

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Foreign Trade Regimes and Economic Development: Chile

Volume Author/Editor: Jere H. Behrman

Volume Publisher: NBER

Volume ISBN: 0-87014-508-8

Volume URL: <http://www.nber.org/books/beh76-1>

Publication Date: 1976

Chapter Title: Effective Exchange Rates, Effective Protection Rates, and Domestic Resource Costs

Chapter Author: Jere H. Behrman

Chapter URL: <http://www.nber.org/chapters/c4028>

Chapter pages in book: (p. 126 - 146)

## Chapter 5

# Effective Exchange Rates, Effective Protection Rates, and Domestic Resource Costs

In this chapter, one of the major purposes of this study is carried out: determining the impact of the NER and supporting policies, described in the two previous chapters, on effective rates of protection and exchange and related constructs. The focus of section 5.1 is on the time patterns of import premiums, PLD-EERs, and PLD-EER(PI)s in the years since World War II. In section 5.2, ITR, EPR, and DRC estimates are examined for selected years in the 1960s.

### SUMMARY AND CONCLUSIONS

i. Over-all PLD-EERs have been moving secularly downward. PLD-EERs for imported goods, moreover, continued to decline even in the 1965-70 sliding-peg period. *Ceteris paribus*, this trend implies increasing balance-of-payments pressures.

ii. Import premiums have been quite high and have tended to move inversely to PLD-EERs. During the sliding-peg experience of 1965-70, however, the large expansion in the availability of foreign exchange (primarily from the copper boom generated by the Vietnam War) made it possible to reduce both import premiums and PLD-EERs.

iii. Barriers for imports generally have been quite high and variable.

iv. The dispersion in such barriers has been very substantial among production sectors and subsectors and among end uses. Moreover, policy changes have not been highly correlated in their effect on these categories. Nevertheless,

the regimes have generally tended to favor manufacturing over agriculture and agriculture over mining—the traditional “easy” import-substituting industries, which had received high protection since the nineteenth century—over industries producing intermediate goods (at least until the late 1960s); import substitution over export promotion; and goods imports over nongoods international transactions.

v. Such discrepancies in the treatment of sectors of the economy generally declined at the start of liberalization attempts, although not the preference for manufacturing over agriculture. The discrepancies often increased as these efforts faltered. They were reduced most substantially and maintained at a low level for the longest period of time during 1967–70, the last four years of the Frei administration.

vi. In times of foreign-exchange crisis, restrictions have been increased most severely on nongoods transactions and on investment-goods imports. These restrictions have resulted in a clear trade-off between short-run balance-of-payments needs and long-run growth objectives.

vii. Since exports respond to price incentives (see section 7.2), those policies utilized in part because of the export pessimism derived from the Great Depression experience have reinforced that pessimism by strongly discouraging export expansion and diversification.

## **5.1 TIME PATHS OF IMPORT PREMIUMS, PRICE-LEVEL-DEFLATED EFFECTIVE EXCHANGE RATES, AND PREMIUM- INCLUSIVE PRICE-LEVEL-DEFLATED EFFECTIVE EXCHANGE RATES**

Aggregate patterns are described in section 5.1.1; disaggregate patterns, in section 5.1.2.

### **5.1.1 Time Patterns in Aggregate Import Premiums and Price-Level-Deflated Effective Exchange Rates.**

A summary of the aggregate impact of the policies on import premiums and PLD-EERs described in the two previous chapters is shown in Table 5.1; the PLD-EERs are shown for both goods imports and nongoods transactions. The first important characteristic to be noted in the data shown, as well as in the summary statistics shown in Table A.1 and elsewhere, is the secular decline in the PLD-EERs since World War II. These movements have not been monotonic. The PLD-EER for imported goods has increased in seven of the twenty-

**TABLE 5.1**  
**Chilean Price-Level-Deflated Effective Exchange Rates for**  
**Imported Goods and for Nongoods Transactions and**  
**Import Premium Rates, 1946-70**

Phase and Year	PLD-EERs		Ratio: Col. 2 to Col. 1 (3)	Import Premium Rate (4)
	Imported Goods (1)	Nongoods Transactions (2)		
II				
1946	5.64	5.30	0.94	76%
1947	4.69	5.68	1.41	79
1948	4.49	6.14	1.37	61
1949	4.11	6.36	1.55	93
1950	4.59	6.51	1.42	68
1951	4.24	5.12	1.21	67
1952	4.01	6.04	1.51	90
1953	3.64	6.74	1.85	112
1954	2.85	6.83	2.40	166
1955	2.90	7.35	2.53	204
III				
1956	3.62	4.61	1.27	132
1957	4.89	4.70	0.96	65
1958	4.37	5.69	1.30	64
IV				
1959	4.61	3.90	0.85	51
1960	4.26	3.53	0.83	60
1961	4.02	3.27	0.81	62
II				
1962	4.00	4.82	1.21	60
1963	4.33	5.68	1.31	46
1964	3.65	4.26	1.17	69
III				
1965	3.85	3.89	1.01	57
1966	3.66	3.80	1.04	56
1967	3.59	3.79	1.06	52
1968	3.70	3.98	1.08	43
1969	3.48	3.83	1.10	46
1970	3.35	3.98	1.19	47
Mean (1946-70)	4.02	5.03	1.25	77

SOURCE: The PLD-EER for imported goods is obtained by deflating the EERs in column 14 of Table A.7 by the Chilean GDP deflator. The PLD-EER for nongoods transactions is the PLD-NER for the black or free market before 1950 and the PLD-NER for the brokers' market thereafter (columns 6 and 12 in Table 3.2) adjusted for the taxes described at the start of section 4.3. The import premium rate is defined in the notes to Table A.1. The PLD-EERs are in 1965 escudos per dollar.

five years shown; the PLD-EER for nongoods transactions, twice as often. Nevertheless, the basic underlying trend is clear: the mean PLD-EER for imported goods over phases and subphases, for example, fell from 8.48 escudos per dollar for 1940–46 to 3.60 for 1965–70, increasing only between 1952 and 1955 and between 1956 and 1958 (line 1.1.7 in Table A.1). The major factor underlying this fall was the drop in PLD-NERs discussed in section 3.2. *Ceteris paribus*, such a decline would seem to have increased the need for quantitative restrictions to prevent large balance-of-payments deficits.

