a particular firm may also reflect countrywide conditions and affect other firms and industries.

Generally, the more competitive LDC industries are those which have effectively incurred the initial costs of getting established, are located in countries where there is a reasonably realistic exchange rate and where the number of firms in the industry is not so large as to cause unduly low production volumes in individual firms. Even where this combination of favorable factors prevails, infant-economy factors may impinge on LDC competitiveness, and it is not uncommon to find price differentials up to 15–25 per cent.

Much empirical work currently in progress is based on industry aggregates. However, the data on individual products presented here suggest great variation within the industries. It is worthwhile to check the findings based on industry studies against those pertaining to individual products. Perhaps one ought to be more cautious about broad tariff policy conclusions based on industry aggregates. Certainly, proposals for individual tariffs must be based on studies of individual products.

The data in this paper make possible some intercountry comparisons for similar products. Although industry in the countries selected is in different stages of development, the differences in protection observed are caused also by other factors, such as the structure of industry and exchange rate policy. The conclusions should be substantiated further by studies of the development of industry or production of individual products *over a period of time*. After a five-year lapse it would be worthwhile to take a repeat look at the firms and products studied here.

The high cost of inputs is an important cost-raising factor for some (e.g., the automotive) but not all industries studied here. The data suggest a close correlation between net and gross protection and between the net protection of finished goods and the protection of inputs used in the production of these finished goods. This points to the importance of factors operating on the whole industrial sector or even the economy. This is particularly relevant to the formulation of “minimum conditions” which, as suggested above, should refer in part to conditions for the economy as a whole.

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## COMMENT

DAVID FELIX

My initial reaction to de Vries's paper was, What is there for me to say? The two World Bank studies, *Automotive Industries in Developing Countries* and *Manufacture of Heavy Electrical Equipment in Developing Countries*, are chock-full of hard-to-get information on comparative prices and costs for carefully specified individual products of these two industries; consequently, one can only urge the bank's economics staff to exploit further its unique entree to individual firm data and give us more such valuable studies. De Vries's referral to these data is wrapped in appropriate warnings about their limitations as a basis for broad explanations of the difficulties that LDC's encounter

in trying to move from industrial import substitution to industrial exporting. His analysis of those difficulties is equally qualified, cautiously incorporating most of the conventional explanations without seemingly committing himself on their relative importance. And to cap it all he concludes with a plea for more data. How to uncover grounds in all this blandness for some sort of scholarly confrontation?

I think I have found such grounds. It took some additional readings and a rather unfair stripping away of caveats and qualifications to uncover them, but unfairness is, after all, part of the style of confrontation politics. At any rate, it enables me to move from the uncustomary role of praise-singer to the more comfortable one of critic.

Ruthlessly and unfairly stripped of its qualifications, de Vries's rather optimistic diagnosis of LDC industrial exporting problems is the following.

1. Although unit costs and prices of most LDC industrial products are too high for profitable exporting, this is in part because the cost of final products is substantially increased by heavy duties on imported materials and high rates of protection of domestically produced materials.

2. Independently of import liberalization measures, however, domestic unit costs can still be expected to converge in time toward c.i.f. prices in the LDC's as

- a. High start-up costs are overcome and operative experience improves efficiency at the firm level;
- b. The growth of the home market permits greater exploitation of economies of scale and extensions of backward linkages;
- c. Physical and human capital and external economies accumulate *pari passu* with the further economic development of the LDC's.

3. The favorable cost-price trends can be hastened by adopting more "realistic" (i.e., lower) exchange rates and more liberal commercial policies, i.e., lower tariffs and fewer quantitative import controls. There is ample room for this, since the LDC's manifest a penchant for "overvalued" exchange rates and excessive protection and controls.

The first general point finds ample support in de Vries's Table 1. Although only one of the twenty-eight products has an LDC domestic price below the c.i.f. import price, the number would rise to seven if

all material inputs could be obtained at the estimated c.i.f. prices (and provided, one should add, that the shift to foreign sources of materials would not require firms to hold substantially higher inventory levels).

