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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: Resource Allocation and Structural Change

Chapter Author: Jere H. Behrman

Chapter URL: <http://www.nber.org/chapters/c4033>

Chapter pages in book: (p. 240 - 253)

## Resource Allocation and Structural Change

The foreign sector long has been important in Chilean resource allocation among sectors and subsectors. Before the Great Depression, substantial resource movements accompanied the rise and fall of nitrates and the decline and resurgence of copper, to cite but two examples. In that era the government also consciously used the international economic regime to promote industrial import substitution (see section 1.2).

The catastrophic impact of the Great Depression greatly strengthened export pessimism (sections 1.3 and 1.4). The nation turned inward. The government utilized numerous foreign-sector policy tools to try to induce resource shifts into industry (Chapters 3 and 4). The impact of those policies on PLD-EERs, ITRs, EPRs, and DRCs after the Second World War was analyzed in Chapter 5. A major characteristic of these price-related measures is the substantial variation in their applicability to different production sectors and subsectors and different end uses. Trade barriers have been highest for manufacturing and lowest for mining, with agriculture in between. Within industry they have been greatest for the traditional "easy" consumer-oriented subsectors (at least until the late 1960s). They also have been higher for consumer products than for intermediate or investment goods. Finally, the price-related measures generally have favored import substitution over export expansion.

The general patterns noted in the previous paragraph have persisted throughout recent decades. Distortions in the signals for product use and in the rate of transformation between domestic and foreign resources, therefore, also have persisted. The degree of discrimination among categories, however,

has varied significantly. Liberalization has tended to reduce discrepancies<sup>1</sup> and vice versa.

These patterns and variations in the price-related measures raise several questions: (i) What have been the long-run trends and phase-related movements in resource allocation? (ii) What has been the relation between ratios of the prices of final product to intermediate inputs and resource allocation? (iii) What have been the costs of the attempts to alter resource allocation by using the international economic regime to create differential incentives?

### SUMMARY AND CONCLUSIONS

i. Secular trends in the composition of output have included declines in the shares of agriculture and mining, increases in industry until the early 1950s, and increases in all other sectors. Discriminatory aspects of the international economic regimes have contributed to the declines in the first two sectors and to the initial rise in industry. The lack of correlation between import-substitution coefficients and industrial subsectoral growth, however, suggest that in manufacturing, foreign-sector policies may have been less important than is often claimed. Overvaluation has helped to induce the shift from goods to services, although increased quantitative restrictions have tended to work in the other direction.

ii. The secular declines in agriculture and mining have increased pressure on the balance of payments. In this respect the industrialization strategy has added to foreign-sector difficulties.

iii. Phase-associated responses have been quite considerable. The response to liberalizations in agriculture and in the manufacturing subsectors that are more modern and oriented more toward intermediate-goods production has been particularly positive. The more traditional and consumer-oriented manufacturing subsectors, in contrast, have been unable to meet the increased competition associated with liberalization. This failure is all the more striking since protection for many of the latter subsectors dates back to the nineteenth century.

iv. The responses described in the preceding paragraph create somewhat of a dilemma for the government, given industrialization as one of its objectives. Although manufacturing grew considerably in the early years of restrictiveness following the Great Depression, it has stagnated in recent decades and has declined in its share of product and of labor-force absorption. Further restrictiveness does not promise future development. Liberalization, on the other hand, involves considerable short- and medium-run costs until greater efficiency is induced in traditional industries or resources are turned aside from them. For the transitional period some direct subsidization might be necessary.

Given the fiscal problems of the government, however, this alternative can be used only with great care.

v. There is little empirical support for a relationship between subsectoral resource allocation and EPRs or for other price ratios of final to intermediate product partially because factors other than price ratios are important in capacity-utilization and capacity-creation decisions. The poor correlation may also reflect erratic changes in the price-related measures occasioned by the use of quantitative restrictions.

vi. The international economic regimes have had significant implications for resource allocation. Nevertheless, care must be taken not to exaggerate the expected gains from policy improvements in foreign sectors as compared with those in the domestic area.

