

# CHILE'S ECONOMIC PERFORMANCE IN THE 20TH CENTURY, A COMPARATIVE PERSPECTIVE

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## ABSTRACT

This article aims to assess Chile's economic performance in the 20th century in a comparative perspective. The casual analysis of economic performance is conducted at two levels, 'ultimate' and 'proximate'. Ultimate causes refer to institutions, ideologies pressure groups, historical accidents and economic policy at the national level, while involving influences, either positive or negative, from outside the country it is difficult to quantify these 'ultimate' features and legitimate scope for disagreement on what is important remains, as is the case in Chile.

Quantification becomes possible in the case of 'proximate' causes of the economic performance and it is here where all kind of models have been developed. One strand of measures are comparative macroeconomic growth accounts which provide significant insights in trying to 'explain' GDP growth (per capita) and productivity by measuring inputs of labor and capital, availability of natural resources and influences affecting the efficiency with which resources are combined.

In this article emphasis is given to 'proximate' causes of growth through quantitative supply-side analysis, but 'ultimate' causes and especially the role of policy and institutions, both national and international, in economic performance are also analysed.

The study includes seven Latin America countries to compare Chilean and Latin American performance to that of a) three Asian developing countries, b) Portugal and Spain and c) six advanced countries which display levels of income and productivity among the highest in the world.

## SÍNTESIS

Este documento hace una evaluación del comportamiento económico de Chile en el siglo XX desde una perspectiva comparativa. El análisis causal del comportamiento económico se lleva a cabo a dos niveles, 'último' y 'próximo': Las causas 'últimas' dicen relación con las instituciones, ideologías, grupos de presión, accidentes históricos y política económica a nivel nacional, abarcando, al mismo tiempo, las influencias positivas o negativas, provenientes del exterior. Resulta difícil cuantificar estos rasgos 'últimos' y subsiste aún un margen legítimo de desacuerdo acerca de lo que es importante, como acontece en el caso chileno.

La cuantificación es posible en el caso de las causas 'próximas' del comportamiento económico y es en este campo en donde se ha desarrollado toda suerte de modelos. Una línea de medidas la constituyen las cuentas de crecimiento macroeconómico que facilitan significativamente los intentos por 'explicar' el crecimiento del PIB (per cápita) y la productividad mediante la medición de los insumos de trabajo y capital, la disponibilidad de recursos naturales y las influencias que gravitan sobre la eficiencia con que se combinan los recursos.

En este artículo, se destaca las causas 'próximas' de crecimiento a través de un análisis cuantitativo de los factores determinantes referidos a la oferta, pero se analizan las causas 'últimas' y particularmente el rol de las políticas y de las instituciones, tanto nacionales como internacionales, en relación al comportamiento económico.

Participación en el Mercado de Trabajo Urbano en Colombia", *Estudios de Economía*, Vol. 17, 111-34.

#### ABSTRACT

FUNKHOUSER, E. (1980): "Mass Emigration, Resistance, and Economic Development: A Case Study of the Dominican Republic." *Journal of Development Economics*, Vol. 1, 1-18.

GUNDLING, T.H. (1981): "Women's Economic Participation in the Dominican Republic." *Journal of Development Economics*, Vol. 2, 1-18.

Participación en el Mercado de Trabajo Urbano en Colombia", *Estudios de Economía*, Vol. 17, 111-34.

Participación en el Mercado de Trabajo Urbano en Colombia", *Estudios de Economía*, Vol. 17, 111-34.

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#### RESUMEN

En este artículo, se destaca las causas 'próximas' de crecimiento a través de un análisis cuantitativo de los factores determinantes referidos a la oferta, pero se analizan las causas 'últimas' y particularmente el rol de las políticas y de las instituciones, tanto nacionales como internacionales, en relación al comportamiento económico.

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# CHILE'S ECONOMIC PERFORMANCE IN THE 20TH CENTURY, A COMPARATIVE PERSPECTIVE\*

André A. Hofman

## 1. INTRODUCTION

The objective of this article is to make an assessment of Chile's economic performance in the 20th century within a comparative perspective. We follow the approach put forward in Maddison (1991) where the causal analysis in economic performance is conducted basically at two levels, 'ultimate' and 'proximate'. 'Ultimate' causes refer to institutions, ideologies, pressure groups, historical accidents and economic policy at the national level. At the same time, it also involves influences from outside the country, either positive or negative. It is somewhat difficult to quantify these 'ultimate' features and there remains legitimate scope for disagreement on what is important, as is the case in Chile.

Quantification becomes possible in the case of 'proximate' causes of the economic performance and it is here where all kind of models have been developed by economists and statisticians. One strand of measures are comparative macroeconomic growth accounts which provide significant insights in attempting to 'explain' GDP growth (per capita) and productivity by measuring inputs of labor and capital, availability of natural resources and influences affecting the efficiency in combining resources.

Though this article strongly emphasizes 'proximate' causes of growth through quantitative supply-side analysis, especially in sections 3 and 4.2, 'ultimate' causes and especially the role of policy and institutions, both national and international, in economic performance will also be analyzed (section 2 and 4.1).<sup>1</sup>

\* *Estudios de Economía*, publicación del Departamento de Economía de la Facultad de Ciencias Económicas y Administrativas de la Universidad de Chile, vol.20, número especial.

<sup>1</sup> See Maddison (1991) pp. 10-11 a. In addition, a referee's point on the theoretical model underlying the growth model, differentiating between outward displacement of the production possibilities frontier through factor input accumulation and technical progress and movement of the actual economy closer to (further from) its boundary through policy and institutional factors, has been very insightful.

The Latin American countries included are: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico and Venezuela. They had a combined population of 343 million in 1989 which is over 75 percent of the Latin American total (including the Caribbean). In terms of output the sample is even larger. We have included the countries by resorting to a criteria of data availability. Especially in the case of capital stock estimates the requirements are such that many countries could not be included.

Chilean and Latin American performance is compared with that of three other groups of countries: (a) three Asian developing countries, Korea, Taiwan and Thailand, where economic growth in the past couple of decades has been remarkably fast; (b) Portugal and Spain, whose institutional heritage has a good deal in common with Latin America; and (c) six advanced countries (France, Germany, Japan, the Netherlands, the U.K. and the U.S.A.) in which the level of income and productivity are amongst the highest in the world.

It is possible to clearly perceive distinctive phases of economic development in the Twentieth century<sup>2</sup>. The first ended in 1913 when the world entered a period of war and turmoil. This phase started around 1820 in the advanced countries when growth accelerated and around 1870 in developing countries under the influence of trade and capital flows. Since this article focuses on Chilean and Latin American economic development in the 20th century, our starting point for the first phase is 1900. We next distinguish the 1913-1950 period, subdivided into 1913-1929, 1929-1938 and 1938-1950. During this period the world experienced two world wars, involving huge losses in military and civilian casualties, and a great depression, bringing about a big fall in world aggregate output and a collapse in world trade, capital markets and the international monetary system. During this period, tendencies to nationalism and autarky, and increased international conflict are clearly perceivable. The pace of growth slowed down worldwide. However, although the whole world economy underwent these disasters, it was worse for Europe and Asia whilst Latin America was sheltered and remained relatively intact.

For the 1950-1989 period, subdivided into 1950-1973, 1973-1980 and 1980-1989, a growth accounting framework is presented using total factor productivity analysis. The period from 1950 to 1973 is to be considered a golden age. There are several interrelated factors which can explain this performance. The new world order which was created, had many more elements of stability than the one created after the First World War with its built-in elements of instability. This new order affected the options of most countries in a positive way, offering greatly enhanced opportunities for trade and specialization and better access to

<sup>2</sup> For this periodization we used Maddison (1989) with some small adjustments especially in the inter-war period, including 1938 for some exercises. In the post-war period we included 1980, the starting point for a severe economic crisis and therefore also a distinct landmark point in the case of Latin America.

foreign capital and technology. Domestic policies were directed to promote high levels of demand and employment in the advanced countries and were oriented to development objectives elsewhere. Finally, there was a large increase in investment ratios and capital stocks, an accelerated educational effort and improvements in international trade and specialization<sup>3</sup>. In both Chile and Latin America the change in policy attitudes and instruments was smaller, because they had fared relatively well in the previous period and there was a tendency to more inward looking-policies.

The last period (1973-1989) can not be characterized as clearly as the previous ones. OECD countries experienced a slowdown as from 1973, but for the other countries of our sample this slowdown is not as straightforward. Latin America continued to grow until the beginning of the eighties with substantial help from increased capital inflow at low interest rates. However, inflation increased and our results show clearly that productivity measures already started to decline in Chile and most Latin American countries as from 1973. And since the beginning of the eighties Latin America is undergoing a crisis only to be compared with the Great Depression.

The Asian countries also experienced some problems, Japan's growth rate fell dramatically, but the developing Asian countries have been able to continue to grow at a fast rate, in some cases even faster than during the golden age.

