The Agricultural Effects of Economic and Land Reforms in Chile, 1965-2000

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1. Introduction

During the last half century Chile experienced several extreme political and economic shifts. Prior to 1964, Chile had a traditional conservative government. By 1965, a more progressive government (Frei administration) strongly encouraged by USA and the Alliance for Progress, initiated economic and structural reforms. These reforms included nationalization of foreign owned copper firms, unionization of rural workers, and land reform. In 1970, a socialist administration gained power (Allende administration), it attempted to increase state power, expropriating industrial firms as well as farms, intervening in markets and moving towards greater protection of domestic industry. A coup d’état in September 1973, brought to power a military government that liberalized international trade, deregulated domestic markets and privatized parastatal enterprises, led the country to a free market economy (military government of Augusto Pinochet). Finally, after 1990 a series of democratically elected governments (Aylwin, Frei and Lagos administrations) maintained the economic framework and introduced policies intended to alleviate poverty and protect natural resources.

Since mid-1960s, Chile transformed from being one of the most conservative import substitution countries, with a widely protected agricultural sector, into a dynamic and export-oriented economy. In this scenario the agricultural sector has emerged as a largely modern commercial farming structure characterized by high growth rates heavily based on fruit exports to

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the Northern Hemisphere. Since Chile initiated the reforms almost four decades ago, its experience is full of lessons that might be of interest for other countries.

During the late 1950s and early 1960s the Chilean agricultural sector was the focus of two main controversy issues. First the land was concentrated in the hands of few owners, concentrating political as well as economic power (CIDA, Kaufman, 1972, Barraclough, 1970) and second the agricultural production was growing slowly, leading to a rising agricultural trade deficit and continuing poverty among agricultural workers (Valdés, 1973). During the Eduardo Frei administration (1965-70) two reforms were proposed to resolve these problems. One was the land reform, intended to improve land management and increase economic and political equity, and the other were trade and price reforms, intended to improve incentives for agricultural development by opening the economy. Each of these reforms was implemented, with the bulk of the land reform undertaken by the Salvador Allende administration and the economic reforms undertaken by the military government of Augusto Pinochet.

The result of changing ideologies translated into macroeconomic and sectoral policies that have continuously affected the allocation of resources within agriculture and between agriculture and other sectors (Krueger, Schiff and Valdés, 1988). Hence, the main objective of this paper is to assess the longer-term effects of these land and economic reforms on Chile’s agricultural sector, separately and more importantly via their interaction.

In evaluating the effect of economic and land reforms on agriculture, this paper emphasizes several aspects that have not been given sufficient attention to date. First, the reforms are best evaluated in terms of their impact on the technical and economic efficiency of the sector. Thus, the reforms probably improved input and product markets, increased access to information, and encouraged the acquisition, development and utilization of improved labor skills, management and
technology. Actually, the Chilean agricultural sector, long thought to be one of least efficient, became one of the more efficient sectors.

Second, the reforms also should be evaluated in terms of their effects on social and political equity, regionally and nationally. For example, the direct effect of redistribution on land holdings was much less than expected. but landowners lost the significant political power they had once held over their workers. Many women entered the agricultural labor force, while increasing family incomes gaining greater personal independence and opportunity.

Third, to evaluate economic and land reforms on agriculture, it has to be considered the effects of structural adjustment and economic stabilization policies. Chile had greater success in the area of structural adjustment than economic stabilization during the first decade of the military government. Inappropriate macroeconomic decisions led to severe economic imbalances and then to macroeconomic corrections that caused sharp declines in real GNP in 1975/76 and again in 1981/82 (Edwards and Edwards, 1987, Bosworth, Dornbusch and Labán, 1994). These crises eliminated much of the growth that the reforms might otherwise have achieved in the early period.

Fourth, the reforms’ costs initially were significantly higher than the benefits. Indeed, many observers (though not necessarily the same observers in each case) would have argued that land and economic reforms had mainly negative effects at least through the mid-1980s. The benefits of the reforms became more apparent over time. The Chilean case is thus one in which different sub-periods manifest different effects. A lengthy period was needed before a fairly positive assessment of the reforms could be made.

Fifth, the reforms had a differentiated impact on agricultural sub sectors and geographic regions. Historically, much of Chile’s rich Central Valley was planted to cereals, oilseeds, grain legumes and sugar beets, all of which received significant protection from imports. Trade
liberalization hurt these sectors more than it helped them, causing a significant decline in the area planted to these crops, employment and agricultural income. Other crops, however, benefited. Chile has a clear comparative advantage in certain Mediterranean products, particularly fruits, nuts and wine, based on its hemispheric location, climate, soils, water, phytosanitary conditions and cheap labor. Output and exports of these products grew rapidly after the reforms and soon compensated for losses elsewhere.

Sixth and finally, the economic and land reforms interacted; neither would have had the same impact in the absence of the other. For example, reaction to land reform motivated changes in the Chilean Constitution that granted greater security to private property rights. Many believe this security was crucial to the investments that fueled agricultural growth in the post-reform period. However, such investments would not have been so profitable unless economic reforms had changed relative prices, liberalized labor markets and improved rural infrastructure. Similarly, land reform created disruptions that probably slowed the sector’s initial response to economic policy reforms, but changes in the structure of land ownership brought about by land reform also facilitated the entry of new agricultural entrepreneurs after the mid-1970s, and their entry also spanned development.

The paper is organized as follows. Section 2 provides a briefly overview of the policy reforms of the last four decades. Section 3 contains an analysis of the expected and actual effects of these reforms. Finally, section 4 presents the main policy lessons.

2. Overview of Policy Reforms

The several approaches to economic policy and structural reforms undertaken since the mid-sixties have affected nearly every aspect of the economy, e.g., international trade, finance,
labor, and tax and public expenditure policies. Major aspects of the economic and land reforms are outlined below, at least insofar as they affected agriculture.