### **10.1 LONG-RUN TRENDS AND PHASE-RELATED PATTERNS IN RESOURCE ALLOCATION**

Table A.1 contains the mean composition of value added by sector for phases and subphases between 1908 and 1971 (lines 3.1.1.1–3.1.1.3). The subsectoral breakdown of value added and of total value of manufacturing in 1957, 1962, and 1967 is given in Table 10.1.

#### **10.1.1 Industrial Production by Sector.**

##### **AGRICULTURE.**

The secular trend in the share of agriculture in production clearly has been downward (line 3.1.1.1 in Table A.1).<sup>2</sup> The same trend exists for the agricultural percentage share of the labor force: 36.2 in 1920, 34.8 in 1945, and 28.2 in 1965. In part these declines reflect an Engel-curve phenomenon. The income elasticity of the demand for domestic agricultural goods is smaller than the income elasticity for all goods.

The falling share of agriculture is not due to relative income elasticities alone, however. It also reflects the response of capacity and capacity utilization to the disincentives for production created by recent international economic regimes (Table 5.2, column 2, and tables 9.1 and 12.1). Numerous policies have had the intent of shifting resources into industry and of mitigating inflationary pressures by keeping agricultural prices low. Partially because of such policies not only has the agricultural share of product steadily fallen, but Chile has changed from a major agricultural exporter in the nineteenth century to a net importer of basic agricultural commodities. One unintended result of these

TABLE 10.1  
 Pattern of Chilean Industrial Production, by Subsectors, 1957, 1962, and 1967

Subsectors	Proportion of Manufacturing Value Added			Proportion of Manufacturing Total Value			Proportion of 1962 Total	
	1957	1962	1967	1957	1962	1967	Value Added	Total Value
Agriculture							.100	.090
Fishing							.003	.004
Mining							.085	.065
Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	.283	.412
Food	0.175	0.120	0.163	0.268	0.232	0.224		
Beverages	0.045	0.062	0.051	0.036	0.082	0.048		
Tobacco	0.054	0.028	0.026	0.026	0.014	0.016		
Textiles	0.128	0.086	0.101	0.120	0.074	0.087		
Clothing and footwear	0.078	0.156	0.047	0.080	0.139	0.048		
Wood and cork	0.032	0.029	0.029	0.029	0.033	0.027		
Furniture	0.016	0.046	0.010	0.012	0.037	0.008		
Paper and paper products	0.018	0.022	0.021	0.030	0.019	0.019		
Printing, publishing	0.037	0.021	0.027	0.027	0.016	0.020		
Leather, leather products	0.012	0.012	0.011	0.016	0.014	0.012		
Rubber products	0.012	0.014	0.016	0.013	0.010	0.012		
Chemicals	0.078	0.050	0.088	0.078	0.054	0.072		
Petroleum and coal products	0.032	0.058	0.018	0.037	0.046	0.031		
Nonmetallic minerals	0.057	0.054	0.032	0.045	0.036	0.026		
Basic metals	0.109	0.044	0.165	0.093	0.040	0.229		
Metal products	0.041	0.045	0.046	0.035	0.036	0.039		
Nonelectrical machinery	0.017	0.031	0.044	0.013	0.027	0.031		
Electrical machinery	0.017	0.034	0.033	0.012	0.027	0.028		
Transportation equipment	0.023	0.060	0.062	0.018	0.041	0.044		
Misc. manufacturing	0.012	0.030	0.011	0.010	0.028	0.048		
Construction							.053	.056
Utilities							.013	.013
Commerce							.232	.179
Housing							.057	.040
Transportation, communications							.053	.049
Services							.120	.093

SOURCE: Calculated from data in DEC [1960a], INE [1970], and ODEPLAN [1970].

policies, thus, has been to add to balance-of-payment pressures by increasing the need for basic imported foodstuffs.<sup>3</sup>

The agricultural share of production also has responded to medium-term fluctuations in the degree of liberalization. For two of the three liberalization attempts it increased on the average (line 3.1.1.1 in Table A.1).<sup>4</sup> The estimates in Table A.2, moreover, indicate significantly positive liberalization-associated increments in the exponential growth rate of agricultural GDP—and significantly negative ones for total GDP. The greater the degree of liberalization, thus, the greater the apparent extent of both short- and long-run resource flows into this sector, *ceteris paribus*.

