

Distr.
RESTRICTED

LC/R.1782
30 December 1997

ORIGINAL: ENGLISH

E C L A C
Economic Commission for Latin America and the Caribbean

**TRADE AND GROWTH IN CHILE:
PAST PERFORMANCE AND FUTURE PROSPECTS */**

*/ This document was prepared by Manuel Agosin, consultant of the International Trade Unit of the International Trade, Development Financing and Transport Division. It has not been subjected to editorial revision. The author wishes to thank Gustavo Crespi for his invaluable suggestions and Leonardo Letelier for discussions of some of the ideas that are found in this paper. Comments on earlier drafts by Héctor Assael, Gerry Helleiner, Mikio Kuwayama and Verónica Silva are also deeply appreciated. He thanks Julio Cáceres and Ernesto Pastén for able research assistance. The usual disclaimers apply.

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Abstract

This study addresses the relationships that exist between Chile's remarkable export performance of the past two decades and its high rate of economic growth since the mid-1980s. It first seeks to determine whether the Chilean experience can be termed a case of "export-led growth" or of "growth-led exports". Using time series analysis, we find that exports and investment have been the two exogenous variables that explain Chilean growth performance, while neither investment nor exports appear to have been in turn influenced by GDP growth.

Next, an attempt is made to explain the causes for the rapid expansion and diversification of exports. Drastic trade liberalization played an important facilitating role, in the sense that price signals were turned against previously favoured import substituting sectors. But other policies, both of a horizontal nature, and sector-specific ones as well, were also important. Exchange rate policies have been fundamental determinants of export performance, both when exports stagnated owing to large exchange rate misalignments (1977-82) and later when they took off in response to substantial depreciation (beginning in 1982). The introduction of drawbacks and subsidies for minor exports, the use debt-equity swaps for stimulating new export-oriented production after the debt crisis, the active participation of the State in the provision of market information, and large subsidies to the forestry sector must also be counted among the variables that contributed to the export drive.

The next stage of Chilean export development will be more difficult and will have more complex policy requirements than the past stage. While natural resources will undoubtedly continue to be the basis of the country's comparative advantages in world trade, the future will have to bring diversification into technologically more sophisticated products and services. This will involve attempting to solve market failures in key activities (training, education, technological and marketing know-how, the provision of long-term financial resources for investment in new and untried activities). Fortunately, the most efficient policies to accomplish these objectives tend to be compatible with the World Trade Organization (WTO) disciplines. As long as supports are of a precompetitive nature and do not directly affect export prices, they cannot be legally challenged, even if they single out specific activities for encouragement.

Since 1990, Chilean trade policy has given priority to continuing the process of trade liberalization through the signing of free trade agreements with its main trading partners. Although several agreements have been signed, the most important one so far is with Mercosur. In fact, this is probably the most beneficial of the potential agreements that the country is at present seeking (particularly entry into NAFTA and a free trade agreement with the European Union). Mercosur is already an important destination of Chilean manufacturing exports and is potentially an enormous market for these exports. At the same time, Mercosur member countries are the world's most efficient producers of food staples, products in which Chile has comparative disadvantages. For these reasons, it is argued that priority ought to be given to strengthening Chile's ties to Mercosur before forging new agreements with other partners.

INTRODUCTION AND SUMMARY

For good and bad reasons, Chile has come to be identified in academic and policy-making circles as one of the foremost examples of the successes that await countries that are bold enough to carry out and stick to policy reforms in favour of market forces. In the period 1974-79, the military government that overthrew President Allende in 1973 implemented a thorough trade liberalization, freed domestic financial markets, and opened up the capital account of the balance of payments (see Meller, 1996, chapter 3; Ffrench-Davis, Leiva, and Madrid, 1991 and 1993; Agosin and Ffrench-Davis, 1995). These reforms had the objective of bringing down the curtain on the import substitution model of industrialization that had served as the main developmental paradigm since the 1940s and that had been upheld by governments of very different stripes. The reforms of the period 1974-79 were guided by the idea that, once market forces were given full reign, resources would be reallocated (costlessly) to export industries in which the country had a comparative advantage and that this would lead to rapid growth not only of exports but also of aggregate output.

Therefore, in any evaluation of Chilean policy reforms, special interest attaches to the behavior of exports and its relationship with the overall growth of the economy. It is certainly true that exports rose rapidly after 1974, and that they have continued to do so up to the present. Thus one of the key ingredients in the Chilean success story, it is claimed, has been outstanding export performance. However, export expansion and diversification, while very successful, has only recently pulled in its train the rest of the economy. Up to the end of the 1980s, vigorous export growth had not been accompanied by a significant rise in the investment rate or a commensurate improvement in overall economic performance. On the contrary, economic growth during the military government was considerably slower than during the sixties, and saving and investment rates declined very significantly. At the same time, the process of export-oriented growth is fairly recent, and the jury is still out as to its long-term sustainability.

This paper looks at the performance of exports and aggregate output over a long period: 1960-1995. It seeks to identify the main trends in the growth of exports and attempts to assign responsibility to various factors for export performance. It provides answers to the following questions: Was trade liberalization responsible for the evident export success that Chile has had since the mid-1970s and has been able to maintain up to the present? What weight can one assign to other government policies that encouraged exports generally and to selective policies at the sectoral level? Why has the connection between export growth and overall economic performance been much stronger during the 1990s than before? What are the prospects for the export-led growth process in the coming decades?

The paper is organized in the following way. Chapter I asks the question whether the Chilean experience can be described as an example of "export-led growth" or of "growth-led exports". In the case of Chile, it is shown that the export-led growth view is more in accordance

with the facts than the competing hypothesis of growth-led exports. Since the mid-1980s, export expansion and diversification have been an engine of growth for the Chilean economy.

Chapter II examines the causes for export expansion and diversification. The trade liberalization of 1974-79 and other policies with a bearing on its results are described, and it is argued that the restructuring of the economy was needlessly costly because an important share of installed capacity in manufacturing was destroyed rather than gradually redeployed toward the export sector. Although no counterfactual is available against which one can evaluate the degree of success of the reforms, it is argued that a different policy package that would have assisted the restructuring of the manufacturing sector would have been more successful. Other policies that affected exports and policies and factors at the sectoral level are also examined. The conclusion that can be derived from the discussion is that it is not possible to ignore other policies and initial conditions that increased the strength of the supply response and that were very important in explaining export successes at the sectoral level.

Chapter III looks at the requirements of participation in the World Trade Organization (WTO) and concludes that several incentives, both of a functional and selective nature, will have to disappear. They need to be replaced by policies that tackle directly the market failures that place obstacles to export growth and diversification. These policies can have both horizontal and selective components. Theoretical arguments against selectivity are not compelling. Moreover, international commitments under WTO still leave plenty of space for selective policies, as long as the effects are of a precompetitive nature. Of course, the sectors to be chosen must build on the country's resource endowment, which is heavily biased in favour of natural resources (mining, agriculture, forestry, sea products). Policies to be considered, both in their horizontal and selective dimension, include the promotion of labour training and higher education, the absorption of foreign technology and greater domestic R&D, the gathering of information on foreign markets, improvements in the operation of capital markets so as to make available needed long-term credit to firms with new ideas, and improvements in infrastructure. Policies toward foreign direct investment (FDI) can also be more active than what they have been up to now.

Chapter IV deals with free trade agreements. Although they have had very little to do with Chilean export success up to now, they could be important in deepening the export-oriented strategy in the future. It is concluded that the recent association of Chile with Mercosur (October 1996) holds out great promise for rapid increases in the exports of manufactures. Mercosur countries and others in the region are potentially "natural" trading partners for Chile, but transforming the promise into reality will require not only trade liberalization but also improvements in infrastructure and trade-facilitating institutions.

Chapter V summarizes the findings of the study and provides a bird's-eye view of the policy requirements for ensuring the sustainability of the export-oriented model which Chile has been pursuing for over two decades. We argue that the "easy" stage of export promotion has already been accomplished. Up to now, besides a few specific interventions (which, nonetheless, it will be argued below, had a very important effect on export growth), the major role of the State has been to dismantle the system of incentives prevailing during the import substitution

period (roughly, 1938 through 1973). The next stage of export development will involve diversification into more sophisticated goods and services and will have much more complex policy requirements. Also, a greater articulation between the private and the public sectors will be essential.

I. THE CHILEAN EXPERIENCE: EXPORT-LED GROWTH OR GROWTH-LED EXPORTS?

Is the Chilean experience compatible with the notion that exports have been the leading sector of the economy and that the expansion of exports has been the main force behind the high rates of growth attained since the mid-1980s? Or has fast output growth been the main factor behind export expansion? The former view emphasizes the role of exports in promoting overall growth. On the other hand, those who advocate the growth-led export paradigm stress the importance of capital accumulation and the building up of indigenous technological capacities as preconditions for successful exporting.^{1/}

Most approaches to economic growth and development do not distinguish between exports and non-exporting production. In practically all growth models, be they of a neoclassical bent (Solow, 1956), of Keynesian inspiration (e.g., Pasinetti, 1974), or of the "endogenous growth" variety (see Barro and Sala-i-Martin, 1995), pride of place is given to investment rates and technological progress as variables explaining economic growth. Those who advocate a key role for exports have a problem, which is akin to the problem of identification: since exports are a part of GDP, and sometimes a rather large part, rapid increases in exports have an automatic impact on the rate of growth of GDP, without there being any particular causal relationship involved.

Is there, however, something special about exports? We hypothesize that, in a small, open and industrially backward economy, export growth and diversification are important for three reasons. In the first place, domestic markets are small and are unable to support, from the demand side, a sustained increase in GDP. Any growth impulse that has its origin in the growth of domestic demand must have a tendency to exhaust itself, sooner rather than later. By contrast, export markets are unlimited for a small country and, therefore, do not present constraints to growth from the demand side.^{2/} However, if incentives have an anti-export bias, the promise of fast growth will not materialize. Second, in most developing countries, technological change comes almost entirely from abroad, mainly in the form of imported capital goods. Third, since most small developing economies do not produce machinery, investment requires imports of capital goods. While such imports can be, for a time, financed with capital inflow, the

^{1/} Rodrik (1995) and Akyüz and Gore (1996) give pride of place to the increase in the investment rate as the fundamental cause for the high growth performance of the Republic of Korea and Taiwan Province of China. In the view of these authors, the rise in the investment rate can, by itself, explain the high rates of growth of exports in these two economies, without the need to appeal to trade policies at all. These analyses beg the question of whether the sharp increases in investment would have occurred in the absence of active trade policies that made exporting new products profitable.

^{2/} Provided, of course, that market shares in importing countries do not become too large. In other words, the sustainability of export-led growth from the demand side depends on the exporter remaining a "small country" in world markets. This requires continuous export diversification.

sustainability of high rates of growth normally requires vigorous export growth. Thus export expansion provides the basis for overall economic growth, with export diversification ensuring the stability of the process.^{3/}

Which of these two competing views is the correct one has policy implications. If physical and human capital accumulation and technical change are the keys to growth, there would be little reason to aim policies at promoting exports. If, on the other hand, the facts fit the description of the export-led growth paradigm, successful growth performance would require policies that stimulate the increase and diversification of exports. It would become important to support the growth process through horizontal policies that correct market failures impeding export diversification; also, given that developing countries are far from the technological frontier, policy would need to be oriented to the support of "infant exporting sectors".

A. EXPORT AND GDP GROWTH, 1960-1995

The stylized facts of the growth process in Chile can best be understood by dividing the period since 1960 into five subperiods. The period from 1960 to 1970 was characterized by steady (albeit unremarkable) economic growth. While copper dominated the export basket, there was significant growth in non-traditional exports. In the second half of the decade, economic policies had already begun to shift from unrestricted support for import substitution to greater emphasis on export promotion.

The period 1971-73 corresponds to the upheavals of the socialist experiment. In a radical break with the past, the Allende government nationalized large segments of the economy, including the copper mines (which at the time had 49 per cent foreign ownership), the banks, and most large and even medium-sized industrial firms. There were widespread price controls, high tariffs, various sorts of non-tariff barriers, and multiple exchange rates. Non-traditional exports declined steeply during this period.

After the military coup of September 1973, there ensued another attempt at radical departure from the past, this time in a neo-liberal direction. The military regime can be divided into two subperiods, 1974-81 and 1982-89. The first begins with the reorganization of the economy and ends with the boom of 1981; as a response of the banking and balance of payments crises of 1982, the second subperiod is marked by strict prudential regulation of the banking system, sharp exchange rate depreciation, and a greater pragmatism with respect to measures in

^{3/} Export diversification may be desirable for other reasons as well. Moving up the "technological ladder" in export diversification allows an economy to raise real wages, thus further stimulating growth and improving the distribution of income. But clearly this has not been the case of the Chilean economy in the last couple of decades. Although exports have become more diversified, with few exceptions, their technological content is still quite unsophisticated, and wages are still considerably lower than they are in advanced industrial countries.

support of non-traditional exports. In spite of the fact that positive growth resumed in 1984, *per capita* GDP in 1988 had not surpassed its 1981 level.^{4/}

Both GDP and investment began to expand in 1984-85, albeit from the very low levels to which they had fallen during the depression of 1982-83. Exports also began to grow again in 1985, stimulated by the sharp real exchange rate depreciation caused by the debt crisis. The recovery of investment was given an additional impulse by the tax reform of 1984, which in effect substituted the business profit tax by a unified tax on income from all sources. A withholding tax of 10 per cent (raised to 15 per cent in 1990) began to be imposed on profits, to be later credited against the tax liabilities of owners. Since retained earnings were taxed only at the 10 per cent rate (which was substantially lower than the rates of the steeply progressive income tax), this stimulated the retention and reinvestment of profits.

The final period, which begins in 1990, is associated with the return to democracy. During this period, the growth of GDP has been strong, the investment rate has risen steadily, and non-traditional exports have become the most dynamic sector of the economy. In contrast to what happened in the 1970s and 1980s, the growth of exports has pulled along the rest of the economy. Government policies have been supportive of such growth. In the face of large inflows of foreign capital, exchange rate policies have aimed at preventing a massive appreciation of the exchange rate. Finally, policies in support of technological innovation and marketing products abroad have been introduced or strengthened.

Since 1974, export growth has led GDP growth (see table 1 and figure 1). However, it is only since 1989 that the growth in non-traditional exports has been accompanied by strong and sustained GDP growth and by a rise in the investment rate. During 1974-89, not only did GDP growth trail export growth, but growth and investment rates were substantially below those achieved during the "golden age" of the 1960s.^{5/}

^{4/} Thus the 1981-89 period is appropriate for our analysis, since both years represent cyclical peaks. Although GDP, investment, and exports begin their steep upward course in 1984, any analysis using 1984 as a base year would risk seriously overestimating growth rates in the subsequent period, since a large component of the growth that took place in 1984-88 was only recovery from the sharp fall in economic aggregates in 1982-83.

^{5/} The 1960s can be rightfully called a "golden age": steady growth was achieved in a context of political democracy and social change. The Frei government (1964-70) introduced a land reform without expropriation, bought for the Chilean State 51 per cent of the ownership of the large (and foreign-owned) copper companies, and initiated many innovative economic and social programs (see French-Davis, 1973). This period was succeeded by two dramatically contrasting economic and social experiments that disrupted the economy and destroyed long-established traditions of political and ideological pluralism.

