

# OECD Review of Agricultural Policies

## CHILE





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# Chile



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## Foreword

**T**his Review of Agricultural Policies: Chile is part of a series of reviews of national agricultural policies undertaken on behalf of the OECD's Committee for Agriculture. It was requested by the Chilean authorities, represented by the Office of Agricultural Policies and Studies (Oficina de Estudios y Políticas Agrarias, ODEPA) and carried out by the OECD's Trade and Agriculture Directorate.

The Review classifies and measures support provided to agriculture using the same approach that OECD employs for OECD countries and a growing number of non-member economies. It also evaluates the performance of agricultural policies and provides specific consideration to Chile's efforts to broaden the basis of agricultural development by extending support to smallholders. The study is a precursor to continued OECD engagement with Chile on agricultural policy issues through the regular monitoring of agricultural policy developments.

The authors of the report were Jonathan Brooks, Dalila Cervantes Godoy and Mauro Migotto. Statistical support was provided by Florence Mauclert and secretarial assistance by Anita Lari. The study benefited from the substantive contributions of local experts. Information on the evolution and operation of Chile's agricultural policies was provided by Maximiliano Cox and Octavio Sotomayor, while information on the challenges confronting the country's smallholders was provided by José Díaz Osorio. Analysis of the incomes of agriculture-dependent households was undertaken by Alberto Valdés and William Foster. The study also benefited from the input of staff at ODEPA and participants at preparatory meetings and consultations in Santiago. Overall co-ordination was provided by Jonathan Brooks.

The study was made possible by the financial support of ODEPA. It was reviewed at an in-country Roundtable with Chilean officials and experts in September 2007. Subsequently, Chilean agricultural policies were examined by the OECD's Committee for Agriculture at its 148th session in November 2007, bringing together policy makers from Chile, OECD member countries and selected non-member economies. Chilean officials have been involved from the initial discussions of the study outline through to the peer review and final revisions, but the final report remains the sole responsibility of the OECD and is published under the responsibility of the Secretary-General.



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## Highlights and Policy Recommendations

Chile has made important progress in raising incomes and reducing poverty, and more recently in narrowing income inequality too. The key to this strong economic performance has been sound macroeconomic management, institutional and structural reforms, trade openness, and the prudent management of mineral resources (principally copper).

The agricultural sector, in conjunction with related downstream activities, has played a key role in Chile's economic success. Yet while the incomes of agricultural households have increased, small-scale farmers have seen little change in their farm incomes, with most of the gains coming from improved off-farm opportunities.

Agriculture as a whole has benefited from an open trading environment, characterised by a uniform MFN tariff of 6%, and an average effective tariff of about 2% resulting from a wide network of preferential trade agreements. Agriculture has received no more protection than other sectors, with the exception of commodities covered by the country's price band system (wheat, wheat flour and sugar). In recent years, protection has been low for these products too, as a result of high world prices and (ongoing) policy reforms.

Support provided to producers is low compared with other OECD countries, with an average %PSE (producer support as a share of gross farm receipts) of 5% in 2004-06 – a similar figure to the estimates for Australia and Brazil. Budgetary payments have dominated producer support in recent years, with relatively little use of market price support. Total support to the agricultural sector also imposes a milder burden on the economy than in most OECD countries, accounting for 0.4% of GDP between 2003 and 2005, compared with an OECD average of 1.2%.

Government expenditures on agriculture have nevertheless more than trebled in real terms over the past ten years. About half of that spending is on public goods, while the other half consists of measures which aim to make Chile's poorer farmers commercially competitive.

The spending on public goods includes essential investments that help raise agricultural competitiveness and protect the country's environment and natural resource base. But the fact that money is spent on public goods does not itself guarantee that policies are effective, and there is a need for a more systematic evaluation of policy performance.

Payments to improve small-scale farmers' commercial viability need to be based on a realistic assessment of who is potentially competitive within the sector, and to target that constituency. For future generations, that group is likely to be a minority of smallholders. For the majority, the main requirements are for non-agricultural policies that help them diversify their incomes and find better paid jobs outside the sector. In most cases the ultimate aim should be to transform the poorer family farm into a structure in which the farm operation may be retained, but family members (especially sons and daughters) develop the opportunities to obtain higher paid skilled employment. Recently introduced smallholder credit policies that focus on correcting underlying market failures represent a more productive use of resources than traditional credit subsidies.