This study is built up as follows: The next section (2) gives a very short historical retrospect of the 1900-1950 period. Section 3 analyzes labor productivity and growth acceleration and slowdown in the 20th century. Section 4 addresses the post-war period from two angles; the first part (4.1) deals with policy and performance in the post-war period; and the second part (4.2) presents the results of a growth accounting analysis for the 1950-1989 period. In the final section some conclusions are drawn.

## **2. RETROSPECT 1900-1950**

### **The Liberal World Order**

The period before the First World War, which started around 1870 (for some authors even earlier, around 1820), has been denominated the liberal world order characterized by growth acceleration, through trade and capital flows. The period 1900-1913 in Table 1 represents only the final years (1900-1913) of a much longer phase.

<sup>3</sup> See Maddison (1989), p.65.

Chile and Latin America experienced fast growth during the first years (until 1913) of the 20th century. The final years of the liberal world order was a period of great prosperity for almost all countries of our sample (only the Asian developing countries grew rather slowly), and on a comparative basis it was the best period of the 20th century for Latin America. Table 1 shows clearly the outstanding performance of Chile, above the average of Latin America.

The growth process of Chile during the first years of the 20th century was influenced by the natural sodium nitrate boom which had started in the 1880s. The enormous expansion of production and exports of nitrate caused a transformation of the Chilean society and economy as documented in Cariola and Sunkel (1985) and Mamalakis (1976). GDP per capita grew fast at a rate not to be repeated, until only very recently, in the 20th century.

**TABLE 1**  
**GDP PER CAPITA 1900-1989**  
(average annual compound growth rates)

	1900	1913	1929	1950	1973	1980	1990
	13	29	50	73	80	89	89
Chile	2.4	1.6	0.6	1.2	1.8	1.2	1.3
Arithmetic Average:							
Latin America	1.9	1.6	1.9	2.8	2.6	-0.9	1.9
Asian Countries	0.5	1.0	-0.6	4.8	5.4	5.9	2.3
Iberic Countries	1.1	0.7	0.4	5.3	1.4	1.9	2.1
Advanced Countries	1.2	1.5	0.5	4.7	1.8	2.1	2.1
USA	2.0	1.7	1.5	2.2	1.0	2.2	1.8

Sources: Tables A1 and A2.

### World Wars and Interbellum (1913-1950)

The period from 1913 to 1950 witnessed three major disasters at a world scale: the First and Second World Wars and 'The Great Depression'. This period 1913-50 has been divided into three different subperiods with benchmark years in 1929, the starting year of 'The Great Depression', and 1938 which clearly marks out the dividing point between 'The Great Depression' and the Second World War. We only go into a detailed analysis of the subperiods when the data show marked differences between them, as is the case especially with the data on labor productivity.

For the period up to 1929 when the liberal world trading order broke down, the expansion of per capita real income in different regions was not too different, with Asia as the laggard region. Per capita income grew in Chile by 1.6 percent, the same as the average for Latin America. In 1929-1950 when growth was interrupted by the collapse of international trade and the Second World War, most areas of the world suffered major setbacks to growth, and their performance was generally very poor, or in the Asian case<sup>4</sup>, negative.

However, 1929-1950 were good years for Latin America, considering the state of the world economy. From 1929-1938 GDP per capita grew around 1 percent, the same growth rate as the developed countries (except the U.S.A. where per capita GDP fell), while our Asian countries grew rather fast. For the Iberian countries we only have data for Portugal because Spain was engaged in its Civil War. During the 1938-1950 period Latin America did remarkably well growing at average rates of 2.4 percent, while in other areas, like Asia, GDP per capita fell an average 2.7 percent and was stationary in the developed countries, except for the U.S.A. where growth accelerated.

**TABLE 2**  
**GDP PER CAPITA 1900-1989**  
**(USA = 100)**

	1900	1913	1929	1950	1973	1980	1990
Chile	39	41	41	34	27	28	26
Arithmetic Average:							
Latin America	25	24	23	25	28	31	23
Asian Countries	18	15	14	9	16	22	26
Iberic Countries	34	31	28	21	41	42	40
Advanced Countries	60	54	51	43	68	71	70
USA	100	100	100	100	100	100	100

Sources: Tables A1 and A2.

It could well be worthwhile to make a pause in order to review the economic performance of Chile in this period. It can be seen in Table 1 that growth was well below the average Latin American level. From Table 3 it becomes clear that

<sup>4</sup> The three countries selected in Asia are, of course, not at all representative for Asia and therefore to use them to typify 'the Asian case' is misleading. This is even more the case in the period before 1950 when Korea and Taiwan were colonies of Japan.

Chile was affected very heavily by the 'Great Depression'; as a matter of fact, the fall in GDP in Chile was the biggest in Latin America. And although the recovery was somewhat stronger in 1938-50 than in the rest of Latin America, it was not sufficient to make up for the loss in 1929-1938.

During 1913-1950 the Chilean growth performance can be divided into the 1913-1929 period of somewhat higher GDP per capita than the Latin American average and the 1929-1950 period of much lower comparative performance. The nitrate boom was affected by the outbreak of the First World War and the contraction of the European markets; however, the rapid growth of the North American market compensated the loss of the European markets and the boom apparently continued until the thirties when the combined effect of actually starting to use artificial nitrate and the low technological level caused the industry to collapse. Copper production and exports entered a new period of expansion after the great decline from 1880 until the second decade of the 20th century; however, the interactions between large-scale copper production and the rest of Chile's economy were limited and fewer linkages than in the case of nitrates were established. Chile was affected severely by the Great Depression and average GDP per capita fell during the period 1929-1938. This experience induced the government to seek a policy to reduce external dependence, and industrialization became an important instrument in attaining economic growth.

From Table 2, showing GDP per capita relative to the U.S.A., it becomes clear that the whole period 1900-1950 was, comparatively, a period of prosperity for Latin America. Its GDP per capita remained almost unchanged relative to the U.S.A. whilst the Asian group had fallen from an average of 19 percent in 1900 to 9 percent in 1950. The Iberian level which was 31 percent in 1913 had fallen to 21 percent. Also the advanced countries' level had fallen drastically.

Chile's position relative to the U.S.A. was 39 percent in 1900, rising to 41 percent in 1913-1929 and then went down once again to 34 percent in 1950.

### **3. LABOR PRODUCTIVITY, GROWTH ACCELERATION AND SLOWDOWN IN THE 20TH CENTURY**

Table 3 shows labor productivity figures from 1913, the earliest year for which data was available, to 1989. One of the most important findings is that the process of acceleration of growth and labor productivity started in Latin America already around 1938, when GDP per capita and productivity growth accelerated at growth rates which were about four times higher than those of the previous 1929-1938 period. Especially in Argentina, Chile, Mexico and Venezuela growth accelerated from 1938 onwards. It was during this period that the combined effects of expansionary fiscal and monetary policy and import substitution resulted in high growth of productivity per man hour and per capita GDP. In addition, some



countries also benefitted from the positive effect of the Second World War. During the first part of this period Latin America was still recovering from the effects of the depression and growth was based upon better utilization of installed capacity, but it can be assumed that during the last years of this period the production frontier was also moved. Although Chile experienced a growth acceleration similar to the average of the Latin American countries, it should be noted that its growth rate, 2 percent, is far below the average 3.5 percent.

As can be seen in Table 1 this growth acceleration started not only in the developed countries, but also in the developing Asian ones, only after the Second World War, during the golden period of 1950-1973. In the case of Korea growth accelerated in the late fifties. Another important element is that the growth acceleration in this period was much stronger in the non-Latin American countries than in Latin America. The Asian developing countries had an average negative per capita growth in the 1929-1950 period and grew at 4.8 percent during the 1950-1973 golden period. The Iberian countries had a comparable performance and the developed countries, except for the U.S.A., grew a mere 0.6 percent during 1929-1950 as opposed to 4.7 percent in 1950-1973.

Table 1 above and Tables A1 and A2 of Appendix A show the long term growth record since 1900 for our sample of countries. In terms of total GDP growth for the 1900-1989 period, the record was very respectable for Latin America. At 4.2 percent per annum, it was a great deal faster than the 3.0 percent recorded in the advanced OECD countries, and the 2.9 percent in the two Iberian countries. It was, however, slower than the 4.5 percent a year in the Asian group. Over the whole 1900-1989 period Chile experienced an average growth rate of only 3 percent per annum.

Since 1950, Latin America's performance has been systematically much worse than in all the other areas, with the exception of the 1973-1980 period. The 1950-1973 was a period of great expansion in Latin America, when growth per capita averaged 2.5 percent a year (faster than the 1.7 average for 1929-1950). Within the Latin American group the 1950-1973 performance of Chile was extremely weak, growing at only 1.2 percent per capita. This weak performance, however, is influenced a great deal by the periodization used. If we take 1971 as a benchmark the 1950-1971 and 1971-1980 growth rates per capita are 1.9 and 0.2 percent, respectively; however, the 1950-1971 and 1971-1980 growth performances remain among the weakest in Latin America<sup>5</sup>.

<sup>5</sup> Our GDP estimate for Chile comes from ECLAC based upon official estimates. In a revision of the official estimates Marcel and Meller (1986) arrive at a somewhat lower estimate due in great part to the reduction of the growth of the industrial sector during the 1973-81 period.