There is, however, more in the table that is relevant to the diagnosis of export potential. For example, although for 15 of the 28 products the cost of imported materials is a higher percentage of final price than is the cost of domestic materials, lowering domestic material prices to c.i.f. levels would nevertheless reduce the cost of the final product much more than would lowering imported material prices to c.i.f. levels. In other words, the nub of the high materials cost obstacle lies in high protection of domestic rather than imported materials. All four LDC's seem in fact to have been pursuing the standard mercantilist strategy of keeping protection levels high for competitive imports and low for noncompetitive ones. This is indicated in Table 1 by the distribution of values for  $(T_1 - T_2)/T_1$  and  $(T_2 - T_3)/T_1$ . In fact, Table 1 probably understates the ubiquitousness of the strategy, since

TABLE 1

Percentage Decline of Unit Costs of Products in de Vries's Table 1, with Imported and Domestic Materials at C.I.F. Prices<sup>a</sup>

	0-10%	11-20%	21-30%	Over 30%
<b>Decline with Imported Materials at C.I.F. Prices - <math>(T_1 - T_2)/T_1</math></b>				
Argentina	3	3	0	0
Brazil	3	0	0	1
Mexico	6	1	0	6
Pakistan	1	1	1	0
Total	13	5	1	
<b>Decline with Domestic Materials at C.I.F. Prices - <math>(T_2 - T_3)/T_1</math></b>				
Argentina	0	2	2	2
Brazil	0	2	1	1
Mexico	1	1	4	7
Pakistan	0	0	1	2
Total	1	5	8	12

<sup>a</sup> Excludes two products with negligible gross protection ( $T_1 < 10$  per cent).

of the seven  $(T_1 - T_2)/T_1$  items in the 30 per cent group, over six are heavy electrical equipment products whose main domestic buyers, the state-owned utilities, are generally constrained by law and political pressures to buy national.<sup>1</sup>

Table 1 thus suggests two reasons why the convergence of domestic and c.i.f. prices may be a more difficult accomplishment than is implied by de Vries's rather optimistic prognosis. The first is that the easier sort of import liberalization—the lowering of duties on noncompetitive imports—would contribute far less to convergence than would lowering protection on competitive imports, while the latter, though contributing more toward reducing costs, would also drastically disrupt industrial employment and output, at least transitionally, and hence would be a difficult feat to pull off politically. The second is that whatever contribution extending backward linkages may make to employment and foreign exchange saving, it appears to raise rather than lower production costs of final products. This is contrary to the implications of de Vries's analysis, although to be fair, he seems to be of two minds on this. This is further indicated by regressions of gross protection,  $T_1$ , and net protection,  $T_3$ , on the ratio of imported materials cost to total unit cost,  $a/p$  (columns 7 and 9 on column 3 in the de Vries's Table 1).

$$T_1 = 86.883 - 1.186 (a/p) \quad R^2 = 0.155$$

(2.280)

$$T_3 = 49.901 - 0.8895 (a/p) \quad R^2 = 0.153$$

(2.198)

The negative relationships are not strong, but are significant at the 95 per cent confidence level. As an added bonus, the similarity of the two regressions indicates that the net or effective rates of protection correlate fairly closely with the gross rates for the twenty-eight products.

The c.i.f. prices of de Vries's table have been estimated via the assumption that removing formal protection would suffice to lower the

<sup>1</sup>The main exceptions occur when the capital goods purchases of the utility companies involve foreign financing, either suppliers' credits or World Bank financing. In the latter case the bank requires competitive bidding, with only a maximum 15 per cent preference margin to domestic bidders.

prices of imported materials, intermediate products, and equipment to levels roughly competitive with those of producers in advanced countries. How justified is this assumption? Let me cite some contrary evidence from pre-World War II Argentina, from an era when, as we know, the right people, guided by the sacred tenets of economic liberalism, still ruled that country and the efficient Argentine price structure had not yet succumbed to the onslaughts of Peronist policies, that root cause of Argentina's poor postwar economic performance, according to the conservative devil theory of Argentine stagnation. Table 2 indicates that for at least four high-volume capital goods imports, tariffs, custom fees, and carriage costs explain only a modest fraction of the excess of the Argentine wholesale price over the U.S. wholesale price. The neoclassical revival, from which we are, hopefully, beginning to recover, has tended to blind us to the importance of differences in market structure and pricing strategies as causes of sustained differences in relative prices.