*Two-thirds of agriculture-dependent households are headed by salaried farm workers, and these households have similar incomes to the poorest farm households. While salaried farm workers may benefit from the increased employment opportunities offered by agricultural growth, the long-term priority is similarly to help them get better paid (skilled) work, within the agribusiness sector or elsewhere.*

*Agricultural policies therefore need to be framed within an economy-wide context, and consistent with other policies, such as regional initiatives and social safety nets. As agricultural spending by the Ministry of Agriculture is increasingly complemented by the outlays of other ministries and agencies, the need for close co-operation across branches of government becomes ever more essential.*

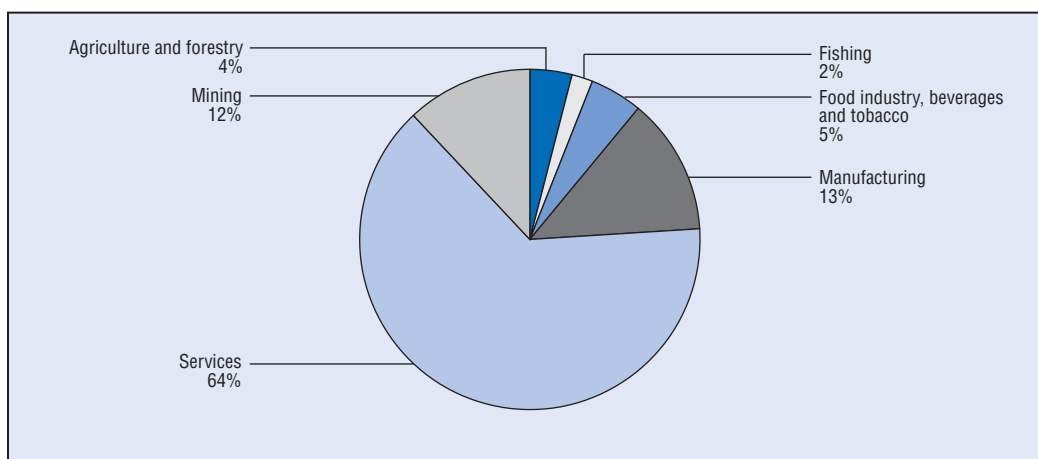
## 1. Reforms and their impacts

Over the past 20 years, the Chilean economy has grown more rapidly than any other country in Latin America. Real per capita incomes have more than doubled since the restoration of democracy in 1990, and the incidence of poverty has declined sharply. Using a poverty line that corresponds to twice the cost of a basic food basket, the incidence of recorded poverty fell by nearly two-thirds, from 38.6% of the population in 1990 to 13.7% in 2006. Over the same period extreme poverty, as measured by the cost of one basic food basket, has been almost eradicated, falling from 12.5% to 3.2%. Chile's income distribution is among the most unequal in the world, but here too there has been some recent improvement.<sup>1</sup> Despite this progress, per capita incomes in Chile are still less than half the OECD average, and at current growth rates it would take another 15 years for incomes in Chile to converge on that current OECD level.

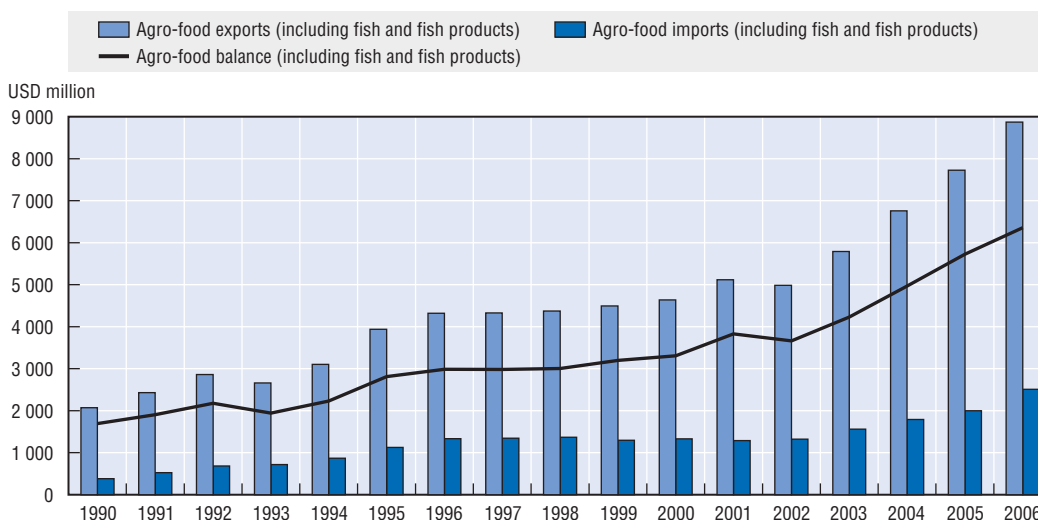
The key to Chile's strong economic performance has been sound macroeconomic management, institutional and structural reforms, trade openness, and the prudent management of mineral resources (principally copper). These basic tenets of economic policy have been upheld by successive governments since the return to democracy in 1990. The economy has become progressively more open, with a ratio of exports plus imports to GDP of about 75% – higher than anywhere outside East Asia. For the past ten years, the ratio of FDI to GDP has averaged 6-8%, which is also higher than the OECD average and in any other Latin American country. In 2005, the stock of FDI reached 65% of GDP, compared with an OECD average of 27%. Inflation has converged on the OECD average, even in the face of global and regional volatility and large swings in the copper price and real exchange rate, although it is poised to exceed the target ceiling of 4% in 2007, mainly as a result of higher food prices.