Nevertheless, other areas experienced a much greater acceleration of growth in the same period. In Asia growth averaged 4.8 percent a year in 1950-1973, in Iberia 5.4 percent a year and in the advanced countries, 4.3 percent a year.

**TABLE 3**

**LATIN AMERICA: GROWTH AND PRODUCTIVITY, 1900-1989**  
(annual average compound growth rates)

	1900	1913	1929	1938	1950	1973	1980	1989
	13	29	38	50	73	80	89	89
<b>GDP per Capita</b>								
Chile	2.4	1.6	-0.9	1.7	1.2	1.8	1.2	1.3
Argentina	2.5	0.9	-0.8	1.7	1.9	0.6	-2.5	0.9
Brazil	2.3	2.5	2.5	2.7	3.9	4.6	0.0	2.8
Colombia	2.1	2.1	2.1	1.1	2.2	2.6	1.2	1.9
Ecuador	2.5	1.6	-0.0	3.6	2.9	3.3	-0.7	2.2
México	1.8	0.1	0.1	2.5	3.2	3.6	-1.0	1.6
Venezuela	0.4	2.3	1.1	4.7	2.6	0.6	-2.4	1.7
Average	1.9	1.6	0.8	2.7	2.8	2.6	-0.9	1.9
<b>Labor Productivity (GDP per Man Hour)</b>								
Chile		2.3	-0.7	2.0	2.9	1.5	0.0	
Argentina		1.6	-0.2	2.7	2.2	1.5	-1.8	
Brazil		2.7	3.0	3.9	3.9	3.7	-1.6	
Colombia		4.2	0.6	2.3	3.2	2.8	0.7	
Ecuador			0.4	4.1	3.6	3.8	0.3	
México		1.5	0.9	3.3	4.2	2.3	-1.4	
Venezuela		0.8	1.0	4.5	3.6	-1.0	-2.4	
Average		2.2	1.0	3.5	3.5	2.2	-1.0	
<b>Levels of Labor Productivity (USA=100)</b>								
		1913	1950	1973	1980	1989		
Chile		44	31	34	36	31		
Argentina		45	32	31	32	24		
Brazil		13	17	24	29	22		
Colombia		18	19	23	27	24		
Mexico		41	30	45	51	38		
Venezuela		47	41	53	47	33		
Average		33	28	35	37	28		
USA		100	100	100	100	100		

Source: See Appendix A.

In 1973 the period of post-war expansion came abruptly to an end. The advanced and the Iberian countries settled at a much lower growth pace of around 2 and 1.5 percent, respectively. The Asian countries continued growing at extremely high average growth rates of above 5 percent and Latin America slowed down its pace in 1973-1980 to collapse completely in the 1980-1989 period.

Table 3 shows the development of labor productivity in our Latin-America countries in the 1913-1989 period. The period 1913-1950 has been analyzed in a previous section. The growth performance during the 1973-1980 period in Latin-America is remarkable. While GDP per capita continued to grow almost as rapidly as during the 1950-1973 period, labor productivity growth declined markedly after 1973, in such wise already announcing the crisis to come. A very clear example of the above described relation between GDP and labor productivity is the case of Chile where GDP per capita growth even accelerated in 1973-1980 as a result of the dismal performance of 1950-1973. Here again, periodization is very important, taking 1971 as a benchmark would alter the result by improving 1950-1971 and drastically worsening 1971-1980. However, labor productivity decelerated sharply in the 1973-1980 (and more if one takes 1971-1980) period and continued to fall to zero growth in the 1980-1989 period.

#### **4. THE POST-WAR PERIOD**

This section addresses the post-war period from two angles. First we offer a brief overview of policy and performance during this period. Our most important yardstick remains GDP per capita and we also show the most important population developments. This period is subdivided into 1950-1973, 1973-1980 and 1980-1989. In the second part of the section a growth accounting exercise for the 1950-1989 period is presented.

##### **4.1. Policy and Performance in the Post-War Period: The Post-War Golden Age (1950-1973)**

For the world economy 1950 to 1973 was a period of unparalleled prosperity with the OECD countries of our sample growing at 5.3 percent, almost triple the rate of 1913-1950. The Iberian countries grew at 5.8 percent compared with a mere 1.4 percent for 1913-1950 and the Asian countries grew at 7.7 percent, a rate 3.5 times faster than in 1913-50. The Latin American countries grew at 5.8 percent compared with a 3.9 percent during 1913-1950.

In 1950 per capita real income in Latin America countries was three times higher than that of developing Asia, somewhat higher than the Iberian countries and about half that of the six advanced countries. Within Latin America real

income per capita as compared to that of the U.S.A. level ranged from around 35 percent for Argentina, Chile and Venezuela, 27 percent for Mexico and 19 and 15 percent for Colombia and Brazil, respectively.

In 1950 the international economy embarked on an expansion which was to continue unabated until 1973, when the first petroleum price shock took place. Additionally, the growth of world output was the highest ever recorded.

Latin America also achieved an expansion during this quarter-century period which probably outstripped regional growth in any previous twenty-five year period. Furthermore, the rate of growth of regional output between 1950 and 1973 exceeded both the rate of growth of world GDP and the rate of growth of output of the industrialized countries as a whole.

But there was a fundamental contrast between the growth performance of Latin America and that of much of the rest of the world. In effect, while the expansion of world commerce, and especially of industrialized countries' trade, was appreciably more intense than the growth of world output, the growth of Latin America's exports was significantly less than the growth of its GDP and, during the final third of this period, considerably less than one-half the rate of increase of its imports. And while the unprecedented expansion of the industrialized countries was achieved together with an exceptional degree of price stability, the acceleration of growth in Latin America was accompanied, in a good number of countries, by sustained price instability.

While mildly expansionary monetary and fiscal policies, in combination with large devaluations, promoted the strong recuperation of Latin American economies from the Great Depression, expansionary monetary and fiscal policies continued to be implemented or were even strengthened throughout the fifties and sixties, i.e., long after output had returned to or approached its potential. Moreover, in a number of countries money supply growth far exceeded the potential rate of growth of output.

The evolution of the Latin American economies thus continued to diverge considerably from that of the Asian developing economies; but in this historical instance the departure entailed the progressive build-up of macroeconomic disequilibria (Bianchi and Nohara, 1988).

Income growth resulting from the expansion of primary exports led to a rise in the demand for manufactured consumer goods and their inputs in Latin America. This demand had become increasingly satisfied by domestic production that enjoyed the 'natural protection' provided by transportation costs, complemented in some cases by tariff protection prior to the Second World War. Not only foreign exchange scarcity created by the fall in primary exports during the Great Depression, but also limited access to foreign goods during the Second

World War subsequently boosted import substitution. Only after the war, however, did import substitution become a doctrine which guided policy making in much of Latin America.

Although the average nominal protection went up gradually in the course of the fifties, the average tariff in 1950 was still rather low in a number of Latin American countries. However, between the mid-fifties and the mid-sixties tariff levels soared and reached extremely high protective levels<sup>6</sup>. It becomes clear that the rates of effective protection come rather close to those of nominal protection, the former being lower in Argentina and Brazil, and much higher in Chile, Colombia and Mexico in the sixties. As a rule, effective protection rates were lower, or even negative, for commodities, including importables as well as traditional exports, and higher for manufactured consumer importables (see Table 4).

TABLE 4

LATIN AMERICA: EVOLUTION OF NOMINAL TARIFFS, 1925-1986  
(percentages)

	1928	1938	1950	1965	1973	1980	1986
Argentina	26	24	12	148	94	34	38
Brazil		26	14	85	55	99	45
Chile	30	35		89	94	10	20
Colombia	23	25	17	48	36	28	
Mexico	28	17	11	20	28	12	27

Source: Bianchi and Nohara (1988), Table 17.

In the fifties Chile continued its industrialization through an import substitution strategy already started a decade before, as a result of the Great Depression and the collapse of the nitrate market due to the substitution of natural by synthetic nitrate. However, this development model began to encounter problems, such as a stagnated agriculture, on the one hand, and the emphasis on import substitution, on the other, which hindered the development of new exports, severely restricting external trade options and the management of the balance of payments. The instability of the prices of traditional exports was transmitted to the domestic economy through recurrent balance-of-payments shocks (French-Davis and Muñoz, 1992). The increasing price instability drove policy makers to the conclusion that new economic strategies had to be found. A first attempt was

<sup>6</sup> In interpreting Table 4 it should be borne in mind that the benchmark normally given represents an estimate of protection for a period either prior to or subsequent to this benchmark year and that in some cases protection changes drastically from one year to another.

based upon the recommendations of the Klein-Saks mission which marked the return to more orthodox short-term economic policies with maximum priority on price stabilization and proposals for a gradual liberalization of the Chilean economy. However, as inflation was curtailed, it triggered the worst short-term recession since the Great Depression and gave rise to public outcries (Mamalakis, 1976).