#### MINING.

The secular trend for the share of mining in total GDP also has been downward (line 3.1.1.2 in Table A.1).<sup>5</sup> The same downward movement again is found for the percentage share of mining in the labor force: 5.1 in 1930, 5.4 in 1945, and 4.2 in 1965. Engel curves do not aid much in explaining this decline. The response of capacity and capacity utilization to policies which generally discriminated against mining and in favor of manufacturing, however, again was important (Tables 9.1 and 12.1). Such policies, in fact, were even less favorable toward mining than toward agriculture (columns 2 and 3 in Table 5.2), and their impact on the balance of payments again was negative—this time by reducing exports (see Chapter 7).

Both the mean shares of GDP for phases (line 3.1.1.2 in Table A.1) and the estimated deviation from the secular exponential growth rates (Table A.2) suggest a negative impact of liberalization on GDP in mining! This result, *prima facie*, is quite surprising given the lessening of discrimination against this sector at the start of liberalization attempts (column 3 in Table 5.2). In fact, however, it largely reflects coincidental relative price movements. In the 1956–58 liberalization, for example, the volume of copper production increased significantly, and copper was the dominant mining product.<sup>6</sup> But the copper price fell so much that the relative contribution of mining to GDP dropped despite the expansion of production in quantity terms. For this sector—and for this sector alone—fluctuations in the shares of GDP may be quite misleading indices of variations in real product.

#### MANUFACTURING.

The secular trend for the share of manufacturing in GDP was fairly strongly upward until the early 1950s, but has been downward ever since (line 3.1.1.3 in Table A.1).<sup>7</sup> The percentage share of manufacturing in the total work force reflects the same pattern: 15.2 in 1920 (including construction), 18.4 in 1945, 19.7 in 1952, and 18.0 in 1960.

The increased protection given manufacturing import substitution in the

1930s was an important factor in the early relative surge of industry.<sup>8</sup> According to Muñoz's [1968:82] careful estimates, the share of import substitution in real industrial growth in the period from 1927 to 1937-38 was 0.73, as compared with a Chenery normal value of 0.17 (see Table 10.3, below). However, for 1937-38 to 1952-53, Muñoz's estimate of the coefficient of import substitution is only 0.15, as compared to a Chenery normal value of 0.19.<sup>9</sup> For 1952-53 to 1963-64 his estimates imply very little net additional industrial import substitution.

From a longer-run viewpoint, then, the protectionist policies generally utilized after the Great Depression have been unsuccessful in a number of their direct objectives regarding manufacturing. Since the Second World War, import substitution has been quite limited. Since the early 1950s industrial growth has been lower than over-all growth. At the same time this sector has declined relatively in its labor absorption, thereby adding to the unemployment and underemployment problems of the 1960s and 1970s.<sup>10</sup>

From a shorter-run perspective, nevertheless, there appears to have been an inverse association between the degree of liberalization and the relative importance of industry in resource utilization and in production. During the past two decades, for example, the mean share of industry in GDP has fallen or remained constant with each liberalization effort and has risen or remained constant with each more restrictive phase or subphase (line 3.1.1.3 in Table A.1).<sup>11</sup> This phase association reflects a definite response in industrial capacity utilization to the reduced favoritism that has accompanied liberalization, and vice versa (see Tables 6.2 and 9.1). Many of the industries that developed behind high protective barriers have not been able to compete very well when those barriers have been lowered. Rather than make their production more efficient or allow resource shifts to other subsectors, moreover, they have found it more effective to push for the reinstatement of higher barriers for competing products.

The combination of short-run and long-run considerations thus leaves a policy dilemma. Highly protectionist policies have realized sharply diminishing returns in Chilean industrialization efforts. Yet the inflow of competing products accompanying a liberalization causes a reduction in the utilization of existing industrial capacity. To make Chilean manufacturing efficient might require a prolonged period of liberalization so that expectations of a return to higher barriers for competing products would be dissipated. But such an approach entails substantial short-term economic and political costs.