Further evidence on this is supplied by Table 3, which is a summary prewar comparative price information for an array of internationally tradable industrial commodities, some actually imported by Argentina and some home produced. The variance of Argentine from U.S. relative prices appears substantially larger than can be explained by transport costs, tariff duties, and differences in indirect taxes. Moreover,

TABLE 2  
Ratios of Argentine to U.S. Wholesale Prices of Four  
Argentine Capital Goods Imports, 1939

	Actual Ratio	Ratio Net of Argentine C.I.F. Costs and Import Duties
Automobile	1.62	1.35
Tractor	1.38	1.32
Combine (12-ft.)	1.56	1.46
Plow (2-bottom)	1.47	1.40

SOURCE: Armour Research Foundation, *Technological and Economic Survey of Argentine Industries*, Buenos Aires, 1943, Table XII.

TABLE 3

Ratio of U.S. to Argentine Purchasing Power of Cattle and Wheat  
for Selected Commodities, 1937 and 1939

	Terms-of-Trade Ratios, U.S. to Argentina <sup>a</sup>			
	Cattle		Wheat	
	1937	1939	1937	1939
Wool cloth	440	367	119	175
Cotton denim	—	582	156	269
Sulphuric acid	939	568	245	262
Caustic soda	551	564	144	259
Denatured alcohol	756	541	198	249
Kraft paper	402	250	193	194
Coal	836	757	219	249
Fuel oil	410	293	107	134
Gasoline	1,821	1,480	476	731
Steel rails	602	458	156	214
Electrolytic copper	541	501	143	232
Lumber	570	436	149	200
Cement	500	—	129	—
Automobile	—	412	—	306
Radio receiver	—	—	—	342
Tractor	—	580	—	273
Combine (12-ft.)	—	669	—	314
Mowing machine	—	906	—	416
Plow	—	611	—	281

SOURCE: Armour Research Foundation, *Survey*, Tables XIII and XV.

<sup>a</sup>For cattle:  $(p_i/p_c)_{us} \div (p_i/p_c)_a$ ; for wheat:  $(p_i/p_w)_{us} \div (p_i/p_w)_a$ , where  $p_i$  designates wholesale prices of selected industrial products;  $p_c$ , the price of live cattle;  $p_w$ , the price of wheat; *us* refers to the United States; and *a* refers to Argentina.

one can detect in these prewar price ratios the main outlines—though with some deviations—of the Argentine relative price structure of the 1960's, the intercession of Peron and excessive import substitution notwithstanding.<sup>2</sup> Alternatively, there is little evidence of convergence

<sup>2</sup> For detailed 1960's relative prices see Economic Commission for Latin America (ECLA), "A Measurement of Price Levels and the Purchasing Power of Currencies in Latin America, 1960-62," mimeo, Santiago, Chile, March 1963.



between domestic and c.i.f. industrial prices in Argentina during the past three decades, learning curves and capital and skill accumulation notwithstanding.

Tables 2 and 3, however, also modify some of the negative implications of backward linkage suggested by Table 1. They suggest that the margin of maneuver for LDC industrialization strategy is probably much more circumscribed than is implied by the de Vries paper. The potential range of choice for industrial users is not between high materials prices under protection and "competitive" c.i.f.-level prices under free trade, but perhaps a much narrower range reflecting structurally embedded market imperfections. The prewar price tables may also help explain why indignation at the high relative prices of various import substitutes in the LDC's tends to be greater among visiting economists than among the local citizenry. The latter have been partly inured by high relative prices of the corresponding imports during the pre-import substitution years.