2.1. Land Reform Policy

Land reform policy was designed to encourage agricultural investment and improve farm management, while shifting a significant proportion of land ownership from the relatively small number of large landowners to the much larger number of male workers that composed the permanent labor force on the large farms (Thome 1971; Kaufman, 1972). The plan was to leave existing large farmers with a significant plot of land that they could continue farming provided that they demonstrated that their farm was adequately capitalized and well managed, while expropriating the rest and redistributing it.

In 1965, 2% of Chile’s farmers (about 5,000 individuals) held 55% of Chile’s agricultural land. Approximately 43% of Chile’s agricultural land (by productive value) was expropriated between 1965 and 1973 (Jarvis, 1981a, 1985). Nearly all large farms were partly or wholly expropriated. The land expropriating process was most intense between 1967 and late 1973, at which time the process ended abruptly following the overthrow of Allende administration by a military coup. After 1974, 43% of the expropriated land was returned to the previous landowner, the government retained about 15%, a small amount was auctioned, and the remaining nearly 50% was distributed to approximately 50,000 land reform beneficiaries (Jarvis, 1985). Thus, even though most large farmers recovered substantial land, an amount equal to about 20% of Chile’s total land was redistributed to land reform beneficiaries who purchased their parcels for about 50% of market value, payable over 30 years.² (Jarvis, 1985).

² The parcels averaged 9 Basic Irrigated Hectares (BIH). A BIH was the amount of land estimated to have the equivalent productive potential of 1 ha of prime irrigated land in the Maipo River valley, one of Chile’s best agricultural regions.
The beneficiaries constituted about half of the 100,000 adult males previously resident on the transitional land reform farm entities (*asentamientos*) created by expropriation (Jarvis, 1985). The other 50,000 workers were abruptly dismissed, becoming landless laborers in search of work. The agricultural labor force was approximately 500,000 workers, almost all of which were male. The dismissal of so many workers resulted in a large increase in agricultural unemployment (which was already high because of the macroeconomic and structural adjustments proceeding economy wide) and required significant labor market adjustment (Jarvis, 1985; Edwards and Edwards, 1987).

The selection process for the beneficiaries excluded leaders of the farm workers and rewarded men with large families (See Jarvis 1985 for information supporting the information in this and the subsequent paragraph. While having some welfare rationale, most beneficiaries were not well qualified as farmers and, moreover, most were effectively barred by government policy from subsequently receiving technical assistance or credit. Policies toward the beneficiaries were not designed to encourage their success, since the government argued that it would be unfair to sell land to beneficiaries at a discounted rate and also provide beneficiaries with subsidized credit or technical assistance since other poor also needed assistance. Many policy makers in the late 1970s did not want land reform to achieve success and policies toward the beneficiaries reflected this attitude. However, many beneficiaries would doubtlessly have failed even had they received significant assistance given their lack of education and entrepreneurial experience.

By the early 1980s, about 40 percent of the land reform beneficiaries had sold their parcels (Jarvis, 1985); the figure in 2000 was significantly higher, reaching nearly 100% in many areas. Land reform beneficiaries sold their parcels for many reasons. Principal among them were the beneficiaries' lack of capital and technical assistance, their lack of farming and entrepreneurial
skills, and the simple desire of some to leave farming. Moreover, the fruit boom, which dramatically increased the value of land suitable for fruit production, made it attractive for many farmers who did not have the means to produce fruit to sell to others who could (Jarvis, 1994). In turn, declining agricultural prices, to be discussed, and growing competitive pressures, made farming less attractive for those who could not implement new technologies. Many large landowners also left farming during the last 25 years. Some left because of their land reform experience, others because of age, some lacked capital to make the investments needed to operate efficiently and were pressed by competition, and others were enticed by the high prices offered for their land (Jarvis, 1985).

It is debated whether land reform stimulated or retarded agricultural development (Quiroz, Barahones and Valdés, 1988; Jarvis 1990). Analysis of agricultural output suggests that land reform led to faster rather than to slower growth. Output rose in 1965-1970, declined sharply in 1971-73, and recovered quickly after expropriation ended (Figure 1). As noted below, output rose substantially more rapidly in the 20 years following land reform than it had in decades prior to reform, though it is difficult to identify cause and effect. In addition, land reform contributed to a more dynamic land market that facilitated expansion by progressive farmers and entry by investors from industry, commerce and mining (Jarvis, et al. 1993), and these new entrepreneurs were crucial to rapid fruit sector development after 1975. Success in fruit also set the stage for subsequent innovative agricultural developments (Jarvis, 1994). Thus, the land reform constituted one of the bases for the development of agricultural firms able to react to a changing economic environment by adjusting productivity and profitability instead of making an extensive use of land resource, because of the smaller farm size (Ortiz, 2002; Portilla, 2002).

2.2 Exchange Rate Policy
The real exchange rate has exhibited large fluctuations since mid-sixties (Figure 1). This behavior can be explained by changes in terms of trade, productivity, openness and changes in the nominal exchange rate, for example, to achieve competitiveness or to reduce inflation (De Gregorio, 2000). From 1965 to 1970, the Frei administration adopted a policy oriented to keep a higher real exchange rate from. In late 1970, right after the beginning of Allende administration, there was an attempt to reduce and fix the exchange rate, but rapid rise in inflation caused a substantial appreciation. After the militaries took power in late 1973, it began a series of devaluations aimed at achieving and maintaining a higher real exchange rate in the face of high inflation and to restore competitiveness. Thus by 1974 the real exchange rate reached the maximum depreciation since the 1960s. The military government also implemented a monetary shock policy that caused a 14% decline in GNP in 1975/76 (Figure 6). In 1976, the government began to rapidly reduce import tariffs and quantitative restrictions. Despite continuing high inflation, it revalued the peso slightly in 1976 and 1977, officially justified by the fact that the real exchange rate was too depreciated and the external conditions would allow for an appreciation (De Gregorio, 2000).

With disappointing progress in inflation, the exchange rate was fixed in June 1979 hoping that a fixed exchange rate would further reduce inflation. It did, but meanwhile the peso appreciated in real terms. Economic growth was robust from 1976 to 1981, foreign capital was readily available to the private sector and, given that protection had been greatly reduced, imports surged. Many businesses borrowed heavily at high real interest rates to remain liquid. Eventually, the deteriorating balance of trade forced Chile to abandon a fixed exchange rate in June 1982. The

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financial sector, heavily indebted in dollars, collapsed and the GNP fell sharply in 1982/83 (Figure 6), again by 14%. Chile was only one of many Latin American countries that faced a large international debt and an unfavorable economic situation at this time.