The agricultural sector, in conjunction with related downstream activities, has played a key role in Chile's economic success, both benefiting from stability and reforms, and making an important contribution, via rapid export growth. The sector is strategically more important than its 4% share of GDP would suggest. Chile's agricultural and agro-industrial sector has been extremely successful in adding value to the production of primary commodities, and processed products such as wine and fruits account for a similar share of GDP to agriculture itself (Figure 1).

Much of the increase in value added has been in exportable commodities, with the consequence that agriculture and related products accounted for 29% of merchandise exports in 2002 and 2003, although this share has slipped back in recent years as a result of the boom in copper prices. Since the initiation of reforms, there has been a huge increase in the sector's export orientation. The share of primary agricultural trade (i.e. exports plus imports) in agricultural GDP averaged 30% during the period of military government, reached 60% between 1990 and 1998, and has averaged more than 80% since 1999. More widely, the growth of agricultural and agribusiness exports has accelerated in recent years, as new exports, such as pork, poultry and dairy products have added to earlier growth sectors such as wine and fresh fruit (Figure 2).

Figure 1. **Shares of GDP by sector, 2002-05 average**

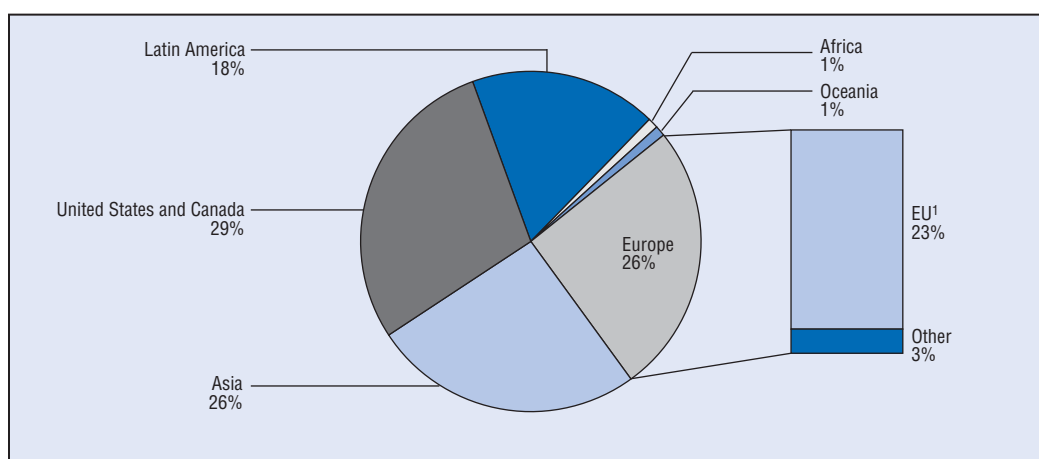
Source: Central Bank of Chile, 2007.

Figure 2. **Evolution of Chile's agro-food trade, 1990-2006**

Source: UN, UN Comtrade database, 2007.

Chile has succeeded in diversifying the destinations of its agro-food exports. In the four years to 2005, 30% of agro-food exports went to the United States and Canada, 25% to Europe and 26% to Asian countries (Figure 3). Latin American markets are relatively less important, with a combined share of 18%. The main reasons for Latin America's low share are twofold. First, Chile's exports are mostly high value products such as temperate fruits, or products with considerable value added, notably wine, for which the demand is stronger in high income countries. Second, Latin American countries are often competing exporters (e.g. Argentina for wine, Brazil for pork and poultry). There have been some new growth markets, such as Korea and Russia, while the United States market has become less important (but has nonetheless increased in absolute terms). In recent years, the growth in agro-food imports has been less dynamic. Chile imports a large share of its domestic consumption of cereals (principally wheat), oilseed products (both oil and meal), beef and sugar. More than three-quarters of these supplies come from other Latin American

Figure 3. Chile's agro-food exports by region of destination, 2003-06 average



1. EU15.

Source: UN, UN Comtrade database, 2007.

countries, with Argentina and Brazil collectively accounting for well over half. Argentina is the main supplier of wheat and beef, while Brazil supplies sugar and oilseed products.