What about more "realistic" exchange rates as a means of hastening the convergence of domestic and c.i.f. prices? Facile references to "overvalued" or "unrealistic" exchange rates grossly overestimate, it seems to me, the ability of economic authorities to sustain a major alteration of the ratio of domestic to international prices by means of a few simple macropolicy devices. The evidence for Argentina—not untypical of industrializing LDC's at least in this regard—is that the short-term price elasticities of demand for imports and supply elasticities of agricultural exportables are very low, that the chief mechanism of adjustment has had to be sectoral income shifts combined with a drop in aggregate income,<sup>3</sup> and that domestic prices tend to rebound quickly,<sup>4</sup> unless special political conditions permit the preservation of the income shifts and/or the recession long enough for the sluggish long-run supply elasticities to take hold. The "realistic" 40 per cent devaluation, in March 1967, approvingly cited by de Vries, is a recent illustration of the last point. It did take until spring 1970 for Argen-

<sup>3</sup> Cf. Carlos Diaz-Alejandro, *Exchange Rate Devaluation in a Semi-Industrialized Country*, M.I.T. Press, 1965; Richard Mallon, "Exchange Policy—Argentina," in G. Papanek, ed., *Development Policy: Theory and Practice*, Harvard University Press, 1968, pp. 175–206.

<sup>4</sup> Arnold Harberger, "The Effects of Inflation on the Price Level," in W. Baer and I. Kerstenetsky, eds., *Inflation and Economic Growth*, New York, 1964.

tine wholesale prices to rebound the full 40 per cent, but this rebounding period, unusually long by previous Argentine experiences with devaluation, was elongated by a military regime that sat hard on money wages to the point of lowering real wages, until the social upheavals of May 1969 forced an easing of wage controls. And yet it seems doubtful that even a three-year rebounding period is enough to allow resource reallocations in Argentina to gain adequate momentum. Be that as it may, the essential argument is that since changes in relative prices also affect income distribution, the changes will, according to the organized strength of discommoded groups operating both in the market place and the political arena, set in motion countervailing price reactions to restore *status quo ante* price relationships. This may, in turn, thwart the desired reallocation, unless supply responses to relative price changes are quick and elastic, a behavioral characteristic for which LDC's are not widely noted.

The emphasis on the convergence of comparative production costs would suggest that LDC industrial exporting should originate and gain momentum from the relatively low-cost, low-technology, and low-capital-intensive side of the industrial product gamut, rather than from the high-technology side where the twenty-eight products of the de Vries paper are situated. The actual export pattern, however, seems more mixed. To illustrate let me summarize some paradoxical findings I have obtained from a study of Argentine nontraditional industrial exporting.<sup>5</sup> These are:

1. Around 60 per cent of these exports in 1963-66 originated in industries with above-average capital intensity, the percentage being similar for exports to the Latin American Free Trade Association (LAFTA) and for those to the rest of the world.

2. The industries originating these exports were in the upper half of the Argentine relative industrial price spectrum.

3. Multiple regressions showed the variance of nontraditional exports for 1955-66 to be unrelated to variations in exchange rates, whether lagged or unlagged (the exchange rates were adjusted to incorporate the differential tax subsidies applicable to various categories of nontraditional exports).

<sup>5</sup> David Felix, "Subsidies, Depression and Non-traditional Industrial Exporting in Argentina," Harvard University Development Advisory Service, Economic Development Report No. 107, September 1968.

4. Export variance, on the other hand, was significantly related to variations of excess capacity of the respective industries and to the establishment of LAFTA in the 1960's.

Spasmodic respect for comparative cost doctrine makes me skeptical that Argentina's destiny is to become an important exporter of high-technology and capital-intensive industrial products in the next few decades. The skepticism is reinforced by an awareness that marketing costs are especially high for this range of products, as are also the levels of marketing sophistication, research and development outlays, and risk required to compete effectively in high-technology production with producers in developed countries. Argentine nontraditional exporting was, after all, still a marginal activity—5 to 6 per cent of total exports—during the period covered by the study, and it is possible that after further shaking out, a quite different longer-run pattern may emerge than that manifested in the twelve years covered by the study.

The twelve-year pattern did conform, however, to the aspirations of the economic authorities and more interestingly, to the expectations of the Argentine business community in the 1960's. The industrial promotion measures of this period were strongly biased toward encouraging the export of sophisticated products of recently established industries, rather than the less technologically exacting products of longer-established ones. Similarly, Argentine trade association executives, when asked in a 1963 survey to predict the chief sources of future Argentine industrial exports, chose high-technology industries such as machinery, motor vehicles and tractors, and organic chemicals, citing as the main reasons for their choice, in order of frequency: (1) current excess capacity; (2) minimal production by other LAFTA countries; (3) future excess capacity; (4) progressive management. Cost competitiveness was virtually ignored despite the urging of the interviewer to give it major weight.<sup>6</sup>

The implications for LDC industrial export prognosis to be extracted from this limited Argentine evidence are: (1) Firms that progress from high-cost import substitution to import competitiveness—and many, of course, do not—need not therefore move on to exporting.