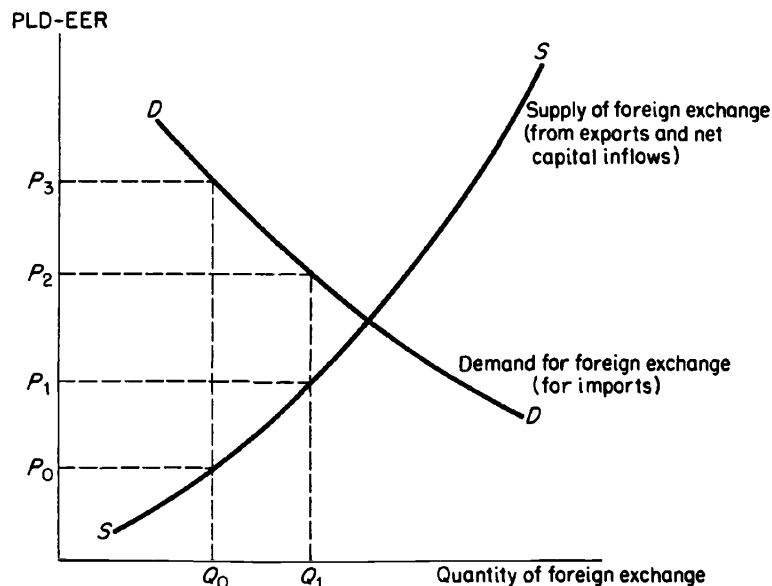
Second, the import premium rate tended to increase until the end of the quarter-century of Phase II restrictions, in 1955, and tended to decrease secularly thereafter (line 1.1.6 in Table A.1). The latter tendency was possible despite the simultaneous secular decline in the PLD-EERs because of the rapidly expanding command of Chile over foreign exchange from exports and from nonmonetary capital inflows (see Table 8.1).

Third, it should be noted that phase-coincident patterns were superimposed on these secular trends. The PLD-EER for goods increased at the start of each liberalization attempt (1956, 1959, and 1965) because of associated large devaluations. At the same time and for the same reason, the import premium rate declined, its fall reinforced by expanded imports financed from stabilization funds. The PLD-EER for nongoods transactions dropped at the start of each liberalization effort as the government attempted to reduce disparities among various EERs. The ratio of the PLD-EER for nongoods transactions to that for goods transactions was greater in the Phase II periods, as disparities in charges among uses increased with exchange control.

Fourth, in terms of short-run fluctuations, the PLD-EER for imported goods and the import premium rate tended to move *inversely* (the simple correlation coefficient between the two is  $-0.46$ ), reflecting price responsiveness in import demand or export supply, or both. This point is illustrated in Figure 5.1 by simplified supply-and-demand curves in a foreign-exchange framework. At a price for a unit of foreign exchange of  $P_0$ , the available quantity is  $Q_0$ , and the import premium rate is  $(P_3 - P_0)/P_0$ . At a higher price for foreign exchange,  $P_1$ , the quantity supplied increases to  $Q_1$ , and the import premium rate falls back to  $(P_2 - P_1)/P_1$ . (In the diagram, the same PLD-EER is assumed to hold for both exports and imports. In reality, a substantial difference has existed, as is discussed below in this chapter.)

Fifth, the PLD-EER for nongoods transactions generally was higher than that for goods. The discrepancy has not been as great, however, as consideration of PLD-NERs alone might suggest (Table 3.2) because other policies have affected exchange costs for goods much more than for nongoods. Nevertheless, policies usually have discriminated against invisible and service imports as opposed to goods imports. Capital inflows, however, have often been

FIGURE 5.1



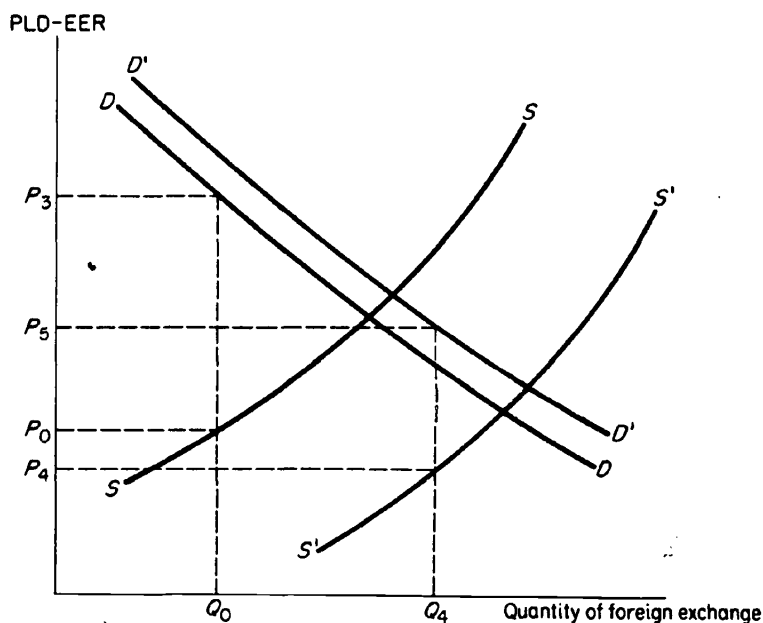
allowed at more favorable PLD-EERs than goods (but vice versa for capital outflows).