#### ALL OTHER SECTORS

For all other sectors—mostly services, but including construction—the secular trend in the share of resources absorbed has been positive. The mean percentage of total GDP originating in these sectors has increased steadily: 57

for 1908-51, 61 for 1952-61, and 64 for 1962-71 (based on lines 3.1.1.1-3.1.1.3 in Table A.1). The same trend is evident in the percentage of the labor force absorbed by these sectors: 41.4 in 1945, 44.2 in 1952, and 47.7 in 1960. Numerous Chilean observers have been preoccupied for some time by the large size of the service sector and by this shift from goods to services.

The causes of this shift are quite complex and hard to identify because the service sector has so many heterogeneous components. In the context of the present study, however, one hypothesis merits mention. Higher quantitative restrictions tend to raise the share of services per unit of foreign trade because they increase the paper work required by traders for each unit of trade; they cause a substantial increase in the expected private returns from lobbying for exceptions to the regime or for reclassification of traded goods; and they require a substantial government bureaucracy for monitoring and enforcing the restrictions. Thus, unless such increased services per unit of trade are offset by reductions in trade, intensified quantitative restrictions would contribute to the shift from goods to services.

A very crude test of this hypothesis from a long-run viewpoint is to examine the secular path of the share of GDP service production to see if it rose substantially in periods during which quantitative restrictions intensified significantly. The percentage shares of GDP cited above do not provide support for this hypothesis. The largest increment in the share of nonmerchandise production occurred not in the 1930s, when quantitative restrictions increased the most, but in the 1950s and 1960s, when three liberalization efforts were made. This test is very weak, however, because *ceteris paribus* conditions are not maintained.

Taken over a shorter run, the same test leads to ambiguous results. The mean share of services increased in the more restrictive years of 1952-55 and 1962-64, but fell in 1971.<sup>12</sup> It fell in the quite liberal 1959-61 period, but rose during the 1956-58 and 1965-70 liberalizations. For annual data simple regressions of the ratios of major components of the service sector to the merchandise sector, moreover, generally do not indicate a significant role for various indices of quantitative restrictions.<sup>13</sup>

The general-equilibrium model of Chapter 2 provides a much more satisfactory tool for examining this hypothesis. Under the assumption that the model captures the structure of the Chilean economy, an intensification of quantitative restrictions results in a substantial short- and medium-run shift from services to goods! The first-year elasticity of the goods-to-services ratio with respect to quantitative restrictions is 0.8, and that for the third-year is 1.4 (line 3.5.4 for simulation 2.3.1 in Table A.11). The expansion of agricultural and industrial production induced by greater quantitative restrictions outweighs the hypothesized effects on services.

However, the results of the general-equilibrium model also indicate that



overvaluation has contributed to the shift from goods to services. Devaluation, *ceteris paribus*, reverses that shift—especially if the NER for large-scale mining is devalued (simulations 2.1.1–2.1.3 and 2.6.1). This impact would at least partially offset that of reduced quantitative restrictions in a program combining liberalization with devaluation.

### 10.1.2 Manufacturing Subsectors.

The manufacturing sector is of particular interest since industrialization *per se* has long been an objective of Chilean policy. Systematic analysis of the impact of international economic regimes on subsectors of manufacturing is beyond the scope of this study because of the difficulties of maintaining *ceteris paribus* conditions. Nevertheless, the examination of long-run trends and short-run phase associations in the composition of manufacturing may be suggestive.

From a long-run viewpoint, it is worth noting, first, subsectoral growth rates in real industrial production before and after the Great Depression (columns 1 and 2 in Table 10.2) and, second, Muñoz's [1968:82] estimates of import-substitution coefficients for 1914–15 to 1963–64 and for various subperiods (Table 10.3).