<sup>6</sup> José M. Dagnino Pastore, *Productos Exportables: Resultados de Encuestas* (Documento de Trabajo), Buenos Aires, Instituto Torcuato Di Tella, 1964.

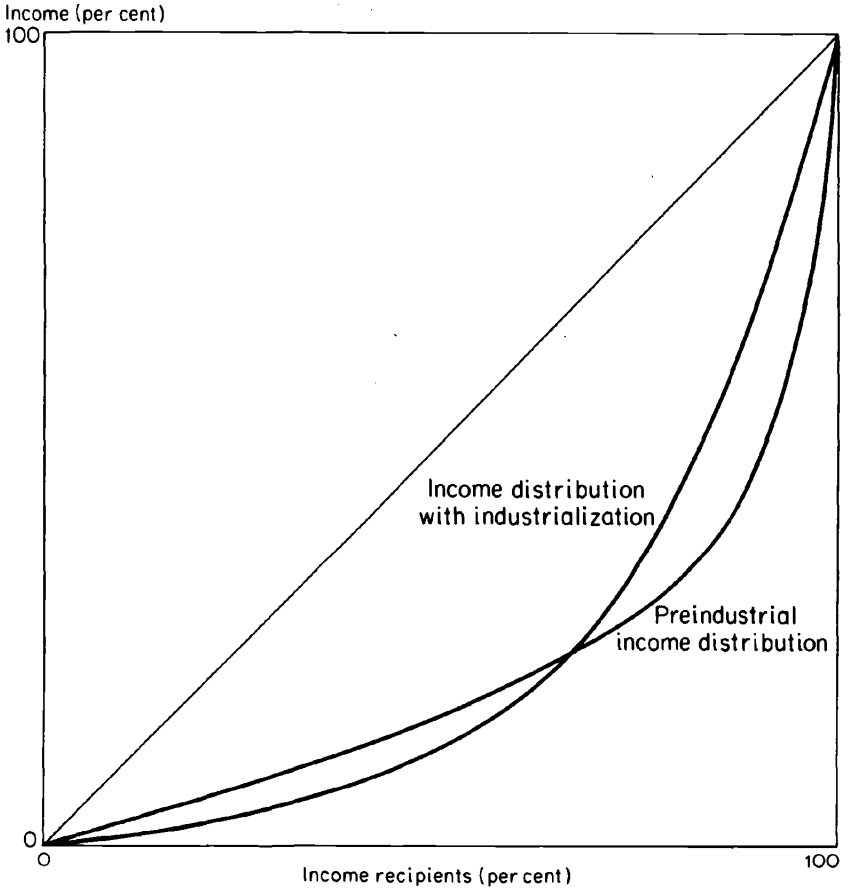
(2) Firms that are tuned into well-established foreign market channels, whether as subsidiaries of international corporations or through other foreign ties, may export despite high unit costs, if exporting helps relieve excess capacity, or fits some short- or long-term international production or marketing strategy of the parent corporation. In general, the assumption that if the price is right exporting will follow may be a particularly unreliable basis for predicting industrial exporting patterns of LDC's.

It has become a commonplace to decry the inadequacy of the theoretical framework guiding analyses and policy prescriptions concerning LDC trade and economic development. The recurring balance-of-payments crises afflicting most LDC's, particularly the industrializing ones, have been seemingly impervious to long-run solutions via the orthodox trade and exchange policy prescriptions of economic liberalism. In just about all of the industrializing LDC's the industrial sector has substantially increased its share of GNP but not its share of employment. Mounting urban underemployment has become a key manifestation of new forms of socioeconomic dualism. I suspect that for Mexico, Pakistan, and Brazil—three of the four industrializing LDC's in the de Vries survey—the before and after income distribution pattern can reasonably be described by an intersecting pair of Lorenz curves reflecting little change in the Gini inequality index, as in Figure 1: The growth of the middle class and industrial worker cohorts are offset by a drop in the relative income status of the income recipients in the lower half of the distribution.