Table 1
Growth and export performance, 1960-95
 (Percentage)

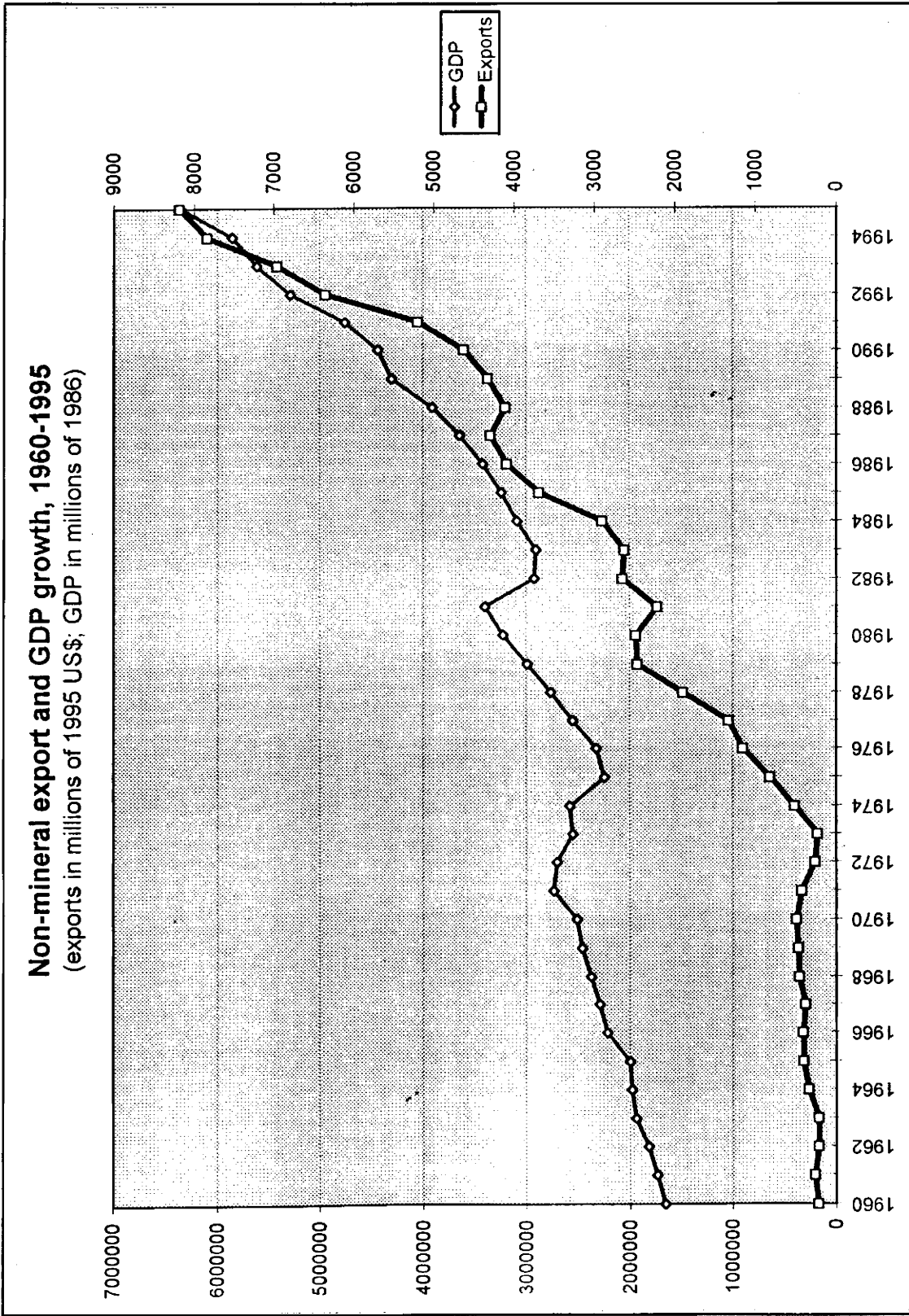
	GDP growth	Gross investment (a)	Total export growth (b)	Non-copper export growth
1960-70	4.2	25.1	5.6	4.6
1971-73	0.5	16.9	-4.4	-11.9
1974-81	3.7	22.2	12.0	20.9
1982-89	2.4	19.8	6.5	8.2
1990-95	6.7	28.5	9.0	9.8

Source: Author's calculations, based on data of the Central Bank of Chile.

(a) As a percentage of GDP in 1986 constant prices.

(b) Goods only.

Figure 1



Source: Author's calculations, based on data of the Central Bank of Chile.

Even so, the degree of openness of the Chilean economy has increased dramatically since 1974. In 1970, exports of goods and services represented about 15 per cent of GDP (current prices). In 1995, this proportion had risen to 29 per cent. In a sense, one of the objectives of the trade liberalization policies can be said to have been achieved: the economy has gone from a situation in which producing either non-tradables or importables was its mainstay to another in which exports are its leading sector. In the process, large patches of the manufacturing sector (e.g., textiles, machine tools) disappeared. Others eventually emerged, mainly oriented towards external markets.

Since 1974, export growth has been very fast indeed, and the growth of non-mineral exports has been spectacular. For analytical purposes, goods exports have been divided into seven categories: copper, other minerals, agricultural products (which are mainly fresh fruit and vegetables), fishmeal and extractive fishing products, wood and wood products (including a growing but small item of furniture), pulp and paper (mostly pulp), and other manufactures. This last category consists of about 3,000 items of the most varied nature. It comprises, among others, confectionery, fruit juices, processed food, canned and frozen fish, cultivated salmon, wine, auto parts, sanitary equipment, and metal products. What these products have in common is that they are either natural-resource intensive or they use standardized technologies. Their main markets are in other Latin American countries, but they are an increasing component of exports to the United States and Europe.

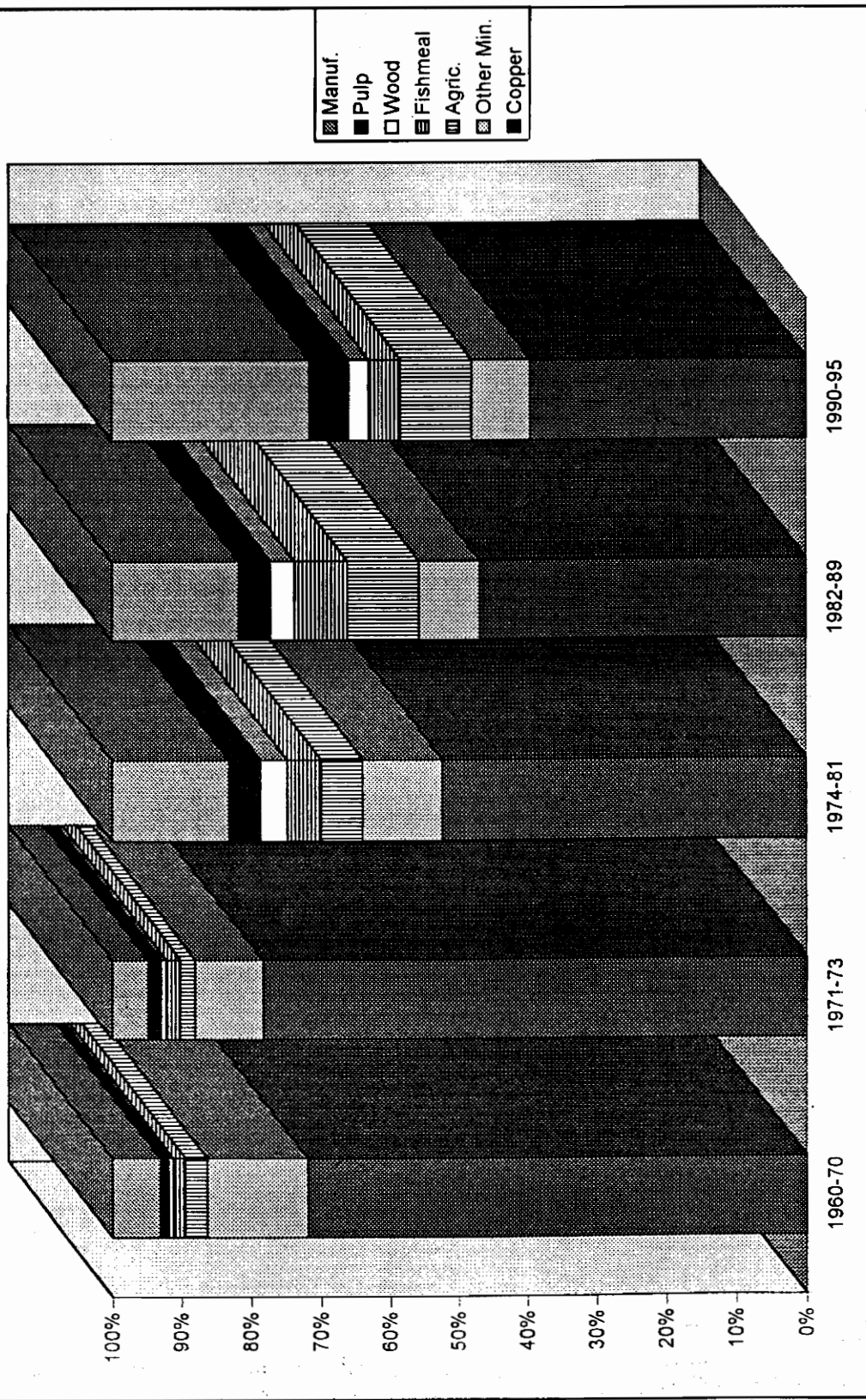
Exports of non-factor services have also risen dramatically. It has not been possible to disaggregate services exports by category. Nonetheless, available qualitative information indicates that some new service industries have begun to export successfully in recent years (software and engineering services, for example). These are sectors where the country has been able to acquire comparative advantage through long-term policies of human resource development, which, parenthetically, suffered serious setbacks during the military regime.

Thus exports have not only grown, but they have become increasingly diversified. In 1971-73, copper represented almost 80 per cent of total goods exports. If we add other minerals, the share of minerals was almost 90 per cent. By contrast, in the 1990s the share of copper has fallen to under 40 per cent and that of all minerals to under 50 per cent.^{6/} On the other hand, the share of "other manufactures" has risen from 5 per cent in 1971-73 to almost 30 per cent in the 1990s. If we add pulp and paper, fishmeal, and wood products, total manufacturing exports comprise over 40 per cent of total exports, as compared to 10 per cent in 1971-73 (see figure 2).

^{6/} However, large investments by foreign copper companies over the last decade may reverse these trends in the coming years, when the output generated by these investments comes on stream.

Figure 2

Sectoral distribution of exports
(in % of total exports in current US\$)



Source: Author's calculations, based on data of the Central Bank of Chile.

Table 2
Average annual rates of growth of export volume,
by type of good, 1960-95
 (percentage)

	1960-70	1971-73	1974-81	1982-89	1990-95
Copper	6.2	-1.0	7.8	4.6	7.8
Other minerals	1.6	-2.6	6.7	6.5	3.4
Agricultural products	2.4	-27.5	32.6	11.8	7.0
Fishmeal and fish prods.	18.7	-31.1	45.8	11.1	3.0
Wood and wood prods.	15.9	-25.1	41.0	7.3	4.3
Pulp and paper	16.7	-7.6	18.5	0.8	22.7
Other manufactures	7.1	-28.0	38.6	9.2	12.7
Total non-copper	4.6	-11.9	20.9	8.2	9.8
Total goods	5.6	-4.4	12.0	6.5	9.0
Services	18.8 (a)	0.1	8.0

Source: Author's calculations, based on data of the Central Bank of Chile.

(a) 1976-81.

For all of these seven categories of products, price indices were estimated with which to derive export volume growth rates by category.^{7/} Non-mineral exports have grown rapidly in volume terms since 1974 (see table 2). The rates of growth of export volumes during the first period under military rule (1974-81) are particularly impressive, but this is due mainly to their small (and depressed, in the case of manufactures) levels in 1973.

Moreover, to a large extent, the growth of exports of "other manufactures", which include items that are produced both for export and for domestic markets, was induced during this period by the huge excess capacity created by the trade liberalization policies. Fiscal adjustment in order to reduce a fiscal deficit that had grown to almost 20 per cent of GDP, together with very high interest rates (resulting from financial liberalization, with little or no banking supervision) also contributed to the depression in aggregate demand and to the contraction in GDP in 1975, which bordered on 13 per cent. One way in which domestic producers of manufactures defended themselves was to seek foreign markets for the goods they could not sell at home (see French-Davis, 1979). The manufacturing sector shrunk in absolute terms, manufacturing output did not recover its 1972 levels until 1987 (see figure 3), and the share of manufacturing in GDP contracted from 26.6 per cent in 1972 to 20.8 per cent in 1987.^{8/}

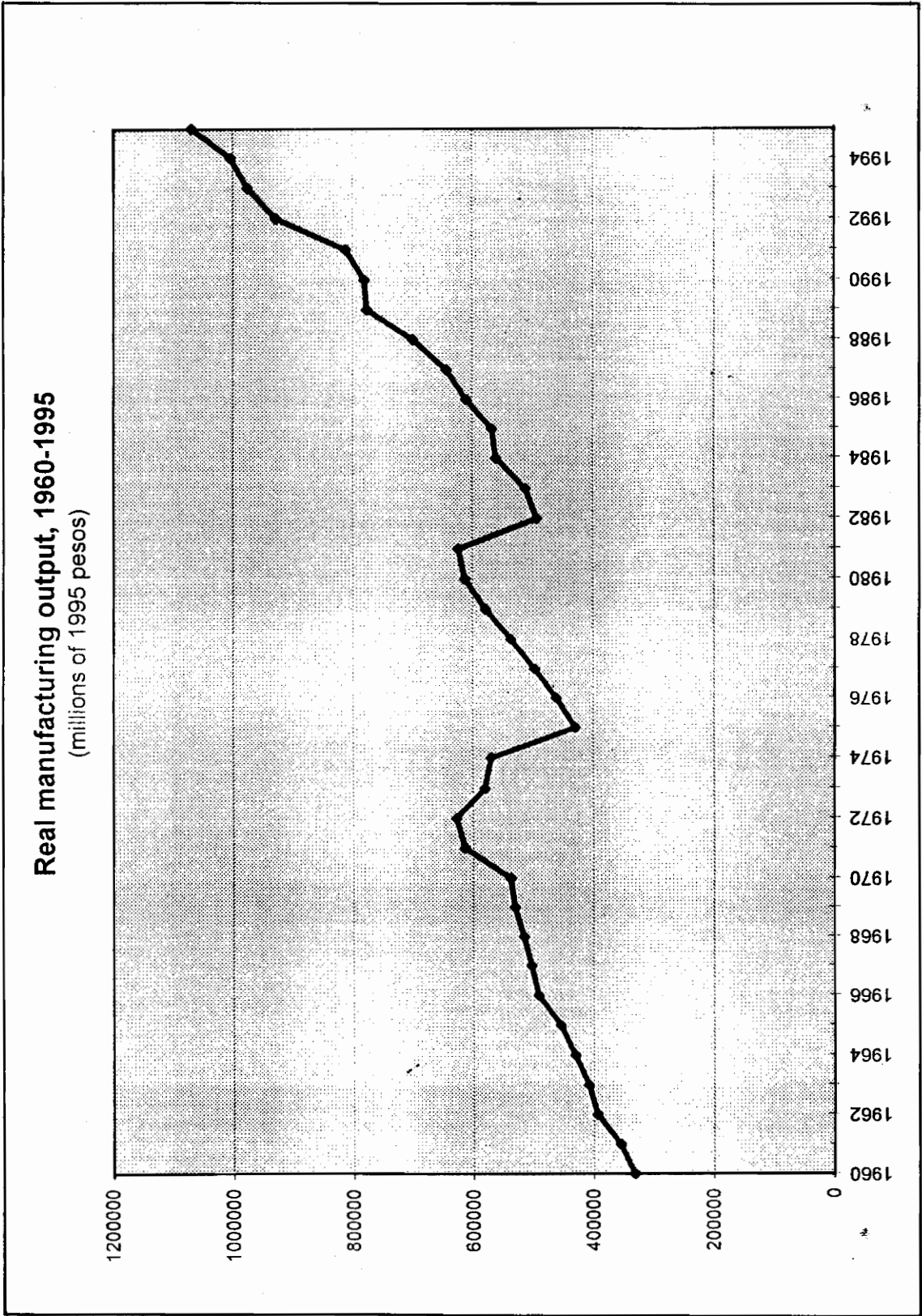
Excess capacity also played a role in the expansion of manufacturing exports in the 1982-89 period. Once again, there was a severe economic contraction in 1982-83, with GDP falling about 15 per cent. It was not until after 1985 that one can speak of export-led growth with positive net investment in this sector. By contrast, during the period since 1989, output has been close to potential output, investment has grown sharply, and exports have led a rapid increase in overall manufacturing production.

