

## **A Historical Perspective of a Hundred Years of Industrialization. From Vertical to Horizontal Policies in Chile**

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COMMENTS WELCOME

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## Section 1

### Introduction.<sup>1</sup>

During an important part of the 20<sup>th</sup> century, most developing countries, Latin American countries in particular, implemented a long succession of economic policy reforms aimed to improve their prospects for growth. While during the 1950s and 60s most Latin America and Caribbean (LAC) countries followed prescriptions of import substitution industrialization (ISI) policies to at least some degree, by the end of the 20<sup>th</sup> century, many of them had started to open up their economies. The changes continued and, by the beginning of this century, many of them had implemented some sound macroeconomic policies that allowed them to safely navigate the turbulence of the sub-prime crisis.

Nonetheless, given the evolution of the policies followed by LAC; the astounding growth rates of first Korean, and then China and India; and, more recently, the significant growth rates of Brazil, there is great debate regarding appropriate development policies. In particular, it is questioned whether active industrialization policies are better for long-term economic growth than laissez-faire policies aimed at “unleashing” the growth potential of free market forces in developing countries.

The work of Sachs and Warner (1995) constituted a first step in questioning whether the structure of production was important for economic growth. In particular, these authors claimed that natural resource abundance was detrimental for economic growth. More recently, the work of Hausmann and Rodrik (2003), Hausmann, Hwang and Rodrik (2005), and Hidalgo, Klinger, Barabasi and Hausmann (2007) has cast further doubts on whether laissez-faire is better for economic growth and how the structure of production turns out to be important for development. Rodrik (2007) discusses some relevant aspects of debates on issues related to the current “development agenda.”

The view that the structure of production is important for economic growth has a long tradition in LAC. Since the seminal work of Prebisch and Singer (1950), many Latin

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American policy makers and economists have supported this perspective. However, this is not unique to Latin American economists. According to Krugman (1993), both Rosenstein-Rodan (1943) and Hirshman (1958) also proposed this idea in the English-speaking world.

For Latin American policymakers, the Chilean experience is a source of further doubt regarding the right policy to follow and whether active industrial policy is a precondition for economic growth. As it will be discussed, before the 1920s, Chilean policymakers implemented steadily increasing levels of protectionist and active industrial policies. However, after Pinochet's coup d'état in 1973, the Chilean economy moved away from those policies and strongly embraced free markets. But was the outcome of industrialization policies in Chile a development failure? Was the move towards a free market a successful policy change for economic growth in Chile? This document examines some possible answers to these questions. To our surprise, neither of the two more widespread, yet opposing views held by Chilean economists seems to explain Chile's economic performance before and after 1973. Our objective is to analyze industrial policies – both those that succeeded, as well those that failed – implemented in Chile during the last century in route to creating new theoretical alternatives.

Our research started as a small review of successful and failed policies that Chile followed during the second half of the 20<sup>th</sup> century. However, we realized that there was no thorough review that provided a detailed account of Chilean industrialization policies. Most of the existing literature is more general than the analysis offered in this paper. Furthermore, a significant part of it analyzes long-term economic growth from a macroeconomic perspective. Hence, this document is unprecedented, as it presents a comprehensive and detailed account of Chilean industrialization policies from 1927 to the present. In addition to reviewing historical and economic literature, we also studied primary data in the form of historical documents describing the policies implemented during this period.

But what was the economic growth outcome of ISI in LAC compared to other regions of the world? Additionally, what was the relative performance of Chile before and after 1973? The next section offers a historical perspective regarding Chile's performance related to economic growth. Section 3 adds historical context and analyzes the economic policies followed in Chile between 1927 and 1973, a period in which Chile pursued active industrial policies. Section 4 does the same for the period 1973-1990, a period in which

reforms based on market liberalization were implemented with great force and speed. Section 5 covers the period from 1990 to 2010, a period marked by a gradual, yet significant increase in openness and in which important social and production-based reforms have been implemented. Section 6 studies how industrial policies in Chile have impacted the primary Chilean exports. Finally, Section 7 presents a discussion of our findings and presents some preliminary conclusions. We are aware that this is a lengthy document, so if the reader's main interests are the central findings, we suggest reading the following section and then jumping to Sections 6 and 7. Given that this is the case, there is some redundancy in the document; however, we have done our best keep duplication to a minimum.

## **Section 2.**

### **2.1 Historical Context in Figures.**

We are interested in examining the effects of the industrial policies implemented, more specifically, whether these policies have been effective in generating sustained economic growth. These questions pose daunting empirical problems given that industrial and trade policies were applied simultaneously and that macroeconomic policies were influencing, and being influenced by, trade and industrial policies. At the same time, economic outcomes such as economic growth are directly influenced by which policies were implemented and when. Thus, for the purposes of this research, the only option was to write an overarching review, in which we make a concerted effort to avoid incurring selection bias in our research. Our aim was to give a full account of the broad range of policies applied, rather than solely address successful cases, as has been done elsewhere. A focus only on successful experiences would constitute an incomplete account of the degree of success of industrial policies and the reasons for success and failure.

To organize/lay the groundwork for the next sections, in the following paragraphs we discuss some key economic indicators from the 20<sup>th</sup> century for Chile, Latin America, the US, and the world overall. The figures are taken from Maddison (2001) and all figures are expressed in 1990 International Geary-Khamis dollars. We present these figures in

order to help us to put industrial, trade, and macroeconomic policies in historical and, hence, a long-term perspective. Without examining this context, we do not believe that it is possible to give a full account of the impact of the reforms implemented. This is because the policies' impact goes beyond the historical periods in which they were implemented. Thus, we take the historian's view that contemporary history is the product of events long past, recent occurrences and future expectations.

Table 1 shows the Gross Domestic Product (GDP) per capita for several regions of the world, including the US and some Latin American countries. By 1913, the US had a per capita income of \$5,301, the average in Latin America was \$1,511, and in Chile it was \$2,653. The relatively high level of per capita income in Chile, greater than Latin American average, was mainly due to the nitrate industry in northern Chile, formerly Peruvian territory. By 1950, the US had a per capita income of \$9,561, in Latin America it was \$2,554, and the Chilean average was \$3,821. The evolution of GDP per capita in Chile shows the long lasting effect of the nitrate crisis and the Great Depression. As we will see, these two events were very important in shaping industrial policy in Chile. Finally, by 1973 the US had a per capita income of \$16,689, the average in Latin America was \$4,531, and the average was \$5,093 in Chile. The increasing gap in income in relation to the US is a consequence of the significantly faster growth of the US. The closing gap between Chile and Latin America is due mainly to the growth of Mexico and Brazil and, to some extent, Argentina. By 1998, however, the US had a per capita income of \$27,331, the Latin American average was \$5,795, and Chile reached \$9,756. Thus, by the end of the 20<sup>th</sup> century, Chile had retaken a prominent economic position relative to the rest of the region. How was this possible? The objective of this paper is to identify key determinants that explain this change in relative positions.

Tables 2, 3, and 4 shows the rates of growth of GDP, population, and GDP per capita. Table 4 also shows how the changes in Chile's relative position for income were possible through the 20<sup>th</sup> century. During the period 1913-1950, US per capita income grew at a yearly rate of 1.61%, the growth rate in Latin America was 1.42%, and in Chile, it was a modest 0.99%. This period coincides with an important phase of the implementation of Chilean industrial policies and, to a high degree, with the most protectionist period of trade policy. During the period 1950-1973, Chile gradually started opening up its economy and

grew at an average of 1.26%, while the US per capita income grew at 2.45% per year, and in Latin America as a whole, the rate was 2.52%. Finally, after the free market reforms over the period 1973-1998, Chile grew faster than the US and Latin America, reaching a growth rate of 2.63%; whereas Latin America reached 0.99%; and the US rate decreased to 1.99%.

Despite the information provided in the previous tables, the selection of the initial and final years of the periods can be misleading in that it does not give a full account of the impact of the reforms. In the following exercise, we compare the evolution of GDP per capita in Chile and the US to help us to contrast Chilean economic performance with a benchmark. We corroborate that the periods analyzed are not neutral to as a way to extract potential lessons. We prove this with the help of Graph 1, which identifies the years in which there were changes in industrial policies in Chile, as documented in the following sections. After an initial period of active industrial policy and protectionism between 1913-1956, there was a gradual movement towards a more open economy during the period 1956-1970. From 1970-73, there was a movement towards a socialist economy. This was followed by a shift towards a free market economy with a fast liberalization process up to 1990, with more gradual reforms since then.

In Graph 1, the per capita income for both the US and Chile is plotted on the left Y-axis. The share of US income corresponding to per capita income in Chile is plotted on the right side Y-axis. The colored lines show the horizontal distance between income in the US and Chile for the years previously mentioned. This horizontal distance corresponds to the number of years between Chile and the US having the same income; this is the time lapse, or the number of years that Chile lags behind the US. In 1913, Chile lagged behind the US by 33 years. Yet by 1927, this distance had increased to 48 years. As we will see, 1927 was the year when the Chilean Ministry of Industry was created. By 1956, the time gap was 57 years, which we interpret as proof that the previous industrialization efforts had not been very successful. Then, in 1956, Chile started a slow movement towards trade liberalization that lasted until 1970, when Allende became president. By 1970, the time gap had been reduced to 37 years. In 1973, when Pinochet gained power, the gap was 39 years. By the end of his government, the gap had increased to 53 years. With the return to democracy, Chile experienced almost a decade of high and sustained growth, decreasing the time gap to 48 years. By 2008, the gap had been further reduced to 43 years. The figures and

discussion presented here are not beyond criticism, but they do offer a less traditional view of what has been discussed elsewhere.

In Graph 2 the same relationship is depicted using per capita income for Chile and for a select group of developed economies. The fluctuations are very similar to those observed in Graph 1; however, relative income in Chile now fluctuates between 77% in 1910 and 32% in 1985. Currently, Chilean income is close to 56% of the income of developed countries. Thus, Graph 1 tells us a slightly different story than the one in the tables. Once the appropriate beginnings and endings of periods are selected, it becomes possible to more accurately assess the growth performance of the Chilean economy in light of reforms.

The following section describes the main historical events that have shaped the origins of active industrial policy in Chile. While these conclusions add new evidence to the current debate by providing an alternative interpretation of the history of state-led industrialization, they are not beyond criticism depending on the perspective used to interpret historical events.

## **2.2 The Genesis of Industrial Policy in Chile.**

It has commonly been asserted that the process of Chilean industrialization was mainly initiated during the crisis of the 1930s. According to the literature, before that time, manufacturing-led development would have been limited by a series of factors, such as an incompatibility with an export model. This assumption would have generated a model of economic dynamics that led the economy to a structure specializing in the production of exportable goods and non-tradable ones at the expense of the production of importable goods, particularly manufactured goods. According to this school of thought, there were no major development possibilities in the manufacturing sector until the Great Depression forced the local economy to take the first steps towards industrialization.

While this long held view would seem to be plausible, a second stream of the literature suggests that this proposition does not fully conform to historical facts, because the 1930s

did not prompt the country's industrialization process, or its import-substitution stage. As pointed out by Palma (1984), this stage would have started with the First World War and the collapse of the nitrate industry. According to this view, the most important contribution of the crisis of the 1930s to Chile's development was to speed up and consolidate the transition of the economy away from, instead of towards, its export-substitution model.

As documented by Palma (1984), the start of WWI led to an increase in the international demand for nitrates, and Chile was the only producer. In turn, this generated a trade imbalance by reducing import flows as a consequence of the war, but at the same time allowed high levels of aggregate demand derived from exports. According to Palma (1984), this imbalance forced aggregate demand to orient towards the local market. As calculated by Muñoz (1968), the response capacity of the local manufacturing supply to this demand stimulus was outstanding; local manufacturing production grew by 53% during the four years of the war.

However, these exporting and manufacturing activities suddenly disappeared with the end of the conflict, as the industrial demand for nitrates fell sharply. Moreover, the development of synthetic nitrates marked a definitive decline in the local nitrate industry. The impact was felt immediately and its effects were devastating; in 1919, nitrate exports reached only a fourth in volume, and a fifth of their real value with respect to the previous year. This was a decrease of 38% in terms of trade between 1917-1919. According to Palma (1984), it was the response to the difficulties in the external sector that led to an early attempt to transform the exporting model to one that stressed the development of economic activities oriented towards the local market, especially manufacturing. Therefore, prior to 1927, the Chilean economy would have begun its transition from an exporting economy towards an import-substituting one.

Lederman (2005) offers an explanation grounded in political economy for this turn towards protectionism, arguing that the growth in the manufacturing industries during the war gave interest groups enough power to demand economic protection once the nitrate crisis manifested. This was clearly the case during the government of Alessandri. In 1920, he

raised import duties by 50% and special levies (sometimes up to 100%) on a range of specific items, representing a turn toward higher levels of political support for protectionist policies. All of this occurred in the context of the 60% real devaluation of the peso between 1913 and 1929. This constituted another important stimulus for aggregate demand to be increasingly oriented towards local markets.<sup>2</sup>

### **Section 3. Period from 1927-1956.**

#### **3.1. Economic Context.**

From 1927 until the middle of 1931, General Carlos Ibañez was the President of Chile. From the beginning of his administration until 1929, the economy was booming, especially due to a high level of real and financial external variables (Marfan, 1984). Despite the fact that the first effects of the crisis started in 1929, these were only generalized at a local level until 1931, when Ibañez was forced to leave Chile.

According to the World Economic Survey (1933), reported by the League of Nations, Chile was the most affected by the Great Depression out of all countries. When the Chilean economy plummeted in 1932, the economic situation was the following: GDP fell by 38.3%; the level of exports and imports decreased by 78.3% and 83.5%, respectively; the GDP per capita declined by approximately 60% from the 1927-1929 levels; the volumes of nitrate exports and copper fell by almost 70%, and the international prices of these products fell by 60% and 70%, respectively (Meller, 1998). This effect was magnified by the economic dogmatism of Chilean policy makers, who stuck to gold standards and full convertibility even after they had been abolished almost everywhere else.<sup>3</sup>

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<sup>2</sup> This period was also characterized by an expansion of state intervention in the economy. This tendency is illustrated by the number of institutions created during this period: the establishment of the Central Bank (1925), the National Mining Service (1925), the Agrarian Credit Bank (1926), the Mining Credit Bank (1927), the Coal Subsidy Program and the Institute of Industrial Credit, both created in 1928. Other institutes created during this time were the Institute for Mining and Industrial Development of Tarapaca and Antofagasta and the Caja de Colonización Agrícola. These institutions provided funding to regional production activities of the country and, in some cases, took control of the commercialization of the products (Palma, 1984).

<sup>3</sup> Diaz-Alejandro (1982) argues that those Latin American countries that applied heterodox policies turned out to be less affected than those who stuck to orthodox policies.



During the recovery years, that is, from 1932 onwards, the most outstanding factor from a demand side point of view, was the lack of orthodox monetary policy after the fall of Ibañez. This was particularly true during the period known as the “Socialist Republic”, when the money supply M1 doubled in less than two years (from August 1931 to April 1933) to provide support to developmental institutions with the purpose of stimulating production in such areas. According to Palma (1984), these kind of positive actions combined with the fiscal deficit stemming from such situations would suggest a pre-Keynesian orientation in fiscal policy.

Despite successes such as reducing unemployment and boosting greater economic activity during the administration of Alessandri, as compared to when he assumed his presidency in 1932, his presidential period finished amidst strong popular discontent. This contributed to the electoral defeat of the right-wing candidate in the presidential elections of 1938, Gustavo Ross against Pedro Aguirre Cerda, among other things (Marfan, 1984).

The new government was elected with the support of the middle class and blue-collar workers. These new social groups considered the state to be a mechanism that could offset the power of oligarchic groups. There was, therefore, political support and pressure to incentivize the role of the state in the economy. The Great Depression and its consequences also contributed to generating consensus regarding the need for a more active state role (Lederman, 2005). Based on these new objectives, the government created a very expansive monetary policy: greater taxes on foreign property for the mining sector and the creation of The Chilean Economic Development Agency (CORFO) as the main instrument of the entrepreneurial state in Chile (Butelmann *et al.*, 1981).

### **3.2. Trade policy.**

As mentioned in the introduction, during the government of Alessandri in the 1920s, the parliament raised import duties by 50% and special levies (sometimes up to 100%) on a range of specific items. As pointed out by Lederman (2005), the evidence indicates that this change in trade policy was an important episode in Chilean history because it represented,

along with the general modifications to import tariffs implemented in 1914 and 1916, an increase in protectionist policies.

The tariff structure was revised several times during the 1920s. The revision of 1928, the last before the crisis increased the tariffs on a number of manufactured goods. In addition, it authorized the President to increase, at his discretion, the tariffs on any product by up to 35%. Two years later, Ibanez would employ this instrument to raise the tariffs on products included in 440 custom classifications. Thus, import taxes increased from 12% of total public revenue in 1915, to 20% in 1925, and 28% in 1930 (Palma, 1979; and Ellsworth, 1945). A second set of economic measures that affected the transition from one model to another is related to the exchange rate. As documented by Palma (1984), between 1913 and 1929, the peso suffered a real devaluation of 60%. This constituted another important stimulus causing aggregate demand to be increasingly oriented towards local markets.

During the recovery years, starting in 1933, import tariffs were increased to 50% across the board (Butelmann, 1981). Additionally, import quotas and licenses were set, and administered by the Comisión de Licencias de Importación (Lederman, 2005). This was followed by a replacement of the aforementioned tariffs with general surcharges of 100% applied in the gold standard of 1934 (Palma, 1984). After 1935, there were no more general revisions to the tariff system.<sup>4</sup>

During the presidency of Pedro Aguirre Cerda, there was a period of increasing controls over trade in the form of import quotas, prohibitions, a number of different exchange rates and, to a lesser extent, tariffs starting in 1938. The regime of quotas served multiple purposes, including the rationing of foreign exchange and protection. It also constituted an instrument to favor the import of “normal” goods at the expense of “luxury” ones. However, there were certain difficulties in establishing such quota practices. On many occasions, the

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<sup>4</sup> In general, during the period between 1928 and 1935, there were not any major variations in the tariff policy established in 1928. However, in 1936, an *ad valorem* tax on imports was set (over customs, insurance, and freight [CIF] value). This tax involved a number of modifications; until 1943, the Ministry of Finance set the structure that would remain in force until 1967, namely; 2.5% for primary goods, 10% for goods of “ordinary use,” and 20% for “luxury goods”(Butelmann, 1981; Lederman, 2005).

total number of quotas granted surpassed the quantity of foreign exchange available, thereby preventing the clearance of the merchandise.<sup>5</sup>

Trade barriers were the result of continuous concerns about the balance of payments during the 1950s. In turn, this led the government to set greater restrictions on imports, as well as controls on the foreign exchange rate that are difficult to describe owing to their complexity. At the beginning of the 1950s, there were four different exchange rates and, by 1953, the number had reached eleven. During this period, copper exports were significantly stifled by a discriminatory exchange rate policy.

This changing and complex trade policy certainly had effects on national production. The industry that represented 17.6% of the total product in 1940 increased to 24.4% in 1955. The share of agriculture decreased from 15.7% to 13%, and the mining industry from 9% to 4.2%. Nonetheless, the dependence on copper remained stable, with mining exports consistently representing approximately 80% of total exports. However, the agricultural sector exhibited a sustained decline. Meanwhile, the industrial sector exhibits an important increase: in 1938 it constituted only the 3% of the total, whereas in 1955, it had reached 7.3%; getting as high as 13% in some years.

### **3.3. Industrial policy.**

As mentioned in the introduction, the turn towards greater protectionism started just after World War I and it was mainly characterized by controls over trade and a number of revisions to import tariffs, quotas, and exchange rate controls. This economic reality coexisted with some attempts to modernize the apparatus of public administration in Chile during the government of Ibanez, with the creation of developmental agencies aimed to

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<sup>5</sup> Facing these constraints, in 1947 the government establishes a “Foreign Exchange Budget”, which consisted of estimates of the available foreign exchange to import the incoming year, to be assigned among the different groups of products. The idea of this “Foreign Exchange Budget” was to avoid deficits in the balance of payments (BoP); however, it did not achieve this end. Until 1952, it coexisted with the free acquisition of many goods at a higher exchange rate. That same year there was a BoP crisis and the authorities decided to subject all imports to the quotas set by the “Foreign Exchange Budget.”

boost the national industry, such as the Ministry of Promotion.<sup>6</sup> However, these attempts were interrupted by the Great Depression and the political turmoil that came with it. Specifically there were a number of different short-lived governments, whose efforts were not always sufficient to alleviate the economic situation of the country and thus, implement industrial policies with long-term prospects. Only by 1939, with the creation of CORFO, did the State participate in the economic activity of a number of sectors. Through CORFO, the State quickly began to dominate economic activity in the country, participating in most of the largest investments in the Chilean economy. This institution was financed mainly by the tax revenues of the large-scale copper mining industry and credits from the Central Bank, which was subordinated to the needs of CORFO. As such, CORFO became the main instrument for promoting growth through development policies. In this regard, it provided technical assistance and financing to the private sector through credit policies. It played either a direct or indirect role in these firms, delivered them in concession to private or public institutions, but only when they were oriented to promote the progress of the country in the absence of the cooperation of private capital.<sup>7</sup> After a thorough analysis of imported manufacturing goods that could be produced by Chilean industries, CORFO isolated four sectors to orient its promotion policy: metallurgy, textiles, chemicals, and fishing.

The results of these policies, as we will see, changed the economic reality of the country. The development of metallurgy and the subsequent creation of a national iron and steel company, CAP, paved the way for further developments in this sector. Also significant in this sense was the creation of the National Electricity Company (ENDESA) of Chile, which carried out the national electricity plan that provided the necessary infrastructure for the development of a number of sectors of production. Basically, these would constitute the main successes of government intervention during the 1940s. However, as it will be noted throughout this section, not all interventions were successful. The government made a number of efforts in other sectors, including forestry, fisheries, livestock farming and

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<sup>6</sup> In order to finance this promotion plan, the government was highly indebted to other countries. The plan was executed by the Institute of Industrial Credit, created in 1928, which used pension funds and government money to stimulate the manufacturing industry. By accepting plant equipment as collateral, it also acted as a lender to industrialists, providing technical assistance and financing the modernization or expansion of plants. It also channeled credit to the metallurgical, furniture, textile, food, and beverage industries (See Lederman, 2005).

<sup>7</sup> CORFO, 50 años de realizaciones.

training. In the case of forestry, the interventions had no immediate effects. Meanwhile, some of the other industries, such as fisheries and livestock farming, were mainly stagnant during the period. Other noteworthy efforts were those intended to boost the agricultural sector, but again these would be in vain, given the high concentration of land in the so-called Chilean “Hacienda” during this period.

While most of the state intervention during this period was carried out by CORFO, there were some sectoral policies in place during the period before 1939 that are worth mentioning. Some of them came to fruition in the 1960s, such as the forestry policy created in the 1930s. Some others were prompted by the Great Depression, such as the construction policy<sup>8</sup> and policies designed to stimulate agricultural production.<sup>9</sup> These latter definitely were circumstantial; therefore, they do not constitute part of a long-term development plan with long-lasting effects.

In the following section, we will outline the interventions related to industrial policy that was carried out by the government during this period. We will divide policies into vertical and horizontal and, in each case we will try to decipher which of these policies were successful. Additionally, there are some policies considered to be failures that, nonetheless, had an important social role. This was indeed true in the case of the beetroot sugar production plan, which became relatively sustainable.

### **3.3.1. Successful Vertical Policies.**

#### **Forestry**

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<sup>8</sup> This policy was launched in December, 1933 (Law 5,314). This law suspended taxation on all the construction started in August of 1933 that ended before 1936, with the exception of pavement and drains. Later on, this legislation was modified to include all buildings whose main construction ended in 1936. In just one year, this mechanism increased the built square meters by 77% (Palma, 1984). In 1936, when this policy was not in place, a public infrastructure program was launched. Ellsworth (1945) considers this policy to be one of the main causes explaining the rapid recovery from the Great Depression.

<sup>9</sup> Between 1934 and 1935, the Board of Agricultural Exports was authorized to buy and sell, export and import, and fix the wheat price and its derivatives. The main motivation of this policy was not to directly control prices, but rather to create a purchasing power and stabilize prices so that farmers could better organize their operations (Marfan, 1984).

During the 1930s, an active industrial policy for forestry was initiated.<sup>10</sup> The timber industry was one of the first sectors to be promoted and receive protection from the government. The motivation was to create a processing industry, supported by legal monopolies and guaranteeing the supply of raw materials. With the *Ley de Bosques* of 1931, the exploitation of the native forest was boosted with the help of high tariffs and domestic-content requirements. There were also implemented exemptions from property and inheritance taxes during 30 years to landowners who reforested cleared land. The Ministry of Agriculture managed most of the plantations directly with resources obtained from state-run pension funds (Clapp, 1995).

The response to these policies was immediate but not sustained. By 1936, the growth in the surface area of land dedicated to plantations was noticeable, yet did not reach its zenith until 1945. Soon thereafter, the demand for lumber slowed down in local markets. Faced with this scenario, the country initiated exports to foreign markets. However, these efforts failed for a number of reasons. As documented by Clapp (1995), the quality of Chile's lumber decreased as old forests were depleted, and pine was not yet available. The Chilean industry was also hindered by outdated technology, unsuitable infrastructure, and a shortage of capital. In addition, foreign demand was limited, and transport costs were very high. Another factor that contributed to the poor performance was that also during this period many countries had not exhausted the exploitation of their native forests.

Thus, through a joint effort between CORFO and the U.S. Department of Agriculture, the Chilean government carried out The Special Forestry Mission of 1943-44.<sup>11</sup> According to the recommendations, presented in the Haig Report, there was a need for the construction of a cellulose plant to supply local consumption, and in anticipation of the possibility of exporting chemical pastes. Also, in line with the recommendations of The Special Forestry Mission, Chile initiated the reforestation of 40,000 hectares of land in a span of five years.

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<sup>10</sup> The incapacity of the Chilean government to capitalize on the benefits derived from its mineral resources is widely recognized as the lost opportunities of economic development from 1880 to 1930. According to a number of authors (Clapp, 1995; Monteon, 1982; O'Brien, 1982; Zeitlin, 1984), industrial policy in forestry since the 1930s was motivated in part by the desire to avoid repeating past mistakes.

<sup>11</sup> Investments of human capital were also noteworthy. For the most part, strategies entailed bringing foreign experts or sending Chilean agronomists abroad to get training.

They used insignis pine and eucalyptus globulus, because of their fast growth and, in the case of insignis pine, the ability to use it in the production of cellulose. In a similar vein, they also created the forestry association '*Sociedad Anónima Maderera del Sur* (SOMASUR)', for the manufacture of forestry-related products.

During this period, the CORFO was involved in a number of projects related to forestry by providing technical assistance, rather than direct management, e.g. cellulose and paper production. Credit policies were also available in this area, with the Paper and Cardboard Manufacturing Company (CMPC) being the most productive, helping to construct cellulose plants in Laja and San Pedro. It is possible that this helped the firm to become in the national leader in paper production by mid-1960, supplying around 90% of domestic consumption.

### **Beet Sugar Production**

By the beginning of 1945, CORFO embarked on a number of studies regarding the adaptation and cultivation of sugarbeets in different agricultural zones of the country. These studies involved the cooperation of the Ministry of Agriculture and, for a short period in the 1940s, the Swedish Sugar Corporation.

The success of sugar beet production in the provinces of Linares and Valdivia, confirmed the perceived benefits of sugarbeets for the industrial and agricultural sectors. This led the council of CORFO to create the National Sugar Industry S.A. (IANSA) in 1952, "with the idea to promote agricultural development through the cultivation of sugarbeets and initiate the national production of sugar."<sup>12</sup> The role of IANSA led to beets supplying 22% of national sugar consumption by 1959, reaching 40% in 1963.

However, IANSA had to face several problems that were not anticipated when the project was designed. The construction of the sugar factories was carried out in years of high

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<sup>12</sup> With the creation of IANSA, CORFO was pursuing more than the simple production of sugar at a national level. The belief was that the rotation of beet crops would increase soil fertility, the returns of alternate crops, and favor the creation of artificial grasslands with subsequent benefits for livestock. Likewise, the by-products of sugarbeets would constitute highly-nutritious forage.

inflation, therefore costs were significantly increased. Also, sugarbeets had to compete with imported sugar cane, which was exempted from tariffs for several reasons. As mentioned at the beginning of the section, despite these problems, beet sugar production had an important social effect, creating greater employment for the peasant population on medium and small sized farms. As we will see throughout this paper, although IANSA was primarily kept afloat by the State during this period, after the move to privatization in the 1980s, it would become self-sustained. It became the leader of sugar production and beet by-products in the country.

## **Mining**

During this period, CORFO was mainly focused on developing the mining sector. The Mining Development Plan basically consisted in creating the necessary infrastructure and knowledge to produce refined minerals for industrial use with the prospect of export. Examples of this strategy include the construction of the Paipotes foundry in 1950 and the Fábrica de Ácido Sulfúrico S.A., Fassa in 1956, as a subsidiary to CORFO intended to meet the needs of the lixiviation copper plants located close to the city of Antofagasta. In addition, this motivated the construction of the Ventanas foundry, which was closely related to the copper industrialization policy led by CORFO with the Paipotes foundry.

Another important initiative in that period was the creation of the Ministry of Mining in 1953, intended to develop mining and energy policy and implement these policies through other state institutions, as well as the private sector. CORFO also carried out prospecting activities in the whole country, with the aim of creating a National Mining Record. These activities led to the creation of the Geological Research Institute in 1957. At the same time, CORFO devoted resources to the Institute for Mining and Industrial Development of Tarapaca and Antofagasta for the development of research and mining exploration.

## **Metallurgy**

The development of the metallurgy sector certainly had a significant impact for CORFO. It was created with the idea of providing support for the creation of workshops, as well as the



development of the iron and steel industry.<sup>13</sup> CORFO also participated in the creation of firms. In December 1943, Madeco (Manufacturas de Cobre S.A.) was created, focusing on the transformation of national copper and its alloys into elaborated products or semi-elaborated products, such as copper sheets, bars, cables, wires, lamination, etc. This industry created new trade relationships, as Chile began to export to several countries in Europe and America.

Under the government of President Ríos (1942-46), a special commission was designated to examine the possibility of building an iron and steel plant in Huachipato. In May 1948, the Compañía De Acero del Pacífico (CAP) – Chile’s public corporation for iron and steel – was created. In mid-1947, they started the construction of the iron and steel plant in Huachipato. Finally, in May 1948, the government declared CAP to be a legal entity.

The creation of CAP represented a very important moment for Chile’s industrial development. By 1951, the production of steel was 8.5 times higher than 1939 levels. Moreover, it allowed for significant diversification in the elaboration of steel products. At the same time, it allowed for the expansion and creation of a number of industries. This was especially true in the “industrial zone of Huachipato”, where many firms produced wires, cables and metallic structures, carbide and ferroalloys, and ball mills. Another firm was created to process the waste materials of the CAP plant for the production of cement, agricultural lime, and refined zinc-tin.