Let me conclude, however, on a positive note, by briefly suggesting a neglected aspect of trade and growth analysis that may indicate one of the paths toward a more relevant theoretical framework. There are two fundamental tenets on which the propositions of international trade theory have been erected. One is that countries can be viewed as decision making units writ large, with well-ordered and autonomously determined preference functions and sharing common and exogenously determined menus of goods and techniques. The other tenet is that trade is an engine of growth, a dynamic cultural force leading to the introduction of previously unknown goods, wants, and technology from without.

From the first tenet come all of the theorems of international trade,

FIGURE 1



the welfare propositions and the policy prescriptions, whereas the second has mainly added rhetorical flourishes to international trade textbooks. Yet the analytic implications of the second tenet are profoundly disturbing for the theorems derived from the first. In effect, they could render many of them empirically irrelevant. For example, unless all goods are only gross substitutes—a proposition that would destroy the basis for aggregation—the introduction of new goods will alter the elasticity of substitution in consumption between older goods, so that before-and-after community indifference curves cross and judgments of the gains from trade have to rely on additional and more

direct *ad hoc* measures of socioeconomic welfare to supplement flawed aggregate indexes like changes in GNP per capita.

We are increasingly aware of various forces affecting LDC trade and economic growth trends that have not been handled convincingly with our conventional tools of analysis, particularly as these are constrained in their use by widely shared if largely implicit behavioral and ideological assumptions about economic behavior. But we still try to comfort ourselves by pigeon-holing contradictory behavioral manifestations and persistent difficulties of the LDC's as "transitional." Something like this, I suspect, may underlie the optimistic tenor of de Vries's prognosis of LDC industrial exporting prospects. Yet when countries ranging from Pakistan, with less than \$100 per capita income, to Argentina, with over \$800 per capita income, are used to illustrate common industrial inefficiencies and exporting difficulties, the assumption that the difficulties dwindle away as income and productive capacity rise seems little more than an analytic copout.

The tendency has been to get around such difficulties by aggregating goods into broader classes, so that the auto and the oxcart lose their individuality in the category, transportation goods, and by assuming a symmetrical flow of influences between trading countries which does not affect the time-shape of preference functions. But aggregation buries as well as summarizes, and for some issues the buried information may be critical. Thus the fact that the auto is an import-intensive substitute for the oxcart could be quite important in analyzing employment and balance-of-payments problems in LDC's. As for symmetry of influence, it is obviously not inherent in trade and communication, but only one possibility.

Symmetry may not be an intolerable simplifying assumption for the analysis of contemporary trade between advanced countries, although the Vernon product cycle trade model suggests that the dynamics of industrial trade in a world of multinational corporations may be better explained by introducing asymmetrical influences. Possibly the analysis of nineteenth-century trade between the technologically advanced countries of that epoch can also be based on the simplifying assumption of symmetry of influence with only moderate damage to the relevance of the analysis. For despite British technological leadership, there was considerable technological interchange, and as the speed and volume of

international communications grew, there was also a growing interchange of consumer tastes, French consumption patterns being partly anglicized, British patterns somewhat gallicized, etc.

For LDC's, however, the influence flow has been patently one-way. The older export economy dualism models of the Myint type rest, for example, on asymmetrical technological and taste intrusions from without. But so also do the new forms of dualism associated with LDC industrialization. Import substitution can be viewed in this regard as a strategy of shifting the external technological and demand influences from the import structure to the productive structure of the industrializing LDC.

Confronted by accumulating evidence that LDC's are importing excessively labor-saving techniques, economists have tended to view the problem exclusively from the production function perspective. There ought to be a more labor-intensive least-cost way, they seem to be saying, of producing petrochemicals, motor cars, and TV picture tubes than the imported techniques actually employed. Yet the fact seems to be that both locally owned firms and foreign subsidiaries in the LDC find it more profitable and less risky to import packaged technologies and product designs than to incur the costs and risks of doing indigenous R and D on production processes and of pioneering in indigenous product development; hence LDC producers of even high-technology products do very little of either.