Therefore, it is only since the mid-1980s that export-led growth has become firmly based. Non-traditional exports have become the most dynamic component of the economy, investment rates have been rising from Latin toward East Asian standards, and overall growth has been high and steady. Since 1989, actual output has been close to potential output, and excess capacity in manufacturing (and in the economy as a whole) has been close to zero and, therefore, cannot explain the increase in manufacturing exports.

^{7/} There are no long time series on export volumes and prices available in Chilean official statistics. For the period from 1960 to 1989, as deflators of the value statistics we used the export price indices calculated by Sáez (1991). For the period 1990-95, Central Bank estimates for export prices and volumes are available. Unfortunately, there are no data for 1990 with which to splice together the two data sets. Therefore, price indices for 1990 were forecast with the Sáez (1991) data using an autoregressive scheme with 7 lags. Since both the Sáez and Central Bank price index for manufacturing prices include pulp and paper, fishmeal, and wood products, and we wished to estimate export prices and volumes for an aggregate excluding these items, we proceeded to calculate an export price index for manufactures of our own. A price index was constructed for these three items using moving yearly weights. In spite of the flimsiness of the price series, the volume series obtained with them behave reasonably.

^{8/} Data drawn from Central Bank of Chile, *Indicadores Económicos y Sociales, 1960-88*, Santiago, 1989, p. 30. The ratios cited in the text are calculated with data in 1977 constant prices.

Figure 3



Source: Central Bank of Chile.

B. ECONOMIC GROWTH AND EXPORT PERFORMANCE: A TIME-SERIES APPROACH

In order to answer the main question posed at the outset of this chapter, we use a vector autoregression model (VAR) and Johansen's technique of estimation.^{9/} This is entirely appropriate, because in a system that determines GDP and exports simultaneously, we do not know which variable is exogenous and which endogenous. In fact, the purpose of the exercise is to determine the direction of causality between exports and GDP. In the system, the data generating process (Z) is assumed to be of the following type:

$$Z_t = [Y_t, K_t, X_t, t] \quad (1)$$

where Y is GDP; K, the capital stock; X, real exports; and t a time trend. This system contains an equation in which GDP is a function of capital inputs and of exports (which can be thought of as a production function where exports could be interpreted as increasing the productivity of capital inputs). Of course, the solution of the system allows for the possibility that there may be more than one direction of causation. The production function that we wish to estimate is the following:

$$Y_t = \alpha_0 + \alpha_1 * K_t + \alpha_2 * X_t + \alpha_3 * t + u_t \quad (2)$$

where u is a well-behaved error term. It is easy to demonstrate (see annex I) that, since the capital stock is the sum of net investment rates, equation (3) can be transformed into an equation in which the capital stock is replaced by investment (I). This yields the production function that will be used for estimation purposes:

$$Y_t = \beta_0 + \beta_1 * I_t + \beta_2 * X_t + \beta_3 * t + u'_t \quad (3)$$

In the econometric analysis, investment is proxied by gross fixed capital formation. Since the only long series for export volume that it is possible to obtain with the data available is one for goods exports, this is the one that is used. In the system all variables are expressed in natural logarithms. All variables used in the exercise have unit roots (see table 3 for Augmented Dickey-Fuller statistics). An impulse dummy was added for 1982 (d82) to take into account the large unexplained fall in GDP during that year. The system that was estimated contains the following equation for GDP:

$$\ln Y_t = \gamma_0 + \gamma_1 * \ln I_t + \gamma_2 * \ln X_t + \gamma_3 * t + \gamma_4 * d82 + u''_t \quad (4)$$

^{9/} Figueroa and Letelier (1994) obtain very similar results using quarterly data for the period 1979-1993.

Table 3
Unit root tests

Variable	ADF statistic	No. of lags	Constant and trend
In Y	-0.985	0	Yes
In I	-1.067	0	Yes
In X	-2.498	0	Yes
In XM	-3.719*	0	Yes
In TR	-2.987	1	Yes
In PM	-3.285	1	Yes
EX	-2.491(a)	0	Constant
d In Y	-4.316**	0	Constant
d In I	-4.307**	0	Constant
d In X	-5.777**	0	Constant
d In TR	-3.084**	0	No
d In PM	-5.310**	1	No

* Significantly different from zero at the 5 % level.

** Significantly different from zero at the 1 % level.

(a) EX is I(0) only at the 10 % level.

A two-year lag was used for all the variables because by both Schwarz and Hannan-Quinn criteria the optimal lag was determined to be two periods. Both the trace and the matrix rank criteria revealed that the system contains only one cointegration vector. Hypotheses testing was carried out for weak exogeneity and for whether the coefficients of the long-run equilibrium production function were equal to zero. The results of these tests revealed that short-term GDP disequilibria (as reflected in the error-correction variable obtained from the long-run equilibrium GDP equation) affect short-term movements of GDP, but do not affect short-term movements of gross fixed capital formation or of exports. In fact, it was not possible to obtain sensible short-term equations for either gross fixed investment or for exports. In other words, GDP is endogenous and both fixed investment and exports are weakly exogenous in the system. Tests of hypotheses for the coefficients of the production function reject the joint hypothesis that the coefficients of fixed investment and exports are zero (at the one percent level) and do not reject the hypothesis of zero coefficient for the time trend. Thus the final long-run equilibrium production function obtained was:

$$\ln Y = 0.373 * \ln I + 0.324 * \ln X \quad (5)$$

As already noted, both exports and investment are very significant variables explaining the long-run equilibrium behavior of GDP. The elasticities obtained indicate that, in the long-run, a three per cent increase in exports or in investment results in roughly a one per cent increase in GDP. The error-correction equation corresponding to equation (5), which shows the short-term path of GDP toward its long-run equilibrium level, is shown in table 4 in its parsimonious version (i.e., after eliminating non-significant variables). This equation has good diagnostic properties and shows that disequilibria in GDP, as reflected in deviations of GDP from its long-run path, affect short-run GDP behavior, as witnessed by the highly significant coefficient associated with the lagged residuals of equation (5) (ECM_{t-1}). Almost 40 per cent of the disequilibrium in GDP is corrected within one-year's time, with 90 per cent of the disequilibrium disappearing in 5 years.

Summing up, one can conclude that whatever was responsible for orienting the economy toward foreign markets was one the main causal factors behind economic growth since exports began to expand in the mid-1970s. Increases in the investment rate were equally important. Investment appears to have been exogenous, just as exports were. In other words, increases in exports did not influence investment but they did influence GDP. At the same time, increases in GDP did not have a measurable impact on exports or in investment.

Table 4
Parsimonious vector error correction model
(Dependent variable: $d \ln Y(t)$)

Variable	Coefficient	t-statistic	t-prob.
Constant	2.742	4.48	0.0001
$d \ln Y(t-1)$	0.249	1.67	0.1070
$d \ln I(t)$	0.240	5.47	0.0000
$d \ln I(t-1)$	-0.136	-2.35	0.0270
$d \ln X(t-1)$	-0.121	-2.01	0.0560
D82	-0.098	-2.68	0.0130
ECM (t-1)	-0.376	-4.43	0.0002

ECM stands for the error in equation (5).

Diagnostic statistics :

AR (1) = 0.567 [0.575]

Normality Chi square = 1.666 [0.435]

ARCH 1 = 0.001 [0.982]

Xi square = 0.790 [0.648]

C. EXPLAINING THE INCREASE IN MANUFACTURING EXPORTS

Perhaps the single most important feature of the Chilean export success story is the emergence of a diversified group of manufactures for export comprising a great variety of products, most of which are light manufactures or are natural resource intensive. And it is this group of products -their further growth and continued diversification- that provides the greatest hope for future growth in exports and in the economy in general. Therefore, great interest attaches to explaining the factors that are behind the growth of these exports.

There have been two studies of the behavior of Chilean exports in the past. Using a partial adjustment approach, De Gregorio (1984) estimates supply functions for Chilean non-copper exports and finds positive and statistically significant price elasticities of export supply. Within an error-correction framework, Moguillansky and Titelman (1993; MT henceforth) estimate supply functions for several categories of non-copper exports. They conclude that long-term price elasticities are consistently higher than short-term elasticities (and that both are statistically significant). In their supply functions for manufacturing exports, tariffs, which are entered as an additional explanatory variable, turn out to be negatively associated with the exports of manufactures.

MT apply a more advanced econometric technology than De Gregorio. However, for our purposes, their study has a number of shortcomings which justify yet another try at econometric estimation. In the first place, MT do not include an excess capacity variable, in a context where recession and idle capacity played a key role in the initial spurt of export growth in the mid-1970s. Second, their relative price of exports variable uses the CPI as *numeraire*, which mispecifies the model: importables represent a large component of the CPI, so that tariffs appear as a separate variable *and* in the denominator of the relative price of exports. In our model, we avoid this problem by using nominal wages as the *numeraire* of export prices. Third, we have a longer time series: 1960-95, as compared with 1962-90 for MT.

As MT, the role of various factors -tariff reductions, real exchange rate depreciation, and excess capacity- in explaining the growth of manufacturing exports are explored in the framework of a supply function. The small country assumption being appropriate in the case of Chile, one can safely assume that Chilean manufacturing exports do not affect world prices of those goods, and this entitles us to ignore feedback effects from export volumes to relative export prices.

In this exercise, manufacturing exports (XM) are a function of the real price of manufactures for the export market (PM, defined as the price index for manufactures in dollars multiplied by the nominal exchange rate for the dollar and deflated by nominal wages in manufacturing), the unweighted average tariff (TR), and an index of excess capacity in manufacturing (EX, defined as the percentage by which potential manufacturing output, calculated by the peak-to-peak method, exceeds observed output). The basic idea of the model is that there are two groups of manufactures: products for the domestic market and which could be exported under certain circumstances, the relative price for which is the tariff rate; and goods produced

largely for export markets because the domestic markets for them are small. The relative price of these goods is expressed in terms of non-tradables, here proxied by the nominal wage rate. All variables except excess capacity are expressed in logs.

According to ADF tests, the log of manufacturing exports turned out to be a stationary variable with a deterministic trend. EX is also stationary (without trend). All other variables have unit roots (see table 3). This means that the level of manufacturing exports cannot be explained by recourse to the price variables or excess capacity. We are left with the possibility of explaining the rate of growth of manufacturing exports, using as explanatory variables $d\ln PM$, $d\ln TR$, and EX. The general procedure employed was to start with a generalized structure with two lags and reduce the model by eliminating variables that were not significant. The final equation obtained was:

$$d\ln XM_t = 0.083 - 0.47 * d\ln TR_{t-1} - 0.28 * d\ln PM_t + 0.45 * d\ln PM_{t-1} + 0.008 * EX_t - 0.42 * d\ln XM_{t-2}$$

(2.0) (-4.27) (-2.17) (3.31) (3.03) (-3.64)

(6)

$R^2 = 0.758$; $AR(1) = 1.67 [0.208]$; $ARCH(1) = 0.0005 [0.981]$; Normality $\chi^2 = 0.55 [0.761]$; $X_i^2 = 0.89 [0.560]$; $X_i * X_j = 0.69 [0.757]$; $RESET = 2.07 [0.161]$. Figures in parentheses are t-ratios and figures in brackets the probability of not rejecting the null hypothesis involved.

The results are good from an econometric point of view, and all variables are significant at standard statistical levels. Signs are as expected, except that contemporaneous changes in the rate of change of relative export prices are associated with declines in the rate of growth of manufacturing exports. However, the lagged effect of price changes is positive and higher in absolute value than the contemporaneous effect. Therefore, the long-run static equation shows the expected positive association. In the steady state, the rate of growth of manufacturing exports is the following:

$$d\ln XM = 0.058 - 0.33 * d\ln TR + 0.12 * d\ln PM + 0.006 * EX \quad (7)$$

This equation tells us that the long-run trend rate of growth of manufacturing exports in the period 1960-95 was 5.8 per cent and that tariff and export price changes produced deviations of the expected signs from this trend rate of growth. Changes in excess capacity also were important contributors to the growth of exports: each percentage point increase in excess capacity was associated with an 0.6 percentage point increase in the rate of growth of exports.

An exercise was carried out to gauge the importance of excess capacity in generating exports over the periods 1975-77 and 1982-85, when the indicator of excess capacity averaged

36 and 25 per cent of potential output, respectively. We compared the levels of exports yielded with the rates of growth predicted with equation (1) with those that would have occurred had the levels of the excess capacity indicator remained at 10 per cent, which is about the average for the whole period 1960-95. The results of this exercise are quite interesting. During 1975-77, above average excess capacity in manufacturing is estimated to have generated about 38 per cent of manufacturing exports; in the period 1982-85, a similar calculation yields 12 per cent.

II. TRADE AND INDUSTRIAL POLICIES

A. THE ANALYTICAL FRAMEWORK

The central idea that underlies the analysis of the paper is that the launching of export-oriented growth requires not only a well-designed trade liberalization, as well as supporting policies with regard to key macroeconomic variables (e.g., the exchange rate and interest rates) but also overcoming barriers that inhibit a strong supply response to price signals. These constraints are not spontaneously removed by the operation of market forces and require more purposive policy action by governments or by other institutions that are able to internalize the externality or to correct the market failure involved.

The objective of trade liberalization is to change market signals from favouring import-competing and non-tradable sectors towards encouraging the production of exports and import substitutes that do not require high protection to be profitable. Usually, conventional trade policy advise (which always advocates liberalization, without bothering to look at a country's institutional setup) relies on a simple two-sector trade model with one exportable and one importable *and no non-tradables*. In such a model, it is possible to ignore the exchange rate, since it disappears from relative prices. However, in the real world non-tradables loom large in the economy and, moreover, there are many tradables, with various levels of protection for importables. Likewise, there is a set of potential exportables, which can be ranked from lowest to highest according to their average costs.

Ceteris paribus, the real exchange rate must depreciate as a result of import liberalization; therefore, those sectors which initially had effective rates of protection below the percentage real depreciation induced by the reduction of import barriers would *benefit* from the package of trade liberalization *cum* depreciation. Thus, they cannot be considered to have been inefficient and, therefore, candidates for the block, just because prior to import liberalization they enjoyed higher effective protection than post-liberalization rates. In addition, the depreciation will generate (with a lag) new exports, as the economy moves further down the list of potential exports ranked according to costs. In fact, some of these new exports may come from sectors previously protected at higher rates than those prevailing after liberalization.

As a result of the trade liberalization, it can be shown that the compensating depreciation^{10/} must be as follows (see appendix for a formal derivation):

$$\hat{e} = \frac{\hat{t}}{\epsilon_x / \epsilon_m - 1}$$

where e is the exchange rate, t the average tariff, a hat over a variable is percentage change, and $\hat{\epsilon}_x$ and $\hat{\epsilon}_m$ are (average) export and import price elasticities, respectively. In the Chilean case, the average tariff went from 94 per cent in 1973 to 10 per cent in 1979, implying an induced decline in import prices of 43 per cent. Assuming a price elasticity of export supply of 0.5 and a price elasticity of import demand of (minus) unity, the compensating depreciation would have been 29 per cent. This means that any importable with initial tariff of up to 29 per cent was, indeed, internationally competitive and that, with a final tariff of 10 per cent it should have been able to compete with imports and/or become an exporter.

Even if price signals are favourable to exporting, there are, as already noted, important constraints to a swift and strong supply response. Some of them are of an informational nature. Domestic producers do not have adequate information about (1) technologies for producing goods or services that will sell in foreign markets or that will help them to compete with foreign producers at home; (2) marketing and distribution channels in overseas markets; and (3) consumer tastes or producer needs in potential markets. Successful countries, such as those of East Asia, have been able to overcome these barriers (see Lall, 1994). The peculiarity about information is that it is both costly and in the nature of a public good: on the one hand, it is a non-rival good, in the sense that its consumption by one agent does not reduce its value to another; on the other, it is non-excludable -i.e., individual agents find it difficult to keep others from using it.^{11/} This gives the policymaker an important role in the process of opening up the economy: subsidizing the gathering of information on technologies, foreign markets, and foreign tastes; subsidizing the establishment of reputation for domestic producers (what in recent years has been called "creating a country image"); and assisting existing firms to retool, orienting their activities towards foreign markets and becoming better able to compete in domestic markets with foreign producers.