### **3.3.2. Unsuccessful Vertical Policies.**

#### **Fisheries**

After starting an annual plan for fisheries in 1944, CORFO hired a group from the United States Fisheries and Wildlife Service, whose report and recommendations served as the foundation for the policy of increasing local consumption and exports, which started in

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<sup>13</sup> It also provided financial support to this industry. This was the case, for example, with Mademsa, which formed in 1937 with contributions of private capital and financial help from CORFO. This allowed Mademsa to develop a complete line of home appliances. Also in 1941, CORFO provided financial help to Siam Di Tella, S.A., a firm dedicated to the construction of electrical engines, industrial and domestic cooling systems, industrial and domestic furniture, etc.

1946. The positive result of such action was demonstrated by the increase in production: in 1939 the total catch was 36,553 tons, while in 1952 it reached 118,286 tons.

Also during the period 1941-1945, CORFO and the Universidad de Chile collaborated to support the installation of a marine biology station in Montemar, close to Valparaiso. Beginning in 1954, it promoted a number of oceanographic studies oriented towards building a national charter for fisheries, and it also coordinated the import of marine engines, the acquisition of fishing boats, and the installation of cold chambers. It was also directly involved in with the catch, treatment and distribution of fish in conjunction with two State firms: the Compañía Pesquera Arauco S.A. (1941) and the Industria Pesquera Cavanha S.A., the latter of which was fully incorporated into CORFO in 1953. However, all of these efforts were insufficient to give a boost to a sector characterized by slow development and minimal tradition. It was not until 1959, when the government gave CORFO the authority to prepare and execute a development plan for fisheries, that this activity acquired true relevance (CORFO, 1960).

## **Agriculture**

Prior to the existence of CORFO, there were not explicit policies designed to boost agriculture. This sector was poorly developed, mainly because of poor exploitation of natural resources, and was plagued with low returns caused by a combination of both low technical and investment levels.

To address this, CORFO made a number of efforts in order to modernize the agricultural sector by importing new machinery and providing credit lines to farmers so they could purchase these machines, and generally stimulate the industry of specialized use equipment. In 1946, CORFO created the Servicio de Equipos Agrícolas Mecanizados (SEAM), to expand the use of agricultural machinery, mainly by providing machinery to farmers who could not afford it. The use of automatic irrigation was also promoted, with CORFO providing irrigation by mechanical elevation of 26,126 hectares. CORFO's agricultural plan of 1940 increased cultivated land by around 50,000 hectares between 1940 and 1959 and improved the irrigation of 165,000 hectares over the same period. By 1960, CORFO's

irrigation work covered about 10% of the entire irrigated surface of the country. The plan also included a generous credit policy for livestock farming, as well as a number of studies and general research aimed at promoting the fruit industry between 1961-1964.

However, the most ambitious project of agricultural mechanization carried out by CORFO was the tractor plant CORFIAT (1953), whose construction started in 1958. However, the decree for the settlement of CORFIAT only came out at the end of the second mandate of Ibanez. Despite the fact that the construction works were still in place, CORFO suddenly stopped the project at the end of 1959.

With the entry of the Huachipato factory into the market in 1950 and the continuation of the electricity plan, conditions were created for a new kind of industrial expansion that aimed to revive the agricultural sector. This motivated the development of a new Agricultural Development Plan, which included transport and infrastructure items.<sup>14</sup> Later, in 1960, CORFO created the Agricultural Executive Committee as a body to bring together different agricultural associations. The following year, it established the Instituto Agrológico, for research on natural resources.

While most of these policies were aimed at boosting the agricultural sector, they were not sufficient to achieve the desired effects. Moreover, despite all of these efforts, the agricultural sector remained stagnant until the 1960s. This was a decade of profound changes to the structure of landownership that ultimately ended with the total destruction of large farms.

## **Textile Industry**

In relation to textiles, CORFO oriented its activities toward those sectors that manufactured high-quality products or were highly underdeveloped. To this end, between 1940 and 1943, it granted credits to benefit Hilanderías Rudloff, Sociedad Lavadora de Lanás, Talleres

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<sup>14</sup> This plan was only partial and addressed only infrastructure, rather than the needs of the agricultural sector.

Minerva, Sociedad Sericicola Ltda, and Hilanderia de Lino La Union and collaborated in the creation of a fabric of artificial silk yarns of Said and Sons, in Quillota.

### **Coal Policy**

A number of efforts were made to reinvigorate the weak coal-mining sector, with the aim of being able at least to satisfy local demand. However, the most optimistic believed in its capacities to generate foreign currency reserves. By the 1950s, the two most important coal companies of the country, Lota and Schwager, faced a very deep crisis due to the depletion of available coal, as well as their obsolete machinery. In order to alleviate this situation, CORFO made a number of contributions aimed at modernizing the industry, reducing costs, as well as increasing productivity and installed capacity. However, neither company could overcome the crisis and, in 1964, both firms merged and remained under state control in a number of ways.<sup>15</sup>

When comparing the dedication of CORFO in the coal industry in relation to the rest of the mining sector,, turns out to be overwhelming. Most likely, the increasing needs of Huachipato could explain why this labor was taken so seriously.

### **National Tire Industry**

By means of another example of the production-related activities of CORFO, The National Tire Industry (INSA) was established in 1941. It was based on the cooperation between Chilean and North American investors and technicians (General Tire and Rubber Company) who manufactured tires, tubes, batteries, and rubber-based products for industrial use. INSA fully supplies national markets, with some exportable leftovers to neighboring countries, like Argentina.

### **Livestock Policy**

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<sup>15</sup> Consequently, CORFO created a number of state coal companies, such as Pilpilco, Colico, and Victoria de Lebu. Together, these firms produced 15% of the national total of coal, which represented three thirds of the quantity not supplied by Lota and Schwager, which supplied 80% of the market.

Ever since CORFO was first established, one of its main goals was to remedy the increasingly insufficient production of some basic foodstuffs such as meat and eggs. It proposed a progressive increase in livestock production through the imports of new species to diversify the livestock population, thus improving quality. Credit lines were established for the acquisition of dairy samples, to increase and improve foraging areas, as well as to fight against contagious and parasitic diseases that affected livestock.

### **Cement and Ceramics Industry**

In 1943, CORFO decided to establish two cement producers: Juan Soldado. S.A, near La Serena and another to exploit lime deposits of Santa Rosa, close to Iquique. In August 1942, the CORFO council decided to sell two ovens and other related equipment to the cement factory Cemento Melon, allowing them to increase production from 380,000 to 480,000 tons.

In order to bolster the ceramics industry, CORFO granted loans to industrial producers of plaster and kaolin, and also provided financial support aimed at increasing capacity to three ceramics producers: the Sociedad Cerámica Castro Olivera, the Fábrica Nacional de Loza, S.A. (FANALOZA), and the Sociedad Cerámica El Carrascal. Along with the Caja Nacional de Ahorros, the Distribuidora de la Industria Casera S.A. was established with the goal of stimulating the development of small productive units by strengthening their purchasing power, and creating the capacity for the acquisition of raw materials.

### **3.3.3. Successful Horizontal Policies.**

#### **Energy and Fossil Fuels**

From its very inception, CORFO developed a number of urgent action plans mainly oriented towards providing the country with the necessary infrastructure to help industries where energy supply was the main impediment to productivity. To do so, in 1939, CORFO launched an urgent action plan designed to meet the needs of the national electricity plan.

This plan entailed the construction of hydro-electrical plants, as well as stimulating the production of electrical conductors and other electrical appliances in the country.

In order to execute the electricity plan with greater flexibility, during the period 1944-1945, two decrees created ENDESA. The resources devoted to ENDESA by CORFO translated into an increase of 161% in the installed capacity between 1939 and 1952, with approximately a fifth provided by the private sector.<sup>16</sup>

In terms of fossil fuels, the Departamento de Energia y Combustibles of CORFO focused its efforts on coal, studies related to solid or liquid fuels, or on petroleum. With the discovery of oilfields on the island of Tierra del Fuego in 1945 – the Manantiales deposit – the government provided CORFO with the legal rights to explore, exploit, and refine these resources. This led to the creation of the National Petroleum Company (ENAP). With this development, ENAP was already able to meet the national consumption of liquefied gas, a highly popular domestic fuel, by the beginning of 1960, and was even able to export half of the gas produced (CORFO, 1989).

### **Commerce, Transport and Tourism**

One of the goals of this sector was the development of a refrigerated warehouse network capable of supporting a number of food industries. The second part of the plan proposed the development of a credit system of warrants, and the improvement of storage facilities. According to the third part of the plan, the project would create credit grants and investments in distribution firms.

In addition, with the aim of assisting the mining sector, the Mining Suppliers Society (Sociedad Abastecedora de la Minería, Ltda) was created in 1941 by CORFO, the Mining Credit Fund (La Caja de Crédito Minero) and the National Mining Society (La Sociedad

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<sup>16</sup> Also, in order to meet the needs of the national electricity plan, CORFO stimulated the production of electricity conductors and other electrical appliances in the country. During this year, CORFO contributed 70,000 pesos and the creation of Electromat, S.A. This firm produces light bulbs, plugs, switches, insulators, etc.

Nacional de Minería). The Mining Suppliers Society offered tangible support to the mining industry in the form of food supplies, tools, mining machinery, etc. The society kept agencies in the main mining locations, such as Antofagasta, Atacama, El Salado, Inca de Oro, Carrera Pinto, Copiapo, Presidente Aguirre Cerda, Elisa de Bodos, Vallenar, Domeyko, Tres Cruces, Coquimbo, Ovalle, Illapel and Santiago.

Regarding the air transport industry, CORFO granted credit to the Linea Aerea Nacional (LAN) for the acquisition of flight materials, and to the Club Aereo de Chile for the purchase of training aircrafts.

### **Technical Assistance**

Regarding technical assistance policy, CORFO created the Technical Cooperation Service (SERCOTEC) in 1952 to support small and medium industries through the introduction of more efficient techniques, and to stimulate and increase knowledge production and dissemination in these industries. Its initial structure was based on a Chilean-American partnership, whereby North American experts provided training on modern techniques related to productivity, industrial engineering, accounting, and costs. During this period, the purpose of the SERCOTEC was to create demand for technical assistance with a specialization in SMEs.<sup>17</sup> This was done through a number of demonstrations showing the benefits of their assistance, focusing on medium and large firms. The impact of this role can be measured by the number of firms consulted. Between 1953 and 1956, the SERCOTEC visited 400 of the most relevant firms of the country.

#### **3.3.4. Unsuccessful Horizontal Policies.**

### **Commerce, Transport and Tourism**

Regarding transportation, between 1945 and 1952, CORFO collaborated by providing credit to the merchant navy with the goal of increasing their fleet to 25,000 units. Its role was even more intense in relation to ground transportation, where it financed imports of

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<sup>17</sup> It is worth mentioning that this objective reappears in the current design of the Technical Assistance Fund (FAT), although with a few minor variations.

railway rolling stock for Chile's state-owned railway company, Empresa de los Ferrocarriles del Estado, and for the Empresa Ferrocarril del Maipo S.A. They even intervened by creating the State Public Transport Company (ENTC), which guaranteed the purchase of buses, spare parts, and materials.

#### **Section 4: Period from 1956-73.**

##### **4.1. Economic Context.**

This period was mainly characterized by slow economic growth and high inflation. During the second term of President Carlos Ibanez del Campo, huge efforts were made to restore price stability and to end corruption. Unfortunately, inflation soon increased to 80% per year and the government decided to invite the Klein-Saks Mission to design and implement an anti-inflationary program.

After some preliminary studies, the Klein-Saks mission suggested that a number of institutional reforms had to be undertaken, such as fiscal and trade-related reforms, in order to allay inflation significantly and permanently. Essentially, the mission's main recommendations were to substantially liberalize external trade, prices, and factor markets; to raise real interest rates to positive levels compatible with asset profits; to privatize some public enterprises; to reform the social security system; to balance public finance; to rationalize public expenditure; to impose monetary discipline; among other things. The government of Ibanez accepted these recommendations and the mission started their projects at the end of 1955.

According to Lüders (2012), they managed to reduce inflation from 77.5% in 1954-1955, to 17.2% in 1957. Despite rapid economic growth during 1956-1958, GDP per capita grew 5.2% yearly, and most reforms significantly affected powerful interest groups, some union workers, and entrepreneurs. This was accompanied by a reduction of poverty levels, but also a large increase in income inequality. These conditions definitely did not create ideal conditions for demanding sacrifices from the population. In April 1957, a number of violent protests took place, with at least 20 people being killed. The government of Ibanez, already



very weakened, did not have any other choices and did not renew the contract with the Klein-Saks mission. The structural reforms were stopped and, during the following government of Alessandri, some of them were even reversed. During Frei's presidency, some of these reforms were partially reinitiated, most of the process that began with the Klein-Saks Mission experienced a drastic reversal during the government of the Popular Unity.

Nevertheless, in the governments of both Alessandri Rodriguez (1958-1964) and of Frei Montalva (1964-1970), the fight against inflation continued to have a fundamental role. While the first opted for a fixed exchange rate, based on the law of one price and a passive monetary role, the second regulated by controlling increases in the exchange rate, salaries and basic costs by manipulating the money supply accordingly. Both governments had initial successes, but both were forced to abandon their anti-inflationary efforts. In the case of Alessandri, this was due to the excess of fiscal expenditures and the subsequent loss of international reserves. In the case of Frei Montalva, it was a product of the competition among Christian Democrats and Marxist worker unions to increase salaries.

The government of Salvador Allende (1970-1973) wanted to transform the existing mixed economy into a centralized one. This objective explained the massive nationalization of mining, agriculture, public utility, wholesale, services, and even manufacturing companies.<sup>18</sup> It has been argued that the PU government applied a set of populist macroeconomic policies with the purpose of achieving a fast economic boost with accelerated redistribution. In the first stage, this generates high growth levels, together with increasing real wages while price controls depress inflationary pressures. This, however, is followed by a second stage in which the great expansion of demand generates increasing imbalances: exhausted inventories, the external sector acts as an exhaust valve while foreign currency begins to be scarce. These stimulate the inflationary process, capital

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<sup>18</sup> This was in order to configure the so-called Social Property Area (SPA), which involved the nationalization of the main industrial monopolies of the country; this probably represents the essence of the ideological nature of the P.U. However, there were certain ambiguities and difficulties for Allende's government in operationally defining monopolies or industries as "strategic," as well as legal difficulties in developing the SPA, given the opposition in parliament. The impossibility of generating new legislation that would allow the creation of the SPA led the government to use any law or article in place that served that purpose.

outflows, and the demonetization of the economy. The public sector ends up with high deficits, tax collection falls and public deficit increases at a great pace. The third stage ends with the attempts of the government to apply anti-inflationary adjustment policies, reducing the subsidies and real wages.

#### **4.2. Trade policy.**

As mentioned above, there were three attempts to liberalize the Chilean economy before 1973. As we will see in the forthcoming sections, all of them failed for a number of reasons, varying from the inability to cope with external shocks to copper prices, to the lack of a consistent monetary policy with a fixed exchange rate or due to incomplete policies as seen in Frei's government.

The initial attempt was during Ibanez's government with the Klein-Saks Mission, which proposed a modest liberalization program.<sup>19</sup> The list of permitted imports was expanded throughout this period; from 530 goods in April of 1956 to 958 two years later. Capital goods were the most common, and represented 20% of the list. However, they decreased in importance over time, representing only 5% by 1956. However, in 1957, copper prices decreased by a third, generating a 14% deficit. This, in turn, caused the government to discourage imports in order to balance the BoP. This would be the first sign of the end of liberalization.

A second attempt at liberalization was during the tenure of Jorge Alessandri. This liberalization program was similar to the one instituted in 1974. Basically, it established a fixed exchange regime, liberalized FX markets, and also expanded the list of permitted imports to include most goods. However, this process was not accompanied by a monetary policy consistent with a fixed exchange regime, which generated a substantial credit expansion that culminated with the depletion of international reserves in 1961. Thus, the government was obliged, once again, to set controls over trade. Like the first attempt,

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<sup>19</sup> As pointed out by Lüders (2012), the structural reforms recommended by this Mission were not significantly different from those implemented later on by the "Chicago Boys" during the military regime.

liberalization had failed and a number of different mechanisms were used in order to prevent local demand from turning to external markets.

Finally, during the government of Eduardo Frei Montalva, the liberalization program was postponed, justified by the pressing foreign debt problem. Later, in the context of high copper prices and restructured foreign debt, the government launched a modest liberalization program by adding 100 items to the list of permitted imports. However, the prior import deposits were abnormally large, by the order of 10,000%, and machinery and capital goods were the most privileged.

Despite the fact that the FX market was unified, copper exports were significantly limited by a discriminatory exchange rate applied to copper exports. The most important event in this sector was the “Chilenization of copper,” whereby, after long negotiations, the government became a majority shareholder of the large-scale copper mining companies.

Other exports were widely favored through the drawback (which amounted to 30% of the value), exchange rate guarantees, and special credit lines. The industrial sector benefited the most; by 1969, half of the total funds were designated to manufacturing, distributed among 331 items. However, this system of incentives for exports did not turn out to be very efficient.

In summary, by 1970 the government had achieved a certain rationalization of trade by making it more stable and less bureaucratic. However, protectionism persisted through explicit prohibition and obstacles that, in practice, were not affordable. This is the case of prior-deposits of 10,000% over the CIF value (Butelmann *et al.*, 1981).

#### **4.3. Industrial policy.**

By 1952, most national companies were dedicated to supplying basic industrial inputs, and energy and steel were already consolidated. During the difficult years to follow, there were no new initiatives in these sectors. This did not mean that the existing industries stagnated;

rather, these kept on growing and modernizing. A clear example of this is the case of ENAP, where the state monopoly was stipulated by law. It was during these years that the expansion in terms of the scale and the variety of operations made it possible to talk about a maturation process. It is also important to mention that ENAP achieved full self-financing during this period and, therefore, did not require state contributions.

Another sector illustrating the legitimacy of state intervention was the outstanding growth in electricity. By 1964, ENDESA contributed 68% of the total production. Unlike ENAP, however, the elevated costs of investment prevented ENDESA from self-financing. Therefore, it was subject to continuous state contributions and external financing.

The case of CAP provides a distinct contrast, given that it continued with an expansive trend. From the start, CAP was defined as a mixed enterprise with both private and public participation. This decision was justified by the need to manage a number of international loans for the construction of Huachipato, and the preference of giving capital to private firms. This generated a debate between those who were in favor of public administration, versus those who were against it. This discussion reached its zenith in 1955, and ended with the prevalence of the privatizing trend of the period that was recommended by the Klein-Saks Mission.

During Alessandri's government, CORFO was instructed to move away from its entrepreneurial role to a more subsidiary role, with a very active credit policy and greater financial support to the private sector. In the National Development Plan of 1961, emphasis was placed on sectors such as food; wood, leather and chemical products; construction materials; ceramics and porcelain; non-metal foundries; metallurgy; and others. The credit policy was fairly generous for these sectors. As mentioned in the last section, this credit policy could not be sustained due to the exchange rate crisis. One of the few sectoral policies during this period was the Livestock Development Program and Transport Program in 1961. These included credit lines for the creation of artificial grasslands, the acquisition of fine livestock, the construction of facilities and inner roads, and machinery. There was also provided was technical assistance in the form of the provision of forage seeds,

livestock sanitary control, improvement of races, poultry promotion, and investment in dairy plants and slaughterhouses. As expected, the National Development Program performed relatively well between 1961-1962, the first years of its execution. However, the economic deterioration of the country that followed made it difficult to sustain improvements. This situation worsened with the inability to promote the domestic savings required to finance the plan, therefore increasing external debt and causing inflationary pressures at the end of 1962. This led to a contraction in public expenditure that prevented the continuation of the plan.

During the government of Eduardo Frei Montalva in 1967, the state-planning agency 'Oficina de Planificacion Nacional (ODEPLAN)' was established based on the importance of social and economic planning. With the creation of ODEPLAN, CORFO stepped out in its planning role and was redefined as a coordinator of a number of sectoral programs carried out by specialized state institutions. This entailed the creation of a number of state organizations dependent on CORFO, such as the National Vocational Training Institute (INACAP) created in 1966, and the National Commission for Scientific and Technological Research (CONICYT) in 1967, which was in charge of basic research and policy proposals on a variety of subjects. Along these lines, a number of public institutes for sectoral development were established, with the purpose of producing applied research. Some of these include the National Institute for Agricultural Research (INIA), created by CORFO in 1964 to produce agricultural research, the Natural Resources Research Institute (IREN, 1964),<sup>20</sup> the creation of the Fisheries Development Institute (IFOP, 1963),<sup>21</sup> the Mining and Metallurgy Research Institute (CIMM, 1971), and the National Standardization Institute (INN) (metrology, 1973) (Zahler *et al.*, 2012).

It becomes clear that most of the policies carried out during Frei's government were vertical, in line with an import-substitution strategy aimed to strengthen national industries

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<sup>20</sup> The IREN was in charge of the identification of fields, and soil study aimed at determining the extension of irrigated lands, creation of soil charters, forestation, keeping records of the resources of the Austral region, as well as gathering hydrometric and hydrological information of the rivers between Coquimbo and Valdivia. These constituted the lines of action of the IREN during Frei's government.

<sup>21</sup> The fishing resources survey carried out by the IFOP in 1963 focused on the number of studies on oyster production (1967); mussels, clams, and algae in the north and south of the country during 1968, were certainly of great importance.

and, at the same, prioritize income redistribution. This was attempted in a number of ways, starting with the development of a new plan for agrarian reform, and the so-called “Chilenization” of the large-scale copper mining (LSCM) industry.

Under the government of President Allende, the program of the PU involved the rapid formation of a so-called “social property area” and the creation of a unique economic system. This system was based on the implementation of an industrial strategy understood as decisions made by the state in order to create a production process conducive to a socialist economy. In order to achieve this goal, CORFO was of central importance. As we will see in the following sections, the PU government was not concerned with creating new firms. Instead, the administration was characterized by the massive acquisition of a number of firms under its control to form the social property area. This entailed a major administrative effort for CORFO, which included the management of firms under its control, as well as the transformation and reorientation of production units.

As in the previous section, we present industrial policy carried out by the government during this period. Policies are divided into four subcategories: vertical and horizontal and, for each of these cases, we will assess which of these policies were successful, and which were considered to be failures.

#### **4.3.1 Successful Vertical Policies.**

##### **Nationalization of the Large-scale Copper Mining Industry**

This process had already begun during Frei’s administration with the aforementioned “Chilenization” of the LSCM. Additionally, as a result of repeated conflicts with North American firms throughout history, there was a popular consensus for this action.

In December 1970, one month after assuming office, the PU sent a petition for constitutional reform to nationalize the LSCM to the Congress. The nationalization of the LSCM industry was approved unanimously in July of 1971. The constitutional decree for

nationalization established that the State was the only owner (with exclusive and absolute control) of all minerals in Chile, and automatically declared all the contracts previously established in the LSCM industry as invalid. This generated reprisals from the U.S. government, such as the seizure of the bank accounts of the National Copper Corporation of Chile (CODELCO) in the U.S.; the impossibility of acquiring capital goods in the U.S., and obstacles to obtaining them in other countries; as well as the brain drain of technicians and supervisors in the LSCM industry who received job offers with Anaconda and Kennecott in other countries. Therefore, it is not clear whether there were no costs associated with the nationalization of the LSCM industry, or whether they were less than those of the “Chilenization.”

However, more recent assessments argue that this decision was positive stemming from the output of the LSCM industry, which under the control of CODELCO, experienced a yearly average growth of 4% between the 1970s and 1980s, compared to a meager 1.2% during the 1960s (Meller, 2003). This growth process was also accompanied by an increase in private sector participation in the total production of copper, particularly that of foreign companies. As documented by Meller (2003), while CODELCO was responsible for almost 85% of total copper production in 1980, its share decreased to 33% in 2000. Currently, large private companies represent almost 60% of copper production.

## **Agriculture**

During this period, the government, through CORFO, carried out a number of concrete actions such as the recovery of soils, irrigation projects, drainage, leveling, etc. Regarding irrigation, CORFO carried out a number of projects of mechanical irrigation, such as the excavation of wells in order to take advantage of groundwater and also provided credit for that purpose. Moreover, they favored extreme zones such as Arica and Cautin for these initiatives. As a result, there was a great increase in the soil available for cultivation: around 50,000 hectares between 1940 and 1959, and improved irrigation of another 165,000 hectares over the same period. By 1960, CORFO had irrigated nearly 10% of Chile.

## **Agrarian Reform and the End of Land Ownership**

In the 1960s, there was consensus regarding the poor performance of the agricultural sector in terms of the great underutilization of productive resources and the inability to develop food self-sustainability. The subsequent process of land reform had started during Alessandri's government and was implemented on a massive scale during Frei's government.

During the PU government, agrarian reform was regarded as fundamental for the transition from a capitalist society to a socialist economy. This implied the expropriation of all farms, but also "that the bulk of the agricultural sector had to belong to the State or peasant cooperatives or consumers cooperatives." The PU platform called for speeding up the process of agrarian reform "without the owner having preferential right to choose the reserve." Using the same legal framework as Frei's government, Allende expropriated almost the same number of farms during his first year in office as Frei did throughout his entire presidency. This process intensified in the second year, when "the destruction of large farms" was practically completed.

### **Creation of SAG (Servicio Agrícola Ganadero, 1967)**

The Agriculture and Livestock Service (SAG) was created in 1967, during the government of President Frei. He used the law to change the Ministry of Agriculture from an entity that exclusively promoted production, into one that could solve the main problems affecting the operation of the production process with maximum efficiency.

These problems were varied and mainly related to plant and animal health; the preservation of soil, water and renewable natural resources; statistical information and records for agriculture, forest, livestock, and fisheries; creating infrastructure for the benefit of production; training for people in agro-rural areas; and monitoring compliance with the control rules designated by the Ministry of Agriculture (SAG website, 2012).



As pointed out by Agosin *et al.* (2010), the creation of SAG certainly was an important vertical policy instrument in terms warranting food safety at the borders, supervising food export quality so as to meet foreign phytosanitary requirements, and also to participate in the negotiation of free trade agreements.

### **Forestry Policy**

Policies oriented to strengthen the forestry sector were also noteworthy. In a joint venture with private capital, CORFO founded the forest industry association, *Industrias Forestales*, S.A. (INFORSA) in 1956. Despite the lack of an export market during the 1960s, the State continued to be committed to forestry. Since the creation of INFORSA, an industrial forest complex emerged along the lower valley of the Bio-Bio River. CORFO also directly participated in this development process by taking over Forestal Colcura's stationary sawmill to keep it from bankruptcy. CORFO also converted its stake in INFORSA to direct ownership and began the construction of two long-fiber cellulose factories. Celulosa Arauco began its construction in 1967, with CORFO maintaining 60% ownership of the plant. Celulosa Constitucion (CELCO) followed in 1969. Other noteworthy actions include the reforestation programs carried out by the National Forest Corporation (CONAF) and the program initiated by SAG for direct forest plantations that grew to exceed 30,000 hectares annually in the early 1970s (Clapp, 1995).

During the PU government, the forestry industry became the most socialized sector of the economy. A massive forestation plan, designed to cover 63,000 hectares, was launched in 1972. This was in addition to the reforestation of 15,000 hectares to be carried out in 1973 by the "social property area" firms in the provinces of Ñuble, Concepción, Arauco, and Bio-Bio. However, these initiatives towards achieving greater development in the sector came with a cost, as many small sawmills failed for lack of working capital and plantation rates declined as private landowners withdrew capital from the sector (Mamalakis, 1982).

### **Mining**

Through the *Centro de Investigacion del Salitre y la Industria Quimica* (1965), CORFO carried out a number of studies on the industrial uses of the existent mineral resources in the provinces of Tarapaca and Antofagasta. This consisted mainly of research on the industrial procedures for the creation of chemical products and, in particular, fertilizers.

The creation of Chile's National Mining Company (ENAMI) during 1960 is also noteworthy. ENAMI was entitled to provide assistance to small and medium sized gold and copper producers by buying their production and process it into refined copper and ore metal. CORFO participated directly or through financial and technical assistance in several other projects, including Sagasca, in Tarapaca, and La Disputada de Las Condes, both of which produced copper. Finally, in 1970, CORFO acquired 51% ownership of the shares of the Chemical and Mining Company of Chile (SQM), the entity in charge of nitrate exploitation in Pedro de Valdivia, Maria Elena and Victoria, which was previously controlled by the Anglo-Lautaro.

#### **4.3.2 Unsuccessful Vertical Policies**

##### **Agriculture**

Agricultural mechanization continued to be one of CORFO's priorities during this period. In accordance with the Law of Agrarian Reform, it continued with the plan of restructuring its subsidiary the Mechanized Agricultural Equipment Service (SEAM), which involved a wholesale renewal of equipment, together with new contributions and subsidies to finance the activity. By the 1960s, SEAM had increased its machinery endowment from 301 to 607 units, and had also extended its coverage to the northern and southern regions of the country, to the extent that, by 1969, regional agencies started to work from Arica to Punta Arenas.

Agricultural modernization was also emphasized during the presidency of Eduardo Frei. It was regarded as a fundamental area to achieving economic development. While there were a number of initiatives in this area, there are four cases worth discussing in detail. Firstly,

within the fruit industry, existing gardens were improved and new varieties were introduced. Secondly, there was a large-scale study of the wine industry in 1965. Thirdly, in 1965, the National Seed Company (ENS), produced seeds from different species. Finally, 1966 marked the beginning of the production of canned tomatoes. These initiatives were accompanied with great investment in extending the electricity plan to rural areas, including the construction of new transmission lines, through ENDESA and the Federation of Electric Cooperatives. As pointed out by Contreras (1995), the National Fruit Plan, together with the agrarian reform, had only minor effects on plantations and production, mainly oriented towards the reduced local market. As it will be discussed, the fruit export boom began in 1974 with the entry of private capital from outside the industry. These private businesses identified the business opportunities of fruit production, as well as the internal and external conditions favorable to economic success. We will address these issues in more depth in the following sections.

During the PU government, there were two programs that CORFO focused, owing to their export potential. The first was the wine program that sought to increase cultivated land, particularly the arid lands of the central-southern zone. The second program, inherited from the 1960s, was the fruit and horticultural program. This initiative aimed to replace the agricultural products cultivated in the central zones by those with the best export potential. For this purpose, new credit lines were opened for plantations, the elaboration of fruit records, as well as research on industrial production techniques in agriculture, including canning, refrigeration, packing, and juice production (CORFO, 1989).

## **Fisheries**

CORFO launched the Fishing Development Plan in 1960. This plan addressed all aspects of the industry, including research, equipment, training, technical assistance, development policy, credit, commercialization, and even a greater intervention in the industrialization of fisheries.