If, however, we dispense with the notion that the changing final demand mixes in the LDC's reflect only autonomous forces that can be fully analyzed under the rubric of price and income elasticity, we may come up with a more persuasive explanation of the perverse choice of techniques by the LDC's. That is to say, the choice may be as much a demand mix as a production function phenomenon.

The regressions of the 1965 stock of TV receivers per 100 persons on per capita income for OECD and for Latin American countries, illustrate the point. Although the TV set is a more recently introduced artifact with a much higher relative price in Latin America than in Europe, the regression coefficient is similar for each group of countries and the intercept is considerably smaller for the Latin American group.

I suspect similar patterns illuminating the international demonstration effect on LDC's can also be uncovered for other import and capi-

tal-intensive consumer items. We might also, perhaps, uncover significant differences among LDC's in the strength of the effect, and explore whether these differences correlate with the relative vigor of consumer indoctrination, as measured by the relative importance of foreign subsidiaries in the LDC industrial sector or the relative persuasiveness of Americanized sales promotion techniques, as indicated by the ratio of advertising outlays to sales, the uses of TV and radio, and similar indexes. For example, the much greater strength of these influence channels in Latin America compared to the Third World as a whole for equivalent per capita income classes may help explain why Latin American countries, although in the higher ranges of per capita income in the Third World, suffer with at least equal intensity from the new dualism with its inequalities, growing underemployment, and persistent balance-of-payments impediments to growth.

With these asymmetrical influences, liberal trading rules become double-edged. They do not merely promote a more efficient specialization of LDC's in the production of a subset of an exogenously determined menu of goods, but also maximize the channels through which the one-way international demonstration effect enriches the menu and twists preferences in indigestion-prone directions.

Given any double-edged situation, an economist instinctively thinks of some optimum trade-off. In this case, the trade-off could be a set of controls which selectively meters the influence flow so as to minimize unemployment and balance-of-payments distortions. This seems to be the direction toward which the economic policy of many LDC's, beset by these problems, seems to be tending. Crude and lurching though these policy trends may be, they may nevertheless have a more rational economic basis than conventional analysis has been willing to grant. Another possible arrangement could be one-way trade concessions by advanced countries to make amends for the vigor of their one-sided cultural impact on the LDC's. The growing popularity of this ploy among trade economists has to be viewed, so far, as a victory for benevolence over existing theology. We could, however, do the Lord's work with less theological *angst* if we would recognize that it is the theology, not the benevolence, which may be analytically inappropriate to the situation.



DOROTHY WALTERS, Economic Council of Canada

In respecting the constraint which time imposes on us this morning, I shall comment only briefly from some notes made during the conference. To begin with, I should like to express my regret that Barend de Vries was not able to be present at this session to discuss his interesting paper. Baranson has given us an admirable presentation; nevertheless one is left with the unsatisfied wish to "confront" the author himself.

Many participants at this meeting with experience in the collection and analysis of international price data will find it interesting to examine the tabular data on capital goods prices. The de Vries comparison of domestic and international prices allows us to look at the impact of prices of domestically produced and imported materials on gross price differences. The data for four countries and twenty-six items are too sparse to provide other than a rough indication of wide price differences among commodities and between countries. As de Vries pointed out, "the data should be interpreted with care" and "proposals for individual tariffs must be based on studies of individual products." It may be that the two forthcoming World Bank studies by Baranson and Cilingiroglu will provide a broader statistical base for more general policy conclusions.

In his discussion paper, Felix neatly summarized the data to highlight one not surprising conclusion—that price differences of domestically produced inputs are a more important factor in gross or final price differences than imported input prices. This raises a number of questions concerning productivity in the supplying industries, and the relative size of tariffs on the domestic materials industries compared to those on imported inputs. The special comparison raises questions of the relevance of the exchange rates for conversion. The Grunwald and Salazar paper deals particularly with the problem of evaluating competitiveness to take account of differences in price levels and equilibrium exchange rates in Latin America. Earlier this morning a comment by Ruggles reminded me of the Braithwaite-Dias price comparisons, which showed high prices in the Argentine and a number of

other Latin American countries for capital compared to other goods.