^{10/} In this paper, we follow the Latin American convention of expressing the exchange rate as units of domestic currency per unit of foreign currency. Therefore, a depreciation represents an increase, and an appreciation a decline, in the exchange rate.

^{11/} These characteristics of information tend to be ignored by standard trade theory and conventional trade policy advice, which assume that all relevant information is costlessly available to all agents. The consequence of relaxing this assumption will be that trade liberalization is rendered more costly, as agents are less able to reallocate resources towards export-oriented activities. Therefore, complementary policies become indispensable in order to ensure strong supply responses to changed price signals within a reasonable time period.

A less direct way of dealing with this evident form of externality, and one that makes use of the market, is to create institutions or firms to internalize it. For example, associations of exporters may find it profitable to gather information on markets or technologies on behalf of their members. Thus the role of government can be to assist in the formation of such associations.

In most developing countries, capital markets are non-existent or very shallow. As emphasized by an abundant literature (e.g., Stiglitz and Weiss, 1981), there are important informational asymmetries that make capital markets imperfect in any part of the world. In developing countries, these imperfections are magnified (Stiglitz, 1994). Supply responses are blunted if potential entrepreneurs have inadequate access to long-term investment finance. Therefore, policies to deepen domestic financial markets and to improve their operation (by, e.g., better regulation or disclosure requirements) are complements to trade liberalization. Even these policies are unlikely to be enough: formal financial markets, no matter how developed, tend to discriminate against small producers and firms without reputation or collateral. Therefore, it will be necessary to supplement private financial markets with appropriate public action. For example, Díaz-Alejandro (1985) advocates the use of development banks to provide credit, at positive and market-related rates of interest, to projects with high social and private returns but which are rationed out of private markets.

Other supply-side bottlenecks are related to low levels of human capital formation and to lack of adequate infrastructure. In these areas, public policy is also indispensable. Education and training have strong externalities; therefore, private market solutions will underproduce them. In addition, human capital formation is an investment for which capital markets are particularly unwilling to supply funds. The planning, design, and, despite current fashion, the construction of infrastructure continues to be a priority task of governments.

If one accepts this view, trade liberalization acquires a more limited, although still important, role in the process of launching export-oriented growth. Trade liberalization is a means for altering relative prices in the economy and making it more likely that producers will allocate resources to activities in which the country has a current comparative advantage. Since it does nothing to correct the market failures associated with the factors mentioned above, it is a rather blunt tool for encouraging producers to create new comparative advantages. In fact, some countries -e.g., Korea or Taiwan- launched very successful processes of export-oriented growth *without* trade liberalization (see Wade, 1990; Amsden, 1993 and 1994; Rodrik, 1995). In spite of its free market rhetoric, there were a few instances of industrial policy in post-1974 Chile -notably in the forestry sector. In addition, prior to 1974, history and policies had created the precondition for adequate supply responses.

B. THE ROLE OF TRADE LIBERALIZATION

One of the first measures of the military government after the September 1973 coup was to announce a trade policy reform. Indeed, at that time trade policy can best be described as

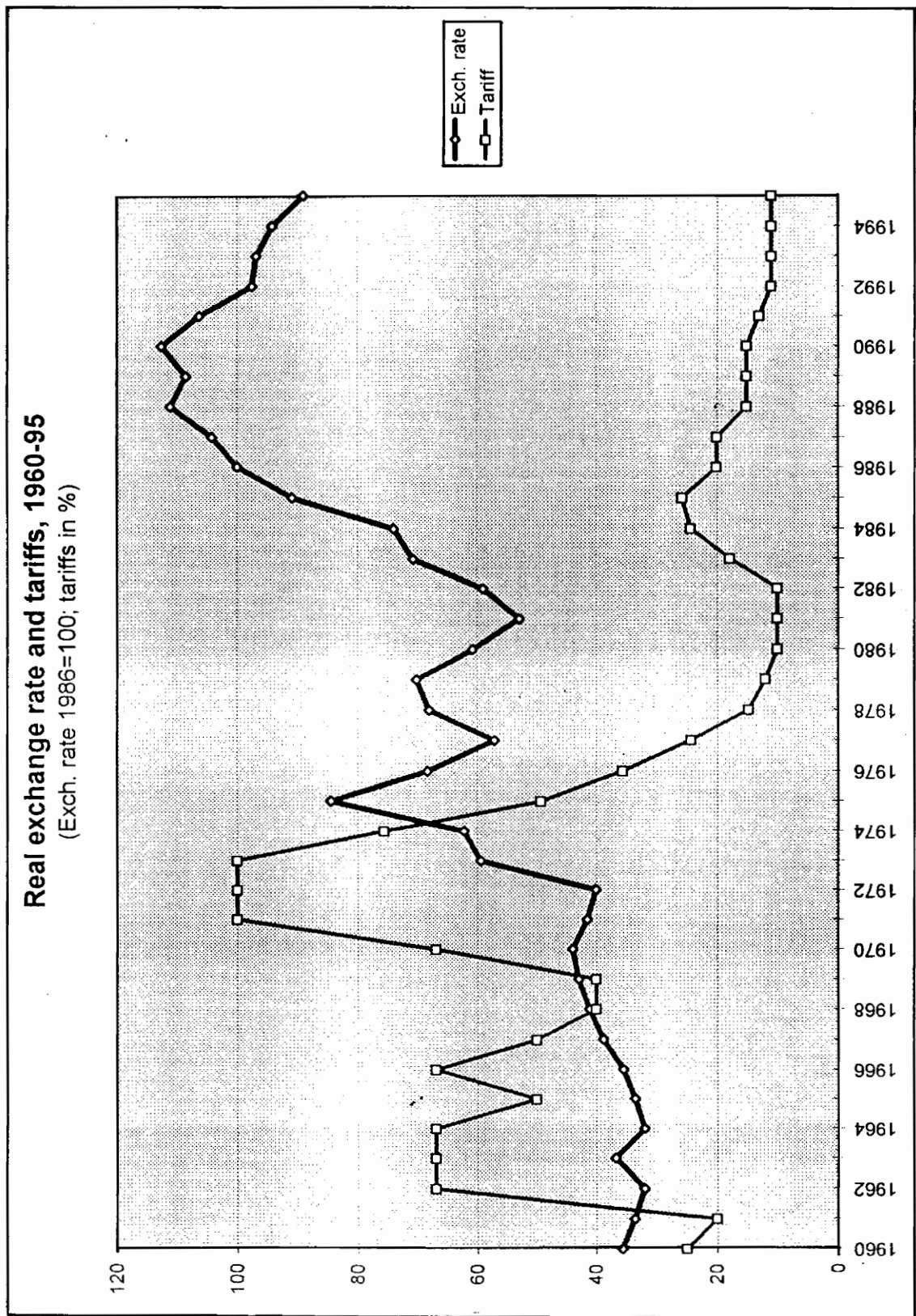
chaotic: the (unweighted) average tariff was 94 per cent; there were 57 different tariff rates, ranging from zero to 220 per cent (plus surcharges on a number of items); there were many non-tariff measures (prior import deposits, prohibitions, quotas, etc) and a multiple exchange rate system with eight rates, where the highest price for the dollar was 10 times the lowest. This *ad hoc* system of protection served no development purpose at all. The disorganization of the Allende period had led to stagnation in manufacturing, the disappearance of economic growth, and a strong contraction of a fledgling non-traditional export sector (which included several manufactures).

The trade liberalization announced in late 1973 involved the elimination of all non-tariff barriers, the gradual reduction of tariff rates and their consolidation into three tariff levels (with a maximum rate of 60 per cent), the unification of the exchange rate, and *a devaluation to compensate the reduction in the average tariff*. In effect, the real exchange rate did depreciate in real terms during the two and a half years following the introduction of the reform. In the absence of capital flows, this was the outcome of market forces: the opening up of the economy led to an import surge which caused the exchange rate to depreciate sharply (see figure 4).

Several events induced a change in the course of the reform. As the trade liberalization program progressed, it was radicalized. In 1975, the authorities announced a new tariff range of 10 to 35 per cent, to be reached in gradual steps by 1978. Toward the end of 1977, the objective of reaching a 10 per cent tariff by mid-1979 for all imports was set, with monthly tariff reductions. In addition, prospects for tapping international financial markets changed for the better by mid-decade. This made it possible for the authorities to assign exchange rate policy to the objective of slowing down inflation (essentially, by appreciating the real exchange rate). As a consequence, beginning in 1976, limitations to international capital movements were steadily lifted.^{12/} At the same time, a strict crawling peg was abandoned, and nominal exchange rate changes began to lag past inflation. Finally, the nominal exchange rate was fixed in mid-1979. Since inflation wound down slowly, considerable real exchange rate appreciation accumulated in the period 1976-81. This was made possible, of course, by large capital inflows. Real exchange rate appreciation, together with the liberalization of imports, implied a negative shock to the entire tradable sector. Rather than reconversion and the orientation of tradables towards international markets, the tradable sectors of the economy shrunk and non-tradables expanded.

^{12/} Ironically, the process ended in 1981, shortly before the onset of the debt crisis, with the complete freeing up of international capital flows.

Figure 4



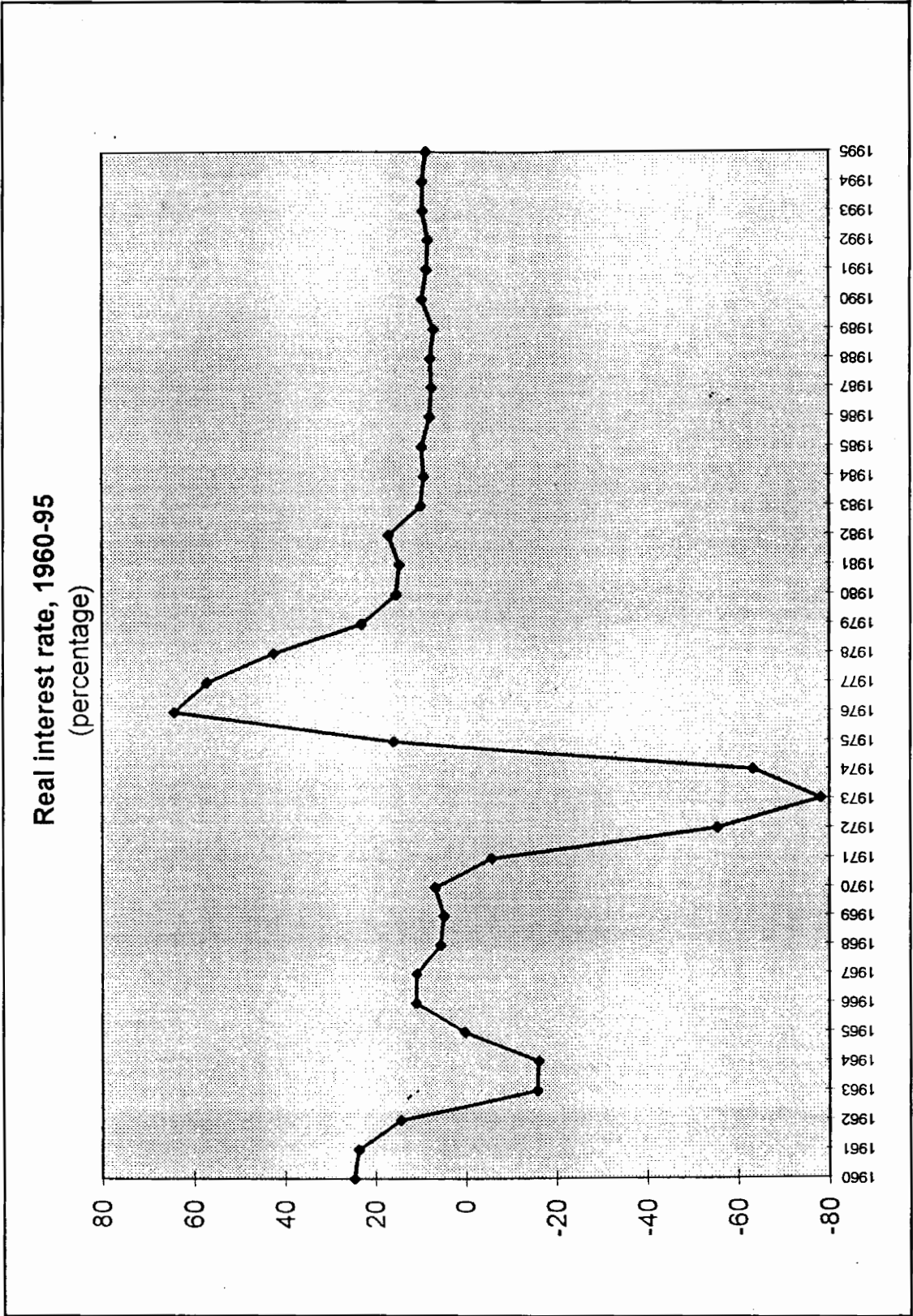
Source: Central Bank of Chile, French-Davis (1984); French-Davis, Leiva, and Madrid (1991); and De la Cuadra and Hachette (1992).

The way domestic financial markets were liberalized also had an important bearing on the poor initial results of the trade liberalization program. The situation in domestic financial markets before the coup was one of extreme financial repression: the banks had been nationalized; ceilings on interest rates were set which bore no relationship to domestic inflation, resulting in extremely negative real rates and financial disintermediation; and the monetary authorities intervened heavily in the allocation of credit, with a proliferation of special credit lines which, *in toto*, did not amount to anything close to an industrial policy. The reforms instituted in 1975 included the privatization of banks, the lifting of interest rate ceilings, the reduction of reserve requirements, and the elimination of any restrictions on credit. At the same time, with the aim of encouraging competition, entry barriers to the banking and finance industry were lowered significantly. There were no prudential regulations on the activities of banks or other financial institutions; no considerations of moral hazard in banking and finance deterred the reformers. As a consequence, the financial sector grew enormously, financial operations crowded out real investments, and interest rates went from very negative to extremely high in real terms (figure 5).^{13/} The retooling of firms producing for the domestic market, or their transformation into exporters, was rendered well-nigh impossible.

In order to deal with the consequences of the drying up of foreign capital inflows and a rapidly worsening domestic crisis, in mid-1983 the flat tariff was raised to 20 per cent and in September 1984 to 35 per cent (the level bound by Chile in 1979 at the end of the Tokyo Round of GATT multilateral trade negotiations). Surcharges on automobiles and consumer electronics were also introduced. As the crisis abated, the flat tariff was again reduced in gradual stages beginning in 1985. In 1989, at the end of the military regime, it stood at 15 per cent, from where it was lowered in 1991 to 11 per cent by the democratic government. During the 1980s, policies favourable to the expansion of exports were introduced: duty drawbacks for exporters, a subsidy for new exports, and foreign direct investment policies favouring non-mineral exports. More on all of these below. In addition, owing to stringent prudential regulation of financial institutions, interest rates settled down to more reasonable levels in real terms, which favoured investment and technology acquisition. Last but not least, a binding foreign exchange constraint produced steep real exchange rate devaluations in the period 1982-88.

^{13/} In his last published article, Carlos Díaz-Alejandro (1985) provides a masterly description and a devastating critique of the Chilean financial liberalization.

Figure 5



Source: Author's calculations, based on data of Banco Central de Chile.

Figure 4 shows data for the evolution of the real exchange rate and the average tariff rate.^{14/} Broadly speaking, the relationship between the real exchange rate and the average tariff (for the period before 1979, a crude but probably accurate indicator of trade policy) behaves as one would expect: the much lower tariffs since the mid-1970s have been accompanied by a higher real exchange rate. As theory would predict, this relationship holds in a long-run context. However, between 1976 and 1981, dramatic tariff reductions were associated with a sharp real exchange rate appreciation.