The fishing plan also considered the active urbanization of industrial areas near ports and rivers. It became quite evident that most of this work was taking place in the provinces of

the north, where most of the fishing activity was concentrated. With no doubts, the most significant policy was the creation of the fishing port of Iquique, which required 32.5% of CORFO's total investment in the sector until 1964. Through the assistance of a specialized firm called the Marine Construction Design Co., the new port was equipped with elements that were indispensable for the functioning of a highly specialized fishing industry.

CORFO also acted as a direct producer in this area via a subsidiary called the Fishing Company Tarapaca S.A, created in 1961. It was located in the port of Iquique, which was expected to become the most important port in the country. This industry was oriented towards producing canned fish and, to a greater extent, oil and fishmeal. These last two products became the engine of the fishing industry by the beginning of 1960s, which included years of very high prices for fishmeal.

The success of the fishing plan was instantaneous, surpassing the goals set by CORFO in merely two years.<sup>22</sup> Such apparent success, however, would be overshadowed by the eventual threat of supply shortages of raw materials, particularly in the case of anchovies, which started to exhibit a worrying downward trend by 1964. Given these circumstances, CORFO had to suspend subsidies for the construction of new processing plants.

In light of this, CORFO took special measures to rationalize the fishing industry in the north of the country. Many of these measures involved the mergers of a number of financially stable firms, with the participation of industrial associations affected by this depletion.<sup>23</sup> The measures taken to face the crisis stabilized anchovy populations, and the industry quickly rebounded and, in 1966, reached the highest level of fishmeal production.

### **Electronics industry**

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<sup>22</sup> In monetary terms, in 1964 the fishing industry generated foreign reserves of \$22 million US, surpassing the previous year by 70%.

<sup>23</sup> In the beginning of 1966, there were 34 independent fishing firms in Arica and Iquique. By 1970, after CORFO's intervention, only 14 were in operation, concentrated in the hands of 9 companies. CORFO made capital contributions to 7 of them. Likewise, fishing fleets were reduced by 50%, therefore inducing greater efficiency.

During this period, a great emphasis was placed on orienting the metallurgy and electronics industry towards the creation of capital goods producers and modernizing the industry. To these ends, in collaboration with the Instituto Chileno del Acero, CORFO extended special credit lines for the purchase of new machinery and the acquisition of national machinery. In the electronics industry, CORFO, through the Commission for Development of the Electronic Industry (1965), incentivized the production of home and professional appliances, electronic components and special manufactures.

Another intervention in this sector was the creation of the National Computing Service Company (ECOM) in 1968. It was a subsidiary of CORFO and included the participation of both ENDESA and CORFO. The objective of this subsidiary was to develop a national computational system that allowed entities of public administration to process all information at any level with minimal additional investment. The idea was to gradually construct a number of computational centers in different parts of the country, interconnecting them via ENTEL. This would create a storage network and allow for information processing at the national level. Unfortunately, this initiative was a total failure, and represented great losses during the 1980s (CORFO, 1989).

### **Automotive Industry**

In the automotive sector, the government created the Automotive Sector Development Commission to satisfy transportation demands and, also, to secure national participation in the programs of the Latin American Free Trade Association (ALALC). During this period, the national production of vehicles increased from 7,813 in 1964, with national spare parts and pieces constituting 26% of the total, to 22,069 units, with a national input of 58%.

Of particular interest for the PU and CORFO, was the creation of an automotive industry. Using international public tender, CORFO signed agreements for the manufacture of small and medium sized cars by creating CORFO-Peugeot and CORFO-Citroen. However, the automotive policy had even greater ambitions than this and, from 1973 onwards, demanded increased investment in the production of spare parts. This led to the establishment of a gearbox and rear bridges factory in Los Andes, as well as an increase in the capacity of the

engine and electrical components factory in Rancagua, allowing for a production increase of 458%.

Another initiative associated with this policy was the consolidation of tire manufacturing through the national INSA-MANESA. Hence, the main objectives of this initiative were the creation of a specialized industry producing spare parts and the establishment of INSA-MANESA in Coquimbo (CORFO, 1989).

### **Livestock Policy**

Another priority during this period was the livestock-farming sector, as reflected by a number of initiatives such as the creation of a national slaughterhouse network and sanitation programs, the construction of dairy plants, development of cattle and sheep farming in the southern provinces, and the development of poultry and pork production. The latter involved providing technical assistance for the creation of new breeding houses, facilitating the acquisition of specialized machinery, and offering assistance in relation to other production components.

During 1965, direct investments in livestock farming increased by 256.7% compared to the previous year. In the following year, CORFO created the National Livestock Development Plan with the intention of increasing production. The programs during this period were: (a) national slaughterhouse network, (b) a program for dairy plants, (c) an animal sanitation program, (d) a southern livestock program, and (e) a poultry and pork development program, which included technical assistance for the creation of new breeding houses, machinery acquisition, and poultry and pork implements, mainly for increasing the production of chicken “broilers” (CORFO, 1989). The program for livestock development in the south was considered one of the main projects and speeded up the development of cattle and sheep farming in the southern provinces.

### **Chemical industry**

In addition to investing in the production of sulfuric acid via its subsidiary FASSA, a sulfuric acid plant, CORFO also participated in the construction of a triple superphosphate plant by the Compañía Sudamericana de Fosfatos, both in Rancagua and Valdivia. Its goal was to increase the national production of phosphate fertilizers. Meanwhile, in 1966, CORFO and its subsidiary ENAP invested in the petrochemical industry by contributing 50% of the capital to establish Chilean Petrochemicals S.A.

### **4.3.3 Successful Horizontal Policies.**

#### **Energy**

During President Frei's government, there were two national initiatives in the energy and fossil fuel sectors – the National Petroleum Company (ENAP) and the National Electricity Company (ENDESA). CORFO also embarked upon other projects oriented towards maintaining and increasing energy sources such as coal, wood, and industrial alcohols.

#### **Development of Communication Infrastructure**

The long distance between northern and southern regions of the national territory forced improvements to communication networks, which were revealed to be considerably underdeveloped, technologically speaking. Services were constantly affected by seismic movements or climatic phenomena. Given this situation, CORFO was encouraged to build a national communication network, which was initially to be executed by its Telecommunications Committee. when the National Telecommunications Company (ENTEL) was established in June 1964 as a subsidiary of CORFO, it took over the project.

The objective of ENTEL was to plan, design, construct, and exploit a national telecommunications network of high technical quality and great physical safety, meeting both private and state needs. It would connect different regions of the country with each other, and with foreign countries, thereby allowing for the simultaneous transport of all means of communication, such as telephone, telegraphy, television, radio broadcasting, etc.

CORFO also entered into agreement with the Telephone Company of Chile (CTC) to acquire 40% ownership in 1967. It also created the Empresa Nacional de Television in 1969, with the purpose of extending television to all of Chile. By 1970, this channel spanned the country from Aconcagua to Temuco.

During the PU government, CTC and CORFO, through its subsidiary ENTEL, continued with the microwave network program inherited from the previous administration. It completed a network covering Santiago to Arica, increased circuits in the southern network and connections to the international system, and also expanded national coverage (CORFO, 1989).

### **Technical Assistance**

During the 1950s, most programs of SERCOTEC were aimed at medium and large sized firms. The SMEs begin to appear in public programs during the next decade. In 1962, SERCOTEC developed the *Programa de Fomento y Desarrollo de la Pequena Industria y el Artesanado*, aimed at industries of “low capital consumption and labor intensive.” This program included four basic projects: (i) Technical Assistance, (ii) Technological Assistance, (iii) Financial Assistance, and (iv) Studies and Projects.

During the PU government, the Technical Support Center, founded in 1970, was one of the most relevant programs in this area. It was formed with the objective of providing technical support related to product quality, process technology, industrial design, general information, and technological training. It basically consisted of workshops and labs built with contributions from the ILO and UNDP. However, these facilities were seized in 1978 as part of a self-financing policy implemented by the government. As a result, SERCOTEC ceased to be a technological promoter until the 1990s, when it undertook very specific actions with dubious results (Monsalves, 2002).

### **Training Policy**



In 1960, SERCOTEC created a Professional Training Department with the idea to address the shortage of qualified workers for industrial development in Chile and to participate in the process of infrastructure reconstruction as a result of an earthquake.

The increasing importance of professional training led to the creation of the National Vocational Training Institute (INACAP) in 1966. It was the successor of the SERCOTEC Professional Training Department. In partnership with selected universities, INACAP widened the range of training programs, offering courses in different areas, learning programs, and training courses, covering all economic sectors. A number of bilateral and multilateral agreements contributed to the technical consolidation of INACAP. By 1976, INACAP had trained more than 45,000 workers, representing 2.6% of the labor force at the time.

#### **4.3.4 Unsuccessful Horizontal Policies.**

##### **Configuration of the Social Property Area**

A broad nationalization policy started in January 1971. Under the premise of nationalizing monopolies, the government acquired, intervened, and/or expropriated some of the following: cement producers, construction firms, textile firms, coal firms, beer and food producers, fishing and poultry firms. In addition, another 90 small units were incorporated into the social property area during the first of government of the popular unity.

This took place most rapidly in the metal-mechanic sector, including products such as iron, steel, and industrial goods. In March 1971, CAP was included in the social property area, with the gradual acquisition of ARMCO, INDAC, INDESA, PRODINSA, SOCOMETAL, INCHALAM, COMPAC, MADECO, NIBSA, SGM, EQUITEM, and AZA. Thus, the “iron-metal complex” was created.

The nationalization policy was also intensely applied to the transport and service sectors, affecting distribution firms, and maritime and land transport. By October 1972, CORFO

controlled a total of 185 banking, industrial, commercial, and transport companies. Of these, 64 were requisitioned, 51 had an undefined status, and 11 were purchased. By September 1973, the total number of companies controlled by CORFO had increased substantially (CORFO, 1989).

Paradoxically, most firms established by CORFO between 1970 and September 1973 belonged to the distribution sector, particularly wholesale distribution. This involved the creation of the National Distributing Company (ENADI) in March 1971, and the National Directorate of Marketing (DINAC). However, neither of these firms ever had the same impact as the nationalized private firms.

## **Section 5: Period from 1973-1990.**

### **5.1 Economic Context.**

On September 11, 1973, the military troops commanded by Augusto Pinochet put an end to the Popular Unity government, taking power by force. The military inherited an economy characterized by enormous macroeconomic imbalances and massive price distortions. This could be observed in the high inflation rates and low economic growth trends. After some hesitation, the military entrusted the economic management of the country to the so-called “Chicago Boys,” led by the economist Sergio de Castro. This was a group of economists who had completed postgraduate studies in the U.S, with a significant proportion studying at the University of Chicago. The fact that many of these economists were trained there may simply be due to the fact that there was a long-standing exchange program between the University of Chicago and the Universidad Catolica de Chile. This group provided technical support to the government, and, some members even occupied high positions in the military regime, as well as in subsequent governments.

The “Chicago Boys” proposed reforms aimed at transforming the Chilean economy into a modern market economy in order to achieve greater economic growth and social peace. With these reforms and the regulations they brought, the State played a key role in

weighing social costs and benefits and took the necessary measures to gradually achieve price stability. By the end of 1973, the Chilean economy had many features of a centralized economy; in comparison with the international price structure, price distortions were overwhelming, and the country was showing the first signs of hyperinflation. To a large extent, the economic reforms applied during the military regime were indeed implemented, although not without certain pauses and even occasional reversals.

The military government underwent a number of reforms in order to liberalize markets away from any kind of price distortions. In the same vein, the government pursued non-discriminatory policies across sectors. This latter strategy was justified by claims of efficiency. However, as pointed out by Lederman (2005), policy-makers also recognized that there were political motivations. This policy discouraged interest groups from participating in politics, thus keeping political turmoil to a minimum.

As will be discussed later in the paper, despite the reforms implemented during the military government, there was not a real payoff in terms of economic growth during its mandate. Sustained levels of growth were not achieved until after the recovery from the crisis in the beginning of the 1980s. The military government experienced two plateaus with zero growth. According to Maddison's (2001) figures, these happened between 1974 and 1984, and 1981 and 1989. Thus, for those of us who believe in the power of allocated efficiency and free markets, the experience of the military government should make us question whether allocated efficiency should be achieved at any cost. Another question that should be asked is whether the speed of reforms impacts the realization of goals. The answer seems to be clear: reforms should not be achieved at any cost, nor should they be carried out in a short period of time (see Stiglitz and Charlton, 2005; Stiglitz, 2006).

## **5.2 Trade policy.**

In October 1973, right after the military intervention, the Minister of Finance suggested that the country's best prospects for growth were to open its market to international competition. During this period, political authorities did not know precisely how deep and how fast the

liberalization process should be. In fact, as documented by Lederman (2005), it was only after Chile withdrew from the Andean Pact in December 1977 that the government's chief economic strategist, Minister Sergio de Castro, declared that the main goal was to reduce tariffs to a uniform rate of 10% by mid-1979. This change in tariff policy was justified based on the disparate tariff structure in 1977, with rates between 10% and 35%, because it generated unjustifiable discrimination across sectors.

The first stage of liberalization was sudden. By June 1976, the average tariff was 33%, equivalent to a reduction of more than 60% compared to the average tariff in December 1973. This result was particularly noteworthy since quantitative import restrictions had been eliminated by August 1976. By June 1979, when the first stage of liberalization came to an end, all items had a nominal import tariff of 10%, with the exception of automobiles. As pointed out by Lederman (2005), the impacts of this stage of liberalization varied across sectors.

Aedo and Lagos (1984) examine the evolution of the effective rate of protection for eighteen industries within the manufacturing sector during 1974-1979. They found strong evidence showing that the dispersion level of the effective rates of protection decreased as reforms continued. For instance, by June 1979, the average effective tariff was 13.6%, and the range between the maximum and the minimum effective tariff was around 6%. Another apparent consequence of the reforms was that it increased the effective rate of protection granted to the agricultural sector. Historically, through the imposition of price controls on agricultural products and high import tariffs on inputs, most crops had suffered from a substantial negative effective rate of protection. In 1974, for example, the agricultural sector had a negative average effective rate of protection of 36% (Lederman, 2005).

This first stage of liberalization was accompanied by a very active exchange rate policy with the idea of maintaining competitive real exchange rate. The reduction in trade barriers, together with the deterioration of the country's term-of-trade after 1974, required a depreciation of the equilibrium exchange rate. This depreciation was first carried out through a sharp devaluation in October 1973, and was subsequently maintained by mini-

devaluations (a crawling peg exchange rate regime), until January 1978. The importance given to a depreciated real exchange rate was clearly stated by a number of government officials, including General Pinochet (Lederman, 2005): “We shall continue to encourage nontraditional exports....The Minister of Finance will announce the manner in which the exchange rate shall be established in order to guarantee a viable and permanent value for foreign currency.” As argued by government officials, the relatively forced industrialization of the country was achieved through an artificially low exchange rate policy, hindering Chile’s export possibilities. As documented by Lederman (2005), by the end of 1976, the real effective exchange rate was almost 150% more depreciated than in the third quarter of 1973. Later, in June 1976 and again in March 1977, with the aim of breaking inflationary expectations, the peso was revalued. During 1977, in order to partially compensate for the effects of new tariff reductions, the rate of nominal devaluation with respect to the U.S. dollar was further increased.

The stabilization program was subject to changes in 1979, transforming the exchange rate into the main instrument to anchor inflation. Specifically, the exchange rate was fixed to the dollar. Stemming from the new exchange rate policy, the real exchange rate appreciated significantly from 1978 to 1982. As pointed out by Edwards and Edwards (1991), this appreciation became increasingly unsustainable, leading to a major balance of payment crisis, which erupted in 1982. The country ran out of international reserves, a major devaluation was implemented, and a number of firms and banks went bankrupt. Consequently, unemployment increased substantially, and GDP declined by more than 14% in 1982 alone.

The third stage of Chile’s trade liberalization occurred during the period between March 1983 and June 1985. Uniform tariffs were set from 10% to 35%, aiming to accelerate the adjustment process. Along with this, the government reintroduced price bands for certain commodities, such as wheat, sugar, and edible oils in 1983. This provided an equivalent protection to the uniform tariff rate. Between 1982 and 1983, Chile experienced a severe economic contraction together with a fast adjustment of its current account. As opposed to previous historical experiences where trade protection was used to correct external

imbalances, such as those undertaken during the Great Depression, this time the tariff hike was temporary (e.g. no quantitative restrictions were applied). Notably, price bands still exist today (Lederman, 2005).

The process of unilateral liberalization ended in June 1985, when the uniform tariff was reduced again to 20%. Later on, in May 1988, the tariff was again reduced to 15%. As documented by Lederman (2005), this was the last trade reform carried out by the military, as Pinochet lost the referendum or plebiscite vote of 1988. The result was the democratic elections of 1989, in which Patricio Aylwin of the Christian Democrats won the election in March 1990. During this time, there was a high degree of uncertainty regarding the future economic policies of a democratically elected government. Consequently, several important economic measures were undertaken, including the establishment of an independent Central Bank, which aimed to reassure markets that a dramatic change in economic orientation would not take place after the political transition.

### **5.3 Industrial policy.**

As previously discussed, most of the reforms implemented during the military government and that continued into the next administration were horizontal. This does not mean that the government did not apply vertical policies; however, there are significant opposing trends between horizontal and vertical policies.

Under the government of the military junta, part of the reactivation policy was to increase exports, mainly of non-traditional products. This was an export-oriented system aimed at making better use of domestic resources and the labor force. Since the beginning, CORFO had carried out a multi-sectoral role. This had to continue under the new administration since there were no other institutions that could replace it in certain specific fields. In light of this, CORFO's functions were oriented towards the management of companies, promotion, and development, along with a normalization function of transitory character (CORFO, 1989).

In the spirit of this new role, CORFO created the Fondo de Desarrollo Productivo in 1983, whose objective was to collaborate with the private sector for achieving greater technological development. This would happen through national funding of technological and prospecting research projects on natural resources, while subsidizing part of the costs of executing any initiatives coming from that research. The basic principle of self-financing created surpluses to fund new investment projects. Together with the improvement of administrative efficiency, this delivered surpluses greater than \$1 billion US between 1978 and 1987. Notably, after 1978 it became fiscally self-sufficient. In turn, this made it possible to expand access to hydro-electric power throughout the country, satisfying both popular and economic demand. The expansion of available electricity entailed the construction of hydro-electrical plants in the tenth and eleventh regions.

A number of credit programs established by CORFO have been very important in promoting these development initiatives, including the following: the Global Multisectoral Credit Program, CORFO-Inter-American Development Bank (IADB) I; Global Multisectoral Credit Program, CORFO-IADB II; Programa de Recuperaciones de Colocaciones, CORFO-IDB I; CORFO-World Bank-SERCOTEC Program; and the Financial Intermediation Program, the International Bank for Reconstruction and Development (BIRF)-CORFO-Central Bank.

In the first transitory stage, the normalization function was understood as “the transfer of ownership of most of the firms that the State declared as important, to private hands”. Of the 259 firms dependent on CORFO in 1973, when CORFO did not have capital participation, 251 had been privatized by 1976, with only 8 left to be normalized. CORFO played a role in an additional 235 firms. Summarizing this period, CORFO performed a fundamental role in the application of the government’s growth strategy, mainly by implementing the concept of the subsidiary state (CORFO, 1989).

As we will see in the following paragraphs, the industrial policy reforms carried out by the military were mainly horizontal, consistent with the subsidiary role of the State that was

embraced by the military. There are some exceptions to this rule, which turned out to be very successful, as in the case of Decree Law 701 (1974) in the forestry sector. Under this decree, the government granted a number of subsidies and also intervened directly through CORFO by increasing the amount of planted surfaces. Another interesting case is the large-scale copper mining industry (LSCM), which, after a process of massive nationalization during the PU government, was completely controlled by the military, which decided to create CODELCO (1976). Thus, the military kept control over the mining industry, instead of handing it over to private firms. While there has been tremendous debate regarding whether CODELCO should have been privatized, or whether its strategies should have been bolder, it has certainly proven to be very efficient and continues to be a world leader in the exploitation and production of refined copper.

Other defining policies of the military that are worth mentioning are the creation of the Foreign Investment Statute in 1974, which certainly improved Chile's image internationally. It also provided necessary guarantees to foreign investors that further expropriations would not take place, positioning Chile positively when compared to the rest of the region. In addition, the role of some State institutions has also been very important, such as the creation of ProChile in 1975, with the purpose of promoting export activities and Fundacion Chile (FCh) in 1976, in order to carry out research and technology transfers.

In the following section, we first review horizontal industrial policies and then vertical ones. In each case, we examine both those policies that were successful, as well as those that were unsuccessful.

### **5.3.1 Successful Vertical Policies.**

#### **Fisheries**

The fishing industry and its associated commercial activity has certainly provided large contributions to the growth of the rest of the economy. The sector's constant development has allowed innovation of new technologies and increased productivity, making Chile one of the five greatest producers in the world.



During this period, fishing became the third largest export, reaching \$627 million US as a result of increased volume; between 1973 and 1986 it increased tenfold. This was mainly an effect of the massive increase in certain products that were mostly for export, such as fishmeal, which reached 1.25 million tons. Fishmeal alone comprised 57% of fishing exports. Overall, the latter increased from 102,220 tons in 1965 to 1,331,581 tons in 1985, that is, an increase of 1.302% (CORFO, 1989).

### **National Fruit Plan**

A huge effort was made to promote fruit exports during the period 1974-1978. This initiative consisted of noting the comparative advantages of the area and providing technical assistance, credit, equipment, as well as the development of nurseries and new forest plantations.

Nonetheless, as pointed out by Portilla (2002), the relative success of fruit sector development cannot be solely understood as a favorable environment of prices and seasonal advantages. Rather, its success stemmed from a set of converging factors that accumulated over time.

In fact, the dynamics of the incorporation of new varieties, produced in California, were received by a “nest of knowledge”. This nest was formed during the 1960s, as a result of a sustained training process implemented by the State in collaboration with universities, especially the Agronomy Faculty of the Universidad de Chile, which used a scholarship program from the National Institute for Agricultural Research (INIA). At the same time, CORFO formulated the National Fruit Plan at the end of the 1960s, creating a number of preliminary studies on the behavior of different species and varieties in the cold chain. As part of the plan, a number of fruit centers were built (packing, selecting and frigorific) in different regions of the country.

As pointed out by Contreras and Escobar (1995), during the military government, one of the policies with greatest impact in the sector, together with the liberalization of agricultural

markets and tariff and exchange rate reforms, was the change in port rules and those applicable to the merchant navy. To be specific, the requirement that exporting had to involve Chilean ships was eliminated.

This is how fruit exports increased rapidly from 3,000,000 boxes in 1970, to around 82,000,000 in 1977-1978, making Chile one of the main fruit exporters in the southern hemisphere.

### **Wine Policy**

A project designed to promote wine development was formulated for the years 1975-1977. The project called for the planting of 10,900 hectares of new vineyards and the improvement of another 7,350 in order to increase wine exports. The pisco centrals of Elqui, Huasco, and Limari, which depended on CORFO, also underwent reforms aimed to increase their capacity and achieve greater modernization.

### **Mining**

The position of Chile in the copper mining industry was strengthened by a number of policies. However the government, through CORFO, also invested effort in increasing the mining market of other minerals. Such was the case with lithium, which was promoted through the Lithium Corporation of America created by CORFO and the company Foote Mineral S.A. This entity was established with the idea to exploit lithium deposits located in the Salar de Atacama that contained 4.5 millions of metric tons of lithium. In 1974, lithium exports generated around \$5 million US. This is clearly an example of the government's quest to diversify exports. In the following paragraph, we will discuss the most important policies related to the sectors of mining and minerals.

### **The Copper and the Mining Law (1982)**

The Mining Law of 1982 empowered the State to grant permits for exploration and/or exploitation to a person or company and that these would be entitled to seize all the

minerals within the limits of the given property. These privileges could coexist with the private ownership of the land, that is, for example, if a gold deposit was found on a farm, the mining concession could be delivered to anyone, not necessarily the owner of the farm. Indeed, this latter has led to a number of litigations between privates (Lagos, 1997).

This law is an important component in terms of explaining the large increase in foreign direct investment in mining during the 1980s and 1990s. One of the most important components of this law, as pointed out by Meller (2003), is that it establishes that the owner of the concession has the right to get complete compensation in cash equal to the present net value of all the deposits proved by the concession. In turn, this provides insurance to foreign investors that they will be compensated for the full amount of the proven value of the concession in the case of eventual expropriations.

### **The Creation of Cochilco (1976)**

The Chilean Copper Commission (Cochilco) created in 1976, was oriented to design policies, regulate, and control several aspects concerning mining, as well as assisting the Ministry of Mining in its functions.

The role of Cochilco has changed substantially since it was created. In fact, during the 1970s and early 1980s, its main focus was the study of strategies for the development of Chilean mining companies. It also assisted CODELCO in its development policies. It also acted as an intermediary in the country's mining policy regarding the Intergovernmental Committee of Copper Exporting Countries – created in 1967.<sup>24</sup> As documented by Lagos (1997), in this latter case, Cochilco, unsuccessfully attempted to control international copper prices, regulating its supply.

### **The Creation of CODELCO (1976)**

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<sup>24</sup> Hence, a new organization aimed to play a similar role to the Organization of the Petroleum Exporting Countries (OPEC).

As pointed out by many, one of the most important initiatives during the military government was the creation of CODELCO in 1976,<sup>25</sup> by merging the nationalized mines Chuquicamata, Exotica, El Salvador, Andina, and El Teniente into one mining complex. According to Lagos (1997), the reason why CODELCO never really had an active role reflected in an aggressive production development strategy, was simply due to the fact that it never had the political support to do so. This view changed with the enactment of Law 19,137 in 1992, which authorized the CODELCO to partner with private capitals to explore and exploit mineral deposits. However, in 1996, political arguments about privatization precluded CODELCO from authorizing the decentralization of operations and or the quest for additional profitable activities.

### **The Creation of the National Geology and Mining Service (1981)**

The National Geology and Mining Service (Sernageomin) was created in 1981, by merging the Mining Service and the Institute for Geological Research. The main function of Sernageomin is to conduct geological research; supervise mining properties in terms of mining and exploration rights; produce technical and statistical information; carry out some specific environmental functions, such as worker's health and safety; and issue permits for the construction and operation of mining related installations, for instance, tailing dams.

### **5.3.2 Unsuccessful Vertical Policies.**

#### **Water and Irrigation Policy**

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<sup>25</sup> The history of CODELCO dates back to the 1950s, when President Ibanez del Campo passed Law 11,828 on May 5, 1955, which created the Copper Office (Departamento del Cobre). Later on, during President's Eduardo Frei Montalva mandate, this law was replaced by Law 16,425 on January 25, 1966, transforming the Copper Office into the National Copper Corporation of Chile (CODELCO).. This law would be subsequently modified during the presidency of Salvador Allende, where the State declared himself as the full owner of all copper mines and fields of the country and entitled CODELCO for their management. Finally, the National Copper Corporation of Chile, as it is known now, was made official on April 1, 1976, during the military government (Lagos, 1997).

In 1974, the government explicitly stated: “The construction of irrigation infrastructure will be the responsibility of the private sector.” As a consequence, the construction of irrigation infrastructure by the State stagnated.

Another major change during the military regime pertained to the exploitation of water resources, that is, the government allowed them to be sold or mortgaged independent of land ownership. Despite the government’s refusal to finance irrigation policies, a subsidy program was initiated in 1983 in order to establish new irrigated surfaces, as well as to improve the existing ones. Between 1983 and 1989, the government spent \$34 million US to benefit 900 farmers, covering an irrigation surface of 300, 000 hectares (Portilla, 2002).

### **CORFO Programs.**

It is worth mentioning the role played by CORFO in the different productive sectors between September 1973 and July 1986 (CORFO, 1989):

#### **Program of Agricultural Mechanization**

Between 1973 and 1986, CORFO dealt mainly with the normalization of agricultural machinery imports and both direct and credit sales, as well as quality control testing, the activation of technical assistance, and provision of services. It also established credit lines for the purchase of agricultural equipment in order to create firms that could supply this sector.

#### **Seed Program**

The construction of a storage center for the processing and distribution of potato seed from Corte Alto (Osorno) was finished, as was the facility for pea seeds in Rosario (O’Higgins). These centers had the capacity to processing approximately 50% of the national production of both seeds.

#### **Livestock Program**

The measures adopted by the military in this sector did not have immediate effects due to structural changes introduced, as well as the effects of the oil crisis and, later on, the worldwide recession during the 1980s.

CORFO supported initiatives such as the following: a five-year financing program for the agricultural sector through loans granted by the International Bank for Reconstruction and Development (IBRD); credits for specific livestock programs, particularly for non-irrigated farms in the south; feasibility studies of privatizing state-owned agricultural industries; imports of livestock sold via credit to the country's farmers; and a livestock bank for the acquisition of livestock.

This had a positive, yet not sizeable effect on the livestock mass, when increased from 3.3 million in 1975 to 3.4 million in 1985. In the case of sheep, the increase was from 5.6 million in 1975 to 5.8 million in 1985. Finally, in the case of pork, numbers rose from 734,400 in 1975 to 1,100,000 in 1985.

### **Construction Industry**

A great emphasis was placed on the development of the cement industry. A number of projects were executed in order to increase capacity in the cement plants El Melon, Polpaico, and Bio Bio, the refractory plants of Lota Green asbestos-cement Pizarreno, the glass factory Lirquen and Loza Penco and Carrascal, among others.

### **5.3.3 Successful Horizontal Policies**

#### **Normalization Policy**

In the first transitory stage, the normalization function was understood as “the ownership transfer of most of the firms that the State declared as important, to private hands.”

The firms belonging to CORFO were classified into two general types: basic subsidiaries and transferable firms. The first were those in which the investments of CORFO were

backed by share packages and were to the so-called basic limited companies, to which it made capital contributions. In terms of the second type, given the policy of mixed firms, the CORFO's investments covered shares and property contributions.

The actions followed by the council of firms and normalization in this process corresponded to three phases:

1. Phase 1. 1973-1978: restitution of firms, including financial and administrative regularization. In this stage, CORFO returned 350 firms to their owners (from which 259 were transferred by the normalization council), sold 49 in which it had shares for \$3.1 million US and generated \$12.6 million US in assets in the agricultural industry.
2. Phase 2. 1975-1982: sale of firms with CORFO shares. In this stage, CORFO sold firms considered to be dispensable for the functions of the State and for CORFO itself. During this period, CORFO sold 79 firms for a total amount of \$435.5 million US, as well as share packages from 21 firms for \$287.6 million US.
3. Phase 3. From 1985: the sale of firms of national importance. CORFO executed a privatization program. During 1985, CORFO divested its shares in nine firms, for a value of \$5.308 million US.

As a result of these considerations, in 1981, the subsidiaries of ENDESA, CHILECTRA and CAP came into being, while other firms labeled as transferable were in the clearance process, these included the following: the national hotel association *Hotelera Nacional S.A* (HONSA), the Agroindustrial Cooperative Society (SOCOAGRO), the National Cold Storage Company Empresa Nacional de Frigoríficos S.A. (ENAFRI), Chilean Petrochemicals S.A. and the hydroelectric company RALCO S.A.