The major exception to this situation occurred in the Phase IV years of 1959-61.<sup>1</sup> The unified NER for those years, combined with disparities in the effects of supporting policies, resulted in lower PLD-EERs for nongoods than for goods transactions. As a result, discrepancies between the PLD-EERs for goods and for nongoods were larger than in some periods with a multiple exchange-rate system, e.g., 1965-69.

Sixth, the import premium rate has been quite high, averaging 77 per cent for 1946-70. Import taxes and related policies have absorbed some of the differences between international and domestic prices, but quite substantial returns have been left for importers and for protected industries.

Finally, with regard to the sliding-peg NER policy of 1965-70, it should be noted that despite the government's announced intention to the contrary, the PLD-EER for imported goods declined by 13 per cent during the period. The mean PLD-EER for import goods during the same phase was lower than in all but one (1952-55) of the phases and subphases after 1940 (see line 1.1.7 in Table A.1). The import premium rate declined during the phase and was at the lowest mean level of all post-1945 phases and subphases (see line 1.1.6 in Table A.1) in spite of the low and declining PLD-EER for imported goods. This phenomenon reflected the copper boom generated by the Vietnam War and large net capital inflows that provided foreign exchange to

FIGURE 5.2



finance substantially increased imports (see Table 8.1). The decline is roughly illustrated in Figure 5.2, which is drawn under the same simple assumptions utilized in Figure 5.1. Before this phase the price of foreign exchange was  $P_0$ , the quantity was  $Q_0$ , and the premium rate was  $(P_3 - P_0)/P_0$ . In 1965-70, the demand for foreign exchange may have shifted somewhat to the right to  $D'$ . The supply of foreign exchange, expanded as described above, is depicted by  $S'$ . As a result the following combination is observed: a reduced price at  $P_4$ , an increased quantity at  $Q_4$ , and a lowered import premium rate of  $(P_5 - P_4)/P_4$ .

During 1965-69, the PLD-EERs for goods and nongoods were more nearly identical than in any earlier phase or subphase following the Second World War, except 1946 and 1957. They were also closer than in the years of the unified NER, 1959-61 (Phase IV). The disparity increased year by year during the 1965-70 phase, however, in part because of attempts to limit capital flight during the long political campaign before the 1970 election.

### 5.1.2 Time Patterns in Disaggregate Premium-Inclusive Price-Level-Deflated Effective Exchange Rates.

Because of the complexities, specificity, and frequent alterations in the foreign-sector regime in recent decades, which was described in the two preced-

ing chapters, determination of disaggregate PLD-EERs and import premiums separately would require resources far beyond those available for this study. Instead, therefore, concentration is on PLD-EER(PI)s for disaggregate analysis. Such measures include the total effect of the international regime on internal prices, that is, on the EERs plus any premium importers receive.<sup>2</sup> Equivalently, these measures represent the total effects of foreign-sector policies on prices paid not by the original importer, but by the second buyer, i.e., the person or firm the original importer sells to.<sup>3</sup>

PLD-EER(PI)s on the individual product level for each of 220 items considered in this study could be presented and examined. Such detail, however, would be overwhelming. Important broad patterns would be difficult to discern. Instead, one would run the risk of being sidetracked by unimportant idiosyncrasies. The focus in this subsection, therefore, is on the intermediate level of aggregation of PLD-EER(PI)s presented in Table A.8: 18 subsectors, three sectors, (agriculture, mining, and manufacturing), and nine demand components. Three other tables contain statistics constructed from the series in Table A.8 to aid in the analysis. Table 5.2 includes ratios of various disaggregate PLD-EER(PI)s; the correlation coefficients among them are shown in Table A.9. Table A.10 contains percentage changes in the PLD-EER(PI)s relative to the national accounts PLD-NER. Six important broad characteristics in the post-World War II patterns of the disaggregate rates may be seen in the data contained in the four tables:

i. Variations in the PLD-EER(PI)s among subsectors, sectors, and demand components have been substantial. The ratio of the highest to the lowest PLD-EER(PI) in each subsector ranged from 2.82 to 12.43, with an average of 5.08 (Table 5.2, column 1). The subsectors with mean PLD-EER(PI)s above the over-all average (in order) are footwear, coal mining, textiles, leather and leather products, nonmetallic mineral products, other manufactures, beverages, food products, and basic metals. Policies since the Second World War, thus, have tended to maintain high barriers for those subsectors which first received protection as "infants" in the nineteenth century!

On the sectoral level of aggregation, barriers have been highest for manufacturing and lowest for mining, with agriculture in between. The ratios of the PLD-EER(PI)s for agriculture to those for manufacturing averaged 0.65 (column 2). The mean PLD-EER(PI) for mining was only half of that for manufacturing (column 3). The impact on sectoral terms of trade, thus, has been considerable. These distortions in incentives probably explain in considerable part the relative stagnation in agriculture and the limited expansion of minerals exports (on responses to price incentives, see Part III, below).