During the presidency of Alessandri (1958-1964) the reform of the economic system was tackled in a more comprehensive fashion. The private sector was seen as the engine of growth and was supported by an active fiscal policy in a Keynesian manner, though the Government still also took an active role as entrepreneur through the creation of new public enterprises. This required a broader scope for the market, prices and competition especially from external sources. However, great importance was attached to stabilization in the short run based upon: a fixed nominal exchange rate, the elimination of the 'inflationary' Central Bank financing of the fiscal deficit, rises in remunerations according to productivity increases and the promotion of domestic and foreign investment (Ffrench-Davis, 1973). This program enjoyed considerable, though temporary success, especially in the reduction of inflation<sup>7</sup> but towards the end of Alessandri's presidency a balance-of-payments crisis took place, caused by the rapid increase in imports, especially consumer goods while exports grew at a slower pace, thereby compelling the government to devalue, close the economy and reintroduce exchange controls as inflation broke out once again.

The strategy of the Frei (1964-1970) administration was based upon a three point program. First, a gradual stabilization scheme. Second, an industrial modernization action plan. And finally, a set of policies geared to structural and social changes including agrarian reform and the first steps in the nationalization of the copper mines. The role of the state in production augmented, protection increased to promote domestic production of electronic and other durable consumption goods. But it became clear that the system's low capacity to convert internal and external resources into physical, human, and institutional capital remained the foremost bottleneck to growth and economic independence. Another crucial element was that during Frei's government the antagonisms between the country's principal social and political actors became more and more evident.

Within a three year period, Allende's administration attempted to achieve what Chile's previous presidents had failed to pursue or achieve in almost one hundred years: maximum growth and economic independence through a revolutionary but bloodless redistribution of income. The policy of nationalizing foreign mining and the take-over of private banks, industry and transnational firms brought about a

<sup>7</sup> Inflation was on average less than 5 percent during 1960-1962, compared with an average of around 40 percent during the fifties and about 30 percent in the remainder of the sixties (Ffrench-Davis 1973, Table 29, p.242).

great redistribution of income and power. Salaries and wages of the public sector were raised and the expansion of demand quickly affected sales and production which rose sharply in 1971. But the expansionary fiscal and monetary policies, combined with sluggishness of production due to labor disputes accelerated inflation. During 1973 output started to fall, inflation continued to rise, the external sector deficit depleted foreign reserves very quickly, black market transactions increased and these trends, together with domestic economic opposition and the foreign economic blockade, generated a state of chaos in the economy (Dornbusch and Edwards, 1990).

### **Structural Problems Still Concealed (1973-1980)**

For the world economy 1973-1980 meant the departure from growth trends similar to those experienced during the previous period of very high growth. The OECD countries, as a whole, experienced a sharp slowdown, GDP per capita growth rates being more than half lower than in the previous period. However, Latin America and Asian developing countries continued to grow.

During this period Latin America's GDP per capita continued to grow rather quickly compared to the U.S.A. and its comparative level reached 32 percent in 1980, the highest level of the entire 20th century. However if this performance is compared with that of other blocs, Latin America's performance is not as good as it appears to be at first sight. Asian developing countries more than doubled their level while OECD countries also markedly improved their relative position vis à vis the U.S.A..

In Latin America the drastic changes which occurred in the world system at the beginning of the seventies, such as the fall of the Bretton Woods fixed exchange mechanism (1971) and the action of the OPEC price cartel did not have the same effect on policy-making as it had in developed countries where a sharp change in economic policy took place. The new disturbance was simply a new variation on a familiar theme, and was not regarded as a razor's edge situation, calling for drastic policy change (Maddison, 1989).

The combination of biased macroeconomic policies and compensatory sectoral subsidies with unlimited access to international capital markets was accompanied by economic growth in the 1973-1980 period. Eventually, it created pervasive imbalances, including stagnation of exports and imports, other than manufactured ones, overproduction of non-traded goods and services, uncommonly large resource gaps, unparalleled excess external debt and rampant domestic price instability, all of which contributed to the unusual severity of the crisis of the eighties (Bianchi and Nohara, 1988).

During this period several countries experimented with neoconservative economic policies, i.e., the association of monetarist views concerning economic

stabilization with radical conservative approaches. These two ingredients have been present, to varying degrees, in the economic programs of Chile after 1973 and Argentina after 1976, both put into practice by strong military governments (Foxley 1983).

Two overriding concerns marked the economic policy of the Chilean Military Junta upon taking power at the end of 1973: (1) the unavoidable need to restore basic macroeconomic equilibria, and (2) the intention to instill dynamism in an economy whose performance in the recently past decades was considered quite unsatisfactory. The main objective of the first period (1973-1976) was to reinstall market mechanisms in an economy with extended controls and severe imbalances. The initial policy mix consisted in (i) to free virtually all prices, (ii) to devalue the exchange rate sharply with the purpose of closing the deficit in the balance of payments, (iii) to control wages by demobilizing labor unions and by changing the wages adjustment system, and (iv) to follow a restrictive monetary policy to reduce the fiscal deficit.

During the second period of the Chilean neoconservative experiment the price stabilization strategy was modified as inflation was still advancing at 250 percent per year. Emphasis was not placed on monetary and wage restrictions but rather on controlling expectations and exerting downward pressure on domestic prices via foreign competition and real exchange rate appreciation.

Foxley (1983) summarizes the economic results for Chile in the 1973-1980 period as follows: the rate of inflation decreased, after a deep recession GDP reached pre-recession levels; the fiscal deficit was eliminated; there was an accumulation of reserves, and nontraditional exports expanded rapidly. At the same time, a low investment rate, a significant deficit in the commercial balance, increasing external indebtedness, high unemployment, real wage reduction, and a deterioration in the distribution of income, consumption, and basic social services were among the negative factors.

### **The Lost Decade (1980-1989)**

During 1980-1989 the world economy recovered somewhat from the low growth of the previous period, with the exception of Latin America. Total GDP of the OECD countries grew on average 2.5 percent a year compared to around 2 percent in 1973-1980. The Asian developing countries continued to grow at the same or somewhat higher growth rates. Latin American growth performance was abysmal and the eighties can be considered a lost decade for Latin America.

In 1989 GDP per capita in Latin America had fallen, on average, to the lowest relative levels of the twentieth century. From a level of 32 percent of the U.S.A. in 1980 it fell to 24 percent in 1989. Argentina, which had been a somewhat prosperous country in the world in 1900 (ranking 6th among our 17 countries),



experienced the greatest decline, becoming one of the poorest in Latin America in 1989 (ranking 15th).

Between 1980 and 1989 Latin America experienced its deepest and longest economic crisis since the ill-fated years of the Great Depression. Indeed, so much ground had been lost that from the standpoint of economic welfare the eighties turned out to be a 'lost decade'. On average, GDP per capita fell from 4392 to 3727 constant 1980 international dollars, with heavy per capita income losses in Argentina, Venezuela and to a lesser degree Mexico, virtual stability in Brazil and (recently) some improvement in Chile and Colombia.

Another unique and no less disturbing characteristic of the crisis was the generalized and simultaneous deterioration of virtually all key economic indicators. Many countries not only experienced a decline in the level or in the rate of growth of total output, but also a deterioration in the employment situation and decreases in real wages. Moreover, inflationary processes intensified enormously and became more widespread.

At the beginning of the eighties the Chilean economy was growing rapidly and the key instrument in the modified price-stabilization strategy remained the exchange rate. In mid-1981 the Chilean economy went into a nosedive. The continued buildup of disequilibria in the foregoing period, especially the increased disparity between domestic and international prices and the persistently high real rates of interests, led to a very sharp fall of output. Owing to the crisis the government was obliged to take drastic steps and sharply restrictive policies aimed at deflating the economy and avoiding devaluation were applied. These policies proved ineffective and unnecessarily costly. A massive devaluation was finally inevitable, causing great uncertainty and a massive run to the dollar. Output fell 14 percent in 1982 and unemployment reached the unprecedented level of 30 percent (Ramos, 1986).

The adjustment program which was started in 1983 was less drastic than the previous programs, and included a restrictive monetary and fiscal policy combined with devaluations. In late 1982 Chile put into effect a 'crawling peg' exchange rate system based on minidevaluations. The policy of uniform import tariffs was basically continued although changes were made in the rate and some additional deviations were introduced. The base rate was raised to 20 percent in March 1983 and to 35 percent in September 1984 and was lowered again thereafter to 15 percent in 1988. The economy started growing again in the context of macro-economic stability, although with a very high level of foreign indebtedness (UNCTAD, 1992 and ECLA, 1989). The eighties ended with the Chilean economy growing fast, close to full utilization of its productive capacity with relatively low levels of inflation.

## 4.2. The Growth Accounts

For the 1950-1989 we present a growth accounting exercise using 1973 and 1980 as benchmarks. These growth accounting exercises may serve different purposes, such as, explaining differences in growth rates between countries, shedding light on processes of convergence and divergence, assessing the role of technical progress and calculating potential output losses.

The growth accounts go successively through the main features which could have significant explanatory value. For our sample of sixteen countries, we will present the results with respect to the most traditional explanatory factors, i.e., changes in the quantity and quality of labor inputs and changes in the quantity and quality of capital inputs. We also include natural resources as an explanatory factor because, although difficult to measure, Latin America has abundant resources as compared to other countries of our sample.