The devaluation of 1982 was followed by a period of instability with discrete devaluations, a short period of floating, segmentation of the foreign rate market and so on (De Gregorio, 2000). Thus, the period going from the debt crisis up to 1990 was a period in which the continuous devaluations of the nominal exchange rate were able to achieve a continuous real depreciation. Macroeconomic policy became more balanced and the benefits of ongoing reform became clear as economic growth resumed and inflation was contained. Devaluation without inflation was achieved because the devaluations contributed mainly to correct a large misalignment occurred in the early 1980s. After 1982, the exchange rate began to appreciate increasing the price of tradables relative to nontradables. The external accounts now appear sound and the growth of productivity has been important.

2.3. Trade Liberalization

Prior to the trade reforms initiated in late 1975, Chile was one of the most conservative import substitution regimes, protecting many domestic activities, including domestic food production. Tariffs averaged 98%, rates were highly differentiated, and import quotas were common. By late 1960s this scheme led to progressively slow growth and became dependent on performance of the copper market. The social pressures due to slow growth and serious political problems made the country extremely unstable culminating with the military coup in late 1973. Since late 1975 Chile started to transform into a dynamic export-oriented economy. Hence from 1976 to 1979, Chile moved to implement an essentially uniform 10% tariff, prompting significant

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4 For details on real exchange rates determinants see De Gregorio (1996) and Céspedes and De Gregorio (1999).
economic restructuring. This pioneering program of trade liberalization led to rapid growth, expanding exports and increased productivity to the end of seventies. Opening the economy allowed Chileans access to new products, technologies and perspectives. Agriculture was one of the first sectors to benefit because the fruit boom provided strong incentives to obtain new technologies and shift production activities (Jarvis, 1994). Farmers who knew little economics began to speak about the need to follow “comparative advantage.”

Following the economic crisis in 1982, Chile temporarily increased the uniform tariff to 20%, and to 35% in 1984. In agriculture, specific import tariffs were reintroduced in 1983 for wheat, sugar and edible oils, and a minimum import price was adopted for dairy products. After eradicating foot and mouth disease, Chile also imposed sanitary restrictions on imported beef from neighboring countries with foot and mouth disease, and this caused an increase in the domestic beef price. Agricultural price bands were also introduced for major cereals and, as designed, offered additional protection. Increased protection stimulated output in the short-term, as will be discussed later. After this brief reverse in the reforms and as the economic situation improved, Chile was classical example of an open economy, with low and falling uniform trade tariff rates and almost no non-tariff barriers to trade. The special tariffs for agricultural commodities were removed and the uniform tariff was reduced to 30%, 20%, 15%, and finally to 11% in 1991. The adoption of a low uniform tariff achieved significant increases in productivity throughout the economy. These gains were somewhat delayed in agriculture because of special policies adopted there, mainly to ease the harsh welfare effect on small farmers, but gains occurred. Until 1999, this strategy led to a remarkable period of sustained growth (Figure 6), exports expanded and diversified, inflation remained under control, and unemployment and poverty declined.

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5 For details on trade liberalization process see De la Cuadra and Hachette (1991), Bosworth, Dornbusch and Labán (1994) and Fischer (2001).
From 1990, the Alywin, Frei and Lagos administrations, democratically elected, implemented policies to maintain the exchange rate and a low uniform tariff in order to consolidate the liberalization strategy. Agriculture was fully incorporated into this strategy. Thus, Chile signed free trade agreements with Mexico (1991), Venezuela (1993), Colombia (1993), Equator (1995), and Canada (1997), among others, and became an associate member of the Southern Cone Free Trade Area (MERCOSUR) in 1996, which required it to reduce tariffs on products imported from other MERCOSUR nations (Argentina, Brazil, Paraguay and Brazil). This is increasing external competition for agriculture since Chile’s MERCOSUR partners are low cost producers of many crops and livestock. In late 1990s Chile became one of the most open economies in Latin America, with a level of tariffs as low as 9%.

2.4. Financial Liberalization

Reflecting the inward-looking development model implemented prior to 1973, in Chile and most other Latin American countries, the financial sector was extremely regulated. This meant the prevalence of controlled and usually low interest rates, quantitative restrictions on credit, mandated allocation of credit to priority sectors, and a large state ownership of banks and other financial institutions. Few banks lent to agriculture and those that did lent only to large farms. The radical shift in the country’s development model started in 1974 was reflected in the removal of most regulations affecting the banking sector. Important components of the financial liberalization in the 1970s were the privatization of state-owned banks and a gradual relaxation of entry restrictions to the banking sector. Similarly, several reforms allowed the development of others capital markets such as insurance, bond, and stock markets. Farmers that had debts found it difficult to pay and many accumulated large debt balances. High real interest rates and scarce capital restrained

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6 The price bands offered progressively less protection through the late 1980s.
7 For details on financial liberalization see Gallego and Loayza (2000).
agricultural investment, though many fruit sector investors obtained funds via third parties, especially fruit exporters, because investments appeared so profitable. Long-term agricultural credit began to become available in the late 1970s, primarily through credit lines from international agencies like the World Bank. Real interest rates were high, but declined gradually from about 20% to about 12% in 1980. The high real interest rates contributed to a significant debt balance and many farmers went bankrupt during the 1982/83 crisis. However, a large number defaulted, but avoided foreclosure through legal “stratagems”. As a result of such defaults, bank lending to agriculture declined in the 1980s.