While macroeconomic and structural reforms have helped underpin the growth in agricultural production and exports, agricultural policies have played an important facilitating role. The Agriculture and Livestock Service (SAG) has sought to guard the country's favourable sanitary and phyto-sanitary conditions; Fundación Chile has provided R&D and venture capital for niche exports such as blueberries; the Economic Development Agency (CORFO) has sponsored some successful producer associations (for example in wine); while PROCHILE has engaged in export promotion. Preferential trade agreements have also contained provisions that have improved access to new markets for agricultural products, such as pork in Japan and Korea.

Chile's agricultural growth is likely to continue, as the remaining impediments to growth are alleviated. Most of those impediments afflict the economy in general and are not unique to the agricultural sector. They include weak human capital (in particular, low educational attainment), which has implications for farm management and entrepreneurial skills; and a low R&D intensity and weak diffusion of knowledge, reflected in the low level and uneven provision of farm extension services.

Despite the growth in production and exports, agriculture's share of employment declined from 19% in 1990 to 12% in 2006, a share that remains about three times higher than the sector's share of GDP. The implied low productivity of labour employed in agriculture reflects the sector's duality, where a competitive export-oriented sector co-exists alongside an underdeveloped sector of semi-subsistence farmers.

It is important to recognise that, over the coming decades, agriculture's share of GDP will not rise to match the sector's share of employment – in all OECD countries the tendency has been precisely the opposite. The incomes of households working in agriculture are on average about a third lower than those in other sectors, and a shift of labour out of the sector will be needed to close that gap. More generally, in the long term, it is unlikely that the agricultural sector can itself provide the basis for the 2.5 fold increase in annual per capita incomes required to reach the current OECD average (in PPP terms) of

USD 28 000. As a small economy, Chile is relatively open, with a share of exports in GDP of 40%. If that ratio is to be maintained at higher income levels, as it probably needs to be, then per capita exports would have to rise to USD 11 000. These sorts of returns cannot be generated by the exploitation of natural resources and labour-intensive farming, and require much greater diversification of the economy.

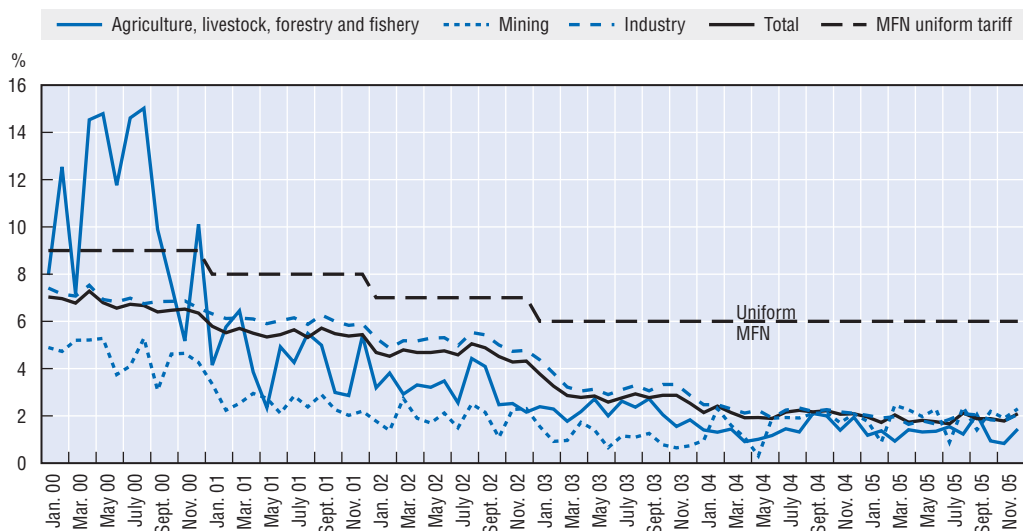
The easing of the remaining constraints to competitiveness should nevertheless enable a share of future growth to be enjoyed by some of the country's poorer agriculture-dependent households, either by drawing them into commercial structures directly or offering them employment opportunities on larger agribusiness operations. But agricultural growth has historically been concentrated among competitive sub-sectors, and over the past 15 years has done little to improve the farm-derived incomes of the majority of agricultural households. Rather, the gains in total incomes have come either from the farm household diversifying its sources of income or leaving the sector for more remunerative work.