The decomposition of economic growth gives clues about the costs of increasing the growth rate. But growth accounting can only explain part of the process of economic growth, it does not deal with other factors such as economic policy, national and international environmental and non-economical factors, as for instance, natural disasters and war.

### Labor

In this kind of international comparisons, it is necessary to estimate labor input in hours worked and not only in employment, due to the fact that the average annual hours worked per employee year varies enormously across different countries. We have elaborated a consistent set of estimates with respect to annual hours worked per employee for Latin America (not available heretofore) and the other countries of our sample.

An important element with respect to labor is the adjustment for changes in the quality of labor input. In this study this change is represented by the rise in the level of education.

Table 5 summarizes the main trends in labor quantity and quality. The first fact that stands out immediately is the great difference in quantity growth between the developed and the developing countries; the Asian and Latin American countries, growing at rates drastically higher than the developed countries. In the 1973-1989 period, labor quantity growth was slightly negative on average in the latter.

The real fast growers were the Asian countries where both elements that influence quantity growth, i.e., employment and hours worked show very high growth rates. In 1989, employment is two to three times higher than that in 1950 and we estimated about a 10 percent increase in hours worked during the 1950-

1989 period. Latin American employment also grew fast but annual hours worked declined steadily throughout the whole period.

**TABLE 5**  
**LABOR INPUTS 1950-1989**  
(average annual compound growth rates)

	Labor Quantity			Labor Quality			Augmented Labor Input		
	1950 73	1973 80	1980 89	1950 73	1973 80	1980 89	1950 73	1973 80	1980 89
Chile	0.53	1.88	2.93	0.59	0.94	0.96	0.67	1.69	2.33
Arithmetic Average:									
Latin America	2.26	2.94	2.38	0.99	1.02	1.41	1.95	2.38	2.27
Asian Countries	3.35	3.21	1.72	1.55	2.01	2.61	2.94	3.14	2.60
Iberic Countries	0.06	-0.65	0.39	1.14	1.14	1.94	0.72	0.29	1.40
Advanced Countries	0.50	-0.22	0.50	0.41	0.40	0.63	0.55	0.11	0.68

Source: See the sources described in Appendix A.

Labor quality which is reflected by educational level shows a steady increase over the whole period for all countries, and the Asian countries again experienced by far the most rapid growth. Latin America and the Iberian countries also show rather high growth rates, whilst the developed countries which on average already had rather high levels in 1950, grew at a much lower pace. We have used the average years of formal educational experience of the population as an indicator of labor quality. Due to lack of data, it was not possible to estimate the level of educational attainment of the labor force which, together with indicators of the efficiency of education, would probably give a less favorable picture of labor quality in Latin America when compared to the Asian and developed countries.

The augmented labor input estimates in the last three columns of Table 5, which reflect changes in the quantity and the quality of the labor inputs, are estimated as the weighted sum (with an assumed factor share of labor in GDP of 0.6)<sup>8</sup> of the labor quantity and quality growth rates and in that way reflect the contribution of labor to GDP growth. Growth rates of augmented labor inputs are

<sup>8</sup> In this study we have used the same weights for capital, labor and land for all countries. Within the present study it has not been possible to include specific country weights which we hope to be able to do in the future. A check with the national accounts for Mexico showed estimates close to ours. In other countries the differences might be substantial.

distinctly different between developed and developing countries and, within our group of developing countries, the Asian group show remarkably high growth rates.

Comparing Chile with the Latin American sample shows extremely low labor input growth in the Chilean case in 1950-1973, which prevails in 1973-1980 to then become higher than the average for all country blocs during 1980-1989.

## Capital

In order to make growth accounting possible, it is necessary to have readily accessible capital stock estimates<sup>9</sup>. Gross and net capital stocks have been estimated according to the 'Permanent Inventory Method' developed by Raymond Goldsmith (see Goldsmith, 1951). The capital stock has been disaggregated into machinery and equipment, non-residential and residential structures with service lives of 15, 40 and 50 years, respectively.

In the augmented version of the capital contribution to growth we have included technical progress in the form of quality improvement of the successive vintages of capital as was first suggested by Robert Solow. The basic argument is that physical investment is the prime vehicle by which technical progress is realized. This capital embodiment effect is not a 'catch-all' effect of technical progress (as suggested initially by Solow) because part of technical progress is embodied in the labor force, in the organization itself and in other relevant aspects. As data on estimates of the embodiment of technical progress in capital are rather scarce and almost non-existent in Latin America we applied rates of 1 percent in the case of non-residential construction and 2 percent in the case of machinery and equipment. This gives the capital quality growth as reflected in Table 6.

The factor share for capital was 0.30 for all countries. This may, in fact, be a rather crude assumption as we know that in some cases capital share has been higher, especially in Latin American and probably also in some Asian countries.

Table 6 shows the rates of growth of the capital inputs (gross non-residential capital stock) in the 1950-1989 period. The 1950-1973 period shows a world of great homogeneity with annual average growth rates of capital stock around 6 percent for our complete sample. However, Chile was an outlier with only 4 percent growth.

<sup>9</sup> These capital stock estimates have been generated in the context of the ECLAC project "Long Run Economic Growth in Latin America" and are published as a working paper of ECLAC, see Hofman (1991) and also Hofman (1992).

TABLE 6

**CAPITAL INPUTS 1950-1989**  
(average annual compound growth rates)

	Capital Quantity			Capital Quality			Augmented Capital Input		
	1950	1973	1980	1950	1973	1980	1950	1973	1980
	73	80	89	73	80	89	73	80	89
Chile	4.21	2.34	1.88	1.26	0.99	1.04	1.64	1.00	0.88
Arithmetic Average:									
Latin America	6.46	7.30	3.94	1.32	1.47	1.04	2.33	2.63	1.50
Asian Countries	5.52	10.79	8.33	1.57	1.72	1.43	2.13	3.75	2.93
Iberic Countries	5.91	6.09	4.20	1.63	1.58	1.27	2.26	2.30	1.64
Advanced Countries	5.94	4.81	3.54	1.65	1.41	1.11	2.28	1.87	1.39

Source: See the sources described in Appendix A.

During the 1973-1980 period capital stock growth showed two markedly different tendencies; in the developed countries capital stock growth decelerated markedly (except in France and the U.S.A.) while in the developing and the Iberian countries growth increased, with exceptionally high rates in South Korea and Taiwan. Again, Chile showed extremely low rates of capital accumulation.

In 1980-1989 growth rates decelerated drastically in all countries with the exception of Colombia. Despite this exception, the fall in Latin America's capital stock growth rate was the biggest for all regions. Growth deceleration in Chile was far lower than the average of all other countries. Asian capital quantity growth rates were double the Latin American ones in 1980-1989.

The capital quality growth rates of Table 6 show a uniform rate of about 1.6 percent for all countries of our sample during 1950-1973. For the period 1973-1980 only the Asian countries display higher growth rates and during the 1980-1989 period all countries, except for Germany and Japan, experienced a drastic fall in capital quality growth.

In the augmented capital input the quality and quantity effects are combined and weighted by 0.3, our assumed factor share of capital, and reflect the tendencies described above.

## Land

Land has been included as an indicator of natural resources endowment for the different countries. Natural resources have been measured as the amount of land in use, weighted arable and permanent crop land .3, permanent pasture .3 and .1 for forest land. At this stage, it has not been possible to include more sophisticated measures of natural endowment which undoubtedly have had a great impact on economic growth especially in Latin America<sup>10</sup>. The factor share for land was 0.10 for all countries.

## Levels of Explanation

Tables 7 and 8 summarize the results with respect to the growth accounting exercise.

TABLE 7

**GDP AND JOINT FACTOR PRODUCTIVITY 1950-1989**  
(average annual compound growth rates)

	GDP			Joint Factor Productivity (JFP)			Doubly augmented Joint Factor Productivity (DAJFP)		
	1950 73	1973 80	1980 89	1950 73	1973 80	1980 89	1950 73	1973 80	1980 89
Chile	3.42	3.39	2.90	1.75	1.48	0.74	1.02	0.62	-0.15
Arithmetic Average:									
Latin America	5.79	5.20	1.34	2.43	1.20	-1.30	1.45	0.18	-2.45
Asian Countries	7.73	7.51	7.64	3.93	2.31	4.09	2.53	0.59	2.10
Iberic Countries	5.81	2.65	2.70	4.03	1.26	1.22	2.86	0.10	-0.32
Advanced Countries	5.34	2.23	2.56	3.26	0.93	1.20	2.52	0.26	0.49

Source: Table A2, 5 and 6.

For the country blocs arithmetic averages were calculated.

In both cases (JFP) and (DAJFP) the land variable was included but its effect is negligible.