The exchange rate trends noted above, together with very high real interest rates prevailing after the freeing of domestic financial markets in 1975, meant that the spurt of export growth after 1974 was not sustainable. In fact, the upward movement in exports was partially reversed in 1979-83.

Other policies have been just as important as, or probably more important than, trade liberalization in explaining the sustained growth of non-copper exports. These policies can be categorized into two broad groups: general policies affecting all exports and sector-specific policies and factors. Both of these are dealt with below.

C. OTHER HORIZONTAL POLICIES

1. Exchange rate policy

In a world with many tradables (which have widely different initial levels of protection) and a large non-tradable sector, the real exchange rate and policies towards its determinants are crucial to the success of a trade liberalization, if success is gauged by (a) the speed with which the economy adjusts its production structure, and (b) the strength of the underlying growth process. As already noted, exchange rate policies were not conducive to self-sustained outward-oriented growth in the 1970s. After several experiments with exchange rate policy in 1982-83, the market exchange rate was allowed to fluctuate within a narrow band (initially set at 1 per cent around the central rate and later gradually widened). The central rate began to be devalued on a daily basis according to the difference between domestic and foreign inflation during the past

^{14/} The real exchange rate is estimated as the nominal price of the US dollar deflated by the CPI and multiplied by an index of external prices (IEP) relevant to the Chilean economy calculated by the Central Bank. For the period 1977 onward, the Central Bank series was used. For earlier periods, we constructed our own series using the IEP estimated by Ffrench-Davis (1984). Our numbers for 1974-76 correct for official underestimation of the rate of increase in the CPI. As regards average tariffs, for 1974 onward the series is an unweighted average. Since there were no non-tariff barriers after 1975, the average tariff rate is a fairly accurate representation of the restrictiveness of the trade regime. No data are available for the period before 1973, which was marked by high tariffs, considerable tariff dispersion, and many non-tariff restrictions. We used an index of trade liberalization developed by De la Cuadra and Hachette (1992, p.79) and applied the ratio of that index to its value in 1980 to the average tariff that year (10 per cent) in order to obtain a tariff equivalent of all trade restrictions for the period 1960-73. It is appropriate to use the 1980 tariff because that was the first full year of application of a unified tariff of 10 per cent.

month. In addition, beginning in 1982, the severe balance of payments situation forced several discreet devaluations. As a consequence, the real exchange rate more than doubled between 1981 and 1988 (see figure 4). These trends in the real exchange rate were undoubtedly one of the factors that accounts for the rapid and sustained growth of non-traditional exports after 1982.

During the 1990s, the Chilean economy has been faced once again with an abundance of foreign capital resources. This time, the management of the capital account has been more flexible than during the last episode of foreign capital abundance. Policy makers responded to the increased supply of foreign capital by discouraging the inflows of short-term capital while maintaining liberal access for FDI (see Agosin and Ffrench-Davis, 1997). Essentially, this has been done by placing a 30 per cent unremunerated reserve requirement (which has to be maintained for one year, regardless of the maturity of the financial instrument) on foreign borrowing and on foreign financial investments (including investments in the Chilean stock market). The scheme is very onerous for short-term flows and has a low cost for flows that have a time horizon longer than one year. While effective in reducing short-term credits and portfolio inflows in the period 1993-95, in 1996 and 1997 medium- and long-term credits bulged, and portfolio inflows returned on a massive scale. Banks appear to have shifted their borrowing toward longer maturities, and portfolio investors may have tended to view the cost of the reserve requirement as akin to taking an option on possible future capital gains.

In addition, the exchange rate band within which the price of the US dollar is allowed to float was broadened (it now stands at 12.5 per cent around the benchmark price), with the Central Bank practicing within-band dirty floating. The reference exchange rate is no longer the US dollar only, but a basket of currencies made up of the dollar, the yen and the deutsche mark. These moves have had the purpose of creating greater uncertainty for short-term operators while giving the long-term participants in the market (most importantly, exporters) greater certainty as to where the Central Bank believes the price of the US dollar will be in the long run. However, even this more flexible exchange rate policy has tended to lose its efficacy over time. Since the market exchange rate has remained close to the bottom of the band for a couple of years now, the Central Bank has, in effect, been guaranteeing a fixed real exchange rate for foreign investors. Considering that the odds are more in favour of real appreciation (through a lowering of the floor of the band) than depreciation, the differential in interest rates in favour of the peso is hard to resist, particularly if one considers that the tax equivalent of the reserve requirement diminishes very rapidly with the time the funds remain in Chile.

Thus the authorities are now in a quandary as to how to prevent a greater real exchange rate appreciation, which would undoubtedly threaten the viability of the export-led model. Several solutions have been proposed, including taxing interest remittances abroad, hiking the reserve requirement rate or extending its duration (particularly for portfolio inflows), and imposing an additional tax on mining exports or profits thereon, which would discourage FDI and capture for the government a portion of natural resource rents. As regards the exchange rate mechanism, the effectiveness of managed floating with a band depends on the authorities' willingness to keep the market exchange rate well within the band through dirty floating and to prevent it from going to the extremes of the band, which only invites one-way speculation.

2. Drawbacks

Since the mid-1980s, two drawback schemes have been in use. One is a regular drawback, which has been in force since 1988, by which duties on imported inputs used by exports are recovered after the fact. This program has some weaknesses. It requires paperwork and has a financial cost for the firm, since it has to first pay the duty, which it recovers with considerable delay. The other system is the so-called "simplified drawback", introduced in 1985. For exports of less than US\$ 20 million for a given tariff item, all exporters receive a cash subsidy of 3, 5, or 10 per cent (depending on the value of exports for the entire tariff line) on their export value in *lieu* of a regular drawback. Although the scheme has been sold domestically and internationally on the grounds that it simplifies life for small exporters for whom it is costly to do all the paperwork needed to apply for the regular drawback, it does in fact contain a subsidy element, with a maximum rate of around 6 per cent, corresponding to the 10 per cent drawback rate (which applies to exports below US\$ 10 million for the entire tariff line).^{15/}

This scheme has become increasingly important as an export incentive. In 1994, the State paid out a total of US\$ 150 million on account of the simplified drawback, compared with just US\$ 26 million for the regular drawback. Approximately 13 per cent of the value of exports (and 70 per cent of the number of exported products) obtained the simplified drawback that year (Ffrench-Davis and Sáez, 1995, pp. 79 and 89).

Although there have been no careful econometric studies of the impact of the simplified drawback on the emergence of new exports, it may be no coincidence that after the introduction of the scheme the number of exported manufacturing products, and the values exported, grew rapidly. In fact, this kind of incentive is close to economic optimality: new exports are certain to have strong externalities related to information gathering; as the exports of an item grow, the externalities disappear. Thus, the automatic extinction of the subsidy is a particularly attractive feature of this scheme.

In addition, importers of capital goods pay duties on a deferred schedule of up to seven years, and exporters are exempted from those payments. This undoubtedly encourages investment for exports. Both this provision, as well as the simplified drawback, which are considered subsidies by the World Trade Organization (WTO), will have to be eliminated by the end of 2002.

3. Policies towards foreign direct investment (FDI)

Policies towards FDI have played a direct and indirect role in stimulating exports. The FDI regime was completely liberalized in 1974. The new Decree Law 600 of that year gave national treatment to foreign investors, opened most of the economy to FDI, made approval of

^{15/} Given the current flat tariff of 11 per cent, the 10 per cent "drawback" would not involve a subsidy if imported inputs constituted 90 per cent of the value of exports. The actual number is more likely to be in the 30 to 40 per cent range.

FDI projects automatic once simple conditions were met, and guaranteed unrestricted remittance of profits at any time and repatriation of capital after three years (reduced to one year in 1992). All performance requirements (with the exception of one in the automobile sector, see below) were also abolished (Riveros, Vatter, and Agosin, 1996).

FDI did not increase until 1987, but since then, its growth has been uninterrupted. About 60 per cent of all new investments through DL 600 have gone to the mining sector. These investments were made for a combination of reasons. In the first place, the comparative advantage of Chile in copper, molybdenum, iron ore, and other minerals is well-known. Second, the liberalization of FDI rules and regulations allowed investment to take place. Third, a Mining Law passed in the 1970s authorized private property in mining and made it very difficult for the State to expropriate mining concessions.

Other FDI policies have had the result of encouraging non-mining exports. In 1985, the authorities instituted a debt-equity swap program whose objectives were to decrease the burden of external debt and to encourage FDI at the same time. But this channel for investing in Chile did not have the neutrality and automaticity of DL 600. As noted by French-Davis (1990), the debt-equity swap program involved a heavy subsidy to FDI; however, projects had to be approved on a case-by-case basis. Mining projects were banned from using the instrument; and projects involving technology transfer and new exports received priority. Thus, the authorities made of necessity a virtue and practiced industrial policy by another name. During the years in which it was in operation (1985-91), about 60 per cent of the investments made under the program went into manufacturing and agriculture, the largest component of which were forestry and pulp and paper operations. Roughly 40 per cent of all FDI during this period was made with swaps. As a consequence of a new interest in investing in Chile, investments through DL 600 continued to rise *pari passu* with investments through swaps. Therefore, the swap program is unlikely to have substituted investments that would have been made anyway through DL 600. Because of the increase in the market value of Chilean debt, swaps stopped being used by foreign investors in 1992, and the program was formally abolished in 1996.

Although quantitatively much less important than investments in mining, several foreign investments in the agroindustrial sector have been very important in the development of new exports. For example, United States fruitpacking firms have brought new storage and transport technology and opened new marketing channels for Chilean products; as will be discussed below, an investment by a Spanish winemaker was responsible for the introduction of new technology into the wine industry. Emulation by traditional Chilean producers made exports soar. Such investments would not have been made if FDI regulations had not been as liberal as they were and incentives had not been favourable to producing for export markets. At the same time, it is important to emphasize the information component that FDI brought, with regard to both technology and markets.

4. Market information

As already noted, information gathering on foreign markets is a costly activity in which social returns are far superior to private returns. Since 1974, the Chilean government has made a significant investment in the gathering of information on foreign markets. With the assistance of 32 commercial offices abroad, a trade promotion division of the Ministry of Foreign Affairs (ProChile) has been in the business of conducting market studies and gathering commercial information relevant to exporters. Recently, it has engaged in an aggressive campaign to create a positive country image. It is about to become an independent semi-public corporation with substantial private sector participation.

During the 1990s, publicly subsidized trade promotion activities have been intensified. Groups of firms have been encouraged to form associations and to promote their products and carry out market intelligence activities jointly. The financing of the foreign activities of these Export Committees is subsidized on a decreasing scale for a maximum period of six years. The Chilean Development Corporation (CORFO, a public agency established in the 1940s which played a key role in the country's industrialization during the import-substituting period) runs a similar program with the assistance of trade associations and subsidizes for a limited time a share of the groups' management costs.

5. Technological development

The problem of underinvestment in technological development has been handled in an ingenious way. Fundación Chile, a profit-making but (until now) publicly subsidized institution whose capital is owned in equal shares by the Government of Chile and ITT,^{16/} has developed new technologies that are appropriate for export products and has set up new firms which it has later sold to the private sector. As any venture capital outfit, it has had many failures, but some notable successes, of which the development of the salmon export industry has been the most remarkable. The encouragement of R&D in the broadest sense (including the development of new products for export markets) is an important component of an organic export promotion effort. In fact, it can be argued that sustained export growth and diversification in the future will require a much larger allocation of resources to R&D, and that the combined efforts of the private sector, the government, and institutions such as Fundación Chile are still quite insufficient.

6. Infrastructure and human resource development

Although Chile's inadequate infrastructure of roads, ports, airports, tunnels, etc. constitutes at present a serious bottleneck to the intensification of its export-led growth process, the existence in the mid-1970s of (for the time) adequate infrastructure was certainly an important facilitating element in the export take-off. In other words, without the infrastructure that existed at the time

^{16/} The genesis of Fundación Chile is interesting. When the military government set out to repay ITT for the nationalization of the Chilean Telephone Company, it was agreed to establish Fundación Chile, with the ITT share paid in by the government.

(e.g., several large ports, a new international airport inaugurated in 1967, a North-South highway finished in the 1960s, essentially with foreign aid), changes in price signals alone would have elicited a weaker supply response.

Likewise, human resources were adequate to the task of reorienting the economy toward export markets. By the early 1970s, Chile could count on a large pool of engineers and managers formed in public (or publicly supported) universities over the previous decades. The import substitution period and active State entrepreneurship since the 1940s had also left a legacy of industrial and management skills that could be put to use in the export drive. As discussed below, universities had begun to turn out forestry engineers in the 1950s. In the 1960s, there were important programs for creating sector-specific human capital in agriculture which later turned out to be essential in the development of fruit and vegetable exports. In 1964, a semi-autonomous agricultural research institute (INIA) was created with public funds. In 1965, a ten year program between the University of Chile (the country's main public university) and the University of California at Davis was established to train Chilean agricultural economists and agronomists. This relationship became an important mechanism for the transfer of technology between two regions with similar climate and soil conditions (Meller, 1994).

D. SECTORAL POLICIES

There have also been important sectoral policies and special factors that have had a direct bearing on the expansion of particular export products. Some of these are described below.

1. The forestry cluster

An important contributor to the increase in exports has been the forestry cluster (logs, chips, processed wood, pulp and paper, and, recently, furniture). In 1995 prices, from 1973 to 1995, the exports of this group of industries have increased seventeen-fold, from US\$ 105 million to US\$ 1.8 billion.

Public forestation and reforestation programs date back to the 1960s. In 1974, a subsidy of 75 per cent of tree planting costs was instituted (Decree Law 701). At the same time, privately planted land was declared unexpropriable, a prohibition on cutting trees of under 18 years of age was repealed, and exports of raw wood in any form were authorized. These legal changes made vertically integrated operations possible and very profitable (see Rossi, 1995). In addition, between 1975 and 1979, the Central Bank provided private commercial banks and the State Bank (a public commercial bank catering to the needs of small depositors and business firms) with a special line of credit for onlending to forest development projects, with particularly favourable conditions for natural persons and small firms.

It had long been known that Chile has a comparative advantage in forestry. Climate and soil conditions ensure the rapid growth of certain species of trees, particularly radiata pine. In

view of this natural resource endowment, during the 1950s, the University of Chile (State-owned) and the Catholic University (which receives large public subsidies) began to offer degrees in forestry engineering, so that, when the sector began to develop, the industry had at its disposal a significant corps of specialists in the field. When conditions were favourable, a large number of these professionals became entrepreneurs in the forestry and wood sector. In more recent years, forestry engineering programs at public universities have grown, and they have started to be offered at many private universities.

In spite of Chile's natural resource advantages in this sector, an industrial policy was necessary to give it the "big push" to become a major industry. This is perhaps the only instance of industrial policy on a big scale -and a very successful one- since 1974. It included special incentives for the development of the sector, a legal framework favourable to private enterprise and exports, removing the liquidity constraint to investment, and the accumulation of human capital specific to the sector. Perhaps the most compelling trait of this policy package has been its transparency and simplicity, something that can be emulated by countries at a lower stage of development.

2. The cultivated salmon industry

Cultivated salmon exports went from almost nothing in 1986 to US\$ 520 million in 1996. At present Chile holds about 15 per cent of the world market for cultivated salmon and trout and is the second world exporter behind Norway. Thus the salmon industry constitutes a real success story and one in which technological adaptation and development played a key role.

Fundación Chile began experimenting with cultivated salmon technology in the second half of the 1970s. In the early 1980s it set up a firm to produce cultivated salmon in Lake Llanquihue using floating cages, a technology developed in Norway and Scotland and which, it was thought, could be adapted very successfully to the natural conditions of the Chilean lake district. The firm, Salmenes Antártica, was later sold to Nippon Suisan, a Japanese company that is one of the largest fishing companies in the world. The example of Salmenes Antártica attracted many other investments by domestic entrepreneurs and by foreign companies (Achurra, 1995).