Among demand classifications, barriers have been highest for consumer goods and about the same on the average for both investment and intermediate goods. The mean PLD-EER(PI) for investment goods was 0.64 of that for



consumer goods, while that for intermediate goods was 0.62 (columns 4 and 5). These relative values reflect the maintenance of high effective protection to encourage import substitution for consumption products.

The mean PLD-EER(PI) for imports, finally, was 1.53 times that for exports (column 6). This difference reflects the basically inward-looking, import-substituting nature of the post-World War II regimes. The lack of more rapid growth in exports, once again, originates substantially in this discriminatory treatment against them (section 7.2).

ii. If there has been any general secular tendency, it has been a narrowing of differentials among subsectoral PLD-EER(PI)s as well as for agriculture relative to manufacturing, intermediate relative to consumer goods, and imports relative to exports (columns 1, 2, 5, and 6). However, such trends are not very pronounced. That the last phase in the 1946-70 period was more liberal than the first, moreover, may cause phase-coincident changes to be misinterpreted as secular trends.

iii. Shifts to more liberal phases were generally characterized by reductions in differentials. In the first year of each of the three cases of shift, the PLD-EER(PI) for imports declined relative to that for exports (column 6). The range among the subsectors declined (column 1) in the first year in two cases, and so did the relative discrepancy between mining and manufacturing (column 3), with an especially large drop in 1956, the first full year of the *Nuevo Trato* (see subsection 4.2.1 above).

On the other hand, the discrepancies of agriculture relative to manufacturing on two occasions increased in the first year of liberalization attempts (column 2), and in the third case remained unchanged. This apparent anomaly reflects the fact that all three liberalization attempts were part of stabilization programs. In each case considerable effort was expended in trying to moderate agricultural price increases since prices in this sector had large weights in the general price indices. These indices were taken as the most important indicator of the short-run success or failure of the anti-inflationary effort and thus strongly affected short-run inflationary expectations.

The ratio of the PLD-EER(PI) for intermediate goods relative to consumer goods moved toward unity in the first year of only one liberalization attempt (column 5 in Table 5.2). This observation suggests that generally, at least the consumer-good, import-substitution activities were not squeezed by a sharp drop in EPRs at the start of liberalization attempts.

iv. During the more liberal phases, the patterns were somewhat mixed. During the 1956-58 phase, discrepancies tended to decline among subsectors, among demand components, and between mining and manufacturing (columns 1, 3, 4, and 5). Those between imports and exports and, to a lower degree, between agriculture and manufacturing, however, increased substantially as the liberalization attempt faltered (columns 2 and 6).

TABLE 5.2  
**Chilean Ratios of Disaggregate Price-Level-Deflated Effective Exchange Rates,  
 Premiums Included, 1946-70**

Phase and Year	High Sub- sector to Low Subsector <sup>a</sup> (1)	Agriculture and Forestry to Manufacturing (2)	Mining to Manufacturing (3)	Investment Goods to Con- sumer Goods (4)	Intermediate Goods to Con- sumer Goods (5)	Imports to Exports (6)
<b>II</b>						
1946	4.01	0.52	0.47	0.84	0.59	1.85
1947	4.21	0.51	0.52	0.67	0.52	1.72
1948	3.93	0.53	0.55	0.67	0.54	1.73
1949	7.36	0.56	0.48	0.63	0.56	1.79
1950	7.22	0.63	0.54	0.63	0.52	1.68
1951	5.27	0.63	0.54	0.61	0.49	1.54
1952	5.06	0.58	0.51	0.60	0.54	1.44
1953	5.86	0.67	0.54	0.62	0.55	1.37
1954	4.86	0.72	0.50	0.56	0.53	1.52
1955	12.43	0.67	0.39	0.50	0.64	1.35
<b>III</b>						
1956	8.06	0.64	0.47	0.52	0.67	1.34
1957	11.33	0.64	0.50	0.64	0.67	1.74
1958	3.97	0.58	0.56	0.65	0.70	1.90

IV									
1959	4.06	0.58	0.51	0.70	0.70	0.70	1.71		
1960	3.51	0.65	0.53	0.62	0.69	0.69	1.61		
1961	3.55	0.68	0.51	0.63	0.65	0.65	1.67		
II									
1962	3.04	0.71	0.49	0.60	0.63	0.63	1.75		
1963	3.67	0.71	0.52	0.65	0.65	0.65	1.48		
1964	4.02	0.72	0.49	0.69	0.65	0.65	1.65		
III									
1965	3.51	0.65	0.55	0.66	0.64	0.64	1.47		
1966	2.82	0.68	0.55	0.71	0.65	0.65	1.18		
1967	3.22	0.74	0.52	0.67	0.66	0.66	1.30		
1968	3.04	0.70	0.48	0.67	0.68	0.68	1.25		
1969	3.48	0.78	0.45	0.66	0.71	0.71	1.09		
1970	5.41	0.74	0.40	0.65	0.70	0.70	1.09		
Mean									
(1946-70)	5.08	0.65	0.50	0.64	0.62	0.62	1.53		

SOURCE: Calculated from data in Table A.8.

a. Based on high and low PLD-EER (PI)s in first nineteen columns of Table A.8. The high subsector is nonmetallic mineral products for 1946-48, coal mining for 1953 and 1955-57, other manufactures for 1970, and footwear for all other years. The low sector is nitrate mining for 1946-48, 1957, and 1961, petroleum and coal products for 1966, and fishing for all other years.

During the 1959-61 phase most discrepancies tended to decline or remain about the same, with the possible exception of those for demand components by use (columns 4 and 5).