Table 7 presents the growth rates of joint factor productivity (JFP) and doubly augmented joint factor productivity (DAJFP). JFP results from the difference between GDP growth and the weighted, by the factor shares of labor and capital,

<sup>10</sup>This is undoubtedly the case in Chile where natural resources from mining and fishery activities are extremely important. However, the lack of data on the stocks of these resources make it difficult to include them into the growth accounting exercise. If they were to be included this would probably result in higher growth of the natural resources factor leading, therefore, to a fall in joint factor productivity.

growth of the quantities of capital and labor as given in Table 5 and 6<sup>11</sup>. DAJFP includes capital and labor quality. In Table 8 the residual (as either JFP or DAJFP) is given as a percentage of GDP. The remaining residual can be considered to be approximate measure of the effect of disembodied technical progress on long term growth, but also other unmeasured influences, statistical and other errors are included in it.

In comparing different kinds of growth accounting one must be aware that the residual may be quite different for different authors. Joint factor productivity (JFP) without quality augmentation is what very often is presented in studies of this kind. Table 8 shows that for the 1950-1973 period an average of 42 percent of GDP growth in Latin America cannot be explained by increases in factor inputs.

It is somewhat surprising that the unexplained residual in Chile in the 1950-1973 period - roughly 10 percentage points higher than the Latin American average - should have been the same as the average for the Asian countries. In 1973-1980 Chile's residual was even higher than the Asian group. The levels of overexplanation in Latin America become huge during the 1980-89 crisis. These negative residuals are an indication of the enormous economic loss of 'The Lost Decade' for Latin America through a fall in capital and labor productivity. Chile's performance was not as abysmal as the rest of Latin America in this respect, although 1980-1989 also showed very small or even negative residuals.

When analyzing the residual in a comparative perspective at least two striking results become clear. First, the relatively small differences in the residual between Latin America and the Asian group for the 1950-1980. In very general terms there are 10 percentage points difference between the Latin American and Asian group (the Asian countries using their inputs somewhat more efficiently) and an equal difference between Asia and the developing countries. This is an indication of the paramount importance of factor inputs in economic growth. Second, during the 1980-1989 periods the crisis in Latin America caused the residual to become highly negative indicating that total factor productivity growth was negative. The same, however, did not happen in either the Asian nor the developed countries where JFP remained positive, though with declining growth rates. This supply analysis gives an indication of the huge losses in GDP growth experienced during the eighties in Latin America.

<sup>11</sup>Both in the case of JFP and DAJFP the land variable is also included, but we have not included those results separately as the differences are negligible. The actual computation is somewhat more complicated as the whole procedure is calculated, according to common practice, in logarithms.

**TABLE 8**  
**EXPLAINING ECONOMIC GROWTH 1950-1989**

	GDP (average annual compound growth rates)			Unexplained Residual (JFP as % of GDP)			Unexplained Residual (DAJFP as % of GDP)		
	1950	1973	1980	1950	1973	1980	1950	1973	1980
	73	80	89	73	80	89	73	80	89
Chile	3.42	3.39	2.90	51	44	26	30	18	(5)
Arithmetic Average:									
Latin America	5.79	5.20	1.34	42	23	(97)	25	4	(183)
Asian Countries	7.73	7.51	7.64	51	31	54	33	8	27
Iberic Countries	5.81	2.65	2.70	69	47	45	49	4	(12)
Advanced Countries	5.34	2.23	2.56	61	42	47	47	12	19

Source: Table 7.

For the country blocs arithmetic averages were calculated.

In both cases (JFP) and (DAJFP) the land variable was included but its effect is negligible.

## 5. CONCLUSIONS

Latin America's relative position in GDP per capita compared to the U.S.A. remained almost stable during the first 80 years of the 20th century and fell straight during 'The Lost Decade' of the eighties. The relative position of the Asian countries of our sample worsened during the first half of the 20th century, to improve dramatically as from 1950. The relative position of the Iberian and developed countries deteriorated during 1900-1950, but improved gradually during the second half of the 20th century. Within Latin America, Chile's relative position in GDP per capita remained more or less the same during the first decennia to worsen steadily until the beginning of the eighties. During the eighties Chile's GDP per capita fell somewhat compared to the U.S.A. while the average of Latin America suffered a 25 percent fall.

At the beginning of the 20th century Latin America was at the initial phase of demographic transition with high death and fertility rates and, at present, the region is currently experiencing the effects of the third phase of the transition with the death rate down considerably and a fertility rate which is starting to decline (see Chackiel, 1991).

The results with respect to joint factor inputs and the resulting JFP are perhaps the most interesting and surprising results of this study. JFP considered as an approximate measure of the effect of disembodied technical progress (along with



other effects as mentioned above) shows a rather meager role of technical progress in Latin American countries. Chile is in this respect somewhat of an outlier in Latin America as its performance in terms of JFP resembles the averages in the Asian countries more than those prevailing in any Latin American country.

In the Asian countries the role of technical progress has been somewhat more important than in Latin America; however, the contribution is on average only 10 percent higher. During the 1973-1980 period these countries increased their joint factor input (especially capital) and the contribution of technical progress fell somewhat even causing overexplanation in Korea. During the eighties the Asian countries continued to grow at a fast pace, with technical progress contributing around 20 percent to growth.

Total factor productivity's role was more important in the developed countries than in the developing ones due, of course, in great part to different factor inputs. In particular, labor input growth was much smaller in developed countries than in developing ones. However, it also suggests that the strains of fast development and high resource mobilization decreased the efficiency of allocation. Total factor productivity growth slowed down or even became dramatically negative in the eighties in Latin America. Latin America's level of productivity is still much lower than that of the developed countries and if Latin America is able to resolve its major macroeconomic problems and improve the unproductive allocation of resources it still has the potential for a return to fast productivity growth on the basis of incorporating and adapting the internationally available stock of technology into the productive sector.

One of the major conclusions with respect to Chile is that the relatively weak performance in the past can be attributed in great part to the very low levels of factor accumulation which the country has experienced in the past (see again Tables 5 and 6) and not as much to allocative inefficiency as in other Latin American countries.

Labor's participation in factor input was very different between regions during the 1950-1989 period. First, there is a very clear distinction in the quantity of labor which is increasing rapidly (although in many cases not as fast enough compared with demographic trends) in the developing countries while growth has virtually come to a halt in the developed countries. Second, within developing countries employment is growing rather fast over the whole range of countries but annual hours worked show markedly different trends for 1950-1980 between Latin America, with a clear downward trend, and the Asian group where annual hours worked per person increased substantially. Since around 1980, annual hours worked tend to fall as well in the Asian countries.

Latin America data was obtained from 1960-1989 from the source mentioned in Maddison (1987); Venezuela from CECRED. And from 1950 onwards for all

With regard to the quality side of labor as represented by level of educational attainment, systematic improvements in most countries can be noted. Education grew by far the fastest in Asia, at about half the Asian rate in Latin America and the Iberian countries and at a much lower rate in the developed countries. One has to take into account that our measure of years of education of the population is rather crude due to lack of data. If a more refined measure such as level of educational attainment of the labor force were used in combination with indicators of the efficiency of education, then the results would probably change drastically especially in the Latin American case.

One of the major results within the present study is the fact that we have been able to generate capital stocks. Gross non-residential capital increased steadily at significant rates in most countries and the 1950-1973 period shows great homogeneity with annual average growth rates of capital stock around 6 percent for our complete sample. The lowest growers were Chile and Colombia in Latin America and the U.S.A.. Fastest capital stock growth took place in Brazil, Mexico, Venezuela, Japan and Germany.

During the 1973-1980 period capital stock growth showed two markedly different tendencies, the developed countries capital stock growth decelerated markedly (except for France and the U.S.A.) while in the developing and in the Iberian countries growth increased, with exceptionally high rates in South Korea and Taiwan. In 1980-1989 growth rates decelerated drastically in all Latin American countries with the exception of Colombia. Asian capital quantity growth rates were double those of Latin America in 1980-1989.

Capital quality grew at a uniform rate of about 1.6 percent per year for all countries of our sample during 1950-1973. For 1973-1980 only the Asian countries experienced higher growth rates than in the previous period. During the 1980-1989 period all countries, except Germany and Japan, experienced a drastic fall in capital quality growth.

In our analysis we have included the effect of natural resources measured as the amount of land in use. Latin America increased cropped area (especially Brazil) while in the other regions land in use either remained stable (the Asian countries) or declined as was the case in the developed countries. At this stage it has not been possible to include more sophisticated measures of natural endowment which undoubtedly have had a great impact on economic growth especially in Latin America.

## APPENDIX A

This Appendix presents Tables A1 and A2 containing both our estimates for population and total GDP as well as a description of the sources used to elaborate all the basic series used in the article. However, a note of caution with respect to the data has to be given as the quality of the data is not the same for all countries. In general, the data for the six most advanced developed countries are good. The data on the Iberic countries, along with those on Thailand, are probably the weakest of our sample as long run series have not been elaborated or are of poor quality; in these countries research by economic historians is advancing and new data will be incorporated as soon as available. Of our Asian group the data on Thailand are the weakest. For Latin America several new series (capital, hours worked and in some cases GDP) have been elaborated. The historical data on Venezuela have to be used with caution and new data on that country, and also on the others, would be welcomed.