In 1983, CORFO subsidiaries were sold to the following entities: the National Airline of Chile (LAN CHILE), the Aysen Mining Company (EMA), the CORFO Agricultural Society (SACOR) and Maritime Transport Society for Chiloe and Aysen (TRANSMARCHILAY).

During that same year, in addition to the abovementioned firms, the following entered in clearance: the Sociedad Inmobiliaria Copihue, the Fabrica de Acido Sulfurico and, in 1984, the Empresa de Viviendas Prefabricadas “El Belloto,” while ENDESA, CHILECTRA, the Compania de Telefonos de Chile (CTC), SOQUIMICH and the Empresa Nacional de Explosivos (ENAEX). This was according to the instructions of the government and approved by the council of CORFO, with the idea to promote “social capitalism” (CORFO, 1989).

In 1984, CORFO acquired the 74.8% of the shares of Laboratorios Chile S.A., in the pharmaceutical field, and created a new subsidiary, the National Airline of Chile (LAN Chile), with the idea to replace the former LAN, which was a limited company, stemming from the \$40 million US losses registered during the previous year.

Also in 1984, CORFO had to address the problems of ECOM. In 1984, it lost \$466 million pesos adding to the loss of \$171 million pesos in 1982. During that year, the computing services firm lost practically all of its equipment due to a flood of the Mapocho River.

In 1984, CORFO allotted the project of sub-bituminous coals in Magallanes to the Compania de Carbones de Chile (COCAR Ltda.), while the lithium salts project from the Salar de Atacama led to the establishment of the Lithium Corporation of America, with capital contributions from both CORFO and Foote Mineral Co., for an initial amount of \$60 million US.

During this period, CORFO also sold share packages of its subsidiaries to the private sector. In 1986, it totally transferred its shares of ENAEX S.A., and sold high volumes of CAP S.A., CHILECTRA Metropolitana, CHILECTRA V Region, and SOQUIMICH. In 1987, it completed the sale of these companies, along with CHILECTRA Generacion. Likewise, it sold shares until it was a minority shareholder in IANSA and the Compania de Telefonos de Chile.



**Corporacion de Fomento de la Produccion  
Empresas Filiales Basicas 1987**

<b>Firms</b>	<b>CORFO's participation</b>
<b>Corporations</b>	
Empresa Nacional de Electricidad S.A. (ENDESA)	79,64
Empresa Electrica Colbun Machicura S.A.	98,20
Empresa Electrica Pehuenche S.A.	70,45
Empresa Electrica de Aysen S.A. (EDELAYSEN)	92,00
Empresa Electrica de Magallanes S.A. (EDELMAG)	87,58
Compania de Telefonos de Chile S.A (CTC)	74,98
Empresa Nacional de Telecomunicaciones S.A. (ENTEL)	66,97
Linea Aerea Nacional Chile S.A. (LAN Chile)	98,72
Industria Azucarera Nacional S.A. (IANSA)	51,00
Empresa Nacional del Carbon S.A. (ENACAR)	99,99
Carbonifera Schwager S.A.	51,00
Laboratorio Chile S.A.	50,99
Comercializadora de Trigo S.A. (COTRISA)	30,00
<b>Limited Corporations</b>	
Sociedad Agricola CORFO (SACOR)	99,97
Sociedad Chile del Litio (SCL)	45,00
Transportes Maritimos Chiloe Aysen (TRANSMARCHILAY)	96,09
Soc. Complejo Forestal y Maderero Panguipulli (COFOMAP)	94,49
Soc. Agricola y Servicios Isla de Pascua (SASIPA)	99,58
Empresa Minera Aysen (EMA)	99,00
Sociedad Minera Salar de Atacama (MINSAL)	25,00
Soc. Administradora de Creditos del Transporte (SACRET)	99,86

Source: CORFO. Memoria 1987. Nota No. 9 Balance Consolidado. Pp. 105-106.

### **The Creation of the Foreign Investment Statute (1974)**

The Foreign Investment Statute, also known as DL.600 was passed in 1974. The main ingredient of this decree is that it was based on the principle of non-discriminatory treatment, in other words, it states that foreign investors will be treated the same way as local investors, with the exception of obtaining credit from national agencies. It would also provide access for foreign investors to all the sectors of the economy and guarantees minimal government intervention in investment activities.

While the DL. 600 has suffered several changes since it was first instituted in 1974, the decree allows foreign investors to repatriate profits without time limits after one year the capital entered the country. It also allows investors to decide the legal conditions and currency to repatriate such profits, together with a fixed tax regime with a 42% effective rate for 10 years and up to 20 years for large investment projects. In addition to this, the decree also exempted investors from TVA when importing machinery and equipment that is not produced in Chile or listed by the Ministry of Economics (Mayorga and Montt, 1993; Lagos, 1997)

Without going into great detail about the statute itself, this Decree had important effects on the composition of foreign investment in the country, it is said to be responsible for the mining boom starting in 1987 with the investment in the Escondida mine. As pointed out by Lagos (1997), this constituted a critical event as it helped for the international the acceptance of the Chilean economic model and provided safeguards to other foreign investors.

### **Simplified Drawback**

Law 18,480, applied in 1985 with general coverage, created the simplified drawback to exports (reintegro simplicado) smaller than US\$2.4 million a year during the years 1983-1984. Exporters could recoup the import rights paid for raw materials and inputs without presenting documented proof of those expenses. As we have already seen, the export drawback was first implemented during Eduardo Frei's government during the second half of the 1960s.

In 1987, Law 18,653 included a refund of 10% in non-traditional export areas, e.g. those worth \$10 million US or less per year; 5% for areas worth more than \$10 million and less than \$15 million US; and 3% for areas worth more than \$15 and less than \$18 million (Portilla, 2000). With Law 18,768 in 1988, exporters could access a refund of 5-10% for exportable national inputs incorporated in the exported products.

The simplified drawback to exports was abolished in 2003, in order to meet the requirements of the Uruguay Round of trade negotiations. A recent assessment of the effects of the simplified drawback is carried out by Agosin *et al.* (2010), where they investigate whether simplified drawback had any positive influence on exports and carry out a quantitative analysis, using firms and sectoral-level data, in which the dependent variable is export value. They also carry out a quasi-experimental “matching” methodology, using treatment and control groups, and find strong support that the effects of the drawback are unequivocally positive. Their results suggest that the drawback incentivized new export growth and that maybe an effort could have been made to keep it afloat, while satisfying the WTO requirements.

### **Technical Assistance**

From 1974 onwards, in addition to Chile’s political changes, the SERCOTEC, as well as most research institutes, are required to become self-funded. In the first years of the period, SERCOTEC continued its standard activities of training and technical assistance. However, given the increasing funding needs, it became a technical institution that sold specialized research to the private and public sector. By the beginning of 1980, SERCOTEC developed a support line for the participation of SMEs in fairs and expositions within the general framework of the policy of export promotion.

In the context of the 1982 recession, the government viewed SERCOTEC as a useful public instrument to get involved in firm segments and thus generating greater employment. To this end, three programs were created that defined the role of the institution until the 1990s; (i) the Financial Assistance Program to SMEs, (ii) the Export Promotion Program, and (iii) the Support Program for Small Sized Firms. These programs were developed in 1985 through technical assistance programs, information center programs, as well as complementary actions to support the SMEs (Monsalves, 2002).

### **Training Policies**

During this period, a number of policies oriented towards promoting private hiring were launched. This is the case of the Decree Law 889 enacted in 1976, which provided bonuses to private institutions for hiring workers in the far north and far south parts of the country. Also, it created the National Training and Employment Service (SENCE) in 1976, to provide workers with access to training, job search assistance, as well as the possibility of insertion in the labor market (Montero, 2004). During the same year, the government privatized more than 70 industrial lyceums and INACAP, and also promoted the initiatives and management of private sector training programs via state funding through the SENCE (Dini and Stumpo, 2002).<sup>26</sup>

The main instrument used in this new system was the tax credit for training purposes, which was established in 1977. This instrument allowed firms to deduct a share of the amount invested in training programs for workers, partners, and owners. This incentive was granted either through direct training through authorized entities, such as SENCE, or through the Technical Organism for Training (OTIC). During the 1990s, the amount spent on this subsidy increased by 220% in real terms and the number of workers trained rose 153%.<sup>27</sup>

### **The Creation of a Free Land Market**

The restitution of expropriated land under the so-called "regularization of the agrarian reform," starts the process of reinstating more than 3,800 properties, covering more than 30% of expropriated physical hectares. Some lands are transferred to the State and others are sold through auctions (22% of the total). Meanwhile, the requirements for expropriation were increased via Law 16,640, up to the point they were finally abolished.

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<sup>26</sup> Traditionally in Latin America, training systems were based on a model whereby the State had the responsibility of management and administration, while the private sector was the financial contributor of such activities. In contrast, the new system implemented in Chile transferred the responsibility to the firms, leaving the State with only a minor role, essentially just co-financing the training, aimed at increasing the demand.

<sup>27</sup> While the tax rebate was modified by a number of decrees during this period - Law 18,391, Law 18,701 and the D.L No 1 - it remained unchanged in its spirit.

## **Liberalization of Agricultural Markets**

The markets were liberalized with the expectation of an efficient allocation of resources, as predicted by basic economic theory. This, however, was not totally the case. As pointed out by Portilla (2002), there were some areas considered to be of great importance that were protected along with political pressures from agricultural entrepreneurs linked to the government. Between 1974 and 1978, the Agricultural Marketing Enterprise (ECA), kept operating the purchase rights and imports controls, widening the coverage of some areas such as wheat, corn, rice, beans, potatoes, meat, and milk. Gradually, this participation tended to diminish during 1981 until it was totally extinct. Only wheat and oil seeds maintained a price system, with a reference price as a bottom, with sugar beets subject both to a price fixed in dollars and controlled under contract.

The process of trade liberalization was accompanied by the privatization of a number of firms that had infrastructure and operated the regulation of different agricultural markets: the National Cold Storage Company (Empresa Nacional de Frigoríficos, ENAFRI), the Agroindustrial Cooperative Society (SOCOAGRO), the Agrarian Reform Marketing Association (SOCORA), and the National Seed Company (ENDS), among others. The withdrawal of the State from the sector is a given in the privatization process. By 1980, only 43 firms remained under public control, reduced from the 500 firms that previously controlled by the State. (Portilla, 2002).

## **Innovation and Development Policies in Agriculture**

The military government adopted the position that research institutes had to be self-funded and, also, that companies themselves had to access directly technologies. However, they also believed that some activities would need to be state-financed when the private sector was not competitive.

The Institute of Agricultural Development (INDAP) was kept in place, giving private technical assistance and also providing some credit. Simultaneously, INIA implemented a

work scheme aimed at middle and large-sized agricultural producers which, on the basis of the Groups of Technological Transfer (GTT), would receive technical presentations, seminars, field visits, and other benefits. As documented by Portilla (2002), this practice was relatively successful and was subsequently adopted by private organisms, particularly the National Society of Agriculture.

### **Credit Policies for Agriculture**

Between 1974 and 1981, funding sources radically changed, with the private sector increasing its role from providing 9% to 76% of the credit lines for agriculture. Thus, public institutions, particularly *BancoEstado*, CORFO and INDAP, switched from providing 90% to only 24% of funding. Later, the policy was complemented with preferential lines of credit from CORFO for middle and large agricultural producers, with INDAP providing credit to smaller producers. Both institutions reduced their participation from 25% to 5% of the total credit lines (Portilla, 2002).

### **Forestry Policy**

Probably one of the most successful policies of the military was in the forestry sector, which was nearly wholly state-owned. One of these policies was Decree Law 701 in 1974, which invited private sector to carry out the task of reforestation. The Decree Law kept some of the tax benefits from 1931 and included direct transfers. The key benefit was the reimbursement 75% of the reforestation costs. Likewise, reforested lands were declared exempt from ever being expropriated (Clapp, 1995). It also participated directly, through CORFO, in the Forestation Program, completing the 5-year program established in 1975. By 1979, 590,000 hectares of insigne pine, had been planted with the objective of securing the wood supply for the cellulose and paper industries.

According to Agosin *et al.* (2010), the effects were an accelerated increase of forested land, growing from 400, 000 to 1 million hectares between 1974 and 1983. Thus, the groundwork was laid for a promising export sector. Furthermore, from 1974 until 1979, the Central Bank extended and subsidized credit lines, administered through the *BancoEstado*

and private banks, for firms and individuals dedicated to forestry activities.<sup>28</sup> As pointed out by Rossi (1995), this policy was very cheap for the State. In the almost 20 years since the law was established, the bonuses paid by the State have only been \$135 million US. On the other hand, total private investment in the forestry sector over the same period reached \$4000 million US.<sup>29</sup>

### **Creation of PROCHILE**

In 1975, the Chilean Trade Commission (PROCHILE) was created to serve as the country's export promotion agency. Its objective was to improve the insertion of exporting firms into international markets. With that in mind, the agency organized a number of programs in the following three areas: Economic Positioning Campaign (by strengthening the country's image in external markets), Export Promotion Program (financing, operation, design and implementation of international promotional campaigns), and Commercial Information System (by providing information to firms).

Alvarez and Crespi (2000) provide a very interesting analysis of the performance of this agency by carrying out a quasi-experimental study on the impact of a group of instruments on different firms' export performance. Their results suggest that these policies could generate a positive effect on firms. In the particular case of the instruments promoting exports, they claim there is a positive effect on technological, innovation, and other activities in international markets. Regarding quantitative impacts, they show that the instruments used by PROCHILE increased exports and markets. However, they did not find statistically significant evidence on any positive effect on the total number of products exported by firms. In addition, they found that only few instruments, particularly exporter committees, are important for penetrating new markets and boosting exports.

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<sup>28</sup> As pointed out by Agosin *et al.* (2010), while this initiative has not been assessed in a cost-benefit analysis, it is worthwhile noting the current importance of the sector in the export basket and also by considering its increasing export values, this policy definitively seems to have played an important role. Nowadays, forestry-related products amount to over \$ 5 million US, accounting for around 8% of Chilean exports, whereas back in time these exports were practically non-existent.

<sup>29</sup> Also from an environmental perspective, D.L. 701 contributed to stopping and preventing the erosion of discovered lands and strongly decreased industrial pressures to exploit native forests.

## **Creation of Fundacion Chile**

Fundacion Chile (FCh) was created in 1976 from cooperation between the Chilean government and the IT&T Corporation. Its origins come from a settlement for the expropriation of the Telephone Company of Chile (previously owned by the IT&T) during the government of Allende. While it is a private entity, it has the character of a non-profit organization and is mainly oriented to applied research and the promotion of technological transfers among key Chilean industries. FCh was focused on sectors mostly in relation to natural resources: (1) agro-industry, (2) marine resources, (3) forestry, (4) environment and chemical, (5) human capital, and (6) information and communication technologies (Agosin *et al.*, 2010).

One of the most significant successes of FCh has been the development of salmon farming through the comparative advantages of producing successful firms and providing strong incentives for private entrepreneurs and investors to participate. This resulted in explosive growth, representing 7% of non-copper exports.

Another of the major activities of FCh has been the creation of profitable business in non-traditional sectors of the economy with the goal of privatization. By the end of 1970s, it was in charge of implementing and adapting Norwegian technology for salmon farming to Chilean conditions (Agosin *et al.*, 2010). As pointed out by Zahler *et al.*, (2012), other successes of FCh include the development of blueberry cultivation, vacuum-packed meat, and forestry securitization. All in all, FCh has sold over half of the 51 firms created in the last 35 years, with the remainder being either incubated, scaled-up, or in production.

### **5.3.4 Unsuccessful Horizontal Policies.**

#### **Price Bands**



Price bands were set in the middle of the crisis in 1983. The motivation of this policy was to soften the impact of international fluctuations on the prices of some sensitive products, such as wheat, oil and sugar.

Price bands are linked to a right of purchase, which serves as an internal price associated with the band that provides a market signal for the rest of the agents. Initially, this right of purchase was private, but stemming from its bankruptcy, it became state-owned and was named the Wheat Marketing Enterprise (COTRISA), which was established as a subsidiary of CORFO (Portilla, 2002).

The system was motivated by the Common Agricultural Policy of the European Union. It was originally intended to smooth the impacts of international price volatility on domestic producers and consumers. As pointed out by Agosin *et al.* (2010), tariffs like these have, in practice, always been higher than Chile's uniform tariffs for the rest of the goods. Thus, the price bands are clearly a protectionist measure. Since the pressures of farmers in Congress, across political beliefs, deputies and senators have in general voted to protect the interests of traditional farmers at the expenses of consumers. The Free Trade Agreement signed between Chile and the Mercosur (1996) and the United States (2003) required dismantling this system of farm protection, yet gradually over relatively long time periods..

## **Section 6: Period 1990-present.**

### **6.1 Economic Context.**

With the return to the democracy, Chile experienced a period of significant growth during most of the 1990s. After the Asian crisis at the end of this period, Chile's economic growth rate declined significantly. This situation continued during the 2000s. In the 1990s, growth in Total Factor Productivity (TFP) in Chile was significant. However, during the beginning of the 21<sup>st</sup> century, this value became even negative.

While we have defined the return to the democracy as constituting one period based on the consistency of the policies applied, the economic outcomes of the first and second decades have been unequal.

As we will see, Chilean governments have consistently aimed to increase trade liberalization throughout this period. One characteristic of this process is that it has been fairly gradual, without being excessively slow. This process of trade liberalization has been achieved through both unilateral and bilateral tariff reductions. Compared to other regions of the world, this reduction in tariffs has not been accompanied by an increase of non-tariff barriers implemented by Chile.

Other significant reforms have been the increase in primary, secondary, and tertiary school enrollment rates, although the Chilean education system still needs improvement. (See Pisa reports, 2012). The social security system is mostly private in Chile, but it has also been reformed by increasing benefits for the bottom quintiles. Additionally, a National Innovation Council for Competitiveness (INNOVA) has recently been created. At the same time, a system of small royalties for mining activities has been enacted with the aim of funding regional and national innovation initiatives.

## **6.2 Trade Policy.**

The uncertainty regarding future trade policies under the newly elected democratic government of the Christian Democrat, Patricio Aylwin, was mitigated by further reductions of the uniform tariffs, from 15 to 11% in June 1991. This latter confirmed that the liberalizing trend would continue during the new democratic regime. Nonetheless, this did not mean that the new administration would pursue a similar strategy as the military. It was indeed similar, yet focused more on Preferential Trade Agreements (PTA). Most heated domestic debates have spun around Chile's free-trade negotiations with the Common Market of the Southern Cone (Mercosur), implemented in 1997, and, to a lesser extent, the free-trade agreement with the United States. A number of Chilean economists, particularly those from the Universidad Catolica, as well as some members of the National

Society of Agriculture (SNA), have advocated the idea of unilaterally reducing the uniform tariff (Lederman, 2005).

As pointed out by Lederman (2005), there are a number of reasons for this renewed interest in unilateral liberalization as well as growing concerns. For instance, PTAs may increase the degree of trade diversion and affect producers of traditional agricultural products in terms of the real appreciation of the currency. Another challenge is the increasing competition from Argentine and Brazilian exports of wheat and edible oil. In addition, the associate membership agreement with Mercosur stipulates the elimination of the price bands approximately eighteen years after the implementation of the agreement in 1997. In addition, the PTAs indicate that the “tariff structure has again become differentiated in the range of 0-11%, depending on the country of origin” (Corbo 1997).

After a long debate during 1997 and 1998, the government put forward a new bill to reduce uniform tariffs in November 1998. By the beginning of 1999, the tariff was reduced to 10% and scheduled to be further reduced 1% annually, up to 6% during 2003. Following this shift towards unilateral liberalization, Chile’s relationship with Mercosur improved during the presidency of Ricardo Lagos, who was a personal friend of Brazil’s President Fernando Henrique Cardoso. In 1999, President Lagos traveled to Brasilia and officially announced his intention for Chile to become a full member of the South American Trade Bloc (Lederman, 2005).

Nevertheless, as pointed out by Lederman (2005) it was never clear what “full membership” meant because Lagos received Brazil’s blessing to maintain its own external tariff. In December 2000, the government surprised the public by announcing the formal initiation of trade-agreement negotiations with the United States. That trade agreement came into effect on January 1, 2004. As pointed out by Lederman (2005), it is also unclear whether Chile will move forward with its intention to achieve full membership status with Mercosur.

Two other factors that have been detrimental to this new phase of unilateral liberalization in Chile are the ongoing use of price bands for agricultural products and the increased

difficulty in the use of anti-dumping and countervailing duties (Fischer and Meller, 1999). As documented by Lederman (2005), on August 20, 1993, the government implemented Decree No. 575, which established regulations concerning anti-dumping and countervailing duties. According to the World Trade Organization these regulations were not fully compliant with WTO standards. In particular, the national legislation lacked of: (1) a government accountability system of judicial review that could challenge administrative decisions, (2) a system of refunds of duties paid in case decisions are reversed, and (3) accelerated investigations for new exporters (WTO, 1997),

### **6.3 Industrial Policy.**

Regarding credit and financing, during the 1980s CORFO was a direct lender, that is, it operated as a first lending institution. This situation, however, changed dramatically when this role resulted in significant losses. In 1990, all the direct credit mechanisms of CORFO were terminated and their debt portfolios were auctioned with a nominal value of \$714 million US. The difference between the sale value and the nominal value resulted in a \$514 million US loss.

As documented by Dini and Stumpo (2002), CORFO started operating as a second lending institution in 1991, following a scheme in which direct credits to final users were replaced by bank funding and other specialized funding intermediaries that allocated resources to final clients. This substantially reduced the risk of financial losses for the State.<sup>30</sup>

As pointed out by Zahler *et al.* (2012), most instruments used by CORFO during this period were horizontal. Basically, this approach was inherited from the military regime in line with the subsidiary role of the State advocated by most of the opposition. Taking these

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<sup>30</sup> Currently, CORFO's main credit lines are the following: a) Investment funding for SME (credit line B.11), b) Investment funding for small industries, CORFO-Germany (credit line b.12), c) Credit for liability reprogramming for small firms (credit line B.13), d) Input and Foreign Commercialization Fund (credit line B.22), e) Risk Hedging for Exporters (COBEX), f) Quasi-Capital Program, g) Program of "purchase of subordinated bonds to banks for funding the SME", h) Program "FIDES funding for risky capital," i) Leasing, j) Refunding Leasing Operations for the SME (credit line a.3), k) Subsidies and l) Debt renegotiation program for SME. For further details see Dini and Stumpo (2002).

constraints into account, in the first half of 1990, CORFO developed broad-based innovation programs (a,b), the improvement of processes and associative promotion programs (c,d), programs targeted to SMEs (e,f,g), and a program to attract foreign direct investment (f). Later on, this horizontal orientation would become more flexible, creating space for more vertical policies.

As we will see from the description of these programs, these entailed clear cooperation between the private sector and CORFO, in particular those related to associativity and technical assistance, requiring human resources, knowledge and capabilities from the private sector. This is why CORFO initiated an externalization process of functions, which led to the creation of the current network of intermediary institutions of promotion (Dini and Stumpo, 2002).

In general terms, the development of promotion policies and the formulation of instruments to support the private sector had been mainly designed to address “market failures,” with particular attention to market factors (labor skills, technology, management, information, etc.). This aimed at increasing the competitive capabilities of the SMEs, via their rhythm of technological innovation and capacity to increase and diversify exports. This approach was strategically chosen in order to foster a more horizontal approach and to generate innovations that could be applied to any sector, while at the same time dealing with market failures. As a result, CORFO has been designing and implementing instruments that, on the one hand, seek to strengthen management capabilities and, on the other, associativity as a competitiveness instrument.

With the creation of the National Innovation Council for Competitiveness in 2005, CORFO restructured its instruments and fused them into INNOVA Chile instruments, reforming its “Consejos” and creating a new “macro Consejo”, INNOVA, therefore simplifying its innovation role (Zahler et al, 2012).<sup>31</sup>

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<sup>31</sup> In general terms, the structure adopted by CORFO over the years can be summarized in four different roles, which correspond to separate departments or *gerencias*: (i) the provision of subsidized services to the SMEs (Gerencia de Fomento, where the instruments used are the Technical Assistance Fund (FAT), Associative Development Programs (PROFO), Suppliers Development Program (PDP), Quality

As in the previous sections, we first review horizontal industrial policies and then vertical ones. In each case, we examine both those policies that were successful, as well as those that were unsuccessful.

### **6.3.1 Successful Vertical Policies.**

#### **Creation of the Technological Institute of Salmon (1994)**

The Technological Institute of Salmon (INTESAL) established in 1994 by the Salmon Industry Association (SalmonChile) and the government, through CORFO's technological transfer programs. It was oriented to design and disseminate food safety and quality control in salmon production. INTESAL investigates the technological needs of the salmon industry and by providing assistance in sanitary and quality control. INTESAL also implemented studies aimed at assessing the impact of the industry on the environment and on salmon diseases. The Institute also acted as a training institution by giving training to salmon industry workers. (UNCTAD, 2006)

This institute was created because Chilean hatcheries originally relied mainly on imported salmon eggs. As documented by Montero (2004), during 1991 nearly 51 million units of salmon eggs had been imported, the number increased considerably to 62 million units in 1992, followed by 73 million in 1993, and 114 million during 1994. However, during 1995, nearly 40% of salmon eggs used for farming (74 million units) were produced in Chile. This showed the growing importance of national salmon egg production as it helped reducing costs and mitigate the import of contagious microorganisms. During 2000, the Chilean fishing agency (Subsecretaria de Pesca) prohibited the import of salmon eggs from countries where cases of infectious anemia (ISA) had been suspected or detected. This ban

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Promotion (FOCAL), etc.); (ii) investment promotion, of which information-technology-related services are the most interesting; (iii) a number of innovation subsidies, ran through a special committee (*Innova Chile*); and (iv) financial programs aimed at providing long-term capital to SMEs (*Financial Intermediation Management*) (Agosin et al 2006).

provided a boost to the development of domestic salmon egg production. Despite the fact that local research and development in biotechnology and disease control in the hatchery phase has not been sufficient, some significant efforts have been made, mostly in quality control and the management of waste.

### **Irrigation Policy (1992)**

In 1992, the Ministry of Public Infrastructure carried out the Rehabilitation and Construction Program for Small- and Medium-Scale Irrigation Schemes (PROMM), investing more than \$100 million US. Thirty-five percent of the budget financed the development of agricultural projects of 55, 000 irrigated hectares, as well as the 105,000 hectares that are expected to increase their safety. Combined with the extension of the Law 18,450, these programs increased the benefits for small agricultural firms.

One of the most significant measures undertaken was medium- and large-sized irrigation projects, together with subsidies for field irrigation projects, which thereby improved the availability of funding for small farmers.

### **Agriculture**

The resources of INDAP, the main agricultural institution dedicated to small-scale agriculture, have increased by a factor of 2.6 since 1990, and represent more than 50% of the budget of the Ministry of Agriculture.

A program for soil recovery was launched in 1993 by INIA and the Ministry of Agriculture for the XI and XII regions. Over decades, soil use without fertilizers generated large areas of erosion. This policy consisted of a 40% subsidy of fertilizer costs. In the first four years of operation, more than 35 US million have been spent, with a positive yet insufficient improvement if we expect a medium term impact (Portilla, 2000).

### **Attraction of Foreign Direct Investment (FDI) (2000)**

As pointed out by Zahler *et al.* (2012), this was the first formal vertical industrial policy in Chile following the military regime. This program was launched by CORFO to attract FDI. It was aimed at the information and communication technologies (ICT) sector. The program has three main goals. First, it seeks to promote the country as an attractive location. Second, it assists potential investors in obtaining permits, and other requirements etc. Third, it grants several subsidies to investing firms. The following areas fall as potential beneficiaries: software and hardware production; services intensive in ICT, e.g., call centers and business process services, business off-shore process; production and dissemination of multimedia contents; biotechnology and pharmaceutical products; and the production of new materials.

As pointed out by Agosin *et al.* (2010), the results of this program are quite promising. By 2010, 70 firms had benefited from subsidies and 37 had received. Consequently, recorded service exports of the promoted firms have risen to nearly over \$168 million US. To date there has not been any assessment on the impact of the program. Therefore, it is not possible to determine whether the program has been successful at least with econometric techniques. Nonetheless, according to Agosin *et al.* (2010), the results seem impressive considering that the resources spent have been very modest.

### **6.3.2 Unsuccessful Horizontal Policies.**

#### **Creation of FONDEF (1991)**

The Scientific and Technological Development Fund (FONDEF) was created in 1991 to strengthen the scientific and technological capabilities of universities, technological firms, and other institutes aimed at increasing the competitiveness of firms.

Between the years 1991 and 2006, FONDEF invested more than \$146 million US in the development of projects of national impact through its research and technological transfer, creating effective linkages between universities, technological institutes, and firms (FONDEF website, 2012).



## **Training Policy**

In October 1997, the government granted a multi-sectoral tax incentive for those firms that invest in training. With Law 19,518, firms can invest up to 1% of the yearly salary in training, or 9 UTM in the case that 1% is less than this amount and the yearly salary does not exceed 45 UTM (CM).

Given the tax rebate does not benefit small firms, in 1998 the government launched the National Training Fund (FONCAP), to extend direct subsidies to micro and small enterprises along with scholarships and special programs for youngsters. This program demonstrates the government's recognition of the current system's inefficiencies in addressing small firms. However, by 1999, the funds devoted to this area were only 3.8% of total public funds spent on the SENCE programs, while the tax rebate represented 75.9% of the total. In the absence of sufficient and reliable records for SMEs, together with the fact that in most small-scale firms there are few workers, it becomes extremely difficult to assess the relative success of this program. Nonetheless, according to a study carried out by the Universidad de Chile (2003) in which a large amount of data was collected from beneficiary firms of FONCAP using treatment and control groups, there is a statistically significant relationship in relation to the average revenues and utilities obtained after training.<sup>32</sup>

## **PDP (1998)**

The Suppliers Development Program (PDP) was created in 1998 and operational regulations were incorporated in 2000. The objective of this instrument is to support the evaluation, development and execution of projects between firms, with the goal of improving the quality and productivity of small sized suppliers. In this sense, the idea is to

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<sup>32</sup> The current training system was established by Law 19,518 (1997) and Law 19,765 (2001) and establishes that the State devotes resources to SENCE in order to finance FONCAP, which funds public training programs administered by SERCOTEC. Firms hire training institutions and get a tax discount of up to 1% of the total amount spent on salaries. The firms in charge of organizing collective training programs are the Technical Organisms for Training (OTIC). These bodies plan and hire training services from training institutions (OTEC) to meet the collective needs of their adherent firms.

increase competitiveness in national production chains through the creation and consolidation of sub-contractual relations between firms and their small-scale suppliers, enabling specialization in production and a mutually beneficial relationship for both firms and suppliers.

The assessment of this instrument by the Ministry of Economy shows that it has had positive effects in the sales values of the firms, particularly for manufacturing and retail firms. However, there have not yet been any significant effects on the primary sector.