This industry is very interesting for a number of reasons. One of them is that it combines technological change induced by a semi-public institution with the country's natural advantages. Second, salmon exports represent the exploitation of a niche export market. Their success shows that it is not necessary to follow the Asian model of penetrating mass markets for consumer goods in which the main comparative advantage of a developing country is its low wages. These sectors are very vulnerable to protectionism, and, at present, different approaches may have greater pay-off. Last but not least, the salmon industry has many positive backward linkages. It has spawned local industries for floating cages, nutrients, fishnets, packing materials, and transport services. Since it employs highly skilled professionals (engineers, technicians in aquaculture, biologists), it has also had a positive impact on the demand for construction, education, and retail trade in the region.

3. Wine

Chilean wine exports have risen meteorically over the last ten years, from US\$ 10 million in 1985 to US\$ 290 million in 1996. Winemaking is a traditional economic activity in Chile that goes back to colonial times. However, wine exports took off only in the mid-1980s. The kinds of wines produced by Chilean winemakers were not acceptable to consumers in developed countries, and technological change on a large scale was needed for Chilean wines to sell abroad. These included the introduction of stainless steel vats, the use of small and new wood vats (rather than large used ones) for aging wine, and investments in new cooling equipment and machinery for pressing and mashing. Although it was known that Chilean wines could be very advantageously produced with the new technologies being used in Europe and the United States, a demonstration effect was needed. In 1981, the Spanish firm of Miguel Torres bought large tracts of land in the Central Valley (Curicó) and began to produce wines with the new technology. This firm's success led to the rapid introduction of the new methods by Chilean firms.

The openness of the economy aided the process of importing new machinery. In addition, many of the traditional wine producers are large firms by European standards and are also active in other export sectors (particularly fruit). Therefore, they do not face severe liquidity constraints to investment. In more recent years, there have been investments by other large European and United States firms (e.g., Rothschild, Larose Trintaudon, Grand Marnier, Robert Mondavi, and Christian Brothers). Also, several new "boutique" wineries are producing new products for the export market and are trying to position their wines at a higher price and quality range than traditional vineyards. These producers, with less financial muscle than that of the large wineries and the foreign investors, rely on associations of new winemakers to market their exports (Bordeu, 1995).

4. The automotive industry

Automotive parts have been a small but significant component of manufacturing exports for over a decade. They have been stimulated by the only performance requirement that remains in Chilean investment policy. A special program (called the Automotive Statute) allows assemblers duty free imports of CKD or SKD kits to the extent that imports are compensated with exports of nationally produced components of an equal value. The statute also grants assemblers a tax credit on components that are domestically produced or exported. In order to qualify for the tax credit, a component must have a domestic value added of at least 70 per cent if it is for domestic use or of 50 per cent if it is for export. These incentives are incompatible with the WTO's TRIMS agreement and will have to be stricken off the books by the end of 1999. The tax credit expires at the end of 1998.

E. SUMMING UP

Chilean industrial and trade policies in the post-1973 period can be described broadly as neutral. Import liberalization and the introduction of a low and uniform tariff evened incentives facing firms. However, there have been important departures from neutrality. One of them was a classical manipulation of relative rewards and costs: the creation of the forestry complex owes much to direct subsidies. Perhaps not by design, FDI policies have also contained important elements of non-neutrality, with positive effects on export growth and diversification. The only case of export and local content performance requirements -in the automotive industry- has had similar, if more limited, effects.

In addition, impediments to positive supply responses were also tackled by policy. These involve the acquisition of technological and market information, the provision of investment resources to firms that are rationed out of capital markets, the building up of the necessary infrastructure, and the accretion of appropriate human resources. Across-the-board subsidies for new exporters have played an important role. While these policies are more generic and do not represent large departures from neutrality, they do require an active State. The more pragmatic policies toward capital inflows and the exchange rate since the mid-1980s also made a significant contribution to the export drive.

III. TRADE AND INDUSTRIAL POLICY BEYOND THE URUGUAY ROUND

A. THE REQUIREMENTS OF THE NEW INTERNATIONAL TRADING ENVIRONMENT

In the main, Chilean trade and industrial policy conform to WTO standards. Non-tariff barriers are prohibited by law and, in practice, none are in effect at the present time. Tariffs have been bound under GATT since the close of the Tokyo Round. Since the mid-1980s, the flat tariff actually in force has been lower than its bound level. During the Uruguay Round, Chile committed itself to reduce its bound tariffs from 35 per cent to 25 per cent for all goods, with the exception of agricultural goods for which it maintained a system of price bands to isolate the domestic market from the wide fluctuations that prevail in international markets. These are wheat, wheat flour, vegetable oils and oilseeds, milk and milk products, and beet sugar. For these products, tariffs were bound at 31.5 per cent.^{17/} Reductions in bound tariffs have already been implemented.

As regards antidumping and countervailing duties, Chilean trade legislation is in the process of being changed in order to comply with WTO requirements. Cases involving dumping and foreign subsidies are seen by a National Commission (Comisión de Distorsiones) responsible to the President for investigating price distortions and recommending remedies. The Central Bank provides the technical secretariat for the Commission. Fortunately, the Commission has only rarely ruled in favour of the plaintiffs. In the period 1990-96, Chile imposed definitive antidumping and countervailing measures in only ten cases, out of a total of 22 investigations initiated (WTO, 1997, p. 59).^{18/} For a small and open economy, the best policy is to have no antidumping laws at all. As argued elsewhere, antidumping machinery tends to be co-opted by protectionist interests and is, moreover, very rare in practice (see Agosin, Tussie, and Crespi, 1995). The proliferation of antidumping charges could undo the country's trade liberalization, purchased at such high cost. It would entail introducing a great deal of uncertainty with regard to future relative prices, which would send confusing signals to private investors.

^{17/} The price band system in effect since the mid-1980s does not contravene WTO rules prohibiting non-tariff measures, because the system is implemented by varying the tariff between zero and the level bound in WTO negotiations. Therefore, tariffs for these goods never exceed bound levels.

^{18/} However, in a recent case, the Commission imposed a 9 per cent antidumping duty on steel products imported from Russia and the Ukraine without having any information as to prices and costs in the domestic markets of those countries and with insufficient evidence that the only domestic producer had in fact been seriously injured ("Medida Antidumping Impuesta en Chile a la Importación", *El Mercurio*, 11 September 1997, p. B 4).

Subsidies are a different kettle of fish. There is a genuine argument for defending the domestic economy against foreign subsidies, since these can be suddenly removed by foreign governments. Any investment involves sunk costs. Therefore, when a domestic industry disappears owing to subsidized imports, it is highly unlikely that it will emerge again after the subsidy has been withdrawn by foreign governments and import prices have again risen. However, in practice, the problem is much less likely to be serious. The most flagrant use of subsidies in international trade is concentrated in the agricultural sector, and its most assiduous user is the European Union. In other sectors, export subsidies -as well as those that are not export subsidies but nevertheless have a significant effect on price- are in fact prohibited. The safest course is to apply WTO rules strictly and sparingly.

Chile has no safeguard legislation. It would be advantageous to adopt it. There may be cases when it is advisable to spread out over time adjustment to increased imports, in order to give time to domestic producers to improve efficiency or find market niches or new products in which they can compete. The clothing and footwear industries are cases in point. The entry of China and other low-wage Asian exporters into the world market is causing serious problems for Chilean producers, as domestic markets have been flooded with cheap imports and a fledgling export industry is being stifled. Protection, which is, in any case, highly unlikely given current legislation and the political economy prevailing in the country (which favours lowering tariffs, rather than raising them), is not the solution, since it would impose costs on consumers. Temporary safeguards would give breathing space to domestic producers and would promote orderly adjustment.

In order to conform to the TRIPs agreement of WTO, Chilean legislation will have to undergo some adaptations. As regards patents, Chilean law gives protection to its owner for a period of 15 years from the moment the patent is granted, while WTO norms call for a period of 20 years from the moment of filing for the obtention of a patent. In the area of geographical denominations, Chilean producers will have to stop using designations indicating geographical localities outside of Chile, which are widespread in the wine and cheese industries.

As already noted, Chile has committed itself to eliminate the few export incentives it still maintains and which have been deemed to be inconsistent with the subsidies and TRIMs agreements negotiated during the Uruguay Round and incorporated into WTO.^{19/} These are the simplified drawback, the deferral of tariffs on the imports of capital goods and their subsequent exoneration for exporters, and the performance requirements incorporated into the automotive statute. In addition, Decree Law 701, which subsidizes heavily tree planting, is subject to challenge under the subsidies agreement. It should be remembered that Chile has become a key player in the world market for lumber and pulp and is an emergent exporter of furniture. Therefore, a large subsidy such as the one contained in Decree Law 701 is sure to be successfully challenged by producers in importing countries who feel threatened by imports from Chile. The

^{19/} For a description and analysis of the disciplines that emerged from the Uruguay Round, see Agosin, Tussie, and Crespi (1995).

government has announced its intention to modify DL 701 and make it apply in the future only to small firms.

These changes are likely to have adverse effects on future export diversification, especially in conjunction with the requirements of free trade agreements (see next chapter). Most if not all free trade agreements prohibit drawbacks of tariffs on imported inputs from third countries. Thus, not only will the small subsidies on new exports have to disappear, together with policies that have ensured exporters access to machinery at world prices, but regular drawbacks on a growing share of Chilean exports will also have to be scrapped. For an economy such as Chile's, which utilizes inputs from all over the world and whose investment process is heavily dependent on imported machinery, these policy changes are likely to deal export growth a hard blow.

Policy changes designed to deal with these challenges will be essential. The changed international environment within which national policy is formulated calls for, in the first, place, the abandonment of the attachment to the single tariff. In practice, the single tariff rate policy has already been abandoned, as tariffs on agricultural products are normally higher than the "flat" rate (11 per cent since 1991). In addition, various free trade agreements have also eroded the flat rate. In order to deal with the inability to grant drawbacks on imported machinery and on imported inputs for products to be exported to partner countries with which Chile has a free trade agreement, it will be necessary to reduce tariffs to zero on imported capital goods and inputs not produced in the country. It should be noted that an overwhelming proportion of capital goods used in the domestic economy -and of technologically sophisticated inputs as well- is imported. At the same time, the authorities ought to make a firm commitment to reduce gradually tariffs on capital goods and inputs that are produced in the country, beginning with, say, a reduction to the 7-8 per cent level. There is no urgency to reduce tariffs on consumer good imports. Besides taxes on alcohol, tobacco, and luxury cars, there are no specific taxes to discourage consumption of luxury consumer goods. Therefore, the tariff of 11 per cent is a second-best substitute for a tax on luxury consumption and, as such, should be retained, even though, in the context of the other tariff changes proposed, it will raise somewhat the effective rate of protection for the production of domestic consumer goods.

B. SELECTIVE AND HORIZONTAL SUPPORTS ALLOWED UNDER WTO

The elimination of the simplified drawback ought to be met with the introduction of subsidy schemes and other policies that are allowed under WTO rules. These policies should be aimed at correcting market failures. The most conspicuous of these refer to the markets for technology, training, human capital formation, and the acquisition of information on foreign markets. In addition, policies toward FDI need to be organically linked to the outward-oriented development strategy. Finally, liquidity constraints to investment by small and medium-size firms must be relaxed. Most of these policies can be applied either horizontally (to favour any sector that qualifies for support) or selectively to sectors that policy makers wish to encourage. In these

areas, the degree of selectivity depends more on economic rationale and administrative capacity than on WTO disciplines. Both criteria argue in favour of focusing on a few clusters of activity.

1. Technology acquisition and development

R&D subsidies are permitted under the subsidies agreement of WTO, providing that they do not exceed 75 per cent of the cost of basic research or 50 per cent of the cost of applied research. There are several public R&D subsidy programmes available, some of which are funded by multilateral financial institutions, but the volume of their operations is still modest and, therefore, they cannot be thought of as a substitute for the other promotional schemes that will have to be scrapped.

Moreover, up to the present, the available programmes have operated with the philosophy that industrial selectivity is to be avoided. Spreading resources thinly over the entire economy is unlikely to produce good results, since a critical minimum effort is likely to be needed in order to attain international competitiveness, and this calls for concentration of resources in a few sectors.

There are no impediments to selectivity of R&D support in WTO rules. Industrial selectivity is less problematic than what one might think. In the first place, rather than selecting specific sectors for promotion, it is possible to use broad criteria (for example, manufactures for export markets) rather than narrowly defined targets. Second, common sense is a good guide: in the foreseeable future, Chile is unlikely to develop comparative advantages in manufactures at the technological frontier. Present comparative advantages are a good point of departure, and the right course for policy is to seek to intensify the technological sophistication of goods which the country already exports and to develop clusters of modern activity around natural resource products. Third, any exercise of this nature needs close coordination between the private and the public sectors. Fourth, all incentives must be temporary and must be granted against concrete and previously agreed results.

2. Training and education

Subsidies to training and education are permitted by WTO rules, as long as there is no connection between them and export prices. In these areas, policy can be as selective as policy makers desire. So far, the scheme that has been in use since the mid-1980s for encouraging training has been of a horizontal nature. The scheme consists of tax deductions for expenditures on training incurred by private firms. The training activities themselves are carried out by accredited private or public institutes or by the firms themselves. The institution in charge of administering the programme (Servicio Nacional de Capacitación y Empleo, SENCE) approves training plans that are eligible for tax deductions and accredits training institutes (see Paredes and Riveros, 1994).

The solution to the problem of externalities has been dealt with in a way that utilizes the notion of subsidizing demand rather than supply and that preserves for the market a central role

in the allocation of funds to specific training activities. This is the correct approach for encouraging the efficient use of the resources allocated to the programme. However, the scheme reaches neither the firms nor the segments of the labour force that are in greatest need of subsidization, if the objective is to foster training as widely as possible throughout the economy. Small and medium-scale enterprises use a small proportion of the available subsidy, and large firms are the ones that benefit most from the scheme. Furthermore, a large proportion of the training that has been given through the programme has been oriented to white collar employees and to administrative personnel, rather than to workers on the shopfloor. But perhaps the most important shortcoming of the scheme is that the maximum credit available is very small: each firm can deduct from taxes up to one per cent of its payroll, or up to three minimum wages, if its training expenditures are larger than one per cent of its payroll. This makes the system ineffective for small and medium-size firms, for which the maximum tax credit is insufficient to cover any reasonable training programme (Benavente and Crespi, 1997).

Policies toward technical and university-level education must also conform to development strategy. As is well-known, there are severe liquidity restrictions to investment in human capital. Therefore, one alternative for policy in this area would be to relax such restrictions by creating or strengthening existing systems of student loans. In the case of Chile, the State is effectively withdrawing from the provision of higher education, even in State universities, which increasingly must cover their costs. This model is compatible with the needs of development policy only if the availability of student credit is enhanced very significantly, in a way that is commensurate with the importance of human capital acquisition in the next stage of outward-oriented development.

Three ideas must guide these policies. In the first place, the availability of credit for investment in human capital must be increased sharply. Secondly, the programme must include a subsidy element, in order to take into account the externalities that such investments have. Third, education policies must be coordinated with the requirements of the outward-oriented development strategy. The notion that higher education policy can be neutral is a fallacy, since education at this level is highly specific. Therefore, subsidies and the availability of credit must be utilized as tools to promote those capacities that are required by the development strategy. Selectivity in higher education is, of course, fully compatible with WTO commitments.

3. Improving information on foreign markets

As discussed in the previous chapter, Chile has created a complex and efficient system for overcoming the market failures involved in the acquisition of information on foreign markets and distribution systems. Nonetheless, it can still be improved, and to this end the State can use part of the financial resources that will be freed by the scrapping of the simplified drawback, the automotive statute, and the programme to provide exporters with tariff-free imports of capital goods. It is increasingly recognized that interested enterprise associations should play a greater role in this area. ProChile itself is in the process of becoming a corporation with government and private participation. Public support ought to be oriented toward financing the setup costs of private institutions operating in the market for information. These private entities, which could

be the exporter or producer associations themselves, would be in a position to collect information and sell it to individual firms. This is a market-friendly way to overcome two problems that make this activity unattractive for private firms: on the one hand, private costs tend to outweigh private benefits, because information is costly but can be used by those who have not paid for its acquisition; on the other hand, there is a problem of coordination, since for groups of enterprises as a whole, the activity can be quite profitable, but it is not an easy task to coordinate the atomistic decisions of the interested parties. Here again, if no public subsidy is involved, if subsidies do not affect export prices, or if subsidies do not reach the *de minimis* level agreed upon in the Uruguay Round,^{20/} such policies are WTO compatible and can be as selective as policy makers wish to make them.