Liberalization of banking legislation allowed the formation of new banks. The financial sector grew rapidly, but because banks were insufficiently regulated, lending practices were inadequate and essentially all commercial banks went bankrupt during the 1982 crisis. In the wake of this banking crisis, the liberalization process was partially reversed, because the state became manager and main creditor of rescued banks and the financial controls such as restrictions on external capital movements and “suggested” interest rates by the Central Bank were reinstated. The controls on interest rates were eliminated in 1985 and a new banking law was enacted. The financial sector recovered, created additional financial products and services, and became far more efficient. Development of a competitive financial market allowed increasingly efficient intermediation, including direct access to funds for larger firms, some of which were involved in agricultural production.

From 1991 to 1999, the reforms started in the late 1980s were strengthened and moreover, a number of constraints related to external capital account transactions were lifted. In 1997, a new capital market law was passed by the congress that regulated the participation of banks in non-traditional areas such as factoring, non-pension insurance, and investment banking.
2.5. Labor Regulation

Prior to 1965, large landowners contracted labor without significant government interference. Farm worker unionization had been prohibited in 1938. Large Chilean farms traditionally relied on service tenants (*inquilinos*) for their permanent labor force. Service tenants received usufruct rights to small amounts of land, in-kind payments of food and housing, and a small amount of cash in exchange for labor services. The incentive system was weak and labor productivity was low. Landowners usually maintained a paternalistic relationship with their workers, and loyalty to the owner was an important employment consideration. Temporary workers were employed during periods of peak labor demand. More than 90% of agricultural workers were functionally illiterate in 1965, though educational achievements began to increase after the government began to establish rural public schools in 1957.

From 1965 to 1973\(^8\), the government attempted to legislate improved labor conditions, particularly in agriculture. Employers were required to pay a minimum cash wage and real wages rose sharply. Legislation limited dismissals to increase employment security. In 1967, simultaneous with land reform, farm labor unionization was legalized. Indeed, the government encouraged the formation of agricultural unions, political parties each sought to unionize the greatest number of workers and most permanent agricultural workers were unionized. Unions then actively sought and frequently achieved expropriation of the land on which they worked.

The end of land reform resulted in high agricultural unemployment and a significant decline in real wages (Jarvis, 1985). New legislation and a changing structure of labor demand also fundamentally altered the employer-employee relationship. In 1974, the military government sharply repressed again union activity, particularly in agriculture. Legislation implemented in 1976

prohibited farm unions unless farms had more than eight permanent workers. Enforcement of remaining labor laws became laxer. Following unionization and land reform, landowners were wary of workers. The political context allowed them to easily reduce the number of workers permanently employed, i.e., to less than eight workers. Some fired workers were hired back “temporarily,” for 11 months each year, so that they did not qualify for employment security or fringe benefits. Numerous landowners deeded their farm worker housing and small surrounding plots to the inhabitants in the hopes of guaranteeing a resident labor force, but one for which they had no responsibility. The traditional paternalistic relationships largely ceased. The social security tax was also sharply cut, from 40% to 10%, to reduce the cost of labor; this doubtlessly contributed to rising demand for labor in the 1980s.

In addition, in mid-1975 as consequence of a steep decline in terms of trade, which led to a major recession, unemployment rose to unprecedented levels, and the military government implemented a temporary public works program, known as the minimum employment program, to alleviate it. In 1980 the military government enacted its labor reform, known as the Labor plan. From 1980 to 1990, the labor relations were governed by the Labor plan and one of the most important reforms undertaken in this period was the privatization of social security.

Total agricultural labor demand declined in the late 1970s, but the demand for labor rose in the areas where fresh fruit was produced. Fruit production and post-harvest handling became highly labor intensive. By the mid-1980s, fruit production has increased sufficiently that total agricultural employment was rising. The supply of agricultural labor proved very elastic. Unemployed workers were available and movement between the agricultural and other sectors was relatively easy. Women, who traditionally did not work in agriculture, entered the labor force and found ready employment in the fruit sector. Agricultural wages began to rise in the early 1990s. Family
incomes rose sooner, however, as two or more workers found employment, at least part time. New incentive systems, e.g., payment on a contract or piece rate basis instead of a wage, encouraged effort and contributed to rising labor productivity (Newman and Jarvis, 2001).

In 1991, at the beginning of the democratic governments, a new reform to labor legislation was implemented, employment protection was increased and unions acquired more importance in the collective bargaining process. Legislation still inhibits the unionization of agricultural workers, but the market for agricultural labor today functions competitively. Workers’ educational levels and skills have significantly increased. Skilled temporary workers perform a great deal of agricultural work. Women now comprise a significant fraction of these temporary workers during peak periods, primarily in packing plants, but also in the fields. Women also account for the bulk of seasonal labor market adjustment (Jarvis and Vera-Toscano, 2004). A rising proportion of agricultural workers live in rural towns, where access to markets and services is better. Non-agricultural income is rising as a proportion of total income for rural families. The poorest agricultural workers (families) are those that remain in rural areas and their incomes are also growing more slowly (Berdegué, et al. 1999)

2.6. Income distribution

From late sixties different combinations of macroeconomic policies and social programs (including social spending) have led Chile to be one of the outstanding countries in Latin America in terms of its record in reducing poverty, but it also one of the most unequal income distributions in the world\(^9\), measured by different statistics. Despite a relatively rapid reduction of poverty, Gini coefficients and other measures of income inequality have remained persistently high over the years (Chumacero and Paredes, 2002). This persistence, and more importantly, the high inequality,

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have been accompanied by a good economic performance, well developed institutions to help the poorest, and a relatively recognized educational system (see MIDEPLAN, 1999, Chumacero and Paredes, 2002, Larrañaga, 2002 and Valdés, 2002). In recent years, the unemployment has been, particularly among the younger workers, and many of the poorest groups suffer from conditions of social exclusion. In addition, Chile continues to become more urbanized over time and the rural population fell as a share of the total from about 30% in late 60s to less than 15% in late 90s.