In the first four years of the 1965-70 phase almost all relative differences tended to be reduced. Although some increased thereafter, e.g., among subsectors or between mining and manufacturing, important further reductions occurred for agriculture versus manufacturing, intermediate goods versus consumer products, and exports versus imports (columns 2, 5, and 6). In all three cases the relative discrepancy for 1969 was smaller than for any preceding year included in Table 5.2. Liberalization, therefore, increased near the end of the Frei regime to a level which almost merits the characterization of the period as Phase IV.

v. The subsectoral PLD-EER(PI)s were not particularly well correlated. Among the 19 production subsectors, correlation coefficients are positive and significantly nonzero at the 5 per cent level for only 96 of the 171 pairs (Table A.9). In only 55 of these pairs, moreover, was the coefficient of determination 0.50 or higher.

Disaggregation to this level, therefore, usefully points out the disparities not only in the average levels of PLD-EER(PI)s, but also in the changes over time. The latter have arisen for two reasons: First, modification in the regimes, as noted in the two previous chapters, often has been for specific products or small groups of products. Second, unchanged quantitative restrictions have implied import premiums that vary greatly with shifts in demand and supply.<sup>4</sup>

The ratios of the standard deviation to the mean give an index of the relative volatility of the subsectoral PLD-EER(PI)s. On this basis the most volatile subsectors (in decreasing order) have been coal mining, textiles, basic metals, and nonmetallic mineral products (Table A.8). The least subject to such fluctuations (in increasing order) have been other manufacturing, agriculture and forestry, electric machinery, and paper and paper products.

The relative degree of fluctuation among subsectors does not suggest any general cause (intended or otherwise), although the ranking of some of the sectors does have clear explanations. The high value for coal mining, for example, reflects the explicit decision made in the 1950s to reduce the PLD-EER(PI) because of the importance of coal as an input in the new iron and steel industry. The low value for agriculture also may reflect a policy decision (or just good luck) to keep fluctuations relatively low for this politically sensitive subsector.

On the same basis the ranking of fluctuations in PLD-EER(PI)s among demand categories has been (in increasing order) intermediate products, exports, consumer goods, imports, and investment goods. Several aspects of this ranking merit emphasis: (a) The order does not seem to depend upon the extent to which the categories enter into international trade, that is, aggregates

made up more substantially of nontraded goods are not necessarily more (or less) volatile than those made up of tradable goods. (b) The level of exports has been discriminated against, not their fluctuations. (c) Variations for intermediate goods have been relatively low. This implies some success of attempts not to disrupt operation of existing capacity through erratic changes in the availability of imported inputs. (d) The high fluctuations for investment goods reflect the decision to postpone machinery and equipment imports at times of foreign-exchange shortages, but to encourage them at other times.

vi. Changes in NERs are poor indicators of variations in EER(PI)s: the ratios of the latter to the former often change quite considerably (Table A.10). Some fairly general consistencies do appear, however, in these ratios. During the last year of phases these ratios generally have increased because of greater restrictiveness in response to foreign-exchange shortages (which often have been an important factor in the decision to shift to another phase).<sup>5</sup> However, for goods actually imported (as opposed to importable), the EER(PI) generally did not fluctuate much relative to the NER. As would be expected, in the first year of liberalized phases, the ratios for imports generally dropped because of reduced restrictiveness,<sup>6</sup> but the export ratios did not because of the attempt to reduce discrimination against them at the start of liberalization efforts.

## 5.2 IMPLICIT TARIFF RATES, EFFECTIVE PROTECTION RATES, AND DOMESTIC RESOURCE COSTS IN THE 1960s

This section is focused on the implications of relatively careful estimates of ITRs, EPRs, and DRCs, shown in Table 5.3, for 1961, 1967, and 1968 (exports only in the last year) by production subsector.<sup>7</sup>

The implicit tariff rate (ITR) indicates the effect of the international trade regime on the product price. The ITR is defined as the ratio to the c.i.f. price of the difference between the domestic price (net of normal distribution costs) and the c.i.f. price. Chilean ITRs generally cannot be calculated by simply adjusting the c.i.f. prices by legal tariff rates and other legal charges because quantitative restrictions sometimes create substantial import premiums (see line 1.1.6 in Table A.1) and because there are numerous exemptions from the legal rates (see subsections 4.1.5 and 4.1.7). Therefore direct price comparisons<sup>8</sup> are used, as explained in detail in Appendix B.

The effective protection rate (EPR) measures the impact of foreign-sector policies on domestic value added.<sup>9</sup> The EPR is defined as the ratio to the international value added of the difference between domestic value added and international value added. Again, direct price comparisons are used, and the details are presented in Appendix B.

TABLE 5.3  
**Implicit Tariff Rates, Effective Protection Rates, and Domestic Resource Costs in  
 Chile, 28 Sectors, 1961, 1967, and 1968**  
 (per cent)

Tradable Goods Sectors	Implicit Tariff Rates (ITRs)			Effective Protection Rates (EPRs)			Domestic Resource Costs (DRCs)		
	1961	1967	1968 <sup>a</sup>	1961	1967	1968 <sup>a</sup>	1961	1968 <sup>a</sup>	
	(1)	(2)	(3)	(1)	(3)	(4)	(1)	(2)	
1 Agriculture and forestry	43	1	19	50	145	-7	15	250	111
2 Fishing	21			25					
3 Coal mining	37			31					
4 Iron mining	2		0	-7			-12		180
5 Copper mining	0		0	-14			-10		60
6 Nitrate mining	1		0	-6			-11		
7 Stone, clay, and sands	66			64					
8 Other mining	46		6	40			-6		82
9 Food products	82	32	27	2,884	217	365	3	253	97
10 Beverages	122	7		609	164	-23		259	
11 Tobacco	106	0		141	1	-13		47	
12 Textiles	182	99		672	462	492		<sup>b</sup>	
13 Footwear and clothing	255	23	29	386	319	16	5	1,916	52