4. A new approach to FDI policy

FDI policy can be used with the objective of promoting specific activities, be it at the sectoral or functional level. One way of doing it is through a tax scheme that grants special income tax deductions for expenditures with favourable impacts on development. Expenditures on R&D, on introducing a new technology not available in the country, on training, or on opening up new international markets could receive preferential tax treatment (for example, expenditures on items such as those indicated could be deducted twice from gross revenues for tax purposes). Of course, such tax benefits ought to be available to domestic firms as well. Nonetheless, their existence could attract to the country foreign investments that have the desired attributes. In addition, within the framework of a liberal approach to FDI, efforts could be made to attract to the country foreign investments that contribute to the development strategy chosen. For example, State governments in the United States, and Canadian Provincial governments as well, offer tax and other incentives (e.g., the granting of rent-free investment sites) to the firms they wish to attract. These policies do not infringe on WTO disciplines on trade-related investment measures (TRIMS), which prohibit only domestic content and trade-balancing requirements (Agosin, Tussie, and Crespi, 1995, pp. 12-13).

It is also essential that tax policies toward mining investments be revised. The private firms that operate in the mining sector (most of which are foreign-owned) are taxed at the same rates as any other firm in the Chilean economy. It would be highly desirable to impose a special tax on the rents from the country's non-renewable natural resources. It can be implemented as an income tax surcharge, a tax per ton of mineral extracted, or the auctioning of mining concessions.^{21/} Whatever its form, the tax would apply to both national and foreign firms. Besides being an optimal tax, it would have the effect of discouraging investments in mining, reducing the rate of appreciation of the peso (which is being caused by huge capital inflows, most of them in the form of FDI), and eventually reorienting FDI toward other activities.

^{20/} Countervailing cases must be dismissed automatically if the subsidies involved are less than 3 per cent of the value of imports (Agosin, Tussie, and Crespi, 1995, p. 11).

^{21/} This latter option, however, would require a constitutional amendment.

5. Reinventing the development bank

Chile must recreate the concept of the development bank, perhaps through the strengthening of CORFO, which had that mission originally, and/or of Banco del Estado, a State-owned commercial bank which at present receives savings deposits from low-income households and makes loans to small firms at market-related rates. However, the availability of long-term financing for investment purposes by small or new firms continues to be almost non-existent. Generally, the availability of credit to finance activities with positive effects on development is very insufficient. We have already discussed some of these above: investments to move down the learning curve, investments in human capital, investments in R&D, investments in new activities or by firms without track record.

This is the most efficient way of supporting infant industry and, to boot, one that is not prohibited by WTO disciplines. In fact, it should become the major instrument for promoting specific sectors and activities. As Carlos Díaz-Alejandro (1985, pp. 20-21) states in a prescient article (his last published work):

Latin American experience, and indeed that of continental Europe during the last century, makes one skeptical that private markets alone will generate a flow of financial intermediation high enough to support a rate of long-term fixed capital formation which fully exploits available high social rates of return to long-term investments... By providing long-term credit to new, non-traditional activities, development banks would eliminate one of the excuses frequently given for extravagant protection against imports.

The development bank would have the objective of granting long-term credit at market-related interest rates to firms with good export products but which tend to be rationed out of private capital markets. Likewise, it could be used to channel funds toward lending for higher and technical education and for financing R&D expenditures. The development bank need not be involved in the business of making loans directly to firms or individuals: it could function as a second-storey bank, making available to private financial institutions credit lines for specific purposes.

The development bank can also function as an intermediary between international financial markets and small and medium-size firms operating in activities or sectors favoured by the development strategy and without access to such resources. It is also important that the development bank ensure the availability of pre- and post-shipment trade credit to the export sector at internationally competitive rates.

IV. THE ROLE OF FREE TRADE AGREEMENTS

With the return to democracy, there has taken place a significant change in the country's internationalization strategy. While in the 1970s and 1980s the favoured approach was one of unilateral trade liberalization, in the 1990s priority has been given to the signing of free trade agreements; thus, policy makers have come to give priority to reciprocal liberalization with specific partners over unilateral integration with the world economy without reciprocity. Perhaps the single most important reason for this change of emphasis has been that the Chilean tariff at the end of the 1980s (15 per cent, lowered to 11 per cent in 1991) was already low, so that large efficiency gains were unlikely to be reaped by further unilateral liberalization. At the same time, Chile's main trading partners maintained high tariffs or other trade barriers for products in which Chilean producers had attained (or could attain in the short or medium term) comparative advantage.

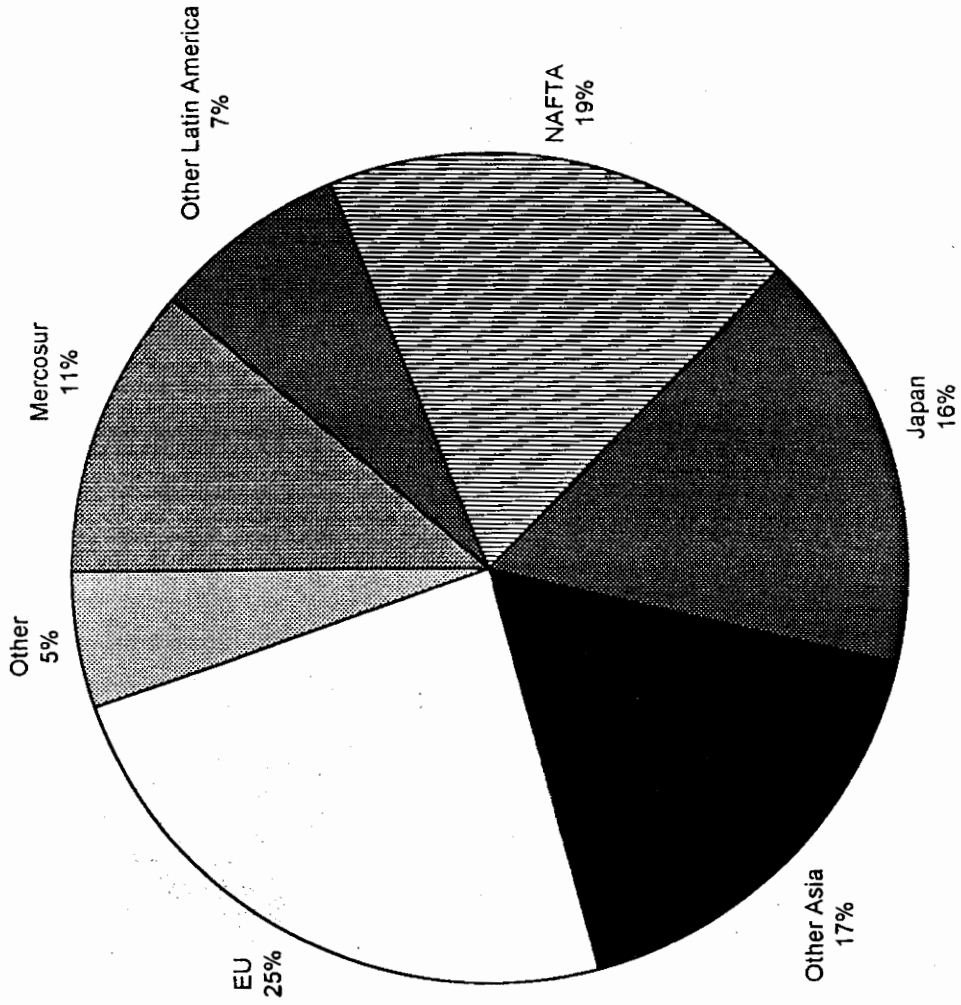
Another reason for attempting to forge free trade agreements with major trading partners was the costs associated with not having such agreements. In the case of the countries that are members of Mercosur, not having a free trade agreement with this grouping would have generated a shift in the group's imports away from Chile toward suppliers within Mercosur. The entry into force of Mercosur's common external tariff left without effect the previous tariff preferences granted to Chile by individual Mercosur members in agreements signed in the framework of the Latin American Integration Association (LAIA). Similar costs can arise from the expansion eastward of the European Union (as well as from agreements between the EU and other countries with export supplies that are similar to Chile's, e.g. South Africa), and from Mexico's membership in the North American Free Trade Agreement (NAFTA).

Still another reason for negotiating free trade agreements with its major trading partners has to do with the fact that, although tariffs and other trade barriers tend to be low for primary products (agricultural products in the EU being the exception), they are considerably higher for more processed products. Tariff escalation is present in the tariff schedules of all of Chile's trading partners, with tariffs on processed agricultural products being particularly high in most of them. This is a serious barrier to market access for processed products in Asia and the Pacific (Clark, 1996), the United States (Butelmann and Campero, 1992) and the EU (Alvarez, 1996). Therefore, free trade agreements would promote exports of processed goods, which are those where the tariff reductions would tend to be greatest.

In Chile's case, the country's highly diversified foreign trade by region of origin and destination (see figures 6 and 7) suggests that the optimal strategy is one of negotiating free trade agreements with all of its main trading partners. Success in doing so would also minimize the major cost of bilateral free trade agreements, which is trade diversion.

Figure 6

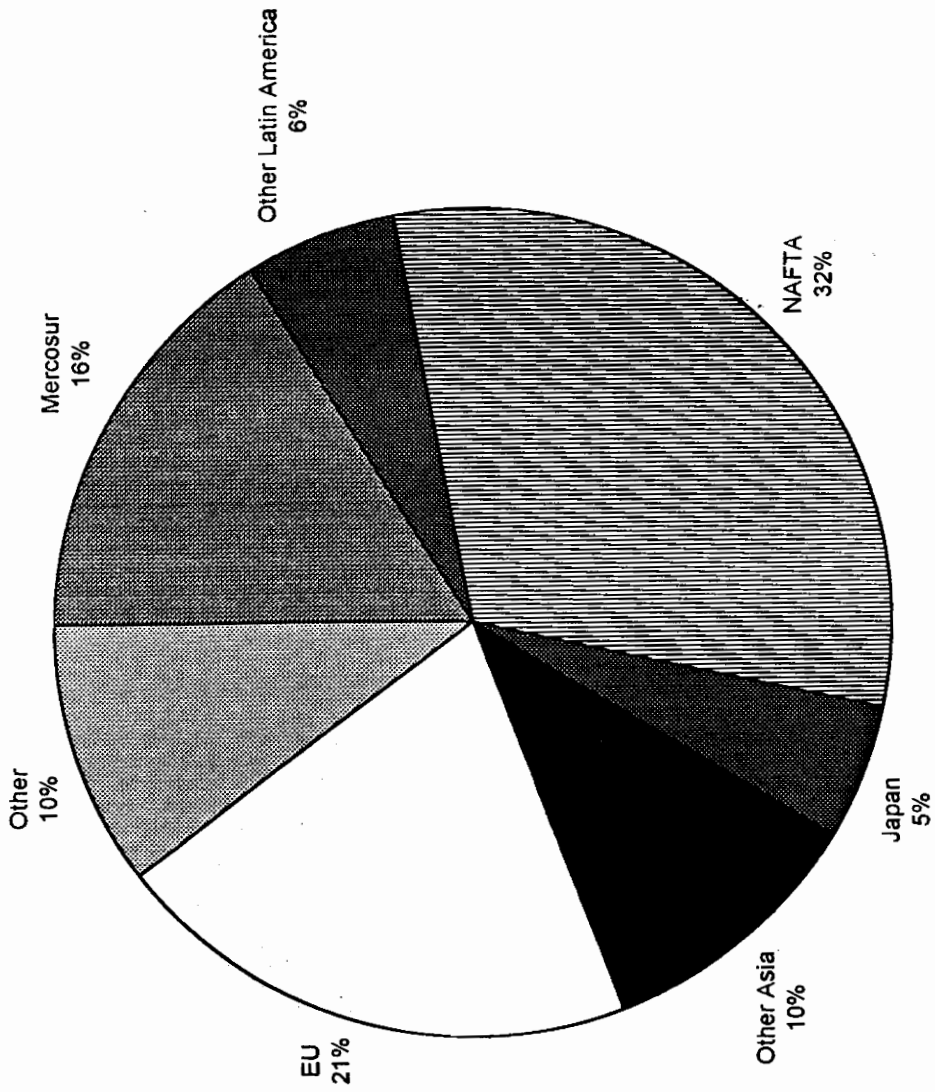
Exports, by destination, 1996



Source: Central Bank of Chile.

Figure 7

Imports, by region of origin, 1996



Source: Central Bank of Chile.

This was, roughly, the strategy adopted. At the same time, the authorities sought admission for Chile into NAFTA, negotiated a free trade agreement with Mercosur, took the first steps toward a free trade agreement with the European Union, and signed a host of other free trade agreements with less important trading partners (Mexico, Venezuela, Ecuador, Colombia, Canada, Bolivia).^{22/} Chile has been participating actively in APEC, but it is unclear what direction that grouping will take. So far, of the free trade agreements sought with major trading groups (NAFTA, European Union and Mercosur), only the association with Mercosur has met with success, the association agreement having gone into effect in October 1996.

This strategy may have, however, important drawbacks. First, administration of several agreements at the same time has high costs and can easily lend itself to corruption. Second, on occasion, belonging to different grouping may be politically incompatible. Third, not all of Chile's major trading partners have the same interest in forging closer ties to Chile. Thus, for the United States or the EU Chile will always remain a very marginal trading partner. Not so for Mercosur. Therefore, Chile may be able to strike a better deal with the United States or with the EU as part of Mercosur than on its own. Fourth, historical trading patterns -based at the present time on selling primary commodities to the main metropolitan powers and importing manufactures from them- may change dramatically once the comparative advantages of the country begin to shift. Geographical proximity ought to play a much greater role in the future, as intra-industry trade in manufactures gains in importance. Therefore, Chile and its neighbors are potentially much closer "natural partners" than their current trade flows suggest.

A. MERCOSUR: THE KEY ASSOCIATION

While Chilean export successes of the past two decades owe nothing to free trade agreements, they are likely to play an important role in the continuation of outward-oriented growth and in the development of new and more sophisticated export products. In this respect, the association with Mercosur is crucial. Even without a free trade agreement, a large share of Chile's exports of manufactures go to other Latin American countries, with Mercosur countries being the main buyers (see table 5). Moreover, almost 60 per cent of the increase in the exports of manufactures since the mid-1980s has been absorbed by regional partners. Trade with Argentina has grown particularly rapidly, in spite of the Argentinean crisis of 1995 and the poor infrastructure hampering commercial relations between the two countries. Exports to Argentina rose by 172 per cent in the 1992-96 period. In 1991, exports to Argentina represented 3 per cent of total Chilean exports; in 1996, this share had risen to almost 5 per cent.

^{22/} The economic rationale of these agreements is doubtful, given the small trade volumes involved. They would make considerably more sense within the framework of a South American Free Trade Association that multilateralizes the myriad agreements signed bilaterally or plurilaterally between individual countries of the region.

Table 5
Composition of exports by market, 1986 and 1993
 (Percentage)

Destination	Natural resources		Processed nat. resources		Other industrial products	
	1986	1993	1986	1993	1986	1993
World	66.1	51.7	29.4	35.6	4.5	12.7
United States	68.0	50.1	27.1	37.1	4.9	12.8
EU	73.6	65.9	24.5	29.6	1.9	4.5
Japan	78.9	53.3	20.2	45.8	0.9	1.0
LAIA	51.6	26.7	40.6	38.3	7.8	34.7
Argentina	51.2	21.6	34.5	36.2	14.3	41.5
Bolivia	14.0	3.7	65.0	24.9	21.0	71.6
Brazil	81.7	55.4	17.1	27.6	1.3	17.0
Peru	14.1	13.3	74.6	46.2	11.3	40.5

Source: French-Davis and Sáez (1995), p. 89.