### **PREMEX (1997)**

The Support Program for the Management of Export Firms (PREMEX) is an instrument used by CORFO to target SMEs, with the objective of promoting the exporting capacity of manufacturing firms and computational programs. PREMEX co-finances the hiring of high level consultants for the evaluation, design, and introduction of improvements in business administration to increase the efficiency of the productive and planning processes, the quality of products, and to optimize information systems in order to boost the mechanization of processes. PREMEX was discontinued because authorities feared that it could be considered incompatible with the norms of the WTO (Macario, 1998).

### **PI (2000)**

The Pre-investment Program (PI) supports pre-investment studies with the goal that firms can make the best decisions regarding a number of investment alternatives that can be identified and assessed technologically, economically, and financially. This instrument is composed of six areas: (i) Environment (2000), (ii) Irrigation (2001), (iii) Movie industry (2005), (iv) Small-scale fishing projects (2006), (v) Non-conventional renewable energies (2006). While this instrument has become broader in its coverage, as well as in the areas involved, the effects of this instrument are still inconclusive.

### **FOGAPE (2000)**

The Guarantee Fund for Small Businesses (FOGAPE) created in 2000, is aimed to guarantee a minimum percentage of credit that public or private financial institutions grant to Micro- and small-enterprises (MSEs), small exporters and small associations of businesses. Most MSEs do not typically have proper access to credit to operate. This happens because MSEs either are not able to post collateral or do not have a track record of timely payments (Agosin et al, 2006). Indeed, this has been considered one of the most important constraints for small businesses. While SERCOTEC and CORFO both have loan programs for small businesses and in particular SERCOTEC grants subsidized loans for the MSEs, the most important is FOGAPE, which is run as a separate entity through BancoEstado.

As we can see, FOGAPE is clearly a horizontal instrument. Thus, it encourages lending to clients that are screened by banks and regulators and considered as risky and without sufficient collateral. A number of studies have assessed the design of this instrument in order to determine the sources of its success. According to their findings, the apparent success of FOGAPE does not come from its ability to deal with asymmetric information neither from supervising the lending activity of banks, but rather the opposite. This is so, because it encourages banks to as if they were bearing the cost of making a bad loan and thus excluding them from future auctions if the deficit rates are too high (Benavente *et al.*, 2006). FOGAPE has also been subject to criticism in that it is run by *BancoEstado*, which is another bidder for funds. This has raised serious concerns on conflict of interests and the allocation of funds by *BancoEstado*. Moreover, there is a similar program ran by CORFO, the Investment Guarantee Fund (FOGAIN), which is addressed to firms that do not qualify for FOGAPE. (Agosin *et al.*, 2010)

#### **FOCAL (2004)**

The Quality Promotion program was created in 2004 and its main objective is to support firms in improving quality and productivity through specialized consultancy projects meant to integrate systems or management standards with performance assessments that can be certified or verifiable.

The advantage of using this instrument is that, as opposed to other instruments such as the FAT, FOCAL is a model of technical assistance that is highly standardized that allows for the verification of final results. In recent studies of the Ministry of Economy that analyze the impact of this instrument, the users' assessment has been quite positive. To be specific, users highlight the fact that it generates processes that translate into a certification that can be valued by the market. The success of this instrument is not limited to subjective opinions the Ministry of Economy has also performed quantitative analysis. They found that according to the so-called average treatment effect (ATE), the use of this instrument has positive effects on revenue, sales value, and margin indicators. These effects are strongest in the manufacturing and service sectors (Ministry of Economy, 2011).

### **PEL (2007)**

The Local Entrepreneurship Program was established with the idea of strengthening local entrepreneurs' management skills through the development of skills and capabilities, as well as investment co-financing that provides access to new business opportunities or enables them to maintain their existing businesses. A PEL could be formed by one or more projects including 20 to 25 entrepreneurs.

In 2007 and 2008, most projects were concentrated in Valparaiso and Antofagasta, 20.3% and 14.5%, respectively. The regions with the lowest number of projects were Tarapaca and Los Rios, both with only 4.3% of the total. In general terms, out of the 69 programs implemented, 95% were in the North and Central zones of the country, and the only projects carried out in the south were in Los Rios. These projects will be assessed in the future, after they have matured.

### **The National Cluster Program (2007)**

During the government of President Bachelet, great attention was given to the development of regional production clusters. This crystallized into the National Cluster Program, coordinated by INNOVA. The program was developed with the consultation of

independent experts<sup>33</sup> who looked for sectors with high potential. After assessing a number of sectors conducive to development, the government selected: (i) Global Services, (ii) Special Interest Tourism, (iii) Mining, (iv) Agriculture, and (v) Aquaculture. These sectors were then analyzed in depth in order to identify potential gaps and bottlenecks that could be addressed by policy intervention. In a third stage, a number of actions were set up to promote these industries, in which the government coordinated different institutions to address these bottlenecks. Once these constraints were solved, the expectation was that increases in efficiency, productivity, and competitiveness would follow (See Zahler *et al.*, 2012).

### **Technology Consortia for Innovation (2007)**

CORFO also participated in the Technology Consortia Program. The program is created to bring together the innovation efforts of the private sector and increase their collaboration with universities. The program was launched as an initiative of the Bicentennial Program of Science and Technology (PBCT), a World Bank program that provided the Chilean government with technical assistance and a loan (matched by the government) to fund these types of programs. The goal was to develop firms with the capability of developing cutting edge research, relevant to their sectors of production, and provide new insights (positive externalities) that could enhance the competitiveness of the sector (Ramirez *et al.*, 2008). The program represented about half of the resources of PBCT (Zahler *et al.*, 2012).

### **Innovation Policy**

#### **SERCOTEC**

In late 1980s and early 1990s, SERCOTEC initiated a phase of changes to its management structure that weakened its capacity for action. This continued until the arrival of the new democratic government. Political changes also redefined the institutional mission of SERCOTEC, which is to contribute to the development of SMI by creating a modern entrepreneurial culture through innovation and the development of appropriate conditions.

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<sup>33</sup> Boston Consulting Group.

The trajectory of interventions implies that the goals of this mission are: (i) to improve environmental conditions, emphasizing the creation and/or development of a sector service market; (ii) to change the thinking of the players; and (iii) to support the production chain, stressing the local and regional dimension. As can be clearly seen from this mission, the new administration strongly emphasized instruments that promote associativity and the joint actions of firms (Molsalves, 2002).

### **Innovation Programs (PCT, 1992-1995; PIT, 1996-2000; PDIT, 2001-2004)**

After the Science and Technology Program (PCT), which operated between 1992 and 1995, the Technological Innovation Program (PIT) was launched, lasting from 1996 to 2000. Then, in 2001, the Development and Technological Innovation Program (PDIT) was established, lasting until 2004.

PDIT was explicitly oriented towards the promotion of innovation in a number of important sectors for Chile, namely forestry and agricultural biotechnology, information technology and communication, and clean technologies. It instituted a prospective fund (initiated in July 2001) designed to identify and prioritize long-term national development in technology and production. It was also the first explicit policy measure aimed at small enterprises. However, none of the lines of promotion in the program's statutes were explicit regarding the creation of specialized instruments targeted exclusively at the technological development of SMEs. FONTEC is the only fund whose purpose was technological innovation for SMEs, despite the fact that it is not explicitly for SMEs.

FONTEC was created in 1991 and was financed by the IADB and the Ministry of Finance. It is an institution dependent on CORFO whose objective is to promote, orient, finance, and co-finance the execution of technological innovation projects. These include associative technological transfers, general implementation of technological infrastructure, and supporting all stages of the development of projects rooted in an innovative process, and carried out by productive firms of goods and services. By 2002, this program had been

assessed by independent consulting firms twice.<sup>34</sup> While the results do not yield themselves to straightforward comparison, in both cases, the assessment has been positive. The first indicated that until 1995, every peso invested generated a fiscal revenue of 8 pesos (through VAT). Meanwhile, the assessment of 1998 concluded that the 15 most successful projects would be able to fund the entire operation throughout its history (Dini and Stumpo, 2002).

### **Creation of the National Innovation Council for Competitiveness (CNIC INNOVA, 2005)**

The period between 2003 and 2006 was very important for innovation policy. A mining royalty was legally passed, whereby all of proceeds would be devoted to innovation programs. Around 25% of funding would be directly allocated to regional governments for innovation programs. This led to the creation of CNIC (Consejo Nacional de Innovación para la Competitividad), a national council for managing these new resources, established in 2005 by presidential decree. Although it had more limited faculties than initially thought, the CNIC is in charge of elaborating innovation strategies by proposing how to spend available resources and also by giving general guidelines on public spending on science and technology.

Before the creation of the CNIC, key loans were made by international institutions to enhance firm innovation, their connection to science and basic research, and to enhance the quality of applied university research. Three programs began with such loans: The Millennium Scientific Initiative (MIDEPLAN) with a World Bank loan, the CORFO-affiliated Chile Innova program with an IADB loan, and the CONICYT-affiliated Bicentennial Program for Science and Technology (PBCT) with a World Bank loan (Zahler *et al.*, 2012).

### **6.3.3 Unsuccessful Horizontal Policies.**

#### **FAT (1992)**

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<sup>34</sup> Gerens (1998) and INVERTEC (1995).

The Technical Assistance Fund (FAT) incorporated, through specialized consultancies, technical management for firm operations and new technologies for productive processes, enabling firms to improve their competitiveness. The FAT co-finances the hiring of small and medium firms which constitute specialized consultancies in areas such as finance design, productive processes, merchandising, marketing, and strategic planning, among others (Dini and Stumpo, 2002). By 2006, the use of this instrument was restricted to information and clean technology. Recent studies assessing the impact of this instrument were carried out by the Ministry of Economy using treatment and control firm groups.<sup>35</sup> The studies found that the effects of this instrument are not statistically significant for practically none of the cases studied, with the exception of a weakly significant increase of sales by firms of about 500 UF per year.<sup>36</sup> Hence, there is no significant impact either on a number of firm indicators (revenues, value of sales, number of employees, average salary of employees, average productivity and costs, and commercialization margins), or by sector (raw material, manufacturing, and services).

### **Integrated Territorial Program (2000)**

According to Zahler *et al.* (2012), this is the first policy that tried to organize production clusters in specific geographical locations. The main goal of this instrument is to support the coordination and direction of projects related to entrepreneurial development, oriented to improving competitiveness in a certain territory/geographical location.

This program organized several mini-clusters, starting with a pilot program for lamb in Magallanes. Basically, the idea of concentrating around a specific sector was aimed to create synergy between the actors involved, therefore having a larger impact in a given industry.

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<sup>35</sup> Evaluación de Impacto – Programas de Fomento de CORFO. Ministerio de Economía, 2011.

<sup>36</sup> It is also worthwhile to note that these results could be partially due to the short sample period between the technical support provided and its subsequent impact assessment, with the effect that it might be difficult to pick up on the potential changes in firms. However, as pointed out by Monsalves (2002) and Dini and Stumpo (2002), there is also a quality problem in consultancies developed through this instrument. This is partly due to the lack of an “effective counterpart” in the firms involved and, on the other hand, the “lack of available resources per consultancy” that prevents the hiring of high-level consultants.



A concrete example of these policies was the creation of a Tourism PTI in Arica, where a number of strategic alliances were made between different members of the production chain.<sup>37</sup> Another was the creation of a fruit cluster in the Region of Valparaiso oriented towards uniting an objective population of medium-sized agricultural producers. In similar studies by the Ministry of Economy, for both cases there are positive changes in the networks sustaining the cluster. There is a decrease in the centrality of the firms involved and the number of firms increased as well as their interactions. Neither of the studies recognized that the effects on the impact indicators within firms are not observed. That is a positive change seen at a local level, which in the present time, still does not generate changes in the profitability of private entrepreneurs (Ministry of Economy, 2011).

### **PROFO (1992)**

The Associative Development Programs (PROFO) is a subsidy to finance collective projects for small and medium enterprises. It is designed to improve competitiveness for groups of firms that are willing to involve in collective actions aimed at solving management and merchandising problems, which because of their very nature or magnitude, may be tackled more efficiently as a group. During the last quarter of 1993 and the first of 1994, CORFO established an agreement with the Manufacturing Exporters Association (ASEXMA) for the management of these projects, with CORFO in the role of private intermediary. During 2004, this instrument was restructured, leading to a new model with new requirements and stages. As in previous cases, the assessment of these instruments has been analyzed by the Ministry of Economy (2011), which found negative results. For the primary sector, the PROFO instruments have not had any statistically significant positive effect on the indicators used (revenues, value of sales, number of employees, average salary of employees, average productivity and costs, and commercialization margins) or by sector

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<sup>37</sup> In collaboration with a number of institutions such as the National Forest Corporation of Chile (CONAF), the National Tourism Service (SERNATUR), the National Indigenous Development Corporation (CONADI), the Ministry of Public Infrastructure (MOP), ChileCalifica, the Municipality of Arica, the Agricultural Development Institute (INDAP), the National Training and Employment Service (SENCE).

(raw material, manufacturing, and services). The effects of these instruments are even negative in the case of the average worker productivity of UF 56 per year.<sup>38</sup>

## **Section 7.**

### **7.1 Tentative Evaluation of Industrial Policy in Chile over the Last Century.**

In this section, we develop a tentative analysis of industrial policy in Chile by using simple rules to classify policies as successful, unsuccessful, and uncertain. We consider a policy to be successful if the sector has developed significantly during the past decades and, in case the policy was discontinued, we assess whether this led to the creation of a new sector or new firms that were competitive once the policy had been discontinued. This includes firms that were privatized and those that were state-owned that still exist and have been able to survive without public support, as has been the mostly the case since 1973 until today. We understand that, in many cases, the policy was not designed with a privatization process in mind; however, given the new environment that emerged after the Washington Consensus, this is an appropriate test of these initiatives. This category will include projects such as LAN, the formerly national airline that was privatized and then merged with TAM from Brazil, forming one of the largest international airlines.

By the same token, we classify as unsuccessful those policies that caused the sector, industry, or firms to disappear or require additional public support through new programs or resources. In this category, we include efforts to develop an automobile industry and agricultural machinery. We classify as uncertain those policies that might or might not have affected the development of a sector and those lacking sufficient data. This category includes many SME policies.

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<sup>38</sup> The lack of significant results can be due to a number of reasons, such as the short average duration of the PROFOS, i.e. when the intervention tends to be less than three years. This shows that the consolidation of the associative experience in the development stage is very limited. In addition, a number of interviews carried out by the Ministry of Economy with users of this instrument have found that there is a certain aversion to the development of associative projects. Hence, these factors can explain the insignificant and negative results.

Tables 7-10 show successful, failed, and uncertain vertical policies while Tables 11-14 show horizontal policies

Table 7 covers the period from 1927-1956, and we classify many initiatives as successful, including the mining industry and its support institutions that are still functioning today as the Ministry of Mining, copper manufacturing firms, and IANSA. Furthermore, a handful of initiatives related to supporting the development of the forestry sector are seen as successful. We consider unsuccessful the SEAM that corresponds to the agricultural machines service, firms to produce tractors, and some fishing firms, among others. Meanwhile, certain mining initiatives and agricultural development funds, as well as the creation of SERCOTEC are considered to be uncertain.

Table 8 summarizes the period from 1956-1973, and in this table we classify many initiatives related to agricultural sectors as successful policies, including the fruit sector, the Chile-California initiative aimed to develop human capital in agriculture, forestry and animal science, support to some initiatives in the forestry sector, etc. Some of the policies that we deemed as unsuccessful were the support to coal mining that was eliminated definitively during the 1990s and that most likely would not have survived market forces much before that. Two other policies we consider to be unsuccessful were the creation of the electronic industry commission, given that today it is an almost non existing sector in Chile, some fishing initiatives, etc. Uncertain we consider some agricultural support initiatives during this period.

Table 9 represents the period from 1973-1990, and, as it demonstrates, many initiatives related to agricultural sectors were assessed as successful policies. The same is true of many forestry sector development initiatives, the tax credit to the industry, the creation of *Fundación Chile* and their efforts in the salmon industry, some fruit industry support programs, the creation of CODELCO, which is today one of the largest copper producers of the world, etc. The unsuccessful policies were support programs to traditional livestock, support to coal mining, and some traditional agriculture price bands. The policies that we considered to be uncertain were the copper mining law that did not establish any royalties whatsoever for mining activities, SERCOTEC reform, and SMEs initiatives.

Table 10 outlines the period from 1990-2012, and, as demonstrated, two of the most successful policies are the possibility for CODELCO to develop joint ventures and the development of a lamb program in Magallanes, as it is one of the most important economic activities in the region. The results of the FDI attraction program are also very promising. During this period, there were no policies that we consider to be unequivocally unsuccessful; however, some of the agricultural programs are categorized as uncertain.

Table 11 lists the horizontal policies in the period from 1927-1956. Many initiatives regarding energy policy, particularly electricity and oil extraction, are assessed to be successful policies. ENDESA was the public electricity provider became one the most important regional electricity producers after it was privatized in the 1990s. On the other hand, ENAP is still the major petroleum refiner in the country. We also designate initiatives that support LAN as successful. Failed policies were those related to the merchant navy and the railroad network that is, even today, a heavily subsidized company. The SERCOTEC industrial engineering program is considered to be uncertain.

Table 12 documents the horizontal policies of the period from 1956-1973 and, as it demonstrates, several policy initiatives are determined to be successful. This is the case for ENDESA and ENAP, the creation of INACAP, the national training institute that was subsequently transferred to the private sector and transformed into the largest educational institution in Chile. One technical support initiative was considered to be a failure, and the simplified drawback created by Frei's government was voted to be uncertain.

Table 13 covers the period from 1973-1990, and INACAP is the only initiative declared to be successful. Failures included some initiatives subsidizing job training, an activity that has never been an important characteristic of the labor market in Chile, and that has been heavily questioned during the current government. The outcomes of SERCOTEC initiatives are defined as uncertain.

Table 14 corresponds to the period from 1990-2012, in which several successful horizontal policies were carried out. Among those were INNOVA Corfo and the National Cluster Program (see section 6.3.2), the creation of FONDEF to support applied research for firms (Preliminary results from Alvarez, Benavente and Crespi (2012) indicate that this program had a significant impact), the creation of CNIC (Consejo Nacional de Innovación para la Competitividad), etc. Different initiatives to strengthen on-the-job training were considered to be unsuccessful programs. The FDI attraction program launched by CORFO in 2000 stands out for the promising nature of its results, as also do some other CORFO programs.<sup>39</sup>

## **7.2 Main Chilean Export Sectors and Products through the Historical Lens of Industrial Policy.**

Throughout the 20<sup>th</sup> and 21<sup>st</sup> centuries, Chile has shown a high and persistent degree of export concentration. During the beginning of the 20<sup>th</sup> century, the nitrates boom created Chile's export industry. However, even before the collapse of the nitrates industry, Chile was already developing what would become its main exporting product for most of the 20<sup>th</sup> century: copper.

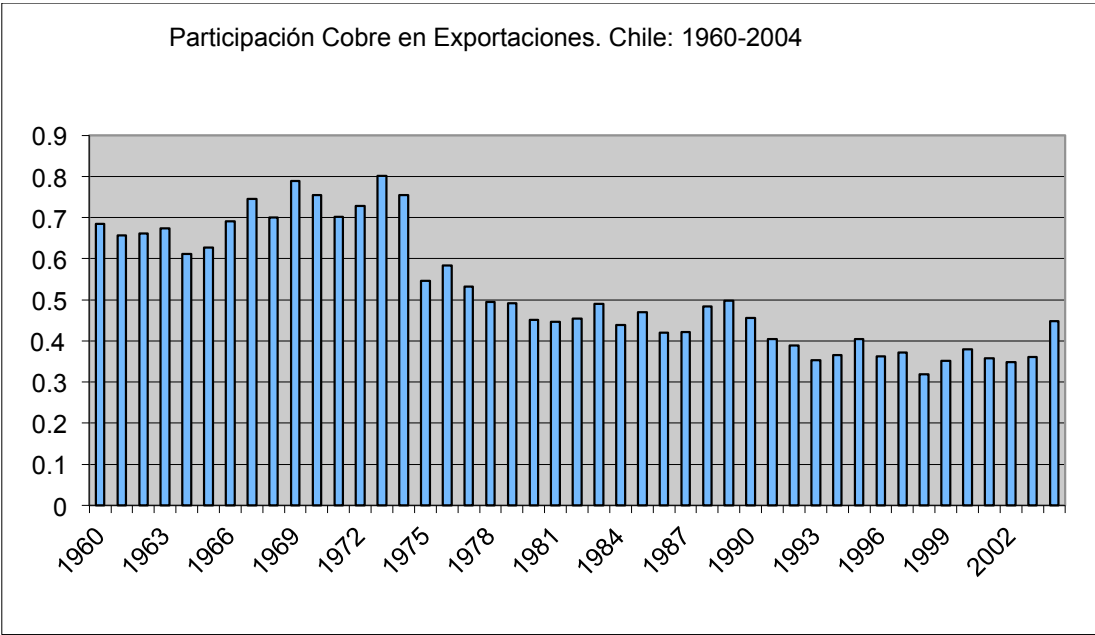
Given the existence of import tariffs acting as export taxes, the Chilean exporting sector was hindered by import substitution industrialization policies during the 20<sup>th</sup> century. Thus, the export composition was, for a significant period of time, close to that of a mono-exporter. In particular, copper exports reached almost 80% on share of total exports during the zenith of the ISI. Graph 2 shows the evolution of copper exports during the past 50 years. With the exception of part of the 1980s and most of the 1990s, copper has always represented 50% of total exports. Even at its nadir in the 1990s, copper was still 30% of exports.

This tendency to mono-export has, without any doubt, contributed to macroeconomic volatility for Chile. However, despite recent evidence that export

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<sup>39</sup> Developed in further detail in section 7.3.2.

concentration can be detrimental for long-term growth (see Lederman and Maloney, 2006), Chile has not systematically tried to diversify its export bundle. The one exception was the military government of General Pinochet, with a number of government officials who were vocal about the importance of a depreciated real exchange rate, including Pinochet himself in a 1976 speech (Lederman, 2005): “We shall continue to encourage non-traditional exports....The Minister of Finance will announce the manner in which the exchange rate shall be established in order to guarantee a viable and permanent value for foreign currency.” In addition to the exchange rate policy, the redesign of the simplified drawback, together with the creation of export promoting institutions and programs such as ProChile and SERCOTEC’s export promotion programs are also noteworthy.



Since the return to democracy, there have been mixed signals on whether the Chilean government cares about export diversification. Indeed, the simplified drawback was retired and no other instrument was created to play the same role. By the same token, despite the mixed evidence regarding the role of capital controls on exchange rates, these were reduced to zero during the 1990s. However, institutions such as ProChile still exist, and some export promotion programs have been created. Moreover, the Central Bank has

lately intervened the dollar market to avoid further appreciation of the peso as consequence of the recent boom of natural resources exports.

Table 15 shows the main industrial export sectors based on a list of 8-digit classifications grouped at the level of industry representing the main 100 products. During 2010, total exports reached \$71 billion US. Regarding export composition, we observe the dominance of the mining sector, which constitutes nearly two-thirds of Chilean exports. The next largest is forestry pulp and paper, although its share is significantly less than that of mining, with 6% of Chilean exports, or approximately one tenth of the mining share. Fruit is the next sector, with 4%; then salmon and trout and wine, with 2% of the export market each. Finally, fishmeal consists of 1% of exports.

Table 16 shows the first 16 categories of products grouped by the first 100 products used for constructing Table 7. We observe that copper is 58% of exports, followed by wood pulp at 3%, and lumber, molybdenum, grapes, wine, and iron at 2%. Gold, salmon, trout, berries, apples, potassium including nitrates, fishmeal, paper related products, and iodine represents 1%.

If we look at the sectors from Table 15 and recall the initiatives implemented throughout the 20<sup>th</sup> century, we find that all these sectors have had at least one industrial policy. If we look at the level of the products from Table 16, all of the products – copper, wood pulp, lumber, iron, salmon and trout, berries, fishmeal, and paper – all had some sort of direct policy aimed at fostering their development. Indirect policies affected grapes, wine, and apples. To the best of our knowledge, among the top 16 categories of products, only molybdenum, potassium products, and iodine were not directly or indirectly affected by industrial policies,

The fact that most of the products from Table 16 were subject to some sort of industrial policies is a surprising result. In the next section, we briefly discuss the main industrial policies implemented for the following eight categories of products: copper, forestry, pulp, paper, fruits, berries, salmon, and trout.

Finally, we discuss Agosin, Larrain and Grau's (2009) results on the simplified drawback.

## **Section 8: Case Studies and Policy Evaluations.**

### **8.1 Evaluation of Key Vertical Policies.**

#### **8.1.1 Copper.**

In the following paragraphs, we describe the main reforms that have affected the copper mining industry since the 1960s.

##### *Nationalization*

During the 1960s and part of the 1970s, Chile made significant efforts to develop large-scale copper mining. Without any doubt, the most significant effort was the "Chilenization" process initiated in the 1960s.

After being in office only one month, the PU government initiated a constitutional reform to nationalize the LSCM industry. The Congress unanimously approved nationalization in July of 1971. The constitutional decree of nationalization established that the State was the only owner (with exclusive and absolute control) of all minerals and automatically nullified all the contracts previously established for the LSCM industry. This generated reprisals from the U.S. government, including seizing CODELCO's bank accounts in the U.S., impeding CODELCO from acquiring inputs and spare parts in the U.S., and interfering in the ability of the U.S. to obtain them from other countries. Another consequence of the Chileanization of copper was the outflow of more than 150 technicians and supervisors from the LSCM industry, as a result of job offers in Anaconda and Kennecott in other countries. Moreover, the industry was shunned by public and private banks in the U.S. as well as by multilateral organizations, and there were problems of confiscation associated with the commercialization of copper.



During the 1960s, the LSCM industry was mostly controlled by the private sector, in particular by foreign companies, and had an average growth rate for copper production was 1.2% per year. The process of Chilenization (Law 16,425, January 1966) entailed a switch to majority ownership by the State. During the 1970s and 1980s, the LSCM industry had an average growth rate close to 4% per year under the control of CODELCO. However, during the 1990s, CODELCO achieved an average growth rate of 2.4% per year, while the largest private companies reached the impressively high average growth rate of 30.3% per year.

Meller (2003) offers an interesting analysis of these effects. He uses a set of regressions in order to study the structural changes in the evolving pattern of Chilean copper production during 1960-2000. He considered three different periods: the 1960s (1960-1971), the 1970s and 1980s (1972-1990), and the 1990s (1991-2000). The regressions were applied to CODELCO, the LSCM industry, and total Chilean copper production overall. There are two interesting cases to consider: first, the effects of the nationalization of copper in 1971; and second, the effects of the enormous private investments in the 1990s.

Meller (2003) finds that nationalization generated a clear structural change in the production patterns of the LSCM industry. He examines what happened to the evolutionary pattern of what might be called the "historical LSCM," industry, which existed privately pre-1971 and then as CODELCO. One of the two dummy variables of the regressions,  $\delta_1$  (value of 1 for the 1970s and 1980s, 0 otherwise) is statistically significant for the constant and time trend. The result is much weaker in the case of other  $\delta_2$  dummy variables (value of 1 for the 1990s, 0 otherwise). Results obtained after applying a Chow test for structural break in the three periods (1960-71, 1972-89, 1990-2000) yielded an F-test of 3.334 and the maximum logarithmic likelihood ratio is 19.92; both have a statistical significance level of 1%. Therefore, the null hypothesis that there were not any structural changes can be rejected as 99%. In short, the nationalization of the "historical LSCM" industry substantially raised the rate of copper production.

In the case of private, mostly foreign investment, the 1990s show that there was a new change in the pattern of evolution of copper mining. In the dummy variable regressions for the 1990s, the  $\delta^2$  t-statistics is quite high for both constant and trend, the t-statistics fluctuate around 6.2. The Chow test provides an F-statistic of 5.213 and a maximum logarithmic likelihood ratio of 27.90, both significant at 1%. Similar to the previous case, foreign investment generated a structural break in the level and growth rate of copper production in the 1990s.

#### *The Creation of the Foreign Investment Statute (1974)*

The Decree Law 600, passed in 1974 (Mayorga and Montt, 1993; Lagos, 1996), stated three main points: the non-discrimination between foreign investors and national investors, whenever this did not involve the obtainment of credit facilities from national agencies; open access to any economic sector; and limited government interference in investment activities.

According to Lagos (1997), the Decree Law 600, was not solely aimed at boosting mining as the leading foreign investment at the beginning of the 1980s. Indeed, the boom in mining started in 1987 when foreign capitals invested in the Escondida mine, which started to produce in 1990-1991. Lagos (1997) states that after the return to democracy in 1990, there was an inflow of foreign investment in the mining sector. The investment in Escondida was the first large foreign investment in the sector and paved the way for further investments in the sector as it helped for the international approval of the Chilean economic model by giving assurance to foreign investors, with clear and sound rules, that expropriation risk were non-existent.

#### *The creation of CODELCO (1976)*

One of the most important initiatives during the military government was the creation of CODELCO in 1976, by merging the nationalized mines Chuquibambilla, Exotica, El Salvador, Andina, and El Teniente into one mining complex. The company is known as

the “Gran Minería del Cobre,”<sup>40</sup> since it was fully nationalized in 1971 when it was the largest copper-mining company in the world. With the passage of Decree Law 1,167 in 1976, CODELCO officially became the property of the State.

From its beginning, CODELCO had specific mandates regarding production quotas, and hence investment, costs reduction and productivity increases. In this context, it was not a very flexible institution. Nonetheless, in 1981, the company was allowed to become more flexible for acquiring external credits and developed long-term strategies to maintain its share of the market (Gana, 1988). As a consequence of this, CODELCO increased production drastically during the years 1976, in 1982 and again in 1989, by doubling its production in 13 years.

Further efforts were made by CODELCO to secure its growth. Since the enactment of Law 19,137 in 1992, the company could associate with privates to explore and exploit mineral deposits.

According to Lagos (1997), the reason why CODELCO never really had an active role reflected in an aggressive production development strategy, was simply due to the fact that it never had the political support to do so. However, in 1996, political arguments about privatization precluded CODELCO from authorizing the decentralization of operations and or the quest for additional profitable activities

#### *Copper and the Law on Mining Concessions (1982)*

The constitution of 1980 dictates the full and exclusive governmental ownership of mineral deposits, further reinforcing what it was stipulated in Law 17,450 of 1971 which nationalized copper mining. The Law on Mining Concessions of 1982 has constitutional character, that is, it would require three-fifths of Parliament to change it. It stated that the government had the faculty to grant exploration or an exploitation permit to an individual person or company. These permits are granted by court and entitle the person or entity to

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<sup>40</sup> The “Copper Mining Giant”

seize all the minerals or permitted substances within the limits of the concession. More specifically, the duration of this permit is four years; while the exploitation permit is indefinite as long as a yearly mining patent is paid. This concession is independent from ownership of the land. For example, if a gold deposit is found on a farm, the mineral deposits could be appropriated by anyone holding the concession, not necessarily the owner of the land. This has led to a number of litigations in court, but generally, the owner of the land is compensated by any potential negative externality the mine would cause to the original productive use of the land. In addition, these mining permits can be sold in the market, which incentivizes further mining exploration.