15 Footwear and clothing

233 23 29 386 319 16 5 1,310 52

14 Wood and cork	35	0	24	21	30	-4	22	210	161
15 Furniture	129	0	30	209	127	-5	18	241	73
16 Paper and paper products	55	44	27	41	49	95	14	683	164
17 Printing and publishing	72	0		82	77	-15		297	
18 Leather and leather products	161	25	15	714	325	18	-20	2,109	55
19 Rubber products	102	125		109	137	304		77	
20 Chemical products	94	38	24	89	107	64	14	356	75
21 Petroleum and coal products	50	55		45	-26	1,140		47	
22 Nonmetallic mineral products	139	27		227	179	1		<sup>b</sup>	
23 Basic metals	66	25	28	198	74	35	21	<sup>b</sup>	380
24 Metallic products	59	80		43	45	92		217	
25 Nonelectrical machinery	84	56	12	85	73	76	-9	150	59
26 Electrical machinery	105	162	26	111	92	449	10	131	50
27 Transport equipment	84	150	21	101	68	271	1	118	56
28 Other manufacturing	125		18	164	129		4	175	41

Equally weighted arithmetic mean  
Standard deviation  
Range

Equally weighted arithmetic mean	83	48	18	254	133	168	3	419	106
Standard deviation	58	51	11	552	117	282	13	598	86
Range	255	162	30	2,898	488	1,127	42	2,109	339

*Notes to Table 5.3*

NOTE: Sources and definitions are given in Appendix B. Some analysis of the consistency of the alternative sets of accounts is also presented there. For 1961, two sets of EPRs are given. The first includes more sectors, but the second is more consistent with the 1967 estimates (see Appendix B).

The estimates shown are not adjusted for overvaluation because of the difficulty of establishing the degree of overvaluation. All available indices suggest that the escudo was overvalued by 20 to 70 per cent in the 1960s (see line 1.1.1 in Table A.1 and the source note for column 2.1.3 in Table A.11). If overvaluation were taken account of in the calculations, the real protective barriers for import substitution would not appear to have been so high on average as is implied in the text. In any case, overvaluation did not alter the dispersion of protection among subsectors, which is the point of major interest. To illustrate the possible effect of such adjustments, however, note that Jeanneret [1971: 165] presents overvaluation-adjusted counterparts of ITR1 and EPR1 with respective means of 9 and 111 per cent. Although her adjustment seems to be too large for a 68 per cent overvaluation in 1961, this example is suggestive of the possible order of magnitude of this effect.

a. For subsectoral exports only.

b. Value was negative, indicating that the total foreign-exchange cost per unit exceeds the foreign-exchange final-product price.

---

The domestic resource cost (DRC) is the value of domestic resources (at opportunity costs) employed in earning or saving a dollar of foreign exchange in the domestic production of a good.<sup>10</sup> As before, the sources and method of construction are presented in Appendix B.

**5.2.1 Mean Level of the Rates.**

The levels of the ITRs and EPRs for 1961 and 1967 were quite high. The respective mean ITRs were 83 and 48 per cent. For 10 subsectors in 1961 and 3 in 1967 the ITRs exceeded 100 per cent. The respective mean EPRs were 133<sup>11</sup> and 168 per cent. For 11 subsectors in 1961 and 6 in 1967 the EPRs exceeded 100 per cent. The protective barriers created by the trade regimes thus seem to have been quite substantial on the average.<sup>12</sup>

**5.2.2 Sectoral and Subsectoral Differences in Relative Protection.**

The most important characteristic of the estimates in Table 5.3 is the existence of substantial differentials among sectors and subsectors and between end uses. For all but the 1968 ITR and EPR estimates, which are for exports only, the ranges and standard deviations between subsectors were quite high: for ITR1, a range of 255 per cent and a standard deviation of 58 per cent; ITR2, 162 and 51 per cent; EPR1, 2,898 and 552 per cent; EPR2, 488 and 117 per cent; EPR3, 1,127 and 282 per cent; DRC1, 2,109 and 598 per cent; and DRC2, 339 and 86 per cent. These variations imply substantial cross-sectoral distortions in signals for product usage and in the rates of transforma-



tion between domestic and foreign resources. As Nugent [1971] has demonstrated, moreover, the welfare loss due to greater variance in protection among products for a given mean level of protection can be quite considerable.

#### RANKING OF SECTORAL DIFFERENCES.

On the sectoral level, protection has been highest for industry, lowest for mining, and in between for agriculture. However, in 1961 agriculture had a relatively high EPR (EPR2) and DRC. This result raises questions about the widespread assumption that agriculture is a low-DRC sector against which substantial discrimination has occurred.

#### RANKING OF SUBSECTORAL DIFFERENCES.

In 1961 the ranking (in decreasing order) of subsectors with EPRs (EPR2) of over 100 per cent was textiles, leather and leather products, footwear and clothing, food products, nonmetallic mineral products, beverages, rubber products, other manufactures, furniture, and chemical products.<sup>13</sup> The most protected subsectors near the end of the most liberal phase since the Great Depression thus tended to be the traditional, "easy" import-substitution ones. These industries not only had received conscious protection in most cases since the 1897 tariff law, but most import substitution in them had been made before the Second World War!<sup>14</sup> Moreover, the DRCs for many of these subsectors were quite high (see DRC1).