There are other interesting points raised by these data, for example, the relatively high price of imported inputs for truck production. Does this reflect a peculiarity of the parent-subsidiary relationship which has wider relevance? Are the differences in the value-added prices related to labor or capital costs, or are they a function of efficiency, of market size, or of the degree of product specialization?

The data and the substance of underlying relationships would provide a better basis for understanding the price differences for capital goods which the de Vries paper sets out. But the whole thrust of the discussion around this point yesterday suggested that there may be serious limitations to drawing policy conclusions from this type of static price comparison about the effects of changes in tariffs or rates of exchange on scale, competitiveness, or resource allocation. Indeed, as the discussion between Balassa and Bhagwati suggested, there is still room for controversy about the relationship among productivity, prices, and exports.

De Vries has set out a short but comprehensive statement of the range of factors which affect price and competitiveness. As Baranson noted in his presentation, the next, but crucial, step is to assess the relative importance of these factors, before policy prescriptions become evident. Felix has already discussed some of the practical difficulties associated with the suggestion that tariff reductions provide a realistic answer to achieving a more competitive capital goods industry in the less developed countries. The paper by Ranis also emphasized the forces which act to preserve the established infant-industry "hot-house" environment.

Finally, I should like to re-emphasize a point already made by Felix. There is, among the less developed countries, a strong reversion to job creation as a prime goal of economic development. This may offend many economic sensibilities. But if it be true that the political, social, or economic circumstances require that employment become a priority goal, we should, perhaps, be evolving those "second-best" theories and prescriptions which take account of these realities and minimize the economic loss. It may be necessary to seek what Ranis has called "efficiency promotion" without abandoning the growth and commercial policy aspects of the infant-industry syndrome. As

development policies become oriented to absorbing larger numbers of workers into the industrial mainstream, we may have to prescribe for what Bhagwati called "import substitution in an optimal way." We live in a world of multiple goals, and growing awareness of their conflict and interrelations may further constrain optimality and efficiency.

REPLY BY JACK BARANSON FOR DE VRIES

1. On the point that the narrow sampling of individual industrial products does not give us an adequate basis for the conclusions drawn in the paper, I would agree that this is a legitimate criticism. As I pointed out in my presentation of the paper, there is a basic problem in making international cost comparisons. It relates to the comparability of items included and to the cost accounting systems used in different national environments. Using aggregated data for product groups runs the analyst into the difficult problems of comparing different baskets of goods (in terms of model variations, quality, or performance characteristics).

In the automotive products study, it was possible to get comparability among products manufactured in different national environments only by selecting near-identical vehicle models manufactured by a multinational firm with comparability among national accounting systems. Even within this common framework, adjustments had to be made for noncomparability in near-identical truck models, anomalies among accounting systems, and quality differences among national products.

2. Another criticism leveled at the paper is that the analysis does not tell us where the cost differences lie. These could be attributed to (a) differences in taxes and tariffs; (b) exchange rate anomalies; (c) varying operations. These differences are not articulated in the de Vries paper but have been dealt with in some depth in the automotive and electrical equipment studies cited there. The same applies to insights on the competitive position of capital goods industries, which are treated more definitely in the cited studies.

3. David Felix has questioned the paper's conclusion that tariffs

and overvalued exchange are the basic causes of high manufacturing costs. In a sense, we are dealing with a tautology, in that high costs are the creature of protection linked to an overvalued exchange rate, but the reverse is also true. It is true, as I indicated earlier in my remarks on the Ranis paper, that once industrialization under import substitution is carried to an extensive and excessive degree, cost efficiencies are undermined in other industries, including those that are export oriented. However, I do not believe that the prescription of "low-cost, low-technology" industries can be applied generally. The fact is that Argentina has exported \$50 million to \$100 million a year of fairly sophisticated industrial equipment, including machine lathes and IBM sorting machines. The chief disadvantages that manufacturing plants in developing countries face are scale and the dearth of supplier industries. If a plant manufactures at near-international scale, and if the country's trade policy allows a firm to import the high-cost range of materials and parts, a fairly broad range of manufacturing opportunities is feasible, including elements of the more complex engineering goods and capital equipment.<sup>1</sup>

<sup>1</sup> See Jack Baranson, *Manufacturing Problems in India*, Syracuse University Press, 1967, pp. 110 ff.