2.7. Protection of Property rights.

Land reform was possible because the Chilean constitution permitted public expropriation of private assets at less than market value. This experience traumatized property holders. When the military government ended land reform, it explicitly committed itself to ensuring the security of private property and wrote this guarantee into the 1980 Constitution. Regardless, most Chileans are no longer interested in land reform, given the tremendous stress associated with the previous land reform and the agricultural modernization that has occurred. Many poor remain in agriculture, but other policies are deemed more appropriate for dealing with this problem.10

2.8. Infrastructure development

Chile’s historically had a poorly developed infrastructure in rural areas. The Frei administration made infrastructure investments during the late 1960s, but rural public investments were reduced in the 1970s and much of the 1980s, along with other government expenditures. However, the Pinochet administration invested heavily in ports that were essential to the export of agricultural products in the late 1970s, and in road and highways in the late 1980s. The Pinochet administration privatized telephone service, electric generation and distribution, and facilitated private airline development. Rising efficiency of these businesses under private management, e.g., the rapid introduction of the cellular phone and fax machines that greatly improved
communications, reduced costs and allowed for effective management and product marketing. The Pinochet administration sharply reduced large-scale irrigation infrastructure investments during the 1970s and 1980s, but implemented subsidies for private on-farm irrigation 1980s. This program benefited mainly larger farmers who had sufficient capital and knowledge to take advantage of the program. Civilian governments expanded this program and extended it to smaller farms, and also revived larger-scale irrigation investments in the 1990s. Civilian government have also continued to expand other types of rural infrastructure, including schools and health posts, as well as roads.

2.9. Environmental and Natural Resource policies

Only since 1990, the environment was incorporated as an important issue into the agenda of Chilean democratic Governments. Previously the military Government did not give a great priority to develop an environmental policy agenda. Even though it should be noted that Chile's Political Constitution of 1980 for the first time recognized the importance of protecting the environment as one of the State’s functions in order to promote welfare. In this sense the Constitution of 1980 establishes that all people have the right to live in a pollution-free environment and the State has to care for the conservation of natural resources and to assure such right not be affected\(^\text{11}\).

During 1990s the environmental issues received a growing attention both by the democratic Administrations and the public opinion. Yet domestic forces were not the only ones giving urgency to environmental concerns. External actors also were making demands and pressuring the Administrations to develop an environmental policy. Specially important were the advanced state of Chile’s market oriented economy and the potential inclusion of Chile in the North American Free Trade Agreement (NAFTA) and the implicit pressures about environmental issues that this

\(^{11}\) For details on environmental policy development see Silva, 1996 and Taylor, 1998.
implied, and the influence of the World Bank carry out by contributing advisors that participated in
the formulation of national environmental policy and providing funds for institutional development,
mainly for the training of professional staff and for equipment, since the technical background was
very poor in the early 90s.

In this period the Government developed the basic environmental framework law including
norms, principles and institutions that Chile lacked at the beginning of the 90s. In addition to
establishing norms and sanctions, the Government also created the National Commission on
Environment (CONAMA) in 1992 and passed a Base Law on Environment in 1994, but only came
into effect in April 1997. The heart of the law is based upon preventing any further degradation of
the environment by means of environmental impact assessment (EIA), which is compulsory for all
major investments projects to be developed in the country. Chile has also sought to improve its
environmental record by signing on to several Multinational Environmental Agreements such as
the Climate Change Convention, the Montreal Protocol, The Vienna Convention, the London
Conference, the Biodiversity Convention, the International Convention of Hazardous Wastes, and
the Law of the Sea among others.

On the other hand, the community participation has grown markedly. As a result, for
example, some large forestry projects have been delayed until getting a broader assessment on
environmental impact.

Even though the environment has become into the Government’s agenda still there are
several challenges. In recent years the main Chilean environmental problems have been related
with air quality, soil conservation, wastewater disposal, quality life in cities, conservation and
management of natural resources such as mining, native forestry, wildlife and fishery.
The main environmental issues of Chilean agricultural sector are the soil erosion (45% of Chile’s agricultural soil is eroded), the rising level of birth defect seemingly related to the exposure to toxic chemicals and pesticides specially among agricultural workers, and the migration of an increasing number of small farmers (campesinos) into the already overcrowded Capital city.

3. The Expected and Actual Effects of Reforms

The several approaches to economic policy undertaken from mid-sixties were implemented expecting some specific results. This section presents the expected and actual effects of the economic and land reforms from 1965 to 1999.

3.1 Agricultural Prices

The expected effect of economic liberalization was to increase the prices of tradable goods relative to non-tradables but surprisingly real agricultural prices have steadily declined since 1975, and they have declined relative to the prices of manufactured goods, as can be seen in Figure 2. Indeed, the real producer price of nearly every major agricultural product declined and most declined considerably.

To help understand this phenomenon, the movements in real domestic prices can be decomposed for several important agricultural products into three components: changes in real international prices, changes in the real exchange rate, and a residual that captures changes in policy and other factors, including transmission effects. If the law of one price holds perfectly, the residual should equal zero (Quiroz and Valdés, 1993, Helfand and Castro de Rezende, 2001). If a good is not fully tradable or if there are important changes in policy that affect prices, the residual captures these effects.

As can be seen from Table 1 wheat, an importable, was traditionally Chile’s most important crop in terms of area planted and value added. The first column indicates that the domestic price of
wheat declined considerably over the 35-year period observed, with most of this effect a result of a declining international price (column 2), which more than offset the effect of a higher real exchange rate (column 3). The final column of Table 1 shows the effect of policy/residual on the real domestic price of goods. The domestic wheat price fell sharply in 1972 and 1973, when the Allende administration imposed a state monopsony at low producer prices. The price was increased in 1974, but subsequently fell again as protection was reduced. Following the 1982 crisis, devaluation and increased protection (directly and via price bands) caused prices to rise again, but once the crisis was over, prices rapidly deteriorated again due mainly to the decline in protection and declining international prices. Prices of other cereals and oilseeds followed similar patterns (Table 1).

Temperate fruits emerged as the major exportable after the reforms. Table grapes now account for more than half of Chile’s fresh fruit exports. The explosive growth of table grapes began in 1974-5, when the international price rose sharply due mainly to a higher real exchange rate and rising US demand (Jarvis, 1994). Subsequently, as shown in Table 1, although the international price of table grapes fell slightly through 1999, this effect was offset by the effect of a rising real exchange rate. The fluctuation in the residual (last column of Table 1) reflects changes in exporter margins, port costs, and freight. Chile did not impose export taxes. Thus, Chilean farmers enjoyed essentially constant or improving domestic table grape prices. Nonetheless, the domestic price of apples declined (Table 1) and its pattern is representative of most other fruits.