Jeanneret [1971:167] interprets this pattern to mean that those sectors which had relatively high EPRs remained traditional and inefficient in their operation because they had only limited competition from imports. Her interpretation depends upon the assumption that approximately the 1961 EPR structure had prevailed for a number of years. This seems to be a strong assumption, however, given the changes, described earlier, in the international economic regime.

A more plausible interpretation is that in the process of liberalization in 1959-61, protection was lowered less for the more stagnant and more traditional subsectors than for the others, leaving the former relatively protected. This occurred because the vested interests in these industries were very strong politically and because of the desire not to risk too great a disruption in these labor-intensive sectors from a flood of competitive imports. This explanation is consistent with the observed protection patterns in 1961, the general liberalization in the previous years, and the significantly negative correlation between EPR2 and the growth in product over the 1953-61 period (Table A.5).

#### IMPORT SUBSTITUTION VERSUS EXPORT PROMOTION.

A very important set of discrepancies were those which favored import substitution over export promotion despite the comparative advantage of the

latter. The results of discouraging exports included inefficient utilization of resources and reinforcement of already existing export pessimism. At the same time, the authorities evidently failed to appreciate that the limited growth in exports reflected in part a reaction to the policies selected because of the original export pessimism.

Evidence of such differentiation between imports and exports is multifaceted:

i. The lowest three ITRs and EPRs in 1961 (including the only three negative values for the latter group) were for the export-oriented mining sectors—iron, copper, and nitrates. For these same three sectors in 1961 and for all of the 1968 estimates, which are for exports only, the EPRs were always less than the ITRs.

ii. For the 1968 exports-only estimates the mean ITR was 18 per cent; the mean EPR, 3 per cent. These means were far below those for the other estimates (and significantly so at the 5 per cent level). If a reasonable adjustment were made for overvaluation, moreover, the adjusted means would be negative.<sup>15</sup>

iii. The DRCs for the export-oriented products in each subsector were uniformly below those for total subsectoral production (DRC2 versus DRC1). The mean of the former distribution was significantly below that of the latter.

iv. Table A.5 includes several significant correlations which reflect a bias toward import substitution: the positive association between the 1961 average tariff rate on intermediate inputs and EPR1 and EPR2;<sup>16</sup> the negative correlation between the average tariff rate on intermediate inputs and the exports-only EPR4; the negative correlations between the 1962 ratios of exports to domestic production and ITR1, ITR2, and EPR4; the positive association between the 1962 ratio of imports to domestic production and ITR2; the positive association between the 1962 ratio of imported inputs to domestic production and ITR2 and EPR3;<sup>17</sup> and the negative correlation between the ratio of imported inputs to domestic production and the exports-only ITR3.

v. Bacha and Taylor [1973] present DRCs for a number of new Chilean export-promotion or import-substitution products in the late 1960s. The mean value of the former was over 20 per cent below that of the latter. Selowsky [1970:12] also estimates that the DRC of earning one dollar by exporting in 1969 was two-thirds that of saving a dollar by importing.

#### DIFFERENCES AMONG FINAL-USE SECTORS.

Among final-use categories, some evidence exists to suggest higher protection for the more consumption-oriented sectors. Positive correlations exist between the proportion of sectoral production going to consumption (private or government) and ITR1, ITR3, and EPR4 and between the proportion of sectoral imports going to consumption and ITR1 and ITR2 (Table A.7). These

associations again reflect favoritism for the traditional, "easy," and largely consumption-oriented import-substitution industries.<sup>18</sup>

### 5.2.3 Differences in Relative Protection over Time.

A third general feature of the estimates in Table 5.3 is the indication of important differences between 1961 and 1967. In fact neither the ITRs nor the EPRs are significantly correlated across subsectors for the two years (Table A.4). Given that the 1962-64 Phase II period falls between these two years, the existence of differences is not surprising.

#### OVER-ALL DIFFERENCES.

Although the mean level of the ITRs declined from 83 per cent in 1961 to 48 per cent in 1967, the mean level of the EPRs (EPR2) increased from 133 to 168 per cent.<sup>19</sup> The standard deviation and the range for the EPRs increased even more: from 117 to 282 per cent for the former and from 488 to 1,127 per cent for the latter. The barriers protecting various subsectors thus tended to be greater and more dispersed in 1967 than in 1961. This view is consistent with the previous classification of 1961 as being near the end of the most liberal regime since 1930 and of 1967 as being at about the middle of a Phase III regime in which liberalization accelerated during the last years.

#### SECTORAL DIFFERENCES.

On the sectoral level, protection shifted relatively from agriculture to manufacturing. The EPR for agriculture, in fact, dropped from 145 to -7 per cent. This fall is in sharp contrast to the stated intent of the Frei government to improve the terms of trade for agriculture.<sup>20</sup>

#### SUBSECTORAL DIFFERENCES.

Shifts at the subsectoral level were substantial, but were in the direction which the Frei government had indicated it would pursue. The subsectors with EPRs greater than 100 per cent in 1967 (in decreasing order) were petroleum and coal products, textiles, electrical machinery, food products, rubber products, and transport equipment. Even though textiles and food products still were relatively highly protected, a substantial change had been made in the protective structure to favor more import substitution in nontraditional intermediate-goods industries (with lower DRCs, at least in 1961) instead of in the traditional consumption-goods subsectors. The correlation coefficients in Table A.5 provide further support for the foregoing characterization of 1967 protection. The EPRs across subsectors for that year were positively associated with several features of "modern" industries: high ratios of capital to labor,

large components of machinery and equipment in the capital stocks, and heavy use of intermediate inputs, especially imported ones.