### GDP and Capital

Our GDP and capital stock estimates for Latin America, Korea and Spain were based upon the sources described in Hofman (1991) and (1992). The GDP estimates for France, Germany, Japan, The Netherlands, Portugal, Taiwan, Thailand, the U.K. and the U.S.A. come from Maddison (1989) and updated to 1989 for OECD countries by OECD, National Accounts (various issues), whilst our data for Taiwan and Thailand were up-dated to 1989 by using Council for Economic Planning and Development (1990); the capital estimates for France, Germany, Japan, The Netherlands, the U.K. and the U.S.A. were obtained from the worksheets of Maddison (1991), though slightly adjusted for changes in the benchmark year from 1985 to 1980 and for the use of somewhat different asset service life assumptions. For Taiwan the perpetual inventory methodology was used, as described in Hofman (1991) and (1992), by resorting to investment data for 1900-1938 from Mizoguchi and Umemura (1988) and total capital formation from 1939-51 was estimated as follows: 1939-1942 15 percent of GDP, 1943 10 percent, 1944-1949 5 percent and 1950-1951 at 8.3 percent, disaggregated in 30 percent machinery and equipment, 60 percent non-residential construction and 10 percent residential construction. Total and disaggregated capital formation data for 1952-1989 was obtained from the Council for Economic Planning and Development (1990). For Portugal no disaggregated data were available and we applied the short-cut method described in Hofman (1991) to estimate the capital stock using data from sources described in Maddison (1989).

### Population

Latin America data was obtained from 1900-1949 from the sources mentioned in Maddison (1989). Venezuela from CICRED. And from 1950 onwards for all

Latin American countries from CELADE (1990). Other countries for 1900-1987 from Maddison (1989) updated to 1989 with OECD (1991). Korea updated to 1989 with Council for Economic Planning and Development (1990). For 1900-1949 the Maddison (1989) benchmarks; 1900, 1913, 1929, 1938 were used and the years in between directly interpolated, except in the case of Argentina where the yearly estimates for 1913-1949 come from IEERAL (1986). In the case of Mexico INEGI (1985) was used for yearly estimates for 1900-1910 and 1921 and interpolated these with the benchmarks of Maddison (1989). For 1950-1985 CELADE gives 5-yearly estimates which were interpolated and 1986-1989 come from yearly estimates of CELADE.

## **Employment**

Employment figures for Latin America from ECLAC (1990). Estimates for the OECD countries from OECD, Labor Force Statistics, various issues. Other countries from Maddison (1989) updated to 1989 by using growth rate 1980-86. The estimates on hours worked for Latin America come from Hofman (1990). For the other countries Maddison (1989) updated to 1989 using growth rate 1980-86.

## **Land in use**

The land in use data come from FAO, *Production Yearbook*, various issues, using a weighted average of arable land (weight 1), pasture land (weight 0.3) and forest (weight 0.1).

## **Education**

Our data on average years of formal educational experience of population aged 15-64 come from Maddison (1989) and are equivalent years of education per person 15 years and over weighted primary education 1, secondary education 1.4 and higher education 2. Venezuela 1950 from Ministerio de Fomento, *Octavo Censo General de Población*, Caracas, 1957. Other years derived from OCEI, *Indicadores de la Fuerza de Trabajo, Total Nacional y por Regiones, Segundo Semestre 1987*, Caracas, 1988. Netherlands from Maddison (1987). Thailand estimated as arithmetic average of Korea and Taiwan. Portugal and Spain derived from OECD, *Educational Statistical Yearbook*, Vol.I, Paris, 1974. The estimates were extrapolated from 1986 to 1989 using the growth rates of 1980-86.

TABLE A1

POPULATION 1900-1989  
(in thousands of mid year)

	1900	1913	1929	1950	1973	1980	1989
Argentina	4,693	7,653	11,592	17,150	25,216	28,237	31,929
Brazil	17,984	23,660	32,894	53,444	103,158	121,286	147,404
Chile	2,974	3,491	4,306	6,082	10,012	11,145	12,961
Colombia	3,998	5,195	7,821	11,946	22,939	26,906	32,317
Ecuador	964	1,331	1,959	3,310	6,624	8,123	10,327
Mexico	13,607	14,971	16,875	28,012	58,259	70,416	86,740
Venezuela	2,302	2,417	2,979	5,009	11,841	15,024	19,246
<b>Total</b>	<b>45,558</b>	<b>57,387</b>	<b>76,467</b>	<b>121,643</b>	<b>231,424</b>	<b>273,014</b>	<b>330,597</b>
Korea	8,772	10,277	13,397	20,557	34,103	38,124	43,100
Taiwan	2,858	3,469	4,493	7,882	15,427	17,642	20,107
Thailand	7,320	8,690	12,059	19,442	39,303	46,455	55,600
<b>Total</b>	<b>18,950</b>	<b>22,436</b>	<b>29,949</b>	<b>47,881</b>	<b>88,833</b>	<b>102,221</b>	<b>118,807</b>
Portugal	5,451	6,001	6,738	8,441	8,368	9,289	10,337
Spain	18,594	20,330	23,210	27,977	34,810	37,424	38,888
<b>Total</b>	<b>24,045</b>	<b>26,331</b>	<b>29,948</b>	<b>36,418</b>	<b>43,178</b>	<b>46,713</b>	<b>49,225</b>
France	40,731	41,690	41,230	41,836	52,118	53,880	56,160
Germany	34,162	40,825	43,793	49,938	61,976	61,566	61,990
Japan	44,103	51,672	63,244	83,662	108,660	116,800	123,116
Netherlands	5,142	6,164	7,782	10,114	13,439	14,150	14,849
UK	38,426	42,622	45,672	50,363	56,210	56,314	57,236
USA	76,391	97,606	122,245	152,271	211,909	227,757	248,777
<b>Total</b>	<b>238,955</b>	<b>280,579</b>	<b>323,966</b>	<b>388,184</b>	<b>504,312</b>	<b>530,467</b>	<b>562,128</b>

Source: See the sources described in this Appendix A.

TABLE A2

**TOTAL GDP 1900-1989**  
(million 1980 international dollars)

	1900	1913	1929	1950	1973	1980	1989
Argentina	6,008	13,491	23,509	39,705	89,295	104,603	94,222
Brazil	5,291	9,371	19,436	54,068	251,644	405,222	493,542
Chile	3,398	5,432	8,577	13,649	29,560	37,336	48,307
Colombia	2,037	3,476	7,273	15,427	48,680	68,361	91,207
Ecuador	374	708	1,348	3,471	13,472	20,745	24,849
Mexico	13,955	19,485	22,287	50,640	215,684	333,588	374,942
Venezuela	2,112	2,323	4,031	12,329	53,153	70,416	72,776
<b>Average</b>	<b>5,467</b>	<b>8,930</b>	<b>14,186</b>	<b>30,970</b>	<b>114,669</b>	<b>169,921</b>	<b>195,833</b>
Korea	4,817	6,264	10,035	11,584	61,058	98,474	208,340
Taiwan	1,239	1,571	2,835	4,145	32,201	56,190	106,963
Thailand	4,579	5,666	7,423	12,705	52,789	85,802	155,520
<b>Average</b>	<b>3,545</b>	<b>4,500</b>	<b>6,764</b>	<b>9,478</b>	<b>48,683</b>	<b>80,155</b>	<b>156,941</b>
Portugal	3,930	4,894	5,374	9,251	31,714	39,599	49,683
Spain	23,302	31,446	45,817	47,076	184,589	213,205	274,592
<b>Average</b>	<b>13,616</b>	<b>18,170</b>	<b>25,596</b>	<b>28,164</b>	<b>108,152</b>	<b>126,402</b>	<b>162,138</b>
France	65,154	80,636	108,375	123,052	388,908	472,689	566,436
Germany	53,259	77,864	94,293	125,362	470,687	547,383	649,361
Japan	29,840	41,102	73,490	93,343	760,632	929,027	1,329,735
Netherlands	11,036	14,794	26,245	35,951	104,211	123,162	143,557
UK	107,502	130,623	146,167	210,042	416,686	445,162	556,132
<b>Average</b>	<b>53,358</b>	<b>69,004</b>	<b>89,714</b>	<b>117,550</b>	<b>428,225</b>	<b>503,485</b>	<b>649,044</b>
USA	222,352	368,132	600,055	1,019,726	2,326,225	2,688,467	3,554,816

Source: See the sources described in this Appendix A.