TABLE 10.2  
Chilean Mean Percentage Growth Rates of Manufacturing Subsectors for Selected Years, 1914–65, and for First Year of Three Periods of Liberalization

Subsectors	1914– 27	1937– 65	1952– 55 Phase II	1956– 58 Phase III	1959– 61 Phase IV	1962– 64 Phase II	1956, 1959, 1965
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Food	3.2	3.6	4.5	-2.4	11.3	5.2	-0.7
Beverages	2.3	5.9	4.9	9.6	15.8	1.4	9.6
Tobacco	6.5	-0.1	8.4	0.7	-4.0	0.8	9.5
Textiles	4.3	4.9	3.4	0.6	11.9	8.7	7.3
Clothing and footwear	5.3	1.2	0.1	-0.8	-1.5	1.6	2.5
Furniture and wood products	1.0	2.1	3.0	-3.2	8.6	6.4	-3.8
Paper, paper products, and printing	4.0	5.6	2.1	20.4	15.6	2.2	9.9
Leather and rubber products	3.6	3.9	0.9	0.1	16.5	5.0	5.1
Chemicals	4.8	8.9	5.4	18.5	12.7	3.0	1.5
Nonmetallic minerals	3.9	6.1	-3.4	9.4	15.4	6.8	11.4
Metal products	9.7	7.9	3.6	1.8	6.1	11.8	9.8

SOURCE: Calculated from data in Muñoz [1968:160–161].

The manufacturing subsectors in order of the degree to which the mean growth rate in the more restrictive period, 1937-65, exceeded that for 1914-27 are chemicals, beverages, nonmetallic minerals, paper and printing, furniture and wood products, textiles, food, leather and rubber products, metal products, clothing and footwear, and tobacco (column 2 less column 1 in Table 10.2). With a few obvious exceptions (e.g., beverages and metal products) this ordering suggests a shift from traditional, consumption-oriented subsectors to more modern, intermediate-goods industries. Such a change is consistent with stated government priorities.

That more restrictive international economic regimes caused this shift, however, is questionable. The Muñoz import-substitution coefficients (Table 10.3) indicate that most import substitution took place *before* 1937. Thus, import substitution was not a major determinant of growth in the 1937-65 period. Another way of making the same point is to note that the correlation between growth rates and import-substitution coefficients by industrial subsector is not significantly nonzero.<sup>14</sup>

From a shorter-run viewpoint the question arises of the extent to which changes in industrial composition have been phase associated. Table 10.1 provides some data pertinent to this question: 1957 and 1967 were in Phase III periods and 1962 was in a more restrictive Phase II regime. Industries that were relatively flourishing under liberalization, therefore, might be expected to have had a larger share of manufacturing value added in 1957 and 1967 than in 1962. However, the breakdown obtained by classifying sectors on this basis does not suggest any interesting patterns.

The mean growth rates over phases also provides information about medium-run compositional changes (columns 3-6 in Table 10.2). Among the 11 manufacturing subsectors included in the table, mean growth rates for the more liberal phases exceed those for the more restrictive phases by at least 5 per cent in five cases (in order)—paper products and printing, chemicals, non-metallic minerals, beverages, and leather and rubber products (columns 4 plus 5 less the sum of columns 3 and 6). The opposite is true for two subsectors—tobacco and metal products. These patterns suggest, first, that mean growth rates for industrial subsectors were higher in the more liberal years 1956-61 than in the Phase II periods immediately preceding and following. This occurred even though all but four subsectors experienced relatively low rates of growth during the 1956-58 Ibañez-Klein-Saks attempt at stabilization plus liberalization. For the first year of the three liberalization attempts, moreover, a comparison of columns 7 and 2 indicates that the average growth rates exceeded the secular trend for all but three of the industrial subsectors (food, furniture and wood products, and chemicals). The frequent charge that liberalization implied widespread slowdowns in the manufacturing sector, thus, is not supported by these data.