3.2 Technical Change and Productivity

Economic reform and, particularly, the adoption of a (nearly) uniform tariff rate allowed farmers access to a wide range of foreign technology that previously had not been available. Farmers, as well as input suppliers and fruit exporters, began to observe agricultural practices in
other countries and adopted/adapted technologies that seemed appropriate to Chilean conditions. New seeds, rootstock and animal species were imported. New types of machinery were adopted and mechanization increased. Fertilizer applications increased rapidly (Figure 3). Irrigation technology was significantly improved, e.g., aspersion and drip systems, and extended. Input suppliers, machine shops, banks, and labor contractors proliferated in rural areas. Farmers developed new management techniques for increase production and improve labor and financial management. Yields and other indicators of productivity rose rapidly (Figure 4). Thus, agriculture became a technologically leading sector (Jarvis, 1994).

3.3. Agricultural growth

Agricultural growth was slow from 1975 to 1983, lagging the rest of the economy, and varying erratically from year to year (See Figure 5.). Total agricultural value added rose about 4% per year. (See Figure 6). This performance occurred within the context of reduced protection, rising peso overvaluation in the late 1970s, and the economic crisis that ensued. Nonetheless, the fruit sub-sector grew rapidly and forestry plantings increased (See Figures 7, 8a and 8b).

Growth of agricultural value added accelerated from 1984 to 1991, rising more than 7% a year. The fruit and forestry sub-sectors continued to grow rapidly, stimulated by the high profitability of exports. New technology diffused throughout the agricultural sector, affecting the traditional crops, livestock, seed production and vegetables. The temporarily increased protection for wheat, oilseeds, and sugar (tariffs, minimum import prices, and the subsequent creation of price bands for a number of years), also stimulated these outputs. Livestock output increased as domestic

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12 Land reform ended in late 1973. Official data show that agricultural output increased 25% in 1974, to a level of output equal to that in 1970. However, the figures for 1972 and 1973 are questionable since it is hard to know whether the decline shown is true or is due to the omission of (unrecorded) black market transactions. We believe that relatively little change in output occurred in these years since the increase in agricultural output in 1974 occurred prior to the resolution of land reform disputes and with little change in policy as most crops were already planted.
demand recovered; poultry and pork production were especially affected by new technology (Figure 9).

The market for fruit exports weakened in the early 1990s due to world recession and peso appreciation. Fruit sector investment temporarily slowed, but production continued to rise due to improving technology and maturation of planted trees. Fruit acreage and output rose again in the late 1990’s. Livestock output increased rapidly in response to a rapidly growing domestic market. Cereal, legume and oilseed production slowed or declined as domestic prices fell (Figure 5).

3.4. An Overview of Agricultural Value Added

Chile’s import substitution industrialization strategy long discriminated against the agricultural sector (Valdés, 1973; Krueger, et al.,1988). Agriculture was therefore expected to be a prime beneficiary of economic reform. That expectation was borne out, but not because agricultural prices rose. Agricultural value added declined during the two macroeconomic crises of 1975/76 and 1982/83, but nonetheless grew at an average rate of more than 4% from 1974 to 1999, considerably more rapidly than 2%, the long-term agricultural growth rate prior to 1965 (Figure 6). Agriculture grew due to the higher real exchange rate and the deepening reforms that occurred after 1982, as well as the protectionist measures that were temporarily imposed. Agriculture benefited most from access to new inputs and technologies, the creation of more efficient factor and product markets, a more skilled and motivated labor force and improved farm management. Land reform contributed to several of these improvements. Agricultural growth slowed sharply during the late 1990s, as agricultural prices worldwide suffered a slowdown and as domestic protection declined because of MERCOSUR. It is too early to tell how the sector will fare in the new century, but the sector is continuing to increase efficiency and to innovate.
After economic reforms, agricultural activities experienced a fairly dramatic shift from the crops that traditionally had been important, like the cereals, sugar beets, grain legumes and oilseeds produced primarily for domestic consumption, toward fresh and processed fruit, forestry products, and wine that were produced mainly for export. The area planted to traditional crops decreased from about 1.2 million ha to about 800,000 ha. Temperate fruit acreage rose from about 120,000 ha to about 275,000 ha, and fruit output rose much more, from about 1.25 billion tons to about 4.1 billion tons (Figure 7). Indeed, Chile became the dominant Southern Hemisphere fresh fruit exporter. Table grape output rose from about 55,000 tons in 1974 to about 900,000 tons in 1999. The notable rise in yields also captures only part of the technological improvements occurring in fresh fruit production, since fruit quality and condition also improved markedly (Jarvis, 1992). Wine grape planted area fell slightly as Chile tore out obsolete vineyards and replanted with improved rootstock. Yields rose, winemaking techniques improved and value added rose sharply. Similarly, planted forests (mainly *pino radiata* and eucalyptus), rose from about 550,000 ha to about 1.1 million ha. Forest genetics and husbandry greatly improved, resulting in a huge increase in production of logs, mechanical and chemical pulp, and sawn wood, most of which was exported (Figure 10).

The expansion of fruit and nut production occurred mainly in the most fertile parts of the Central Valley, resulting in significantly higher agricultural value added, employment, and incomes in these areas. In the rest of the country, however, agriculture shifted toward lower value-added activities, i.e., livestock and forestry, which were also less labor intensive in production. These crop shifts have led significant population moves, though often displaced agricultural workers moved

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13 Total output rose as higher yields offset the acreage decline (See Figure 5.).
14 Grape acreage includes grapes planted for wine, raisins and table grapes.
15 Fruits not of export quality were largely used for industrial processing (pulp and juice). Technological improvements here are also large.
from rural areas to towns and cities in the same region, though some regional movement is also occurring.\textsuperscript{16} Roads, telecommunications, public services, housing, commerce and services have improved, particularly in fruit producing areas.