Thus, the Law of Mining Concessions of 1982 incentivized foreign investment in mining. In practice, the mining law overrode the constitutional clause that all mines are owned exclusively by the State (Gana, 1988). Through this, multinational mining companies were assured of their effective ownership of the mine, and that the recent nationalization of copper would not affect that ownership. It also established a clear compensation scheme in case of eventual expropriation; stable rules stemming from legal constitutional character; and freedom for companies to take their decisions regarding strategies development and other business activities.

### **8.1.2 Agriculture and forestry.**

It is interesting that the subsectors of fruit and forestry jointly represent two thirds of agricultural exports, and that the State played an important role in starting both subsectors. A CORFO fruit development plan was carried out at the end of the 1960s; additionally the University of Chile and INIA developed activities for sectoral training, specifically human capital. Meanwhile in the case of forestry, the sector has had industrial policies since the 1930s, and had one of the most significant and successful policies during the last century – the forest plantation subsidy initiated in 1976. By 1996, this subsidy had cost the State \$160 million US overall (Rossi, 1996). Thus, the yearly cost was tiny for a sector that today exports around \$5 billion US per year (Agosin *et al.*, 2010).

The programs that were focused on the fruit and forestry sectors will be summarized in the following paragraphs.

### *Land Reform*

Chile's agricultural sector was greatly controversial by the end of 1950s and early 1960s. Land ownership was concentrated, which also concentrated political and economic power (CIDA, Barraclough 1973). Agricultural production grew slowly, creating a rising agricultural trade deficit and kept many rural workers in poverty (Valdes, 1973). There were two reforms launched to address these issues during the Frei's administration. First, the land reform was aimed to improve land administration and increase equity and development (Kaufman, 1972). Second, there was a price and trade reforms aimed to increase the openness of the economy, lower the implicit tax on agricultural products associated to import substituting policies (Echeverria, 1972)..

Although land reform was initiated during the Eduardo Frei's administration, was the Allende administration (1970-73) that implemented the major part of the land expropriation. Under Augusto Pinochet (1974- 1989) only a part of the previously expropriated lands were restored to former owners.

In a very interesting paper, Jarvis *et al.* (2004) assess the effects of land reform.. They postulate that the Chilean agriculture was modernized since mid-60s, although it only became visible in the mid-80s.

Land reform was aimed to incentivize agricultural development and improve the administration of farms. This was achieved by shifting ownership from large "haciendas" to small owners that were the permanent rural labor force (Kaufman 1972). While the expropriation process was initiated in 1965, it was more intensified between 1967 and late 1973 during Frei's and Allende's government (Jarvis, 1985).

By 1965, the 55% of Chile's productive agricultural land was owned by close to 5,000 large farmers, while the remainder 45% was owned by 238,000 smaller farmers.

During the land reform, the State seized nearly 43% of the country's agricultural land (Jarvis, 1981a, 1985). Almost all large farms were seized by the government, to some extent. During the military government nearly 28% of the seized land was restored to previous owners, while the government retained 10%, near 5% was auctioned, and the remainder 57% was distributed to close to 50 thousand beneficiaries. Thus, despite restoration of some lands the land reform produced a significant effect on the size land plots. As documented by Jarvis (1985), by 1979 more than 50% of Chile's land was held in plots of less than 20 hectares,

However, during the first half of the 80s, near 40% of the people who benefited from the reform had sold their lands (Jarvis, 1985). This number further increased at the beginning of 1990s, reaching almost 100% in many areas. While there are many reasons for this phenomenon, as pointed out by Jarvis (1985), many beneficiaries from the reform had lack of capital and technical assistance. All this together, with their lack of farming and entrepreneurial skills, and also the desire of some of them to dedicate to other activities. Furthermore, the fruit boom, increased significantly the value of land, made selling very attractive for farmer who did not have the skills to grow fruit. In turn, the decline in the prices of agricultural products and growing competitive pressures made farming less profitable for those who were not able to implement new technologies. It is also worthwhile noting that several large landowners abandoned farming during the same period.

Debates have focused on whether land reform provided stimulus or hindered the development of agriculture (Quiroz, *et al.*, 1988; Jarvis, 1990). Although, there is evidence that reforms were positive for the sector growth, except for a short-lived period during the Allende administration. During third period, production rose between 1965 and 1970, and then declined abruptly between 1971 and 1973, and picked up significantly after the expropriation process finalized, reaching a level higher than before the reform has been implemented. Looking in hindsight, agricultural production increased significantly in the following 20 years after the reform, when compared to 20 years prior to the reform. In this context, land reform can be regarded as an important contributor to a more dynamic rural

economy as a whole (Jarvis *et al.*, 2004). The reform fostered the rise of new kinds of entrepreneurs that were crucial to the development of the sector.

#### *National Fruit Plan of the 1960s*

The National Fruit Plan was implemented by the Ministry of Agriculture in mid-1965 and finished in 1966. The decision was made to conclude the plan, given that the goals for external and domestic demand had been met, such as: timing of forest plantations and policies in place for industrialization, commercialization, investment, and technical and financial assistance, and also specific projects. All this was done while prioritizing the improvement of existing gardens and the introduction of new varieties with greater export potential. In 1967, CORFO built four fruit centers – in Aconcagua, O’Higgins, Colchagua and Curico – equipped with modern packaging facilities and refrigerated storage, which contributed to the industrialization of the fruit industry.

#### *Chile-California Program (This subsection is an extract from Agosin and Bravo-Ortega, 2009, pages 26-27)*

As pointed out by Escobar and Contreras (1995), the promotion of human capital was crucial for the emergence of new agricultural exports. In this context, the Ford Foundation created a cooperation agreement between the University of Chile and the University of California, in 1965. This program, also known as the Chile-California program, consisted in an exchange program between the two universities, aimed at sending Chilean academics and students to California. Likewise, the program also contemplated bringing academics from the University of California to undertake research projects and provide new teaching programs at the University of Chile. While these areas were broad, this program was mainly focused on agricultural sciences, particularly in the production of fruit. This program provided training to more than 80 Chilean professors and technicians in California and generated more than 300 exchanges of high-ranked staff members between both universities. There were two campuses of the University of California that involved the most, namely, Davis and Berkeley. This program, disbursed nearly \$10 million US, finished during 1978 due to the changing political environment in Chile and also a change

in the funding priorities of Ford Foundation.

The Central Valley of Chile is very similar California in terms of weather conditions. It was acknowledged by many that fruit exports had great potential to become in a very profitable activity, stemming from to the seasonal disparity between the United States and Chile. This generated the necessary conditions for such a program to become successful. Indeed, as pointed out by Agosin and Bravo-Ortega (2009), this program could be considered as one of the first examples of a new industrial policy oriented toward creating comparative advantages in high-potential sectors.

*Fruit and Vegetable Clusters and the public good provision (This subsection is an extract from Agosin and Bravo-Ortega, 2009, page 29)*

Nowadays, in Chile's export basket, there are nearly 75 distinct varieties of fresh fruit. This market is managed by over 550 exporting companies, from which nearly 90% are small companies. In this context, exporting companies either produce fruit themselves and/or buy it from the nearly 16,000 existing producers. Therefore, exports are mainly concentrated in the hands of a few main traders, some of them, multinationals, that purchase fruit to locals and the sell it to international markets.

As discussed by Agosin and Bravo-Ortega (2009), fruit and vegetable exports and, require a common set of public goods. In particular, they need to fulfill sanitary and phytosanitary conditions to the countries they export to. The Agricultural and Livestock Service (SAG) is an agency that fills precisely this gap by working together with producers and exporters, and it has contributed to these tasks for years. SAG also spreads information on what are the best agronomical practices, ensures that sanitary and phytosanitary standards from importing countries are fulfilled and issues SPN certificates for exporting to the major markets. SAG has also participated in trade negotiations with importing countries.

A second public good provided by the State is the negotiation of free trade agreements with importing countries, namely, the United States, the European Union, Korea, China, Mexico, most Latin American countries, and, recently, Japan. Indeed, Chile has become in one of



the countries that has negotiated the most bilateral free trade agreements (Agosin and Bravo-Ortega, 2009).

*Berries. (This subsection is an extract from Agosin and Bravo-Ortega, 2009)*

Blueberries plantations were first developed in Chile during 1979, thanks to a government initiative carried out through the INIA (National Institute for Agricultural Research). The main purpose of the government was to increase the possibilities of rural development to colder weathers compared to those of the central zones of the country. With this in mind, INIA experimented with blueberries, sarsaparilla, and redcurrants, among others, to the country's southern weather and soil. The results showed that blueberries adapted properly to the soil and climate of Regions IX and X. In the following years, INIA designed micro propagation systems to develop new plants, trained researchers and provided technical assistance.

Despite the previous developments, the commercialization of blueberry production was started by Fundación Chile in partnership with privates only in 1985. Fundación Chile and its partners created Berries La Unión as a pilot experience. In this task, Fundación Chile relied on his experience and on the information collected by INIA.

It is worthwhile mentioning other initiatives in blueberries production at that time by Universidad Austral in Valdivia and by UTC, a fruit exporter. All these efforts proved that the production of high-quality blueberries was indeed feasible in Chile and thus satisfy out-of-season demand from the North American market.

In 1992, Fundación Chile privatized completely its blueberry production. However, the new private firm went bankrupt, and its assets were sold to a producer that supplied to Sun Belle Berries. In spite this, there were many followers and the rapid growth of production was led by Vital Berry and Hortifruit, which started exporting massively during the mid-1990s.

Blueberries, are a success story for export development. Berries accounted for only about \$25 million US in 1990, and blueberries exports were below \$200,000 US. By 2005,

the fifth largest fruit export, were blueberries, in terms of value and rate of growth. In fact, export growth rate was over 40% annually between 1990 and 2005. By 2005, blueberry exports had reached \$95.3 million US. While back in 1995, there were only two exporting companies, by the year 2005 there were 59 firms were exporting blueberries.

### *Forestry, Pulp and Paper Policy*

The *Ley de Bosques*, passed in 1931, fostered the exploitation of the remaining native forest. This law also established that landowners who reforested cleared land received property and inheritance tax exemptions for 30 years. State and corporate plantations paved the way; nonetheless, the Ministry of Agriculture established many of the plantations directly with capital provided by state-run pension funds (Clapp, 1995).

In 1942, CORFO created two plans regarding the forestry sector after surveying potential exports from forests. The first plan focused on reforestation with insigne pine and eucalyptus globulus. These varieties were chosen because of their relatively short growing period and, in the case of insigne pine, its use in the production of cellulose. Other determinants were used in construction, packaging, and industrial chemical applications. The second was called the “Forestation Plan,” and consisted of the creation of forest reserves at a rate of 60,000 hectares per year for 50 years.

As pointed out by Clapp (1995), Chilean forest products were mainly concentrated in the domestic market, which was partly due to the limited world market. Transportation costs were high, and many countries were still exploiting their own forest resources for local consumption. Additionally, under import substitution, the export of raw materials was affected as consequence of the implicit tax on exports.

Nonetheless, the State’s commitment to the expansion of the forest industry continued despite the lack of the development of export markets. In fact, as the product of a joint venture between the State and private shareholders, *Industrias Forestales*, S.A. (INFORSA) was founded in 1956. In order to make this possible, CORFO provided direct funding and credit guarantees and retained its control over INFORSA. As documented by

Clapp (1995), a forestry complex emerged in the Bio Bio region. As the plantations established in the 1930s matured, pine lumber replaced native timber. By the end of the 50s, the first panel plant and was opened -*Maderas Prensadas Cholguan*. In 1960, a particleboard factory, *Maderas y Sinteticos*, S. A. (MASISA), opened in Valdivia to supply the increased demand for building materials after a tsunami flooded much of the southern coast (Clapp, 1995).

In 1966, CORFO carried out two projects in the cellulose and paper industry with a majority partner, Arauco and Constitucion. Due to this, the national production of cellulose increased from 87,000 tons annually in 1965 to 243,000 in 1969. Based on expectations regarding levels of production in the new plants, it was expected to reach the 550,000 tons (CORFO, 1989).

In 1968, CORFO took over *Forestal Colcura*, a large stationary sawmill, in order to prevent its bankruptcy. CORFO also converted its stake in INFORSA to direct ownership and began the construction of two long-fiber cellulose plants; the first was *Celulosa Arauco*, which began to be constructed in 1967, and of which CORFO maintained a 60% ownership. The other was *Celulosa Constitucion* (CELCO), built, in 1969.

Both factories required a steady supply of pulp logs. However, a decline in forest plantation rates during the 1960s led to an anticipated deficit of raw materials during the 1980s. The Central Bank was forced to confront this deficit and, as such, restricted the exports of unprocessed logs by certifying the quality of exports. In this context, monopsony powers were granted to large state enterprises as a local market for pine logs. In order to offset the reduced incentives to plant trees, the State promoted reforestation. It did so through CONAF, which entered into reforestation agreements with private landowners. On the one hand, landowners would contribute with land, while CONAF would assume the responsibility for planting, maintenance and harvest of the forest. Moreover, through SAG, the State carried out direct plantations that amounted to 30,000 hectares per year during the early 1970s.

State investment, intervention and massive expropriation during the Popular Unity government transformed the forest industry into one of the most socialized sectors of the economy. As a consequence of this, many sawmills could not continue for lack of working capital (Mamalakis, 1982), and plantation rates decreased as many private landowners withdrew their capital from the sector (Clapp, 1995).

The crisis and the aftermath related to the Popular Unity government have been extensively analyzed by many scholars. In the case of the forestry sector, it left the industry almost entirely in State hands, with responsibility for forest policy and infrastructure divided among many state agencies, each with a different mandate (Clapp, 1995). Together, the combination of different programs increased the average of 11,373 hectares reforested per year from 1940-1974 (Wisecarver and Tardones, 1989) to more than 45,000 hectares reforested from 1965-1973 (Gomez and Echenique, 1988). Later on, under military rule, the State withdrew from direct reforestation initiatives, but still as an overall, the rate of reforestation increase to an average of 80,000 hectares per annum, between 1974 and 1990.

Similar to previous governments, the military government decided to provide the forestry sector with concentrated national investments incentivized by direct production subsidies. These subsidies corresponded to a number of policy measures stipulated by Decree Law 701, enacted in the Forestry Law of 1974. The main idea of DL 701 was to motivate the private sector to carry out the task of reforestation. This decree maintained some of the exemptions from the Law of 1931, and added direct transfers. These included the reimbursement of 75% of the costs of reforestation. The land designated by CONAF as appropriated for reforestation could benefit from the subsidy if the owner presented a management plan among other requisites. Reforested lands were declared exempt from expropriation forever. Additional costs were subsidized, including thinning, pruning, and the annual costs of administration (Clapp, 1995). The subsidies were in place until 1994, when the forestry policy was revised, but some of the tax exemptions were declared permanent.

The law obligated landowners to reforest the area after harvest or to reforest a plot of equal size. A management plan for regeneration and harvest was required. Similar plans were required for the exploitation of native forests (Clapp, 1995).

Later on, with DL 2,565, the subsidy increased to 90% of plantation costs. According to Agosin *et al.* (2010), the effect of this subsidy was the accelerated increase of forest surfaces, from 400,000 to 1 million hectares between 1974 and 1983, creating the foundation for a promising export activity (Portilla, 2000). Furthermore, between 1974 and 1979, special credit lines were targeted to forestry companies and individuals engaging in forestry-related activities, by the Central Bank through the *BancoEstado* and private banks.

As pointed out by Agosin *et al.* (2010), while this initiative has not been assessed in a cost-benefit analysis, it is worthwhile noting the current importance of the sector in the export basket and also by considering its increasing export values, this policy definitively seems to have played an important role. Nowadays, forestry-related products amount to over \$ 5 million US, accounting for around 8% of Chilean exports, whereas back in time these exports were practically non-existent.

### **8.1.3 Salmon and Trout.**

According to a United Nations Report (2006) on industrial development, there have been at least four stages for the development of the salmon industry in Chile: experimentation, development, industrial expansion and market expansion. We provide a fragment of the United Nations paper in order to describe how the industry emerged.

**The experimentation stage started with the first attempts to introduce trout and salmon and lasted until to 1973.<sup>41</sup>**

Salmon industry dates back to the end of the 19<sup>th</sup> century, with the introduction of trout settlements in the rivers and lakes in the south of the country.

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<sup>41</sup> The following paragraphs were extracted from UNCTAD (2006)

During the 1960s, fish farming got new vigour with the signing of two cooperation agreements with two United States universities (Oregon State University and the University of Washington) and the Agency for Agriculture and Fishing and CORFO. The main purpose was to study the feasibility of fish farming

By the end of the 1960s the National Fishing Agency (SERNAP) joint efforts with the Japanese International Cooperation Agency (JICA) in order to introduce Pacific salmon. Their efforts were mainly oriented to the development of human resources and the study of technical and economic feasibility of salmon farming (UNCTAD, 2006). The cooperation found that farming was technically feasible, but its economic profitability was not possible to be assessed.

### **The industrial initiation phase (1974 to 1984)**

This period has been the most studied, where Fundacion Chile played a major role and was characterized by the materialization of public and private cooperation for salmon and trout farming and harvesting

The Chilean company Lago Llanquihue with the cooperation of CORFO, produced and exported trout to France by 1978, exports that expanded to other countries in Europe and the United States. During this period also emerged new firms in the industry.

Domsea Farms Chile started salmon farming in 1974. By 1981, Fundacion Chile bought them and founded Salmenes Antartica which exported more than 1,000 tons per annum, by the end of the 80s

During this period Salmenes Antártica led the expansion of fishmeal production and processing plants. It also provided technical assistance to new producers.

In the second half of the 1980s Fundación Chile created other related firms:

1. Salmenes Huillinco S.A., that produced and sold Atlantic smolts.

2. Salmotec S.A., that developed hatchery and ranching techniques.
3. Finamar S.A., specialized in the exporting of smoked salmon.

All these firms were sold and also Salmones Antartica, that was finally bought by Nippon Suisan from Japan.

### **Industrial expansion phase (1985-1995)**

During this period significant improvements were developed in the farming techniques involved in fish handling and cold chain management. By the mid-80s there were near 36 farming firms. By 1987 there were 56 firms that managed more than 100 farms. By the beginning of the 90s there were close to 1000 salmon farms (UNCTAD, 2006).

Thus, exports grew from zero in 1980 to more than \$2.5 billion US in 2008 (Agosin *et al.*, 2010).

### **Market expansion phase (1996-to date)**

Decreasing international prices of salmon prices by the end of 1980s and the beginning of 1990s resulted in the withdrawal of small firms. This latter highlights a stage of consolidation of the industry (UNCTAD, 2006).

During this period, large firms started to embrace vertical integration, to include feed and egg production, in order to achieve economies of scale and hence reduce production costs. These changes moved the industry towards the standards of leading economies (UNCTAD, 2006: 7).

## **8.2 Evaluation of key horizontal policies.**

### 8.2.1 Simplified Drawback.<sup>42</sup>

In 1985, Law 18,480 was passed and, as such, the simplified drawback to exports (reintegró simplicado) was relaunched. This instrument was used for the first time during Frei's government during the 60s.

The simplified drawback consisted in a benefit to exporters that could recover the import duties paid for inputs, even without a proof of these expenses. Initially, the refund was 10% of the FOB value and assumed implicitly an imported component of 50%.

In 1987, Law 18,653 applied a 10% refund to non-traditional exporters, which considered sectors that had total exports amounting less than \$10 million dollars. It also had a 5% refund for total exports greater than 10 million and smaller than 15 million, and 3% for those total exports greater than 15 million but smaller than 18 million.

With Law 18,768 of 1988, exporters could get a refund of 5-10% for national inputs used in their exports. The objective was to correct the discrimination against domestic inputs created by the value added tax to exports (Portilla, 2000). The simplified drawback was finally abolished in 2003 in order to meet the requirement of the Subsidies Code of the Uruguay Round of trade negotiations (Agosin *et al.*, 2010).

Agosin *et al.*, (2010) evaluate whether the simplified drawback had a positive effect on exports. For this latter, they carry out two exercises; the former, at the sector level, they estimated the growth in export volume over a rolling window of five-year intervals for the period 1991-2000. They found that exports from sectors that received the simplified drawback grew more rapidly compared to other sectors. The strongest effect was during 1991-1996, in which exports in sectors supported by the simplified drawback grew 60-89% more than other exports. The latter, was developed using a quasi-experimental "matching" approach, with treatment applied to firms that received the simplified drawback. They found that treated firm-products increased their exports, on average by 778% in a five-year

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<sup>42</sup> The following paragraphs follow closely Agosin et al, 2010.



period. Regarding the control group, this increased exports by 279%. Thus, the average treatment effect on treated firm-products was 499%, and highly significant.

### **8.2.2 CORFO programs during the 1990s until present.**

#### *Evolution of CORFO during the 1990s until present*

As we mentioned in section 6.3, since the beginning of the 1990s, CORFO has acted as a lending institution by granting credits through the banking system to mitigate the risks of potential losses for the State. In turn, this was accompanied by an externalization of functions in program management in the mid-1990s to private intermediaries. Likewise, as mentioned throughout the paper, the subsidiary role of the State privileged industrial policies that were mainly horizontal during this period, although with some exceptions, such as the FDI attraction program. In this context, both the promotion policies carried out by CORFO and the design of its instruments were mainly intended to address “market failures,” with particular attention to market factors (labor skills, technology, management, information, etc.).

#### *Evaluation of CORFO programs during the 1990s until present*

In this section, we will summarize the evaluations of some recent CORFO instruments implemented during the 1990s. In some cases, the instruments have been proven to be successful in fulfilling the intended purpose. However, in other cases, the outcomes are unsuccessful, inconclusive, or too recent to evaluate. In addition, we provide a brief explanation of what these programs entailed:

1. Technical Assistance Fund (FAT, 1992). This instrument co-finances hiring for SMEs that were specialized consultancies in areas such as finance, design, production processes, merchandising, marketing, and strategic planning, among others (Dini and Stumpo, 2002). Recent studies assessing the impact of this instrument carried

out by the Ministry of Economy using treatment and control groups of firms,<sup>43</sup> have found that effects of this instrument are not statistically significant. This is true regarding the effects on a number of firm indicators (revenues, value of sales, number of employees, average salary of employees, average productivity, average costs, and commercialization margins), as well as by sector (raw material, manufacturing, and services). The one exception is a weakly significant increase of firm sales in date by around 500 UF per year.<sup>44</sup>

2. Associative Development Programs (PROFO, 1992). This instrument is a subsidy to finance collective projects for the SMEs. It is designed to improve competitiveness in groups of firms that are willing to engage in creating collective actions oriented to solving management problems and merchandising which, by their nature or magnitude, may be tackled more efficiently as a group. The Ministry of Economy (2011) analyzed PROFO and the results were not positive. Moreover, while in the primary sector, the instruments do not have any positive statistically significant effects in either the indicators used (revenues, value of sales, number of employees, average salary of employees, average productivity, average costs, and commercialization margins) or the sectors (raw material, manufacturing, and services). The effects are even negative in the case of average worker productivity, with a difference of UF 56 per year.<sup>45</sup>
3. Support Program for Export Company Management, (1997). This instrument is intended to promote the export capacity of manufacturing firms and computational programs. Unfortunately, there isn't conclusive regarding its effects, as the program was

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<sup>43</sup> Evaluacion de Impacto – Programas de Fomento de CORFO. Ministerio de Economia, 2011.

<sup>44</sup> It is also worthwhile noting that these results are partially due to the short time between the technical support and the respective impact assessment, thereby making it difficult to decipher the potential changes in firms. However, as pointed out by Monsalves (2002) and Dini and Stumpo (2002), there is also a quality problem in consultancies developed through this instrument. This is partly to the inability of an “effective counterpart” in the firms involved and, on the other hand, the “lack of available resources per consultancy” that prevents the hiring of high-level consultants.

<sup>45</sup> The inexistence of significant results of this instrument can be due to a number of reasons such as the short average duration of the PROFOS, where the average intervention is less than 3 years. This in turn shows that the consolidation of the associative experience in development stage is very limited. In addition to this, a number of interviews carried out by the Ministry of Economy of users of this instrument have found that there is certain aversion to the development of associative projects. Thus, the level of impatience and by verifiable results in short time can be the explanation for the low duration of the PROFO and the scarce evidence of its impact.

discontinued because authorities feared that it could be considered incompatible with the norms of the WTO (Macario, 1998).

4. Suppliers Development Program (PDP, 1998). This instrument supports the evaluation, development and execution of projects between firms to improve the quality and productivity of their small-size suppliers. The Ministry of Economy (2011) shows that this instrument has positive effects on the sales values of the firms, in particular in manufacturing and retail firms, while significant effects were not observed in the primary sector.
5. Pre-investment Program (PI, 2000). This instrument supports the realization of pre-investment studies. While this instrument has been applied more broadly, in terms of its coverage, as well as the number of areas involved, the results of its effects are still inconclusive.
6. Integrated Territorial Program (PTI, 2000). According to Zahler *et al* (2012), this is the first policy that tried to organize clusters of production around specific geographical locations. In the aforementioned Ministry of Economy study, both cases show positive changes in the networks that sustain the cluster. There is a decrease in the centralization of the firms involved, while the number of firms and their relations increase. Impact indicators within firms were not observed in either case. Thus, the positive changes seen at a local level do not generate, at the moment, changes in the profitability of private entrepreneurs (Ministry of Economy, 2011).
7. Quality Promotion Program (FOCAL, 2004). This instrument aims to improve firm quality and productivity through specialized consultancies. The evaluation of this instrument shows that users find it positive. In addition, quantitative evaluations using average treatment effects (ATE) have found that this instrument has had positive effects on revenues, sales values, and margin indicators. These effects have been more pronounced in the manufacturing and service sectors (Ministry of Economy, 2011).
8. Investment Guarantee Fund (FOGAIN, 2007). In essence, this instrument provides credit to SMEs that do not have access to credit. This program is run separately from the so-called FOGAPE, which is run by *BancoEstado*. Usually, users who do not qualify for FOGAPE do have success with FOGAIN. A recent study carried out

by Agosin *et al.* (2010) spots the potential for ethical issues in relation to FOGAPE, given that it is ran by the *BancoEstado*, which also bids for funds. In this context, they recommend transferring the management of FOGAPE to CORFO and amalgamating the programs (Agosin *et al.*, 2010). All in all, this program seems successful in solving credit constraints for SMEs by lowering the risk of lending.

9. Local Entrepreneurship Program (PEL, 2007). This instrument strengthens the management capacities of local entrepreneurs through the development of skills and capabilities, as well as investment co-financing. A PEL could be formed by one or more projects including 20 to 25 entrepreneurs. During 2007 and 2008, the regions with the greatest quantity of projects were Valparaiso and Antofagasta, with 20.3 and 14.5%, respectively. The regions that contained the lowest number of projects were Tarapaca and Los Rios, both with only 4.3%. In general terms, of the 69 PELs implemented, 95% are concentrated in the North and Central zones of the country, and the only projects carried out in the South were in Los Rios. However, these projects need to mature before they can be assessed.
10. Technology Consortia Program (2007). This program, which was once fully under CORFO's control, gathers innovation efforts of the private sector and increases collaboration with universities. However, despite efforts over more than five years, there are no clear success stories, although there are some very promising initiatives. The general consensus is that the consortia program has been a valuable public and private effort, but that the most interesting developments are forthcoming.
11. The FDI attraction program. In essence, this program provides up-front subsidies to foreign information and communications technology (ICT) firms, which may potentially locate in Chile. As mentioned above, this is the first formal vertical industrial policy in Chile since the military regime. As pointed out by Agosin *et al.* (2010), the results of this program are quite promising. By 2010, 70 firms had benefited from subsidies for feasibility studies, and 37 had located in Chile. As a consequence of this program, the exports recorded for these firms' services have risen to nearly over \$168 million US.

### **8.2.3 Technological Consortia Program.**

The following text is taken from the analysis from Benavente, Bravo-Ortega, Goya, Katz and Zahler (2012), but has been edited and shortened significantly.

The Technological Consortia program gathered innovative and entrepreneurial efforts of different firms and universities (CNIC, 2007). The main objective was to launch new firms with the capability of developing cutting edge applied research and products. The activities developed should be relevant to the associated production sectors and should also increase its competitiveness: It was expected that the Consortia program would generate positive externalities and demonstration effects (Busco *et al.*, 2008).

The program was implemented under the Bicentennial Program on Science and Technology (PBCT), a World Bank initiative hosted by CONICYT. This project provided the Chilean government with technical assistance and a loan. The Consortia program gathered near half of PBCT's resources. It was originally conceived as a 10-year program, with two five-year stages. However, it suddenly stopped in 2006 after the new government decided to discontinue the second stage.

The design of the Consortia program considered the Australian experience for inspiration. However, unlike the Australian consortia policy whose funding for projects lasted 10 years, the Chilean policy only had 5 years of co-financing for each project, with the possibility of a 5-year renewal.

Although CONICYT was in charge of the program, CORFO participated as a co-invoking and evaluating institution. Considering that some of the projects were to agriculture specific, FIA (Agricultural Research Fund) was also invited to be part of the process.

There have been three rounds of projects applications: 2004, 2005 and 2009. The first two involved all three agencies. The third was a thematic bid on biofuels and was launched and managed exclusively by CORFO.

### *Evolution of the program*

The program control was transferred to CORFO starting in 2006. This was due to CONICYT deciding to focus exclusively on basic research. The calls for new Consortia became CORFO's responsibility. In 2008, the remnants of PBCT were absorbed in a new CONICYT program: the Associative Research Program (PIA).

Once CORFO took control of managing new consortia, it tried to make it more, but it also had a much narrower focus, not trying to unite universities and private firms, only requiring a technological institute and fewer participants.

### *Evaluation of the Consortia Program*

In light of the cases analyzed by Benavente, Bravo-Ortega, Goya, Katz, and Zahler (2012) the most important necessary conditions for successful policy implementation and outcome were mainly improved coordination and collaboration among the private agents involved. Specifically, they considered key to have a property and incentive structure fostering coordination and motivation towards results. Appropriated IPR management within the Consortia members was also considered crucial.

Finally, and as obvious as it may seem, a common view stressed by all interviewees of Benavente *et al.* (2012) is that, without the program, the consortia would not exist and most of the applied research, patents, and potential business opportunities would not have happened. Chile currently lacks a well-functioning risk capital market, leaving a significant number of investors within the 'death valley' that occurs between government-funded basic research and market-ready products. The Consortia Program seems to have been useful in the first phase, in terms of developing a patentable idea, but not much beyond that.

## **Section 9: Concluding Remarks.**

In this document we have provided a detailed review of a significant number of trade and industrial policies in Chile throughout the last century. The history of Chilean industrial development has been influenced by both international and national factors. During the first half of the twentieth century, the First World War and the Great Depression were the key events that shaped Chilean industrial policies. In the second half of the twentieth century, industrial policies were determined by the rise of Allende's and Pinochet's governments.