TABLE 10.3  
Chilean Import-Substitution Coefficients, by Manufacturing Subsectors, 1914-64

Subsectors	1914-15, 1927	1927, 1937-38	1937-38, 1952-53	1952-53, 1963-64	1914-15, 1963-64
Food, beverages, and tobacco	0.388 (0.029)	0.455 (0.025)	-0.145 (0.030)	-0.017 (0.035)	0.154 (0.051)
Textiles	(0.482) 0.333	0.788 (0.396)	0.570 (0.362)	0.120 (0.270)	(0.586) 0.623
Clothing and footwear	(0.145)	2.261 (0.106)	0.105 (0.089)	0.540 (0.067)	(0.188)
Wood products	1.314 (0.109)	0.043 (0.092)	0.101 (0.094)	-0.038 (0.082)	0.336 (0.176)
Paper and publishing	-0.235 (0.271)	0.385 (0.221)	-0.168 (0.215)	0.327 (0.169)	0.328 (0.393)
Leather and rubber products	-0.715 (0.356)	0.869 (0.288)	-0.521 (0.259)	0.714 (0.197)	0.116 (0.462)
Chemicals	1.636 (0.388)	0.644 (0.348)	0.248 (0.341)	0.330 (0.302)	0.885 (0.550)
Nonmetallic minerals	0.817 (0.192)	0.955 (0.145)	0.269 (0.134)	0.077 (0.082)	0.821 (0.251)
Metal products	0.470 (0.585)	0.907 (0.522)	0.529 (0.493)	0.216 (0.360)	0.774 (0.753)
Total	0.431 (0.194)	0.730 (0.171)	0.150 (0.184)	0.145 (0.153)	0.410 (0.297)

SOURCE: Muñoz [1968:82]. The import-substitution coefficient is defined as  $(u_0 - u_1) Z_1 / (X_1 - X_0)$ , where  $u$  is the ratio of imports to total supply,  $Z$  is total supply,  $X$  is the gross internal product, and the subscripts refer to the endpoints of the period in question. The values in parentheses are the "normal" values based on Chenery [1960].

Second, the subsectors with higher growth rates in the more liberal phase relative to less liberal ones tended to be more modern and oriented more toward production of intermediate goods. The long-protected consumer-oriented subsectors tended to perform relatively less well under liberalization. These patterns point to the failure of many "infant" industries in the latter group to gain sufficient maturity to compete successfully in the world market.

## 10.2 RELATIONS BETWEEN RESOURCE ALLOCATION AND PRICE RATIOS OF FINAL TO INTERMEDIATE PRODUCT

In the past decade there has been considerable debate over the extent to which EPRs and related price ratios of final to intermediate product might indicate incentives for resource allocation (see Appendix B for references to this literature). By the early 1970s it had been established that these measures did not provide theoretically reliable indicators under a wide set of apparently reasonable assumptions. Nevertheless, the question remains whether or not such measures have actually been associated with resource movements.

Evidence bearing on this question is presented below. For the most part, it requires strong *ceteris paribus* assumptions. Taken together, it lends very little empirical support for the relations sometimes hypothesized between price-related measures of the ratio of final to intermediate product (such as EPRs) and resource allocation.<sup>15</sup> In part, this reflects the impact of a number of other important factors that simultaneously interact within the economic system. In addition, it may reflect the effect of frequent and often bizarre changes in the EPRs resulting from the widespread use of quantitative restrictions.<sup>16</sup>

i. Compositional changes in manufacturing value added do not appear to have been associated with subsectoral EPR levels or changes.

ii. Hachette [1966] provides data for 1959-61 from which the average change in customs barriers and the standard deviation in the annual values of those changes can be calculated. However, neither of these variables was found to be significantly correlated with industrial subsectoral growth over the same period.

iii. Sectoral ITRs for 1967 and changes in ITRs between 1957 and 1967 are significantly correlated with the increase in value added between 1957 and 1967 (Tables A.5 and A.6). Changes in ITRs also are significantly correlated with additions to capacity in terms of horsepower in the same decade. Neither the levels nor the changes in EPRs, however, are significantly correlated with any index of relative growth in output or in resource allocation.