High tariffs are an effective impediment to exports to Mercosur countries. While the average trade-weighted tariff affecting Chilean exports to Mercosur before the entry into force of the association agreement was 8.2 per cent, some exports faced much higher tariffs. Tariffs for exports to Argentina of clothing, metallic products, and paper were 19.6, 14.4, and 14.2 per cent, respectively. Hachette (1994) has estimated that, as a consequence of import liberalization in Chile's favour, exports of clothing to Argentina ought to increase by 45.9 per cent, while the exports of metallic products should rise by 33.7 per cent.

A free trade agreement between Chile and Mercosur went into effect on 1 October 1996. Chile chose not to negotiate to become an outright member of Mercosur because, since that grouping is a customs union, it would have had to accept its common external tariff, something most Chilean opinion was not willing to do. Immediately upon the entry into force of the association agreement, the average trade-weighted tariff faced by Chilean exports declined to 3.2 per cent. The agreement calls for the gradual liberalization of all trade between Chile and Mercosur on a reciprocal basis. Products have been classified into five categories. A general list includes all products that are to receive duty free treatment over a period ranging from two to eight years. The initial tariff cut from the MFN rate is 40 per cent. Products on this list account for about 50 per cent of all bilateral trade. The other four lists include products with increasing degrees of sensitivity for both parties. In the two most restrictive categories, Chile has placed some traditional agricultural products, (e.g., beef, sugar, wheat and wheat flour), which will reach duty free treatment only after 15 and 18 years, respectively.

The benefits for Chile of the agreement with Mercosur are twofold. On the one hand, Mercosur, as well as other regional trading partners, are the main markets for the exports of Chilean manufactures, and this will become even more so as trade barriers are reduced. Quality requirements in these markets are more in line with Chilean supply capabilities than those of developed countries, and distance to markets is also a factor in favour of exports from Chile. On the other hand, Mercosur is internationally competitive in agricultural staples, while Chile is not. In other words, Chile and Mercosur countries (as well as other countries in the Latin American region) are potentially much more "natural" trading partners than what their current reciprocal trade flows suggest. Trade barriers, poor transport links, and almost non-existent infrastructure have prevented the emergence of more significant trade flows among the countries in the region. But, as the example of Mercosur clearly indicates, once trade barriers begin to come down, trade flows can increase very rapidly indeed.

B. OTHER TRADING ARRANGEMENTS

Chile has been pursuing two other major free trade agreements. A free trade agreement with the United States or entry into NAFTA has been a major priority of Chilean economic diplomacy since 1990. Sometimes it is difficult to understand the doggedness with which Chilean

trade negotiators have been pursuing this particular goal, since all estimates of its impact come up with relatively small numbers in terms of trade flows, GDP, or welfare.^{23/}

The average tariff faced by Chilean exports in the United States is only about 2.5 per cent (1.8 per cent under the United States Generalized System of Preferences, or GSP). However, there is significant escalation in the United States tariff, especially as regards agroindustrial products. Thus a free trade agreement with the United States would probably raise Chilean agroindustrial exports to the United States, which face tariffs of up to 35 per cent.

Nonetheless, the increase in trade flows would probably be small. Using a partial equilibrium model for 27 product groups, Valdés (1992) estimates that free trade with the United States would increase Chilean exports to that country by 4.4 per cent. Imports from the United States would rise by 27.5 per cent, of which 16.3 per cent would be trade creation and 11.2 per cent trade diversion (i.e., replacement of imports from other sources by imports from the United States). Welfare would increase by the equivalent of one per cent of GDP. Of course, these are static, or one-time only effects, obtained from changes in prices of exports or imports and the relevant price elasticities of supply and demand.

Computable general equilibrium models do not yield significantly different orders of magnitude. With a CGE model, Coeymans and Larraín (1994) estimate that exports would rise by 4.4 per cent (interestingly, the very same figure estimated by Valdés (1992) with a very different technique), imports increasing by 12.9 per cent. Total output would rise by 0.3 per cent and consumption by 0.7 per cent. In another study, also using a CGE model, Brown, Deardorff, Hummels, and Stern (1994) estimate the overall and sectoral effects of the extension of NAFTA to four South American countries (Argentina, Brazil, Colombia, and Chile). From Chile's perspective, the most relevant scenario is the bilateral elimination of tariffs between NAFTA countries and Chile, which would yield increases of 8.9 per cent for exports and 9.3 per cent for imports. GDP would rise by 1.4 per cent on a one-time-only basis.

An agreement with the United States or becoming a member of NAFTA has other aspects that are not beneficial to Chile. On the trade side, Chile will be pressed to scrap the additional taxes that are levied on the imports of large and high-priced automobiles. These taxes constitute a disincentive to the consumption of luxury goods of low social priority, and they should be retained.

Likewise, becoming a member of NAFTA may involve certain costs that must be avoided. It should not be forgotten that NAFTA is more than a free trade agreement. It also requires of its members the liberalization of domestic services markets, unrestricted entry for FDI originating in partner countries, and the observance of United States norms on intellectual property protection. As already noted, Chile will have to modify the latter to conform to WTO

^{23/} Chile already has free trade agreements with Mexico and Canada, so that entry into NAFTA would be tantamount to signing a free trade agreement with the United States, with the addition of clauses that are dear to the United States, but which could be quite onerous for Chile.

requirements. However, in the areas of FDI and financial services, Chile will be pressured to accept additional liberalizations that would not be advisable, if policy makers wish to preserve the freedom to use policy tools that could be crucial in fostering export-oriented growth. One of them is the requirement that FDI remain in the country for a full year (reduced from three years in 1993), if foreign corporations wish to benefit from the protection of DL 600. This norm has the objective of preventing short-term speculative flows from masquerading as FDI. This restriction obviously does not discourage any *bona fide* foreign investment, which normally has much longer time horizons. In fact, Chile has never experienced such prolonged and steady rises in FDI as during the past decade.

The other restriction that contravenes NAFTA norms on financial services is the reserve requirement obligation on foreign financial investments. In NAFTA, this would be considered to infringe the norm on national treatment for suppliers of foreign financial services. As a small country in a huge international financial market, Chile must safeguard its right to introduce temporary disincentives to excessive financial capital inflows. It is interesting that, in the free trade agreement recently signed with Canada, Chile was able to maintain its right to apply measures such as these, as well as its requirement of a minimum stay period for FDI.

For the past couple of years, Chile has also been pursuing a free trade agreement with the EU. Given the priorities of this bloc, this objective is unlikely to be reached in the short or medium term. However, given the high tariff and non-tariff barriers that the EU maintains on agricultural and agroindustrial imports, a free trade agreement with it would probably be more advantageous to Chile than becoming a member of NAFTA. While the average trade-weighted tariff rate applicable to Chilean exports to the EU is only 3.4 per cent (2.7 under the EU's GSP), there are significantly higher tariffs for many products in which Chile has or can easily acquire competitiveness in the European market. In agricultural and agroindustrial products, the EU utilizes a system of specific tariffs that translate into stratospheric *ad valorem* equivalents. Alvarez (1996) calculates that, in agroindustrial products, such equivalents range from zero to 489 per cent, with an average of 15 per cent. In agricultural and meat products, the range is from zero to 177 per cent, with an average of 14 per cent. Obviously, the export volumes for products with high *ad valorem* equivalent tariffs are very low; and in some cases, products facing high tariffs are not exported at all. Finally, fruit imports into Europe are subject to a system of minimum entry prices that effectively imply the retention of variable levies that the Uruguay Round was supposed to prohibit. Chilean exports of pears and apples are adversely affected by this system.

Using a partial equilibrium model similar to that of Valdés (1992), Alvarez (1996) estimates that the static effects of a free trade agreement with the EU would be to raise Chilean exports to the EU by 10.3 per cent and Chilean imports from the EU by 26.6 per cent, of which 16.3 per cent corresponds to trade creation. These calculations -which, it should be noted, are higher than for an agreement with the United States- subestimate the advantages of an agreement with the EU, since it is impossible to measure the effects on trade in goods that are not being traded in the base year for which the calculations were made. Given the high degree of protection in Europe for products in which Chilean producers are already competitive, some products exported to third markets are altogether left out of Europe.

C. BILATERAL AGREEMENTS: WHICH WAY NOW?

It would appear that the most interesting agreement for Chile is the one with Mercosur. Given the fact that Mercosur still has relatively high tariffs on capital equipment and several intermediate goods, and that the interests of Chile lie in reducing rather than increasing tariffs on these items, a free trade agreement with Mercosur would appear to be preferable to belonging to the Mercosur customs union. However, as Mercosur continues to liberalize its imports, something that is quite likely, differences in this respect will narrow. The evident benefits of association with Mercosur suggest that closer links and close coordination of trade diplomacy with it are in the best interests of the country. As Mercosur draws in other countries (it has already signed a free trade agreement with Bolivia and it is negotiating with other Andean countries), it may well become the hub for a continental free trade agreement. If this were to happen, its attractiveness for Chile would increase.

As for membership in NAFTA, the economic benefits are probably meagre, and the costs in terms of policy freedom can be quite high. Even if NAFTA were an attractive option, the ability of the United States Administration to deliver membership is now very much in doubt. An agreement with the EU appears as more worthwhile, but it is unlikely that this huge grouping will spend a great deal of negotiating effort on an insignificant trading partner such as Chile. Chile is likely to be able to do better in forging a free trade agreement with the EU through, and together with, Mercosur.

Nor would it seem wise to continue to sign free trade agreements with countries with which Chile has a limited amount of trade. The costs in terms of administration, potential corruption, and trade diversion are probably higher than the benefits.

V. LOOKING FORWARD

There can be little doubt that export expansion and diversification, beginning in the mid-1970s but assuming the key role in development around the mid-1980s, has been the main engine of growth of the Chilean economy. What are, then, the causes of Chile's export successes? Undeniably, the trade liberalization of 1974-79 radically altered relative prices and increased the profitability of exporting *relative to producing tradables for the domestic market*. However, the liberalization was faulty in many respects. The concurrent liberalization of the capital account beginning in mid-1976, in a context of very liquid international financial markets, made real exchange rate appreciation inevitable. This meant that, until the exchange rate correction that took place after 1982, price signals encouraged non-tradables rather than exportables and efficient import-competing sectors. In addition, the sky-high interest rates of the second half of the 1970s made it all but impossible for manufacturers to adjust to the new set of relative prices. That is why it took until the second half of the 1980s, when interest and exchange rates were more favourable, for exports to become the engine of growth envisaged by the liberalizing paradigm.

Other policies were also important. Generic export promotion in the 1980s certainly contributed. So did the evolution of the exchange rate after 1982 and exchange rate policy in the 1990s. Sectoral industrial policy in favour of forestry and wood industries had much to do with that sector's take-off. Policies toward FDI also aided in the growth of non-traditional exports. The activities of information gathering and technology development by public or semi-public agents assisted in improving supply responses. These were also enhanced by prior investments in infrastructure and higher education.

The next stage of export-oriented development will be much more difficult. The "easy stage" of export promotion has already been accomplished and more of the same is unlikely to lead to a continuation of fast rates of growth of exports and GDP. In the first place, Chile will have to let go of certain policy tools that have paid off handsomely in the past (the simplified drawback, tariff-free imports of capital goods for exporters, the automotive statute, probably the tree-planting subsidies). Secondly, becoming internationally competitive in more sophisticated goods has more complex requirements than exporting commodities and commodity-like goods, ranging from human resource development, entrepreneurship, acquisition of information, greater R&D efforts by domestic firms, improving the operation of capital markets so that producers have better access to long-term capital, and improving infrastructure such as port, roads, and tunnels. This will require a more active -and efficient- State than in the past.

The deepening of outward-oriented growth will also necessitate the abandonment of dogmatic attachment to a flat tariff and a more aggressive stance toward tariff reductions. There is no reason for the maintenance of tariffs on capital goods and on the wide range of intermediates that are not produced in the country. Export-oriented growth requires zero tariffs on these items, especially in light of the restrictions that Chile will be facing in short order on policies to compensate for the distortions that tariffs on these items cause.

The deepening of the export-oriented growth model also requires improved access to markets. With the proviso that tariffs on certain kinds of goods ought to be dismantled unilaterally as soon as possible, the strategy followed by the authorities of continuing trade liberalization via the signing of free trade agreements seems, in the main, correct. The potential of intra Latin American trade for Chile, both as an exporter of new products and an importer of food staples, gives a strategic priority to Mercosur as a trading partner.

FDI policy can be used to attract desired investments. While maintaining its liberal approach to FDI, Chilean authorities could attempt to attract transnational corporations (TNCs) with desirable technological or managerial assets and which possess access to markets for manufactures. The association with Mercosur could eventually prove important in attracting TNCs in manufacturing, which up to now have been conspicuous for their absence.

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ANNEXES



Annex I
Derivation of the production function

Assume that the production function is as follows:

$$Y_t = \alpha_0 + \alpha_1 * K_t + \alpha_2 * X_t + u_t \quad (\text{I-1})$$

where Y = aggregate output,
K = capital stock,
W = total exports,
u = error term with the usual properties.

The capital stock can be expressed as an the sum of an infinite stream of net investments:

$$K_t = \sum_{i=1}^{\infty} (1-\lambda) * I_{t-i} \quad (\text{I-2})$$

Writing L for the lag operator, (I-2) can be expressed as:

$$Y_t = \alpha_0 + \frac{\alpha_1 (1-\lambda) L}{[1 - (1-\lambda) L]} * I_t + \alpha_2 * X_t + u_t \quad (\text{I-3})$$

Multiplying through by the denominator of the coefficient of I_t , (I-3) can be expressed as:

$$Y_t - (1-\lambda) Y_{t-1} = \alpha_0 + \alpha_1 (1-\lambda) I_{t-1} + \alpha_2 X_t - \alpha_2 (1-\lambda) X_{t-1} + u_t - (1-\lambda) u_{t-1} \quad (\text{I-4})$$

Since in long-run equilibrium $Y_t = Y_{t-1}$, $I_t = I_{t-1}$, $X_t = X_{t-1}$:

$$Y_t = \beta_0 + \beta_1 * I_t + \beta_2 * X_t + u'_t \quad (\text{I-5})$$

where $\beta_0 = \alpha_0 / \lambda$;
 $\beta_1 = \alpha_1 (1-\lambda) / \lambda$;
 $\beta_2 = 1 - \alpha_2 (1-\lambda)$

Annex II
Deriving the compensatory depreciation

Assume that, to start out, the economy is in balance of payments equilibrium. Letting F^* be equilibrium capital flows, the balance of payments equilibrium can be described as follows:

$$p_m^* q_m(p_m) - p_x^* q_x(p_x) = F^* \quad (\text{II-1})$$

where asterisks denote international prices (assumed to be independent of the levels of trade of our country).

We can differentiate (II-1) to obtain:

$$p_m^* dq_m - p_x^* dq_x = 0 \quad (\text{II-2})$$

Under the small-country assumption, the price for the importable and exportable are, respectively:

$$\begin{aligned} p_m &= e \cdot (1+t) \cdot p_m^* \\ p_x &= e \cdot p_x^* \end{aligned} \quad (\text{II-3})$$

where t is the (ad valorem) tariff and e is the nominal exchange rate.

By the definition of elasticity, we obtain expressions for dq_m and dq_x :

$$\begin{aligned} dq_m &= q_m \cdot \epsilon_m \cdot [\hat{e} + \hat{t}] \\ dq_x &= q_x \cdot \epsilon_x \cdot \hat{e} \end{aligned} \quad (\text{II-4})$$

where a hat over a variable denotes percentage change.

Replacing (II-4) and (II-1) into (II-2) and collecting terms, one obtains the value of the compensatory depreciation:

$$\hat{e} = \frac{\hat{t}}{\epsilon_x / \epsilon_m - 1} \quad (\text{II-5})$$