Growth rates during most of the last century were rather disappointing. However, during the last twenty years Chileans have witnessed unprecedented growth rates. The number of years spent lagging behind the income of the US shows the impact of increased growth rates. Lagging increased during the twentieth century, with a lag of 33 years, increasing to a 57 year lag in 1956, and then shrinking to a lag of 39 years in 1973, increasing again in the 1990s to 53 years<sup>46</sup> By 2008, this gap had been reduced to 43 or fewer years.

The historical evidence we have reviewed indicates, at first glance, that the industrial policies were economic failures during most of the time period examined. However, the extreme liberalization policies seen during the military regime did not work either. Some economists argue that the liberalizing reforms finally paid off after 1990, but those results originated in sectors that had been developed and supported previously by state-led industrialization policies. Analysis of Chilean industrialization policies is a controversial issue at best.

For a small country such as Chile, import substitution industrialization policies are unlikely to work. Today we know that there are reasons to protect an industrial sector when

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<sup>46</sup> This reduction in the number of lagged years is mostly a result of the impact of the Great Depression in the US, although Chile was even more greatly affected. Thus, it is not obvious whether or not we should consider this figure as something relevant.

there are economies of scale and they can be developed and reach a competitive stage in a closed economy, developing further once the economy opens. Given Chile's economic and population size, the economies of scale argument did not apply to Chile and, thus, many of the industrial policies failed.

The industrial policies applied by Chile went beyond tariff protection even during the more economically liberal military regime. In particular, there were a significant amount of vertical policies, with the government playing a major role as the owner of many firms. After reviewing the economic history of industrialization of Chile, we may ask what would have happened if the State did not have this role. As we have documented, the level of intervention in the economy was massive. At some point, the action of the State was so enormous that one can imagine a policy-maker comparing input–output matrices of Chile and a developed country, trying to fill the empty cells.

Tables 17 and 18 summarize the vertical and horizontal policies applied since 1927. We observe a significant transition from a vast majority of vertical policies to horizontal policies. Vertical policies, as shown by this document, cover an endless number of sectors and initiatives. However, a significant amount of them were consistently applied to successful exporting sectors. Nevertheless, there were also a significant amount of failures.

Regarding horizontal policies, these have increased in number since 1973. In the final part of the document, we review some of the impact evaluations. If evaluating the impact of vertical policies is difficult, tracking the impact of horizontal policies is impossible, since so many of them overlap in terms of time and beneficiaries.

At this stage, one cannot avoid asking whether all these massive government actions were beneficial or detrimental. To build a counterfactual is impossible. Thus, the question changes, asking what reasons might account for the different outcomes. In some cases, this answer is clearer than in others.

The case of the automotive industry is an illustrative example. Chile did not design cars, nor developed car technology. The industry simply assembled cars. This industry neither had access domestically, nor internationally, to a market in which it could have



exploited the economies of scale properly needed. It may have been able to exploit economies of scale with foreign markets, but could not because of the implicit export taxation of import substitution.

Another example is that of fruit. During the 1960s, this industry had different support schemes, even successful horizontal policies to human capital accumulation. But more importantly, once protectionism was eliminated, Chile was able to exploit its comparative advantages. What would have happened if, before the opening of the economy, there was not any accumulation of human capital and learning? It is likely that the industry would have developed since Chile has a strong competitive edge. However, it is most likely that its growth would have been slower and subject to economic failures because of market mechanisms for the accumulation of human capital

Let us go even further. What would have happened if copper were not nationalized? Most likely, the industry would have developed from foreign investment, and Chile would have lost the hundreds of billions dollars CODELCO has produced since its creation.

Is it the case that no industry could have developed without government intervention? There are some industries that prove the opposite. The wine industry, in particular, shows how market forces and openness can result in the development of a not only a successful, but a key export industry. In this case, the State only collaborated indirectly in the process of human capital accumulation, but the Ford Foundation did intervene through the Chile-California Program.

While reviewing the economic history of industrialization in Chile, our attention was captured by a particular set of institutions. During different periods, institutions in charge of gathering information on sectoral investment opportunities were created. In this category we include: the Forestry Institute; the Fishing Development Plan; the Institute for Geological Research; National Mining and Geological Service; and the Natural Resources Research Institute (IREN), among others. Certainly, all of them had different levels of impact, but were designed to provide public knowledge aimed at helping business decisions.

They certainly undertook relevant research that no one would privately, making it publicly available. Recent literature on production and export costs, and the discovery of profitable activities offer an interesting theoretical framework for these institutions' creation.

Another interesting finding was the discovery of human capital formation institutions or initiatives. The most interesting was the Chile-California program set up by the Ford Foundation and the Universidad de Chile. Considering the development of agricultural and production-based forestry activities during the following decades, this program appears as the most successful \$10 million US ever spent. The creation of INACAP in 1966 as a CORFO subsidiary is another interesting case. However, during the military regime it was transferred to the largest business association, CPC. As a technical institution, the CPC greatly helped INACAP's development and its recent success supports this view. INACAP is currently the largest educational institution in Chile.

Throughout this document we have unraveled the industrial development process. The majority of the evidence supports the idea that government interventions were not successful in a closed economy. The opening of the economy took advantage of the human capital and learning accumulated from the previous interventions. In turn, the process of a permanent, but slower, opening process of the economy has had better payoffs in terms of growth than a fast and radical liberalization. We refer to the trade liberalization in the 1960s and 1990s as slow processes and the fast liberalization process between 1973 and 1982. The lessons that can be learned from our review of the material challenge the two main existing views ascribed by most Chilean economists.

Finally, it is interesting to make brief comparisons with industrial policies applied in Asia either during 1960s and 1970s in countries such as South Korea or, more recently, China. After reviewing these experiences, as is done in Linsu Kim's work on Korea, significant differences emerge, hence elucidating what is key to identifying the determinants of good industrial policies.

First, successful industrial policies are structured and not implemented randomly as they may have been in Chile. Secondly, policies are designed as a sequence of stages and are not implemented all at once as they were in Chile. In Asia, gradualism meant supporting final product industries first, then supplier industries and, finally, capital goods industries. As we have seen, such logic did not exist in Chilean policies. The same logic applies to trade policies where selective applications are more successful, again in contrast to the case of Chile. In this case, tariffs were very high across the board, reaching prohibitive levels in many cases. These results show that policy makers forgot that trade policy can be used to change relative prices and allocations within the economy. This implies that massively changing all prices by implementing strong protectionism does not change selectively relative prices, therefore incentives to fostering a particular industry. High tariffs across the board work only as a tax on exports. This seems obvious but was never internalized by policy makers, further increasing the dependence on copper exports during the period previous to 1973.

Third, successful industrial policies consider the provision and the accumulation process of relevant productive factors such as physical and human capital. This implies that if, in a ten-year period time, I want to develop and support an industry or sector, I have to ensure that there would be enough human capital in this industry. Not doing so significantly increases the economic costs of taxation and its deadweight losses. This provides segue to the fourth characteristic: the industrialization process is a dynamic, gradual, and non-static process, where learning and factor accumulation are the key inputs for the sustainable emergence of new industries. The view that dominated Chilean and most Latin American industrial policies was a static vision that accentuated further distortions of the factors needed to develop industries missing a minimum level of accumulated productive factors. This takes us to the fifth characteristic; these Asian countries did not abandon their comparative advantages, but gradually developed newer ones while still respecting their existing comparative advantages. The fact that many reforms implemented in Chile were not at all to its comparative advantages also increased the social costs of these policies, as the distortions needed to fight comparative advantage were significant. This type of fight

not only creates distortion losses, but also does so at the cost of constrained international trade and the availability of income and associated savings.

The previous analysis sheds light on why some policies were successful in Chile, while others were not. The successful policies were targeted towards sectors that had comparative advantages or that could easily develop them. This conclusion is confirmed in our analysis of successful policies applied to exporting sectors.

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## APPENDIX

### TABLES AND GRAPHS

<b>Table 1 GDP per capita</b>				
(1990 international \$)				
	<b>1913</b>	<b>1950</b>	<b>1973</b>	<b>1998</b>
Western Europe	3473	4594	11534	17921
Western Offshoots (including USA)	5257	9288	16172	26146
USA	5301	9561	16689	27331
Japan	1387	1926	11439	20413
Asia (excluding Japan)	640	635	1231	2936
Latin America	1511	2554	4531	5795
Eastern Europe & former USSR	3015	4954	11043	9354
Africa	585	852	1365	1368
World	1510	2114	4104	5709
Argentina	3797	4987	7973	9219
Brazil	811	1672	3882	5459
Chile	2653	3821	5093	9756
Mexico	1732	2365	4845	6655

Table 2 Total GDP growth							
(Annual average compound growth rates)							
	1000-1500	1500-1820	1820-1870	1870-1913	1913-50	1950-73	1973-98
Western Europe	0.3	0.41	1.65	2.1	1.19	4.81	2.11
Western Offshoots	0.07	0.78	4.33	3.92	2.81	4.03	2.98
USA					2.84	3.93	2.99
Japan	0.18	0.31	0.41	2.44	2.21	9.29	2.97
Asia (excluding Japan)	0.13	0.29	0.03	0.94	0.9	5.18	5.46
Latin America	0.09	0.21	1.37	3.48	3.43	5.33	3.02
Eastern Europe & former USSR	0.2	0.44	1.52	2.37	1.84	4.84	-0.56
Africa	0.06	0.16	0.52	1.4	2.69	4.45	2.74
World	0.15	0.32	0.93	2.11	1.85	4.91	3.01
Argentina					2.96	3.78	2.06
Brazil					4.24	6.75	3.4
Chile					2.52	3.42	4.3
Mexico					2.62	6.38	3.47

Table 3 Population growth							
(Annual average compoud growth rates)							
	1000-1500	1500-1820	1820-1870	1870-1913	1913-50	1950-73	1973-98
Western Europe	0.16	0.26	0.69	0.77	0.42	0.7	0.32
Western Offshoots	0.07	0.43	2.87	2.07	1.25	1.55	1.02
USA					1.21	1.45	0.98
Japan	0.14	0.22	0.21	0.95	1.31	1.15	0.61
Asia (excluding Japan)	0.09	0.29	0.15	0.55	0.92	2.19	1.86
Latin America	0.09	0.06	1.27	1.64	1.97	2.73	2.01
Eastern Europe & former USSR	0.16	0.34	0.87	1.21	0.34	1.31	0.54
Africa	0.07	0.15	0.4	0.75	1.65	2.33	2.73
World	0.1	0.27	0.4	0.8	0.93	1.92	1.66
Argentina					2.2	1.68	1.47
Brazil					2.23	2.91	2
Chile					1.52	2.13	1.62
Mexico					1.75	3.11	2.17

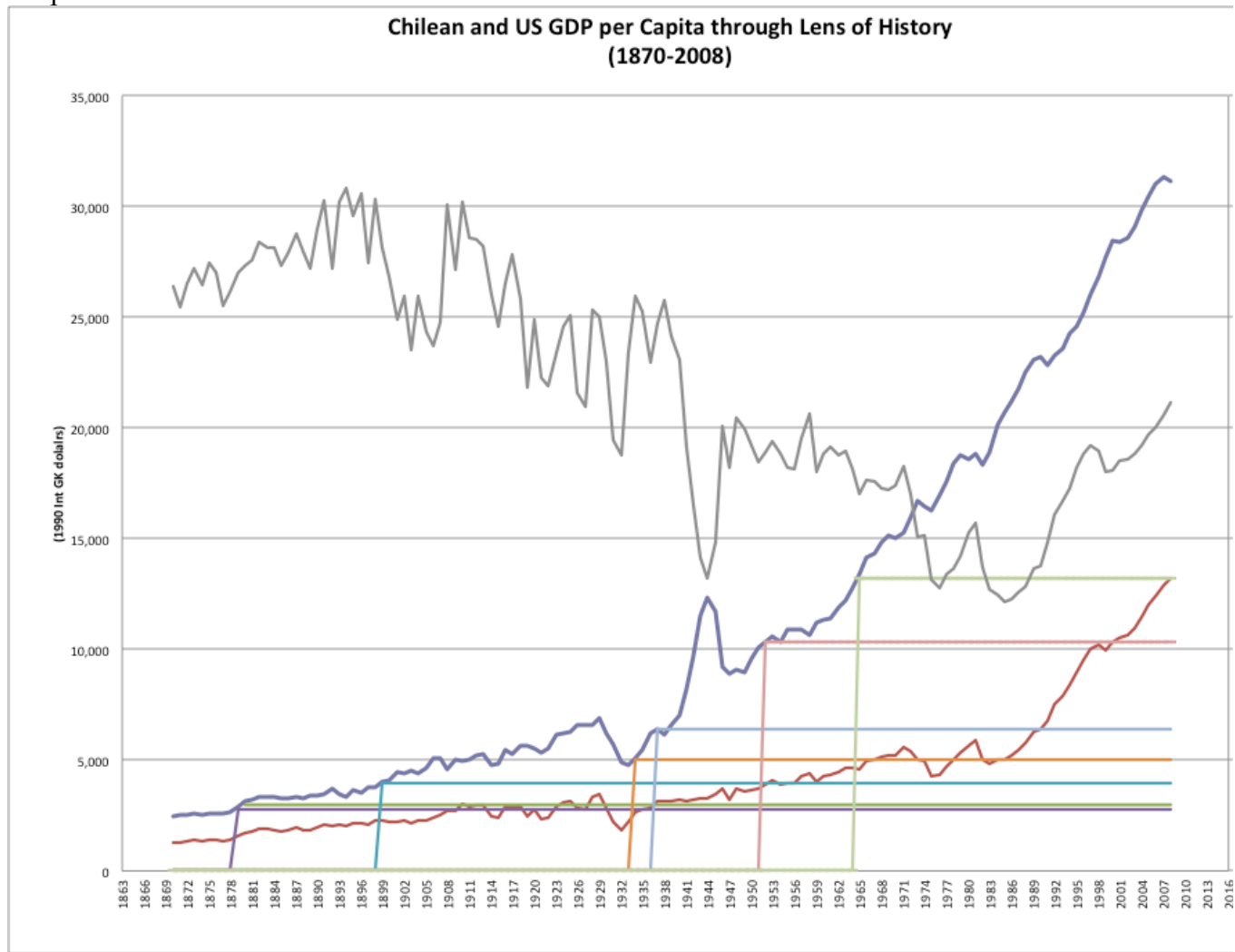
Table 4 GDP per capita growth							
(Annual average compoud growth rates)							
	1000-1500	1500-1820	1820-1870	1870-1913	1913-50	1950-73	1973-98
Western Europe	0.13	0.15	0.95	1.32	0.76	4.08	1.78
Western Offshoots	0	0.34	1.42	1.81	1.55	2.44	1.94
USA					1.61	2.45	1.99
Japan	0.03	0.09	0.19	1.48	0.89	8.05	2.34
Asia (excluding Japan)	0.05	0	-0.11	0.38	-0.02	2.92	3.54
Latin America	0.01	0.15	0.1	1.81	1.42	2.52	0.99
Eastern Europe & former USSR	0.04	0.1	0.64	1.15	1.5	3.49	-1.1
Africa	-0.01	0.01	0.12	0.64	1.02	2.07	0.01
World	0.05	0.05	0.53	1.3	0.91	2.93	1.33
Argentina					0.74	2.06	0.58
Brazil					1.97	3.73	1.37
Chile					0.99	1.26	2.63
Mexico					0.85	3.17	1.28



Table 5 Exports growth			
(annual average compound growth)			
	1913-1950	1950-1973	1973-1998
Western Europe	-0.14	8.38	4.79
Western Offshoots (including USA)	2.27	6.26	5.92
USA	2.2	6.3	6
Japan	2	15.4	5.3
Asia (including Japan)	1.64	9.97	5.95
Latin America	2.29	4.28	6.03
Eastern Europe & former USSR	1.43	9.81	2.52
Africa	1.9	5.34	1.87
World	0.9	7.88	5.07
Argentina	1.6	3.1	6.7
Brazil	1.7	4.7	6.7
Chile	1.4	2.4	9.1
Mexico	-0.5	4.3	10.9

Table 6 Exports share on GDP in 1990 prices				
(per cent)				
	1913	1950	1973	1998
Western Europe	14.1	8.7	18.7	35.8
Western Offshoots (including USA)	4.7	3.8	6.3	12.7
USA	3.7	3	4.9	10.1
Japan	2.4	2.2	7.7	13.4
Asia (including Japan)	3.4	4.2	9.6	12.6
Latin America	9	6	4.7	9.7
Eastern Europe & former USSR	2.5	2.1	6.2	13.2
Africa	20	15.1	18.4	14.8
World	7.9	5.5	10.5	17.2
Argentina	6.8	2.4	2	7
Brazil	9.2	3.9	2.5	5.4
Chile	7.5	5	4	12.6
Mexico	9.1	3	1.9	10.5

Graph 1



Graph 2

Chilean v.s. Advanced Economies's Average GDP per Capita Through the Len (1870-2008)

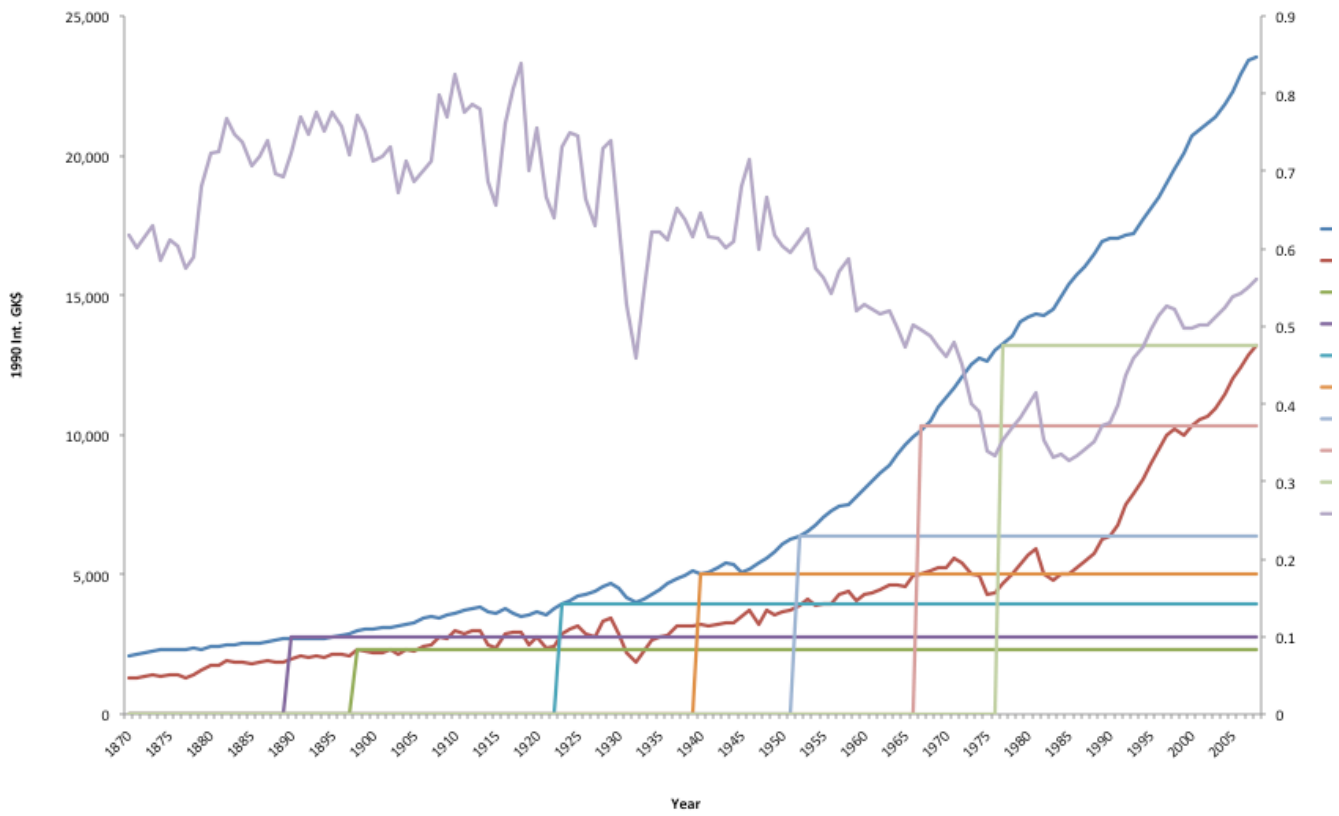


Table 7. Successes, failures and uncertain outcomes of industrial policy interventions. Vertical policies. 1927-1956.	
Classification	Policy
Successful	<ul style="list-style-type: none"> <li>-Creation of the Sociedad Nacional de Minería (1941).</li> <li>-Creation of Copper Manufactures (MADECO, 1943).</li> <li>-Finished construction of Paipotes Foundry (1950).</li> <li>-Creation of the Ministry of Mining (Law 231, 1953).</li> <li>-Credit lines for the creation of the Empresa Minera Mantos Blancos (1955).</li> <li>-Studies of adaptation of beetroot sugar (CORFO, 1945).</li> <li>-Creation of IANSA (National Sugar Corporation, 1952).</li> <li>-Agricultural Development Plan (1954) incorporating around 50,000 hectares between 1940-1959 and improve the irrigation of other 165,000 in the same</li> <li>-Ley de Bosques (1931). Exploitation of the remaining native forest through steep tariffs and domestic content requirements, giving exemptions from property and inheritance taxes for 30 years to landowners to reforest cleared land.</li> <li>-Forest Plan (CORFO, 1942).</li> <li>-Preliminary survey of the Chilean forest (The Haig Mission, 1944).</li> <li>-Forestry Plan (CORFO, 1942)</li> <li>a) Reforestation of 40,000 hectares with insigne pine and eucalyptus globulus (1942).</li> <li>b) Forestation Plan, creation of forest reserves at a rate of 60,000 hectares per year in 50 years (1942).</li> <li>-Creation of SOMASUR (Sociedad Anónima Maderera del Sur, 1942)</li> <li>-Propection activities and finalization of record of the forest resources available (1952-53).</li> <li>-Credit lines to the CMPC (Cia Manuf. De Papeles y Cartones, 1953).</li> <li>-Formulation of the Cellulose and Paper Industry (by mid-1950).</li> <li>-Provide credit support for home appliances production to Mademsa, formed in 1937.</li> <li>-Provided financial support to Siam di Tella for the construction of electrical engines (1941).</li> <li>-Creation of CAP (Pacific Iron Corporation, 1948)</li> <li>-Huachipato Iron and Steel Plant (CAP, 1950)</li> <li>-Con Con Refinery (ENAP, 1954)</li> <li>-Demostrative Plants (VESTEX, CIC, FENSA and Tejedurias de Rayon S.A) and providing assistance (SOCOMETAL, FANALOZA, Muebleria Paris, SHYF,INDURA, SINDELEN, Standard Electric, ICARE, Diario La Union de Valparaiso and INDAC) (SERCOTEC, 1953)</li> <li>Develop ent of Industrial ingeneering program (SERCOTEC, 1956)</li> <li>-Creation of INSA (National Tyres Industry, 1941).</li> <li>-Cement industry: Creation of Juan Soldado (1943). In 1942, CORFO sells equipment to Cemento Melon to increase its production.</li> </ul>
Unsuccessful	<ul style="list-style-type: none"> <li>-Agricultural Plan (CORFO, 1940). Incorporation of great extensions of soils for cultivation and improve irrigation, along with a generous credit policy for livestock farming.</li> <li>-Creation of the SEAM (Servicio de Equipos Agrícolas Mecanizados, 1946).</li> <li>-Creation of the tractor plant CORFIAT (1953)</li> <li>-Creation of the Biological Station in Montemar, by CORFO and the University of Chile (1941).</li> <li>-Creation of Compañía Pesquera Arauco S.A. (1941)</li> <li>-CORFO hires a mission from the United States Fisheries and Wildlife Service for policy advice (1944).</li> <li>-Acquisition of Industria Pesquera Cavanca S.A. (1953)</li> <li>-Oceanographic studies promoted by CORFO (1954).</li> <li>-Credit lines to the textile industry, between 1940-43 (CORFO)</li> <li>-Industrial Development Plan (1939).</li> <li>-Creation of Electromat S.A (CORFO, 1939).</li> </ul>
Uncertain	<ul style="list-style-type: none"> <li>-Creation of the Mining and Industrial Promotion Institute of Tarapaca and Antofagasta (1928)..Most support granted through La Caja de Crédito Minero (1939-43).</li> <li>-Creation of the Caja de Credito Minero (1927).</li> <li>-Creation of the Charcoal Credit Fund (1928).</li> <li>-Creation of the Sociedad Abastecedora de la Minería, Ltda (1941).</li> <li>-Acquisition of La Caja de Crédito Minero (1941).</li> <li>-Creation of the sulfuric acid plant, Fassa (CORFO, 1956).</li> <li>-Creation of the Agricultural Colonization Fund (1928).</li> <li>-Industrial Credit Institute (1928)</li> <li>-Creation of the SERCOTEC (Servicio de Cooperación Técnica , 1952).</li> </ul>

**Table 8. Successes, failures and uncertain outcomes of industrial policy interventions. Vertical policies 1956-1973.**

Classification	Policy
Successful	<ul style="list-style-type: none"> <li>-Creation of the Instituto de Investigaciones Geológicas (1957).</li> <li>-Creation of the Empresa Nacional de Minería (ENAMI, 1960)</li> <li>-Construction of lixiviation plant in Taltal (1964)</li> <li>-Creation of the Ventanas Foundry (1964).</li> <li>-"Chilenization" of Copper (1967)</li> <li>-Nationalization of the LSMC (1971) (Law 17,450)</li> <li>-CORFO became owner of the 51% of shares of SOQUIMICH (1970)</li> <li>-Creation of INDAP (1962).</li> <li>-Research on fruit production (CORFO, 1961-64).</li> <li>-Law of Agrarian Reform (1962).</li> <li>-National Wine Development Program (1964).</li> <li>-Sugar Development Plan and related sectors (1964).</li> <li>Capacity increase for IANSA.</li> <li>-Creation of INIA (1964).</li> <li>-National Fruit Program (1965).</li> <li>-National Fruit Program (CORFO, 1965)</li> <li>-Tomato Can Adaptation Plan (1966)</li> <li>-National Plan of Livestock Development (1966) (this included, a national network of slaughterhouses, Program of Dairy Plants, Animal Sanitation Program, Southern Livestock Program and Poultry and Pork Development Program)</li> <li>-Increase capacity of IANSA for better use of beetroot subproducts 1964-1970.</li> <li>-Chile-California Program (1965).</li> <li>-Rural Electrification Plan (1966).</li> <li>-New Law of Agrarian Reform (1967).</li> <li>-Creation of the Servicio Agrícola Ganadero (1967).</li> <li>-Fishing Development Plan (DL 266, 1960)</li> <li>-Creation of the Port of Iquique (CORFO, 1964).</li> <li>-Creation of IFOP (Instituto de Fomento Pesquero, 1964).</li> <li>-Oyster Program (IFOP, 1967); Commercial Algae (1968).</li> <li>-SERNAP signed agreement with JICA to introduce pacific salmon. Viability studies.</li> <li>-CONAF's reforestation agreement with private landowners in the 1960s.</li> <li>-Creation of Masisa (1960).</li> <li>-Creation of INFORSA (Instituto Forestal S.A, 1961)</li> <li>-Credit lines to the CMPC (Cia Manuf. De Papeles y Cartones, 1964)</li> <li>-Program of Reforestation and Forest Management (1965)</li> <li>-Projects of cellulose and paper plants Arauco and Constitución (CORFO, 1966)</li> <li>-CORFO carried out two projects in the cellulose and paper industry (1966).</li> <li>-Starts construction of Celulosa Arauco (1967).</li> <li>-Direct plantation program of SAG in 1970s.</li> <li>-CORFO took over Forestal Colcura's large stationary sawmill to keep it from bankruptcy (1968).</li> <li>-Creation of Celulosa Constitución (CELCO, 1969).</li> <li>-During the government of the P.U, CORFO privileged two sectors. The first was the Wine Program and the Fruit and Horticultural Program (1971).</li> <li>-Creation of INACAP (SERCOTEC, 1966)</li> </ul>
Unsuccessful	<ul style="list-style-type: none"> <li>-Stem from the crisis in the coal industry (Lota and Schwager), which led the creation of State coal companies, such as Pilpilco (58,59%), Colico Sur (99,67%) and Victoria Lebu (99,46%) in 1964.</li> <li>-CORFO initiated in 1966 the execution of the National Plan of Livestock Development, oriented to increase the production in this área.</li> <li>-During the P.U, the forest industry became in the most socialized sector of the economy. The government nationalized 3 million hectares of native forest or suitable for reforestation. No forest plantations were expropriated during the P.U period.</li> <li>Creation of the Commission of Development of the Automotive Sector (1960s).</li> <li>-Creation of the Commission of Development of the Electronic Industry (1965).</li> <li>-Creation in 1968 of the Empresa de Servicio de Computacion (ECOM) -Creation of the Centro de Investigaciones del Salitre y la Industria Química (1965)</li> <li>-Creation of a Committee for the production of sulfur (1966)</li> <li>-Construction of the Sulfuric Acid Plant of Vallenar (1967)</li> <li>-SEAM increases machinery endowment (1960s).</li> <li>-Creation of the Agricultural Executive Committee (1960).</li> <li>-Creation of the Empresa Pesquera Tarapaca S.A. (1961).</li> <li>-Since January 1971 a wide policy of nationalization was carried out, the government acquired, intervened and/or expropriated, coal firms, beer and food producers, fishing and poultry firms.</li> <li>-CORFO signed agreements to create CORFO-Peugeot and CORFO-Citroen.</li> <li>-SONACOL (ENAP, 1957)</li> <li>-During the P.U period, there was a change in the objectives of the SERCOTEC: promotion and technical assistance to the small industry and artisans, study new ways to organise socially the firms and to boost the development and strengthening of the national cooperative movement.</li> <li>-Creation of the Centro de Asistencia</li> <li>-The Departamento de Pequeña Industria y Artesanado is created (1962)</li> <li>-Great emphasis to the distribution sector, with the creation of ENADI (Empresa Nacional de Distribucion, 1971) and DINAC (Empresa Nacional de Comercializacion, 1971)</li> <li>-Creation of the Programa de Fomento y Desarrollo de la Pequeña Industria y el Artesanado (1960)</li> <li>-Departamento de Pequeña Industria y Artesanado is created (1962).</li> <li>-Promotion Program of Subcontracting (1965)</li> <li>-The Comission of Development of the Electronic Industry is established (1965).</li> </ul>
Uncertain	<ul style="list-style-type: none"> <li>-Creation of the Instituto Agrológico (1961).-Livestock Development Program (1961)</li> <li>Agricultural Development Plan (1965).</li> </ul>