iv. Using the general-equilibrium model of Chapter 2, it is possible to explore the effect on sectoral resource allocation when price ratios of final to intermediate product vary (lines 3.1.1-3.1.3 in Table A.11). Changes in resource allocation are indicated by changes in the allocation of the labor force (lines 3.2.1-3.2.3), capital stock (lines 3.3.1-3.3.3), production capacity (lines 3.4.1-3.4.3), and GDP (lines 3.5.1-3.5.4). Examination of the simulation results leads to a striking finding: in a large number of cases relative changes in the price ratios of final to intermediate product are in different directions than short-run or longer-run movements, or both, in resource allocation

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(e.g., simulations 1.1, 1.2, 2.1.1, 2.1.3, 2.2, and 2.3.1)! Upon reflection, of course, such a result should not seem surprising, since many determinants besides relative prices enter into capacity-utilization and capacity-creation decisions (see subsections 9.2.2, 9.2.3, and 12.2.3.1).

### 10.3 COSTS OF ATTEMPTS TO ALTER RESOURCE ALLOCATION THROUGH DIFFERENTIAL INCENTIVES CREATED BY THE INTERNATIONAL ECONOMIC REGIMES

The implication of the previous section is *not* that foreign-sector regimes have not affected resource allocation but only that EPRs and related measures do not provide very good indications of the direction of such effects.

The general-equilibrium model of Chapter 2, in fact, suggests that foreign-sector policies have had substantial impact on resource allocation among sectors. In the short and medium run, for example, higher quantitative restrictions result in shifts primarily into industry, secondarily into agriculture, and away from mining and services (lines 3.4.1–3.4.3 and 3.5.1–3.5.4 for simulation 2.3.1 in Table A.11). Below-equilibrium NERs, similarly, cause shifts primarily into industry, but also into agriculture relative to mining (simulation 2.1.3).

The costs of such shifts, of course, include the extent to which their occurrence reduced the degree of attainment of all other objectives. Without a social welfare function such trade-offs cannot be evaluated. Evaluation of costs normally focuses, therefore, on the amount of forgone output. Output apparently was lost by the shift in resources from mining to industry.<sup>17</sup> Under the strong assumption that wages have been proportional to marginal product, for example, the mean marginal product in mining averaged over 20 per cent above that for industry in the quarter century from 1945 to 1969. Within industries, moreover, the range of DRCs shown in Table 5.3 suggests that the international economic regimes caused some shifts into inefficient production.<sup>18</sup>

Balassa [1971:82] calculates the over-all static cost of Chilean protection to have been 1.4 per cent of national income on the basis of Jeanneret's 1961 EPR estimates (EPR1 in Table 5.3). He also estimates that the total net cost of protection in that year was a substantially larger 6.2 per cent. To obtain this figure he adds to the static effect 9.6 per cent for dynamic cost and 0.6 per cent for the consumption effect.<sup>19</sup> These are partially offset by additions of –3.5 per cent for a terms-of-trade effect and –1.9 per cent for the cost of increased exports under free trade.

To most neoclassical economists these costs—especially the static ones

alone—would be regarded as surprisingly small, given the degree of distortion indicated in Table 5.3, if it were not for a number of other similar estimates made over the past fifteen years. Furthermore, on the basis of conservative estimates in Behrman [1973b], the mean forgone output in underutilized capacity due primarily to domestic policies has been greater—even if Balassa's dynamic costs are included. Some significant output gains thus may be possible from a more liberalized trade policy. But improvements in other policies—such as anticyclical ones—may have higher benefits. The potential gains in output from resource allocation due to changes in the international economic regime should not be exaggerated.<sup>20</sup>

## NOTES

1. The extent to which manufacturing has been favored relative to agriculture is one important exception (see subsection 5.1.2).

2. For 1940–65 the secular growth rate for real agricultural GDP was 0.02 as compared to 0.038 for total real GDP (Table A.2).

3. For some countries increased imports of basic foodstuffs would be suggested by comparative-advantage considerations. A large number of agricultural economists, however, have agreed that Chile has a comparative advantage in the production of many basic foodstuffs (for example, see Schultz [1968]).