## REFERENCES

- ALTIMIR, OSCAR and ANDRÉ A. HOFMAN (1990): "Latin American Development Problems in Historical Perspective", paper presented at the ECLAC/University of Lund symposium, Santiago.
- BANCO CENTRAL DE VENEZUELA (1990): *La Economía Contemporánea de Venezuela: Ensayos Escogidos*, four volumes, Compilation and Notes: Hector Vallecillos T. and Omar Bello Rodriguez, Caracas.
- BALASSA, BELA, GERARDO M. BUENO, PEDRO-PABLO KUCZYNSKI and MARIO HENRIQUE SIMONSEN (1986): *Towards Renewed Economic Growth in Latin America*, Washington, D.C.
- BIANCHI, ANDRÉS and TAKASHI NOHARA (1988): *A Comparative Study on Economic Development Between Asia and Latin America*, JRP Series 67, Institute of Developing Economies, Tokyo.
- BLADES, DEREK (1989): *Capital Measurement in the OECD Countries: An Overview*, O.E.C.D., Paris.
- BRAZIL, FUNDAÇÃO IBGE (1970): *Contribuições Para o Estudo da Demografia do Brasil*, 2nd edition, Rio de Janeiro.
- BRESSER, PEREIRA LUIS (1984): *Development and Crisis in Brazil, 1930-1983*, Westview Press, Boulder and London.
- BRITO, FIQUEROA FEDERICO (1966): *Historia Económica y Social de Venezuela: Una Estructura para su Estudio*, Universidad Central de Venezuela, Caracas.
- CARDOSO, DE MELLO JOAO M. and MARIA DA CONCEICAO TAVARES (1985): "The Capitalist Export Economy in Brazil, 1884-1930", in Roberto Cortés Conde and Shane J. Hunt eds., *The Latin American Economies*, Holmes and Meier, New York.
- CARIOLA, CARMEN and OSVALDO SUNKEL (1985): "The Growth of the Nitrate Industry and Socioeconomic Change in Chile: 1880-1930", in Roberto Cortés Conde and Shane J. Hunt eds., *The Latin American Economies*, Holmes and Meier, New York.
- CELADE (1990): *Boletín Demográfico*, Año XXIII, No. 45, Santiago.
- \_\_\_\_\_ (1990): *Transformación Productiva con Equidad*, Santiago de Chile.
- CHACKIEL, JUAN (1991): *América Latina: Análisis de la Dinámica de la Población Orientado al Sector Salud. Período 1950-2000*. CELADE, Santiago, Chile.
- CICRED, *La Población de Venezuela*, Caracas, Venezuela.

- COLLVER, ANDREW O., (1965): "Birth Rates in Latin America: New Estimates of Trends and Fluctuations", res. ser. No. 7, Berkeley, Institute of International Studies, University of California.
- COUNCIL FOR ECONOMIC PLANNING AND DEVELOPMENT (1990): *Taiwan Statistical Data Book*, 1990.
- CORTÉS, CONDE ROBERTO and SHANE J. HUNT eds. (1985): *The Latin American Economies*, Holmes and Meier, New York.
- DÍAZ-ALEJANDRO, CARLOS F. (1975): *Ensayos Sobre la Historia Económica Argentina*, Amorrortu Editores, Buenos Aires.
- DORNBUSCH, RUDIGER and SEBASTIAN EDWARDS (1990): "El Populismo Macroeconómico", in Bacha and Edwards (eds), "Sector Externo, Políticas Financieras y Proceso de Ajuste Macroeconómico" in *El Trimestre Económico*.
- ECLA (1989): *Antecedentes sobre la Transformación Productiva y la Competitividad de la Economía Chilena en el Período 1939-1989*, Santiago de Chile.
- FERRER, ALDO (1977): *Crisis y Alternativas de la Política Económica Argentina*, Fondo de Cultura Económica, Mexico City.
- FISHLOW, ALBERT (1972): "Origins and Consequences of Import Substitution in Brazil", in L.E. Di Marco, *International Economics and Development: Essays in Honor of Raúl Prebisch*, New York, Academic Press.
- FFRENCH-DAVIS, RICARDO (1973): *Políticas Económicas en Chile 1952-1970*, CIEPLAN, Ediciones Nueva Universidad, Santiago, Chile.
- \_\_\_\_\_ (1991), "Formación de Capital" in Sunkel Osvaldo (compiler), *El Desarrollo desde Dentro*, Lecturas 71, El Trimestre Económico, México.
- FFRENCH-DAVIS, RICARDO AND OSCAR MUÑOZ G. (1992): "Economic and Political Instability in Chile" in Teitel Simón (editor), *Towards a New Development Strategy for Latin America*, Inter-American Development Bank, The John Hopkins University Press, Washington, D.C.
- FOXLEY, ALEJANDRO (1983): *Latin American Experiments in Neoconservative Economics*, University of California Press, Berkeley.
- FURTADO C., (1963): *The Economic Growth of Brazil*, Berkeley.
- GOLDSMITH, RAYMOND W. (1951): "A Perpetual Inventory of National Wealth", *Studies in Income and Wealth*, Vol. 14.
- \_\_\_\_\_ (1986): *BRASIL 1850-1984: Desenvolvimento Financeiro Sob um Século de Inflação*, Harper and Row do Brasil, Sao Paulo.



- GRIFFIN, KEITH (1989): *Alternative Strategies for Economic Development*, O.E.C.D. Development Centre, Macmillan.
- HOFMAN, ANDRÉ A. (1990): "Note on Hours Worked", ECLAC, Economic Development Division, mimeograph, Santiago.
- \_\_\_\_\_ (1991): "The Role of Capital in Latin America: A Comparative Perspective of Six Countries for 1950-89", ECLAC Working Paper No. 4, Santiago.
- \_\_\_\_\_ (1992): "Capital Accumulation in Latin America: A Six Country Comparison for 1950-89", *Review of Income and Wealth*.
- IEERAL (1986): "Estadísticas de la Evolución Económica de Argentina", *Estudios*, Jul./Sept.
- INEGI (1985): *Estadísticas Históricas de México*, Tomo I, México, D.F., 1985.
- KUZNETS, SIMON (1974): *Population, Capital and Growth*, London.
- LANGONI, CARLOS GERALDO (1974): *As Causas do Crescimento Economico do Brasil*, APEC.
- MADDISON, ANGUS (1982): *Phases of Capitalist Development*, OUP, Oxford.
- \_\_\_\_\_ (1985): *Two Crises: Latin America and Asia 1929-38 and 1973-83*, OECD, Development Centre Studies, Paris.
- \_\_\_\_\_ (1987): "Growth and Slowdown in Advanced Capitalist Economies", *Journal of Economic Literature*.
- \_\_\_\_\_ (1989): *The World Economy in the 20th Century*, O.E.C.D., Paris.
- \_\_\_\_\_ (1991): *Dynamic Forces in Capitalist Development*, OUP, Oxford.
- MAMALAKIS, MARKOS J. (1976): *The Growth and the Structure of the Chilean Economy: From Independence to Allende*, Yale University Press, New Haven.
- MARCEL, M. and P. MELLER (1986): "Empalme de las Cuentas Nacionales de Chile, 1960-1985. Métodos Alternativos y Resultados", *Colección Estudios CIEPLAN*, No. 20.
- MC GREEVEY, WILLIAM P. (1985): "The Transition to Economic Growth in Colombia", in Roberto Cortés Conde and Shane J. Hunt eds., *The Latin American Economies*, Holmes and Meier, New York.
- MERRICK, THOMAS W. and DOUGLAS H. GRAHAM (1979): *Population and Economic Development in Brazil 1800 to the Present*, John Hopkins University Press, Baltimore.

- MIZOGUCHI, TOSHIYUKI and MATAJI UMEMURA (1988): *Basic Economic Statistics of Former Japanese Colonies 1895-1938*, Toyo Keizai Shinposha, Tokyo.
- OECD (1991): *Main Economic Indicators*, Paris, 1991.
- QUERO, MORALES, CONSTANTINO (1978): *Imagen-Objetivo de Venezuela: Reformas Fundamentales para su Desarrollo*, Banco Central de Venezuela, Caracas.
- RAMOS, JOSEPH (1986): *Neoconservative Economics in the Southern Cone of Latin America, 1973-83*, The John Hopkins University Press, Baltimore and London.
- REYNOLDS, LLOYD G. (1983): "The Spread of Economic Growth to the Third World: 1850-1980", *Journal of Economic Literature*.
- SUNKEL, OSVALDO (1991): (compiler), *El Desarrollo desde Dentro, Lecturas 71*, El Trimestre Económico, México.
- SUZIGAN, WILSON (1976): "Industrialization and Economic Policy in Perspective", *Brazilian Economic Studies*.
- THOMAS, VINOD (1985): *Linking Macroeconomic and Agricultural Policies for Adjustment with Growth: The Colombian Experience*, World Bank, The John Hopkins University Press, Baltimore and London.
- UNCTAD (1992): *Trade Liberalization in Chile: Experiences and Prospects*, Trade Policy Series, No.1, New York.
- URQUIDI, VICTOR (1985): "The World Crisis and the Outlook for Latin America" in Wionczek Miguel S. (ed), *Politics and Economics of External Debt Crisis, The Latin American Experience*, Westview Press, Boulder and London.
- VILLA, MIQUEL (1991): *Urbanización y Transición Demográfica en América Latina: Una Reseña del Período 1930-1990*, Celade, Santiago.
- VILLELA, ANNIBAL V. and WILSON SUZIGAN (1977): "Government Policy and the Economic Growth of Brazil, 1889-1945", *Brazilian Economic Studies*, No. 3.
- WORLD BANK (1991): *Proceedings of the World Bank Annual Conference on Development Economics 1990*, Washington, DC.