<b>Table 9. Successes, failures and uncertain outcomes of industrial policy interventions. Vertical policies 1973-1990.</b>	
<b>Classification</b>	<b>Policy</b>
<b>Successful</b>	<ul style="list-style-type: none"> <li>-Decree Law 701. Reimbursement of the 75% of the costs of reforestation (1974)</li> <li>-Forestry Law (1974).</li> <li>-Decree Law 2,565. Increases the subsidy to 90% (1979)</li> <li>-Between 1973-1986 stand out the Reforestation Program, finishing the 5-year program set in place in 1975, which contemplated the plantation of 590,000 hectares of insigne pine until 1979, with the idea to secure the wood supply for the industries of cellulose and paper; In the forest projects stand out the Cellulose and Paper Program and the promotion of projects with foreign companies: Maruberi, Mitsui and Co, Mitsubishi, Weyerhausen and Boise, Cascade and Hercules Inc.</li> <li>-CORFO acquired the Complejo Forestal y Maderero Panguipulli Ltd (COFOMAP, 1985).</li> <li>-CORFO assisted the Company Lago Llanquihue to produce and export trout to France in 1978.</li> <li>-Fch buys Domsea Farms Chile and founded Salmones Antártica (1981).</li> <li>-Fch created three other firms: Salmones Huillinco S.A; Salmotec S.A and Finamar S.A</li> <li>Introduction of berries by INIA.</li> <li>-Starts the "regularization of the Land Reform", with the restitution of the expropriated lands.</li> <li>-Port rules and changes to the merchant navy.</li> <li>Technical Assistance for management of artisanal fishing (CORFO, 1977) (National Institute for Agricultural Research, 1979)</li> <li>-Fch starts production of blueberries (1985).</li> <li>-Between 1973-1986 a huge emphasis was put to the fruit production promotion of studies on technical assistance and credit, equipment and fruit industrialization, as well as the development of nursery and new crops.</li> <li>-Finance livestock program through loans granted by the International Bank for Reconstruction and Development.</li> <li>-Between 1973-1986 stand out prospection and evaluation of new mining metal and non-metal deposits.</li> <li>-Creation of Codelco (1976).</li> <li>-Creation of Cochilco (1976).</li> <li>-Creation of the National Geology and Mining Service (1981).</li> <li>-In addition, by 1983, these programs were complemented with the Technical Assistance Program, the Information Center Program, the Training Program and the Program of Complementary Actions.</li> </ul>
<b>Unsuccessful</b>	<ul style="list-style-type: none"> <li>-Program of Agricultural Mechanization.</li> <li>-Creation of the Comercializadora de Trigo (COTRISA, 1986). -Irrigation infrastructure is explicitly delegated to the private sector.</li> <li>During 1973-1986,</li> <li>-Seed program</li> <li>-Livestock Program</li> <li>-In the middle of the crisis, in 1983, price bands were set. The motivation of this policy was oriented to soften the impact of international fluctuations on the prices of some products considered to be sensitive, such as wheat, oil and sugar.</li> <li>-Creation of Carbonifera Schwager S.A (1986).</li> <li>-Between 1973-1986, CORFO dedicated its attention to keep a track of information for the formulation of a Development Program of the Cement Industry. In this field, a number of projects were executed to increase the capacity in the cement factory Lirquen and Loza Penco and Carrascal, among others.</li> <li>-Increase of capacity in the cement plants El Melon, Polpaico and Bio Bio, boosting the refractory plants of Lota Green, asbestos-cement Pizarreno, the glass factory Lirquen and Loza Penco and Carrascal</li> <li>-Water Code (Law 1,122, 1981)</li> <li>-Price bands (wheat, oil and sugar, 1983).</li> <li>-Irrigation Policy (1983).</li> </ul>
<b>Uncertain</b>	<ul style="list-style-type: none"> <li>-Copper and Mining Law (1982)</li> <li>-In 1984, the project of lithium salts of the Salar de Atacama led to the formation of the mixed Chilean Society of Lithium Ltd -The SERCOTEC is imposed to be self-funded (1974).</li> <li>-Between 1974-1978, the most relevant activities were: development of studies for investment promotion; technical assistance for small firms in the service sector, promotion and participation in fairs and presentations and entrepreneurial training program.</li> <li>-In the context of the 1982 recession, the SERCOTEC is restructured to generate employment in the country/ To these ends, three programs are launched: Financial Assistance Program for the SME's, Program of Export Promotion and the Support Program for Small Firms.</li> </ul>

**Table 10. Successes, failures and uncertain outcomes of industrial policy interventions. Vertical policies 1990-2012.**

Classification	Policy
successful	<ul style="list-style-type: none"> <li>-Enactment of Law 19,137 (1992), that allowed CODELCO to carry out joint ventures in the country to explore and exploit mineral deposits.</li> <li>-Lamb Development Program in Magallanes (CORFO, 1998)</li> </ul>
Unsuccessful	
Uncertain	<ul style="list-style-type: none"> <li>-Irrigation Infrastructure Improvements (1992)</li> <li>-Recovery of Soils Program (INIA, 1993)</li> <li>-INDAP increased in more than 2.6 times since 1990 and represented more than the 50% of the Ministry of Agriculture's budget.</li> <li>-Modern Irrigation Policy (CORFO, 1994)</li> <li>-Agricultural Insurance (CORFO, 1999)</li> <li>- FDI Attraction Program (2000).</li> </ul> <p>This was the first formal vertical industrial policy in Chile since the military. This program is launched by CORFO to attract FDI, which involved explicit up-front subsidies. This program has a sector orientation (information and communication technologies, ICT), and, in this sense, it is clearly vertical.</p> <ul style="list-style-type: none"> <li>-Creation of the Technological Institute of Salmon (CORFO, 1995).</li> </ul>



**Table 11. Successes, failures and uncertain outcomes of industrial policy interventions. Horizontal policies. 1927-1956.**

Classification	Policy
Successful	<ul style="list-style-type: none"><li>-Petroleum prospections in Magallanes by CORFO (1942)</li><li>-Creation of the Petroleum Service (1943)</li><li>-Discovery of the oilfield of Manantiales (1945)</li><li>-Creation of ENAP (National Oil Corporation, 1950)</li><li>-Electrification Plan (CORFO, 1943)</li><li>-Creation of ENDESA (National Enterprise of Electricity, 1944).</li><li>-Gasoline Plant of Manantiales (ENAP, 1952)</li><li>-Creation of the SERCOTEC (Servicio de Cooperación Técnica, 1952).</li><li>-Demonstrative Plants (VESTEX, CIC, FENSA and Tejedurias de Rayon S.A) and providing assistance (SOCOMETAL, FANALOZA, Muebleria Paris, SHYF, INDURA, SINDELEN, Standard Electric, ICARE, Diario La Union de Valparaiso and INDAC) (SERCOTEC, 1953)</li><li>- Also granted credits to the Linea Aerea Nacional LAN, for the acquisition of flight material and the Club Aereo de Chile for the purchase of instruction planes.</li></ul>
Unsuccessful	<p>-Between 1945-1952, CORFO collaborated with credits to increase in around 25,000 tons the merchant navy. However, its role was more intense in ground transportation, by financing imports of rolling stocks for the Empresa de los Ferrocarriles del Estado and for the Empresa Ferrocarril del Maipo S.A.</p>
Uncertain	<p>-Development of Industrial engineering program (SERCOTEC, 1956).</p>

<b>Table 12. Successes, failures and uncertain outcomes of industrial policy interventions. Vertical policies 1956-1973.</b>	
<b>Classification</b>	<b>Policy</b>
<b>Successful</b>	<p>-During the 1960s, two initiatives at a national level, namely, the National Petroleum Program and the National Electrification Program, entitled to two subsidiaries of the corporation: ENAP and ENDESA, respectively. CORFO was encouraged to build a national communication network, whose execution was entitled to its Committee of Telecommunications and then to the Empresa Nacional de Telecomunicaciones S.A. (ENTEL), created as a subsidiary of CORFO in June 1964.</p> <p>-CORFO also subscribed agreements with the Compañía de Telefonos de Chile (CTC), in 1967, to acquire the 40% of shares of that company and also created the Empresa Nacional de Television, in 1969, whose purpose was to extend the network to the whole territory, by 1970, the channel covered from Aconcagua until Temuco.</p> <p>-In 1960, SERCOTEC creates the Department of Professional Training, with the idea to supply shortages of qualified workers for the industrial development in Chile and meet the needs of reconstruction of the infrastructure lost stem from an earthquake.</p> <p>-Creation of the National Training Institute (INACAP) in 1966, based on the previous Department of Professional Training from the SERCOTEC</p> <p>- During the decade of 1950, most programs of the SERCOTEC were addressed to medium and large firms. In fact, the SMEs begin to appear in the public programs in the next decade. In 1962, SERCOTEC develops the Programa de Fomento y Desarrollo de la Pequeña Industria y el Artesanado, addressed to industries of "low capital consumption and labor intensive".</p>
<b>Unsuccessful</b>	<p>- Creation of the Centro de Asistencia Técnica, founded in 1970.</p>
<b>Uncertain</b>	<p>- Drawback applied during President Frei's government (1964)</p>

**Table 13. Successes, failures and uncertain outcomes of industrial policy interventions. Horizontal policies 1973-1990.**

Classification	Policy
Successful	<p>-The National Training Institute (INACAP) is privatized in 1976.</p>
Unsuccessful	<p>-Creation of the National Training and Employment Service (SENCE, 1976).</p> <p>-The main instrument used in this new system was the Training Tax Rebate (or Franquicia Tributaria or FT, 1977, in Spanish). This instrument allowed firms to discount the amount of taxes, a share of the amount invested in planning and the execution of training programs addressed to workers, partners or owners.</p>
Uncertain	<p>-Between 1974-1978, the most relevant activities were: development of studies for investment promotion; technical assistance for small firms in the service sector, promotion and participation in fairs and presentations and entrepreneurial training program.</p> <p>-In the context of the 1982 recession, the SERCOTEC is restructured to generate employment in the country/ To these ends, three programs are launched: Financial Assistance Program for the SME's, Program of Export Promotion and the Support Program for Small Firms.</p> <p>-In addition, by 1983, these programs were complemented with the Technical Assistance Program, the Information Center Program, the Training Program and the Program of Complementary Actions.</p>

**Table 14. Successes, failures and uncertain outcomes of industrial policy interventions. Horizontal policies 1990-2012.**

Classification	Policy
Successful	<p>-In 1991, CORFO starts operating as a second lending institution, following and scheme in which direct credits to final users were replaced by bank funding and other specialized funding intermediaries which allocate resources to final clients, therefore, reducing substantially the risk of financial losses for the State.</p> <p>-With the creation of the National Council for Innovation, in 2005, CORFO has restructured its instruments and fusioned them into INNOVA Chile instruments, reforming its “Consejos” and creating a new “macro Consejo” INNOVA, therefore simplifying its innovation role.</p> <p>-PDP (Programa de Desarrollo de Proveedores, 1998).</p> <p>-PREMEX (Programa de Apoyo a la Gestion de Empresas Exportadoras, 1997).</p> <p>-Program of Pre-investment (PI, 2000).</p> <p>-FOGAPE (2000).</p> <p>-Quality Promotion Program (FOCAL, 2004).</p> <p>-Local entrepreneurial Program (PEL, 2007)</p> <p>-The National Cluster Program (2007)</p> <p>-Technological Consortia Program (2007).</p> <p>-Creation of FONDEF (1991) with the idea to strengthen the scientific and technological capabilities of universities and technological institutes and other institutes, aimed to increase the competitiveness of firms.</p> <p>The Program of Science and Technology (PCT) is launched. After the PCT which operated between 1992 and 1995, the Program of Innovation and Technology was launched (PIT) (1996-2000) and later on, the Program of Development and Technological Innovation (PDIT) (2001-2004).</p> <p>- The National Fund of Technological and Productive Development (FONTEC) is created in 1991. The FONTEC was financed by the IDB and the Ministry of Finance. The FONTEC is an institution dependent on CORFO whose objective is to promote, orient, finance and co-finance the execution of technological innovation projects, associative technological transfers, implementation of technological infrastructure in general and boosting all the stages of the development of projects derived from an innovative process, carried out by productive firms of goods and services.</p> <p>-Creation of the National Council for Innovation (CNIC, 2005). The period between 2003 and 2006 was very important for innovation policy. A royalty to mining is passed by law, where all of its proceeds would be devoted to innovation programs.</p> <p>-In 1997, the government grants a multi-sectorial tax incentive for those firms that invest in training. With the Law 19,518, firms can invest in training up to 1% equivalent to the yearly salary paid by the firm, or 9 UTM in case the 1% is less to this number and the yearly salary does not exceed the 45 UTM.</p> <p>- Given the inability of the tax rebate to address small-scale firms the government launches in 1998 the National Training Fund (FONCAP), to extend direct subsidies to the micro and small enterprises, scholarships and special programs for youngsters.</p>
Unsuccessful	<p>-FAT (Fondo de Asistencia Tecnica, 1992).</p> <p>-Programa Territorial Integrado (2000).</p> <p>-PROFO (Proyectos Asociativos de Fomento, 1992).</p>
Uncertain	

<b>Table 15. Major Exporting Industries Share on Total Exports</b>	
<b>Industry</b>	<b>Share</b>
Mining	0.65
Forestry, Pulp and Paper	0.06
Fruits	0.04
Salmon and Trout	0.02
Wine	0.02
Fishmeal	0.01
Other Exports	0.19

<b>Table 16. Chilean major exports</b>	
(based in 100 items at 8 digits)	
<b>Product</b>	<b>Export Share</b>
Copper	0.58
Wood Pulp	0.03
Lumber	0.02
Molybdenum	0.02
Grapes	0.02
Wine	0.02
Iron	0.02
Gold	0.01
Salmon	0.01
Trouts	0.01
Berries	0.01
Apples	0.01
Potassium	0.01
Fishmeal	0.01
Paper related	0.01
Iodine	0.01
<b>Other Exports</b>	<b>0.19</b>

**Table 17. Vertical Industrial Policies Applied by Chile since 1927.**

	1927 - 1956	1956 - 1973	1973 - 1990	1990 - present
Mining Industry	-Creation of the Ministry of Mining (Law 231, 1953)	-“Chilenization” of Copper (1967) -Nationalization of the LSCM (1971) (Law 17,450)	-Creation of Codelco (1976) -Creation of Cochilco (1976) -Creation of the National Geology and Mining Service (1981) -Copper and Mining Law (1982)	
Agriculture		-Agricultural Development Plan (1965) -National Fruit Program (CORFO, 1965) -Chile-California Program (1965) -Law of Agrarian Reform (1962) -New Law of Agrarian Reform (1967)	-Introduction of berries by INIA (National Institute for Agricultural Research, 1979) -Water Code (Law 1,122, 1981) -Irrigation Policy (1983) -Fch starts production of blueberries (1985)	-Irrigation Infrastructure Improvements (1992) -Recovery of Soils Program (1993)
Forestry	-Ley de Bosques (1931) -Forest Plan (CORFO, 1942) -Creation of INFORSA (CORFO, 1956)	-CONAF's reforestation agreement with private landowners in the 1960s. -Projects of cellulose and paper plants Arauco and Constitución (CORFO, 1966) -Direct plantation program of SAG in 1970s.	-Decree Law 701. Reimbursement of the 75% of the costs of reforestation (1974) -Forestry Law (1974) -Decree Law 2,565. Increases the subsidy to 90% (1979)	
Salmon and Trout		-SERNAP signed agreement with JICA to introduce pacific salmon. Viability studies.	-CORFO assisted the Company Lago Llanquihue to produce and export trout to France in 1978. -Fch buys Domsea Farms Chile and founded Salmones Antártica (1981). -Fch created three other firms: Salmones Huilincó S.A.; Salmotec S.A and Finamar S.A.	-Creation of the Technological Institute of Salmon (1995)
Infrastructure	-Electrification Plan (CORFO, 1943) -Creation of ENDESA (National Enterprise of Electricity, 1944)	-Creation of the Empresa Nacional de Telecomunicaciones S.A. (ENTEL, 1964) -Acquisition of 40% shares of Compañía de Teléfonos de Chile (1967) -Creation of the Servicio de Computación (ECOM, 1968) -Creation of the Empresa de Televisión Nacional de Chile (1969)		
Industry	-Industrial Development Plan (1939) -Creation of Electromat S.A (1939) -Creation of INSA (National Tyres Industry, 1941) -Creation of CAP (Pacific Iron Corporation, 1946) -Huachipato Iron and Steel Plant (CAP, 1950) -Creation of ENAP (National Oil Corporation, 1950) -Gasoline Plant of Manantiales (ENAP, 1952) -Con Con Refinery (ENAP, 1954)	-SONACOL (ENAP, 1957) -The Departamento de Pequeña Industria y Artesanado is created (1962) -Since January 1971 a wide policy of nationalization was carried out. The government of the P.U entitled CORFO to take control of the so-called Social Property Area. In order to configurate it, the government acquired, intervened and/or expropriated, coal firms, beer and food producers, fishing and poultry firms. By September 1973, the government had acquired, intervened and/or expropriated; 45 firms in the textile industry; 27 forest firms; 22 fishing firms; 25 construction firms; 31 chemical firms; 14 firms involved in the energy and combustible sector; 21 firms in the electronic sector; 6 firms of agricultural mechanization; 71 firms in the agricultural industry; 83 firms in the metallurgical sector; 11 firms from the automotive sector; 5 in the pharmaceutical sector; 27 in the mining sector; 5 in the metalworking sector; 68 diverse firms and 19 banks; with a total of 507 firms. -CORFO signed agreements to create CORFO-Peugeot and CORFO-Citroen, together with an ambitious investment policy by constructing a gearbox and rear bridges factory in Los Andes in 1973. -Great emphasis to the distribution sector, with the creation of ENADI (Empresa Nacional de Distribucion, 1971) and DINAC (Empresa Nacional de Comercializacion, 1971)	-Between 1973-1986, CORFO dedicated its attention to keep a track of information for the formulation of a Development Program of the Cement Industry. In this field, a number of projects were executed to increase the capacity in the cement plants El Melon, Polpaico and Bio Bio, boosting the refractory plants of Lota Green, asbestos-cement Pizarreno, the glass factory Lirquen and Loza Penco and Carrascal, among others.	

**Table 17. Vertical Industrial Policies Applied by Chile since 1927 (Cont.)**

	1927 - 1956	1956 - 1973	1973 - 1990	1990 - present
Mining (CORFO)	<ul style="list-style-type: none"> <li>-Most support granted through La Caja de Crédito Minero (1939-43)</li> <li>-Creation of the Sociedad Abastecedora de la Minería, Ltda (1941)</li> <li>-Creation of La Caja de Crédito Minero (1941)</li> <li>-Creation of the Sociedad Nacional de Minería (1941)</li> <li>-Creation of Madeco (Manufacturas de Cobre S.A. 1943)</li> <li>-Finished construction of Paipotes Foundry (1950)</li> <li>-Credit lines for the creation of the Empresa Minera Mantos Blancos (1955)</li> <li>-Creation of the sulfuric acid plant, Fassa (CORFO, 1956)</li> </ul>	<ul style="list-style-type: none"> <li>-Creation of the Instituto de Investigaciones Geológicas (1957)</li> <li>-Creation of the Empresa Nacional de Minería (ENAMI, 1960)</li> <li>-Construction of lixiviation plant in Taltal (1964)</li> <li>-Creation of the Ventanas Foundry (1964)</li> <li>-Creation of the Centro de Investigaciones del Salitre y la Industria Química (1965)</li> <li>-Creation of a Committee for the production of sulfur (1966)</li> <li>-Construction of the Sulfuric Acid Plant of Vallenar (1967)</li> <li>-CORFO became owner of the 51% of shares of SOQUIMICH (1970)</li> </ul>	<ul style="list-style-type: none"> <li>-Between 1973-1986 stand out prospection and evaluation of new mining metal and non-metal deposits.</li> </ul>	
Energy (CORFO)	<ul style="list-style-type: none"> <li>-Petroleum prospections in Magallanes by CORFO (1942)</li> <li>-Discovery of the oilfield of Manatiales (1945)</li> </ul>	<ul style="list-style-type: none"> <li>-National Petroleum Program (1964)</li> <li>-National Electrification Program (1964)</li> <li>-Creation of the Comité para el Aprovechamiento de la energía Geotérmica (1966)</li> </ul>		
Fishing (CORFO)	<ul style="list-style-type: none"> <li>-Creation of the Biological Station in Montemar, by CORFO and the University of Chile (1941)</li> <li>-Creation of Compañía Pesquera Arauco S.A. (1941)</li> <li>-CORFO hires a mission from the United States Fisheries and Wildlife Service for policy advice (1944)</li> <li>-Acquisition of Industria Pesquera Cavanca S.A. (1953)</li> <li>-Oceanographic studies promoted by CORFO (1954)</li> </ul>	<ul style="list-style-type: none"> <li>-Fishing Development Plan (DL 266, 1960)</li> <li>-Creation of the Industria Pesquera Tarapaca S.A. (1961)</li> <li>-Creation of IFOP (Instituto de Fomento Pesquero, 1964)</li> <li>-Oyster program (IFOP, 1967); Commercial Algae (1968)</li> <li>-Creation of IREN (Instituto de Investigaciones de Recursos Naturales, 1964)</li> </ul>		<ul style="list-style-type: none"> <li>-Technical Assistance for management of artisanal fishing (CORFO, 1997).</li> </ul>
Agriculture (CORFO)	<ul style="list-style-type: none"> <li>-Creation of the SEAM (Servicio de Equipos Agrícolas Mecanizados, 1946)</li> <li>-Studies of adaptation of beetroot sugar (CORFO, 1945)</li> <li>-Creation of IANSA (National Sugar Corporation, 1953)</li> <li>-Agricultural Development Plan (1954)</li> <li>incorporating around 50,000 hectares between 1940-1959 and improve the irrigation of other 165,000 in the same period.</li> </ul>	<ul style="list-style-type: none"> <li>-Creation of the Agricultural Executive Committee (1960)</li> <li>-Creation of the Instituto Agrológico (1961)</li> <li>-Research on fruit production (CORFO, 1961-64)</li> <li>-Livestock Development Program (1961)</li> <li>-National Wine Development Program (1964)</li> <li>-Sugar Development Plan and related sectors (1964)</li> <li>Capacity increase for IANSA.</li> <li>-National Fruit Program Program (1965)</li> <li>-Rural Electrification Plan (1966)</li> <li>-Tomato Can Adaptation Plan (1966)</li> <li>-National Plan of Livestock Development (1966)</li> <li>(this included, a national network of slaughterhouses, Program of Dairy Plants, Animal Sanitation Program, Southern Livestock Program and Poultry and Pork Development Program)</li> <li>-During the government of the P.U, CORFO privileged two sectors. The first was the Wine Program and the Fruit and Horticultural Program (1971)</li> </ul>	<ul style="list-style-type: none"> <li>-Between 1973-1986 stand out the seed program (potato, peas); the fruit plan (technical assistance, credit and fruit industrialization, development of nursery and new plantations; livestock program (by financing programs for the agricultural sector by the International Bank for Reconstruction and Development, CORFO credits for specific livestock programs, imports of livestock, etc); Program of agricultural mechanization.</li> </ul>	<ul style="list-style-type: none"> <li>-Modern Irrigation Policy (CORFO, 1994)</li> <li>-Lamb Development Program in Magallanes (CORFO, 1998)</li> <li>-Agricultural Insurance (CORFO, 1999)</li> </ul>

**Table 17. Vertical Industrial Policies Applied by Chile since 1927 (Cont2.)**

	1927 - 1956	1956 - 1973	1973 - 1990	1990 - present
Forestry (CORFO)	<ul style="list-style-type: none"> <li>-Preliminary survey of the Chilean forest (The Haig Mission)</li> <li>-Forestry Plan (1942)</li> <li>a) Reforestation of 40,000 hectares with insigne pine and eucalyptus globulus (1942)</li> <li>b) Forestation Plan, creation of forest reserves at a rate of 60,000 hectares per year in 50 years (1942)</li> <li>-Creation of SOMASUR (Sociedad Anónima Maderera del Sur, 1942)</li> <li>-Propection activities and finalization of record of the forest resources available (1952-53).</li> <li>-Credit lines to the CMPC (Cia Manuf. De Papeles y Cartones, 1953)</li> <li>-Formulation of the Cellulose and Paper Industry (by mid-1950)</li> </ul>	<ul style="list-style-type: none"> <li>-Creation of INFORSA (Instituto Forestal S.A, 1961)</li> <li>-Credit lines to the CMPC (Cia Manuf. De Papeles y Cartones, 1964)</li> <li>-Program of Reforestation and Forest Management (1965)</li> <li>-Starts construction of Celulosa Arauco (1967)</li> <li>-CORFO took over Forestal Colcura's large stationary sawmill to keep it from bankruptcy (1968)</li> <li>-Creation of Celulosa Constitucion (CELCO, 1969)</li> <li>-During the P.U, the forest industry became in the most socialized sector of the economy. The government nationalized 3 million hectares of native forest or suitable for reforestation. No forest plantations were expropriated during the P.U period.</li> </ul>	<ul style="list-style-type: none"> <li>-Between 1973-1986 stand out the Reforestation Program, finishing the 5-year program set in place in 1975, which contemplated the plantation of 590,000 hectares of insigne pine until 1979, with the idea to secure the wood supply for the industries of cellulose and paper; In the forest projects stand out the Cellulose and Paper Program and the promotion of projects with foreign companies: Maruberi, Mitsui and Co, Mitsubishi, Weyerheusen and Boise, Cascade and Hercules Inc.</li> </ul>	
Innovation Policy (CC)	<ul style="list-style-type: none"> <li>-Creation of the SERCOTEC (Servicio de Cooperación Técnica, 1952)</li> <li>-Demostrative Plants (VESTEX, CIC, FENSA and Tejedurias de Rayon S.A) and providing assistance (SOCOMETAL, FANALOZA, Muebleria Paris, SHYF, INDURA, SINDELEN, Standard Electric, ICARE, Diario La Union de Valparaiso and INDAC) (SERCOTEC, 1953)</li> <li>-Development of Industrial ingeneering program (SERCOTEC, 1956)</li> </ul>	<ul style="list-style-type: none"> <li>-Creation of the Programa de Fomento y Desarrollo de la Pequeña Industria y el Artesanado (1960)</li> <li>-Promotion Program of Subcontracting (1965)</li> <li>-The Comission of Development of the Electronic Industry is established (1965)</li> <li>-Creation of INACAP (SERCOTEC, 1966)</li> <li>-During the P.U period, there was a change in the objectives of the SERCOTEC: promotion and technical assistance to the small industry and artisans, study new ways to organise socially the firms and to boost the development and strengthening of the national cooperative movement.</li> <li>-Creation of the Centro de Asistencia Técnica (1970).</li> </ul>	<ul style="list-style-type: none"> <li>-The SERCOTEC is imposed to be self-funded (1974).</li> <li>-Between 1974-1978, the most relevant activities were: development of studies for investment promotion; technical assistance for small firms in the service sector, promotion and participation in fairs and presentations and entrepreneurial training program.</li> </ul>	<ul style="list-style-type: none"> <li>-The Program of Science and Technology (PCT) is launched (2</li> </ul>



**Table 18. Horizontal Industrial Policies Applied by Chile since 1927.**

1927 - 1956	1956 - 1973	1973 - 1990	1990 - present
	<ul style="list-style-type: none"> <li>-Drawback applied during President Frei's government (1964)</li> <li>-New definition of CORFO's Role (DL 1956)</li> <li>-National Development Program (1967)</li> <li>-Creation of ODEPLAN (1967).</li> <li>-Creation of IREN (Instituto de Inversiones Naturales, 1964)</li> </ul>	<ul style="list-style-type: none"> <li>-The Creation of the Foreign Investment Statute (DL 600, 1974)</li> <li>-Research Institutions are imposed to be self-funded (1974)</li> <li>-VAT exemption by exports (D.L 825, 1974)</li> <li>-DL 889, which establishes bonus for hiring workers in extreme zones of the country.</li> <li>-Creation of PROCHILE (1975)</li> <li>-Creation of SENCE (1976).</li> <li>-Privatization of the National Training Institute (INACAP, 1976).</li> <li>-Creation of Fundacion Chile (1976)</li> <li>-Simplified Drawback (Law 18,480 in 1985)</li> <li>-Modification SD (Law 18,653 in 1987)</li> <li>-Modification SD (Law 18,768 in 1988)</li> <li>-Export Promotion Program (SERCOTEC, 1982)</li> <li>-Reorganization of CORFO (1976), management of companies, promotion and development, plus a normalization function, of transitory character.</li> <li>-Creation of the Fondo de Desarrollo Productivo (CORFO, 1983)</li> <li>-Programa Global de Credito Multisectorial CORFO-IDB I</li> <li>-Programa Global de Credito Multisectorial CORFO-IDB II</li> <li>-Programa de Recuperaciones de Colocaciones CORFO-IDB I</li> <li>-Programa CORFO-World Bank-SERCOTEC</li> <li>-Programa de Intermediacion Financiera BIRF-CORFO-Central Bank</li> </ul>	<ul style="list-style-type: none"> <li>-Multisectoral tax incentive for investment in training (Law 19,518 1997)</li> <li>-Training Policy (Law 19,518 in 1997)</li> <li>-Creation of the National Training Fund (FONCAP, 1998)</li> <li>-Innovation Program (2001)</li> <li>-New Role of CORFO - Financial Intermediation (1990)</li> <li>-Creation of FONTEC (CORFO, 1991)</li> <li>-Creation of FAT (CORFO, 1992)</li> <li>-Creation of PROFO (CORFO, 1992)</li> <li>-Development and Innovation Fund (CORFO, 1995)</li> <li>-Technological Missions Abroad (CORFO, 1996)</li> <li>-Plan of Productive Reconversion in the City of Lota (CORFO, 1996)</li> <li>-Long-run credits for postgraduate and graduate studies (CORFO, 1997)</li> <li>-Assurance and quality certification (CORFO, 1997)</li> <li>-Creation PDP (CORFO, 1997)</li> <li>-Creation of PREMEX (CORFO, 1997)</li> <li>-Zone Allocation Committee (CORFO, 1998)</li> <li>-Film Promotion Program (CORFO, 1999)</li> <li>-Entrepreneurial Management Program (CORFO, 1999)</li> <li>-Program of Private Investment Attraction to Regions (CORFO, 1999)</li> <li>-Clean Production Committee (CORFO, 2000)</li> <li>-Certification of Digital Sign (CORFO, 2000)</li> <li>-Integrated Territorial Program (CORFO, 2000)</li> <li>-Creation of FOGAPE (CORFO, 2000)</li> <li>-Creation of FDI Attraction Program (CORFO, 2000)</li> <li>-Facilities in Silicon Valley (CORFO, 2001)</li> <li>-Management "off-sets", Pro-Industrial Committee (CORFO, 2001)</li> <li>-Technological Innovation Committee of Bío Bío (CORFO, 2001)</li> <li>-The Program of Science and Technology (PCT) operated between (1992-1995), the Program of Innovation and Technology was launched (PIT, 1996-2000) and later on, the Program of Development and Technical Innovation (PDIT, 2001-2004)</li> </ul>