4. During the third attempt (1965–70) it decreased slightly, but this may be part of the secular trend and not a fluctuation due to a change in the foreign-sector regime. In general, the increases occurred despite the first-year drops in the PLD-EER(PI)s for agriculture relative to industry, that are described in section 5.2, above. For the 1956–58 liberalization, Crosson [1970] explains that the price ratio of agricultural output to input rose even though the price ratio of agriculture to total manufacturing fell. Therefore, there were price incentives for expanding agricultural production.

5. For 1940–65 the secular growth rate for mining was 0.018 as compared with 0.038 for total real GDP (Table A.2).

6. See the discussion of the impact of the *Nuevo Trato* in subsection 7.1.2.3.

7. The estimates in Table A.2 suggest that for the entire 1940–65 period the mean exponential growth rate for real industrial GDP has been the same as for total product—0.038.

8. Domestic policies also at times played important roles in the structure of incentives for import substitution. For example, the shift from production to sales taxes, enacted in Law 11575 of August 14, 1954, implied an increase in EPRs because the production tax had been basically on goods produced by domestic industries.

9. The Instituto de Economía [1963:2, 9] suggests that during World War II substantial import substitution occurred because of shortages of imported supplies. A finding that considerable import substitution may have occurred then and in the subsequent subphases in an *absolute* sense would not be inconsistent with the *relative* estimates of Muñoz, given that the rate of growth of industrial product was two to three times as high in the three subphases after 1940 as in 1931–39 (line 5.2 in Table A.1).

10. For these reasons Mamalakis [1971:214–217, 370–371] also has serious doubts about the structuralists' characterization of Chilean industrialization as being relatively successful.

11. Table A.2 provides further support for this characterization. The only significantly positive deviation from the exponential growth rate for industrial GDP in 1940-65 is for the 1940-55 Phase II period, and the only significantly negative one is for the 1959-61 Phase IV years.

12. The mean share of services is given by 1.0 minus the sum of lines 3.1.1.1-3.1.1.3 in Table A.1.

13. Only in the regression of the ratio of the size of government to industrial production is a significantly nonzero coefficient of the French-Davis QR index obtained.

The significantly nonzero deviations from the exponential growth rates for GDP in Table A.2 also are ambiguous. Construction had a negative deviation for the Phase II 1940-55 period. Services had a negative deviation for the 1956-1958 liberalization. Government had a positive deviation for the 1940-55 Phase II years, but a negative one for the 1962-64 Phase II period.

14. In fact if the coefficient of determination between these two series is corrected for degrees of freedom, it becomes negative.

15. Taylor and Black [1973] also find that EPR measures often are poor indicators of the magnitude and sometimes of the sign of resource shifts among Chilean subsectors owing to reductions in import taxes.

16. In the real world, not only does domestic policy keep changing, but it takes time for adjustments to these changes to work themselves out.

17. Restriction of mining output might have been an optimal strategy had Chile been able to exploit her limited market power in copper without retaliation. Until the late 1960s, however, she was not able to do so because of the foreign locus of decision-making in large-scale mining.

18. An extreme case of inefficiency due to the international economic regime was the restriction of the automobile industry to Arica in northern Chile by the special regime for that area. Johnson [1967] describes the state of this industry as of 1965. He notes the considerable problems of seasonality due to the difficulties of obtaining both domestic and foreign inputs as well as the pressure to produce before the end of each calendar year so that the annually increasing national-component requirements could be met. He estimates that the trade-off between local resources used and the dollars saved was as high as 4 to 1 at the official NER or 2.4 to 1 at the black-market NER (although he suggests that the elimination of extraordinary rents might lower these estimates somewhat).

19. The relatively large dynamic effect is based on the assumption that those industries which continued after a switch to free trade would do so with production costs which declined to competitive levels. This dynamic effect, however, does not include some important possible benefits of openness, such as greater exposure to technical progress and innovation. Thus, it may understate the true benefits of liberalization. For more details concerning this and other calculations see Balassa [1971:80-82].

20. In Chapter 12 I return to the question of the beneficial effects of liberalization on economic growth.