#### IMPORT SUBSTITUTION VERSUS EXPORT PROMOTION.

The Frei government also advocated furnishing greater incentives for exports, and introduced some policy changes—such as the expanded drawback program for nontraditional exports—in pursuit of that end (see subsection 4.2.2). The impact of such policies on import substitution versus export promotion, however, was quite limited by 1967. Tables A.5 and A.6 contain no significantly nonzero correlations consistent with either a distribution of EPRs in 1967 or a change in this distribution since 1961 that was relatively favorable to exports.<sup>21</sup> The 1968 exports-only estimates in Table 5.3, as is described above, also do not indicate that any very great success was attained in encouraging export promotion.

#### DIFFERENCES AMONG FINAL-USE SECTORS.

EPRs shifted away from consumption-oriented subsectors. The ratios of the 1967 to 1961 EPRs, in fact, are significantly negatively correlated with the consumption share in imports (Table A.6).<sup>22</sup> This shift is associated with the fall in relative protection for the traditional, import-substitution industries mentioned above.

It should also be observed that from 1961 to 1967 the ITRs changed from being positively associated with the share of private consumption in imports to being positively associated with the share of investment in imports (Table A.5). This increased discrimination against imported machinery and equipment (for much of which the ITRs are more significant than EPRs, since domestic production is nil) contrasts with the announced intentions of the Central Bank during this phase.

#### NOTES

1. Isolated exceptions were 1946 and 1957.
2. As is indicated in Appendix A, part of the premium may originate in adjustment lags between domestic and international prices which are independent of the nature of foreign-sector policies.
3. If the original importer uses an import himself then the PLD-EER(PI) represents the effect of the regime on the price which he could have obtained, i.e., on the opportunity cost.
4. Consider how the premium would increase in Figure 5.1, for example, if the demand curve shifted to the right.
5. Another contributing factor was the existence of adjustment lags in highly inflationary conditions, except in 1961 (see section 13.4).

6. Declines in inflation also may have alleviated the shortage of foreign exchange (see the preceding note).

7. For recent discussions of other measures of the effects of the international economic regime on the domestic economy, see Bacha and Taylor [1971], Balassa [1971], Balassa and Schydrowsky [1972], Bhagwati and Srinivasan [1971], Bruno [1972], Cordon [1971], Grubel and Johnson [1971], Hansen [1973], and Krueger [1972a], and the numerous references there.

8. For qualifications to this method occasioned by the presence of market imperfections, see Bhagwati [1970].

9. As Cohen [1971] points out, the notion of effective protection has a long history. Humud [1969] has uncovered references in the Chilean literature dating back to the 1840s. Recent interest in EPRs stems from the studies by Balassa [1965], Cordon [1966], and Johnson [1965].

10. The seminal articles on DRCs are Bruno [1963, 1965] and Krueger [1966]. As Bruno [1972:17] notes, such calculations have a history of practical application at least since the early 1950s in Israel. The problem of determining the appropriate shadow prices in a nonoptimal world is a substantial one, as Balassa and Schydrowsky [1972:66] have stressed. Unless such shadow prices are basically constant, moreover, as Bruno [1972:31-32] has emphasized, DRCs (or, for that matter, EPRs based on shadow prices) cannot be used to infer rankings of projects for ex ante investment decisions, but only to decide whether or not a specific project should be undertaken.

11. For the alternative set of estimates for 1961, i.e., EPR1, the mean was 254 per cent and the EPRs for 13 subsectors exceeded 100 per cent.

12. Since the means for the EPRs exceed the means for the underlying ITRs, both in Tables 5.3 and A.3, it might seem that greater protection is given on average to value added than to product. Under the assumption that the underlying distributions across subsectors are approximately normal, however, none of these differences is significantly nonzero at the 5 per cent level.

13. For the EPR1 estimates for 1961, the ranking differs somewhat in its details, but the basic point is not affected: for either EPR1 or EPR2, reversals in the sense that EPRs were less than ITRs were very rare for the traditional manufacturing subsectors. Instead, cascading predominated.

14. The more traditional industries tended to be subsectors with low ratios of capital to value added and low wages. Therefore the inverse correlations in Table A.5 between each of these two characteristics and EPR2 support the statement in the text. Muñoz [1968] describes the timing of import substitution.

15. Bacha and Taylor [1973], for example, estimate that the escudo was overvalued by 24 per cent in 1968.

16. If final product rates exactly compensated for variances in intermediate import costs, one would expect this correlation coefficient to be nonsignificant. That it is significantly positive suggests overcompensation. The negative one next mentioned likewise implies undercompensation for export-oriented products.

17. The interpretation given in the previous note also holds here.

18. As indicated in Chapter 3, despite the general encouragement of import substitution in consumption industries, certain mass-consumption imports had relatively low EERs. Such imports were concentrated in a few subsectors, however; so the over-all positive association between consumption orientation and protection dominates in the correlation across all subsectors.

19. EPR1 is not comparable to EPR3 because of the different treatment of depreciation. See Appendix B.

20. The figures in column 2 of Table 5.2, however, do indicate some success was achieved in lessening the discrepancy between the PLD-EER(PI)s for agriculture and manufacturing during 1965-70, although the difference at the start of the phase was much greater than that which prevailed in some earlier years (including the preceding phase).

21. As indicated in subsection 4.2.2, however, export-expansion efforts were intensified in the later years of this phase. The suggestion of the figures in column 6 of Table 5.2 is that these intensified efforts were to some extent successful.

22. ITRs may change much differently than EPRs. The ratio of ITRs, in fact, is significantly *positively* correlated with that same variable.