3.5 Agricultural Balance of Trade.

The agricultural balance of trade, already negative in the 1960s (Valdés, 1973), deteriorated sharply during the Allende administration (Figure 11). Following initiation of economic reforms, recovery began. The agricultural balance of trade became positive in 1985. By 1990, the agricultural trade surplus exceeded $1 billion, with exports of about $1.5 billion (not counting forestry and fisheries) and imports of about $500 million. Between 1999, agricultural exports had reached nearly $3 billion. Imports of agricultural products rose rapidly in the 1990s as Chilean consumers developed tastes for a variety of products not previously available, but agricultural exports continued to grow and considerably exceeded agricultural imports (Figure 11). Chile’s agriculture moved from a highly protected, inefficient and inwardly oriented situation, to a little protected, increasingly efficient and outwardly oriented one.

3.6 Agricultural employment and wages.

Land and economic reforms had varying effects on agricultural employment. The agricultural labor force varied somewhat from year to year, increasing from 1965 to 1990 due to population growth and reduced rural to urban migration and then declining. Agricultural labor accounted for about 19\% of the total labor force in the mid-1980s, but in 2000 had fallen to 13\%.

Agricultural employment, as opposed to the labor force, had a similar pattern, though comparability is inhibited by sample redefinition that significantly increased the absolute number of counted agricultural workers. However, the data indicate that employment increased significantly from 1982 to 1987, remained approximately constant till 1990, and then declined (see

\textsuperscript{16} A growing number of farmers with small plots, as well as agricultural workers, have exited the sector.
Figure 12). The apparent employment decline from 1975 to 1981 occurred when growth was slow, as prices of traditional crops declined and the sector adjusted following land and economic reforms. Employment expanded thereafter due to increased employment in the fruit subsector, which was rapidly gaining importance, to the temporary increase in agricultural protection and to the rising real exchange rate.

Labor force composition also changed. A growing proportion of workers were skilled temporary workers, hired for relatively short periods to undertake specific tasks, mainly in fruit production. Some worked only during the peak summer season, but most sought jobs throughout the year. A rising proportion of the temporary workers were female. Women constituted about 18 percent of the total agricultural labor force in 1997 (Berdegué, et al., 1999) and their importance is higher in fruit producing areas.

Agricultural wages fell dramatically in and immediately after 1974. By 1979, shortly after half of the workers on the asentamientos had been expelled, real agricultural wages for comparable jobs were estimated to be about 35% lower than their 1965 pre-unionization levels (Jarvis, 1985). Wages recovered gradually after 1979, but real wages did not surpass 1968 levels until the early 1990s. Agricultural remuneration also changed; the old system that provided service tenants with usufruct rights to land and in-kind payments was quickly replaced by workers hired at salary, a daily wage or, increasingly for many tasks, on a contract or piece rate basis. With pay tied more closely to productivity, impetus was provided for workers to acquire skills and provide greater effort. It appears that productivity rose much more rapidly than did workers’ earnings (Jarvis and Vera-Toscano, 2001).

3.7. Agricultural Land Prices.
Land prices provide an indicator of how reforms affected the profitability of agricultural activities. Morandé and Soto (1992) constructed a series for raw agricultural land prices, 1975 to 1989, using price quotations from advertisements placed in El Mercurio, Chile’s most important daily newspaper. The price of agricultural land rose fairly steadily throughout the period, jumping sharply in 1977, 1982-84, and 1988-89. Over the 14-year period, land prices more than quadrupled, providing an average annual gain of nearly 11%. This rather exceptional rate of increase suggests that farmland, at least in the regions where the advertised farms were located, was a very attractive investment. This increase occurred despite a generalized decline in agricultural prices and thus suggests that rising efficiency and improving technology contributed to rising farm profitability for those who were able to adapt to changing conditions.

4. Conclusions and Policy Lessons

1) Persistent effort to implement and deepen reforms even though the initial resistance by pressure groups and high economic and social costs

2) Need a whole program of economic reforms to get the full benefits

3) Credibility of the reform program and government capability to put it in place.

Chile’s broad-based land and economic reforms, which sought to increase agricultural efficiency and rural equity, had positive effect though not always quite as anticipated. Begun in the 1960s and 1970s, policy changes and policy errors caused short-term setbacks and the reforms’ positive effects were not wholly clear until around 1990. This experience demonstrates the difficulty of reform and the need for continuity and persistence.

Under land reform, considerable land was expropriated from large farmers, thereby significantly reducing their wealth and political power. However, a significant amount of land was

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17 The authors adjusted the quoted prices to remove the effects of farm size and of major investments. Price quotes were used only from land in Regions V, VI, VII, and VIII, the principal growing area of Chile’s Central Valley.
returned to them when ending the reform, with the rest redistributed to their workers, relatively few of whom became viable independent farmers in the long run. Most land reform beneficiaries ultimately sold their land and took up work as employees again when they found it difficult to prosper because they were unprepared to manage, received little government assistance, could not cope with the changes required by the new economic context and were often offered high prices for their land. However, owners of large farms also often sold part or all of their land in the years after the reform ended, or passed it to younger family members who were better prepared to farm within the new economic context. Some farmers were prepared for the new context and expanded their holdings through land purchases, while numerous investors from outside the sector, e.g., commerce, industry, mining and the skilled professions, also purchased land and initiated farming, particularly in fruit production.

Chile’s agricultural land market was traditionally thin and illiquid, with few sales occurring, and a large number of agricultural workers were employed on a single farm for most of their life. Land reform disrupted this system, increasing the number of parcels and breaking down traditional employer-employee relationships. During and after land reform, workers and employers went through a lengthy period of tense, if not open conflict, but then gradually settled into a new period of modern relationships. Workers, who had once voted largely as directed by their employers, now vote independently. Employers, who had once emphasized worker loyalty, increasingly emphasized efficiency and skill, introduced new incentive systems to better reward productivity and encouraged worker education. Though these changes had many costs, they contributed directly

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18 Ironically, economic reforms created conditions that made it more difficult for land reform beneficiaries to succeed as producers, but did confer upon some of them sizeable capital gains.

19 Many of these units were relatively small (15-30 ha.) until the 1990s, but substantial consolidation then occurred, as economies of scale became increasingly important.
to the development of more efficient land and labor markets, which facilitated the entrance of new entrepreneurs and the development of new crops, especially fruit.

Chile’s economic reforms removed previously severe economic distortions and opened the economy to international trade in goods and technologies. As a result, agriculture altered its product mix to match Chile’s comparative advantage. The sector became more technologically advanced, and management and workers gained skills and became more highly motivated. Labor and land productivity increased.

During the first 10 years following the end of land reform and the implementation of economic reforms, growth of agricultural value added was only moderate, about 4% annually. Once macroeconomic policy became more effective and structural issues were resolved, agriculture grew rapidly for more than a decade, with value added averaging more than 7% annually. Growth slowed sharply after 1995, due to a depressed international market.

As a result of the altered context created by economic reforms, the agricultural product mix shifted away from the grains and oilseeds produced traditionally for the domestic market and toward high value activities fruits and nuts for export. Nonetheless, output of grains and oilseeds remained roughly constant as rising yields offset a declining planted area. Livestock and forestry output also rose sharply. This transformation required significant adjustment in terms of jobs, population, and infrastructure.

The two reforms heightened political and social equity not so much because wealth was redistributed from rich to poor in the land reform, but because land reform contributed to changing

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20 The fruit industry is the leading success story of agriculture. Judgments regarding the reform’s success frequently point to the fruit subsector, which boomed after 1974. Although the economic reforms were essential to the exceptional success achieved, such success built on the scientific, institutional and farm development initiated by government policy in the late 1960s. The case thus supports both government intervention and free market theories. Although highly profitable, fruit production was highly risky and many who anticipated success subsequently failed.
the traditional rural structure and the economic reforms then created a more competitive environment that offered greater opportunity to many. However, the social costs of reform were high and were spread unevenly across the population. The main losers were the farmers who suffered expropriation, the permanent workers who did not receive a land reform parcel, the workers who were unemployed and/or who received lower wages and the owners who were forced to sell their farms as economic change occurred.

There is no conclusive evidence regarding changes in the rural distribution of income over time. We doubt there has been much change, though the poor do enjoy improved material conditions, heightened opportunities and greater socio-political independence. The number of farm workers/families resident on large farms has decreased sharply, reducing the control that the farm owner traditionally enjoyed. An increasing number of workers have moved to town where they have greater access to education, health care, and other services, as well as greater employment options, including non-agricultural employment. Many females have entered the agricultural labor force. Their earnings have increased family income, as revealed in improved housing, a growing stock of household consumer durables, motor scooters and even cars. Women also enjoy greater gender equity. Although rural areas still lack much of the infrastructure available in urban areas, they are more favorably equipped now. Life in rural areas is becoming more attractive for many. However, the reforms placed great competitive pressure on small farmers and minifundistas, causing many to abandon farming. Continued emphasis is needed on assisting with the transition of many, poorer farmers and agricultural workers towards employment in other sectors of the economy.

Reforms led to important changes in the size and composition of the labor force. Farmers sharply reduced the number of permanent employees, hiring most workers on a regular, but
“temporary” basis. Contrary to the historical decline in employment, agricultural employment increased during the 1980s, as fruit and other labor-intensive sectors grew rapidly. As the need for specialized, time sensitive tasks increased, employers hired more skilled, truly temporary workers, increasingly working through labor contractors. Many women entered the labor force to meet this demand.

The order of the reforms turned out to be crucial to the effects achieved (Adelman 1975). Had the economic reforms occurred prior to land reform, the huge increase in the value of land that occurred as a result of opening the economy to new technologies (note that agricultural prices actually fell relative to industrial prices) would have accrued to traditional landowners. It is highly unlikely that they could have developed the fruit sector at the same pace, as most did not have the needed entrepreneurial skills to do so. Worse, these gains would have increased their relative wealth and political power, with unattractive effect on Chilean democracy. Though their farms would doubtlessly have become more export oriented, it is unclear whether they would have supported the economic reforms during the crucial years when the traditional agricultural activities suffered a sharp decline in profitability as protection was removed. As it was, many “farmers” became defenders of liberal economic policies rather than of protection. While government intervention was traditionally seen as essential to economic and social development, the "market" and "private enterprise" have gained substantial adherence. Political and economic ideologies have shifted toward moderation. Chileans came to believe that they could compete internationally.
REFERENCES


Figure 1: Annual Average Real Exchange Rate Peso/US Dollar, Agricultural Exports and Imports

* Base=December 1999. Agricultural Imports and Exports have been deflated using USA Consumer Price Index (CPI).
* Base=December 1999, Agricultural Imports and Exports have been deflated using USA Consumer Price Index (CPI).
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Source: Own elaboration.
Figure 2. Agriculture Prices/Industrial Prices (Dec 1974=100)

Source: INE
Figure 3. Fertilizer Consumption (Metric Tons)

Source: FAO
Figure 4. Cereals Total: Yield (Kg/Ha)

Source: Banco Central de Chile
Figure 5. Cereals Total Production: Area harvested (Ha) and Tons

Source: Banco Central de Chile
Figure 6. Chile Economic Growth. Index of Production, Base 1965=100

Sources: Banco Central, ODEPA, ECLAC.
Figure 7. Total Fruits Production: Area harvested (Ha) and Tons

Source: FAO
Figure 8a. Forestry: New Area Planted. Thousand of Ha

Source: ODEPA

Figure 8b. Forestry: Pulpwood Production (Thousand of Tons)

Source: Banco Central de Chile
Figure 9. Livestock Output Index (1965=100)

Source: FAO
Figure 10. Agricultural Exports index (1965=100)

Source: FAO
11. Total Agricultural Exports and Imports. 1999 prices in Thousand US$

Figure
Source: FAO
Figure 12. Agricultural Employment in Thousand of People.

Source: Banco Central de Chile
Table 2. Prices of Agricultural Land in Chile

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Source: Morande and Soto (1992)