## 2. Agricultural policy developments

Since 1990, Chile's agricultural policies have centred around three main objectives: first, the inherited goal of increasing competitiveness; second, achieving more balanced agricultural development by better integrating poorer less competitive farmers into commercial supply chains; and finally reconciling these objectives with goals related to conservation of the environment and the sustainable use of resources. While the specific articulation of objectives has changed from one government to the next, these broad areas have provided a common focus of policy concerns.

These objectives have been pursued in the context of a relatively open trade policy. Chile has a uniform MFN tariff of 6%, and the average effective tariff has been reduced to about 2% by the conclusion of a wide network of preferential trade agreements (Figure 4). With a few exceptions, notably wheat and sugar, for which a Price Band System (PBS) is

Figure 4. **Applied tariffs, adjusted for trade preferences, 2000-05**



Note: Calculations account for both *ad valorem* and specific duties.

Source: Becerra, 2006.

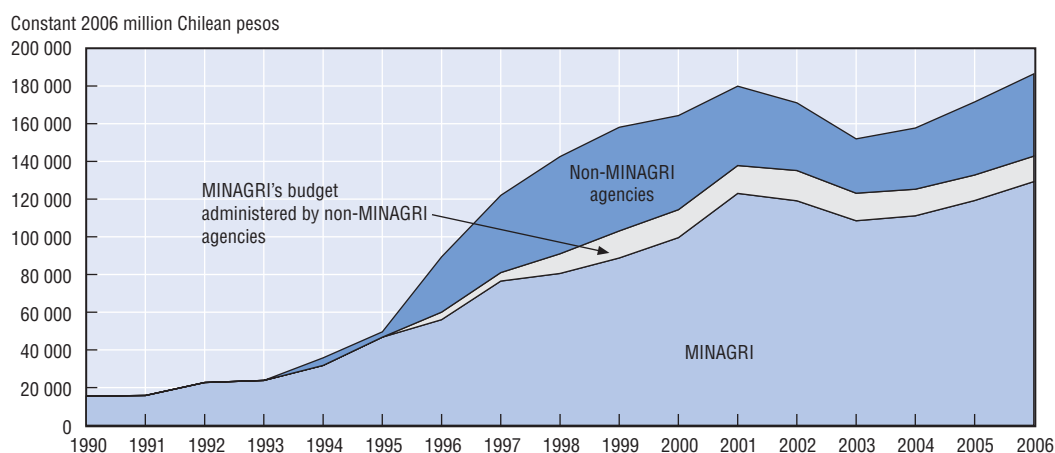


operated, there has been little protection for agricultural products, although Chile's trade agreements have typically singled out agricultural sub-sectors for special treatment. Over the past four years, however, domestic prices of agricultural commodities have been on average no more than 2% above comparable prices in international trade.

The idea behind Chile's PBS was to provide producers of eligible crops – mostly smaller farmers in the south of the country – with some insurance against price risk. Under the PBS, floor and ceiling prices are established around an international reference price. When the reference price is below the lower threshold, a specific duty is applied in addition to the applied tariff. When the reference price is between the lower and the upper threshold, only the applied tariff is applied. Lastly, when the reference price is above the upper threshold, a deduction is made from the applied tariff. Between 1998 and 2000 world prices were sufficiently low that the duty levied on PBS products exceeded the bound tariff of 31.5%. Following a successful WTO appeal by Argentina, the PBS was modified for wheat, wheat flour and sugar, and discontinued for vegetable oils. Chile successfully renegotiated its bound tariff for sugar, which was raised to 98%. Strong world prices for wheat have meant that the actual duty paid has been less than the MFN rate of 6% in three of the past four years. The duty payable for sugar was over 40% from 1998 to 2004, but fell to 20% in 2005 and less than 1% in 2006. A second successful WTO challenge by Argentina means that the PBS for wheat and wheat flour will need to be further reformed.<sup>2</sup>

Although Chile has relatively low trade protection, its agricultural policies are by no means *laissez-faire*. Indeed, government expenditures on agriculture have more than trebled in real terms over the past ten years. Spending by the Ministry of Agriculture (MINAGRI) has increasingly been complemented by the outlays of other ministries and associated agencies (Figure 5).

Figure 5. **Real budgetary transfers on agricultural programmes, 1990-2006**



Source: DIPRES, 2007; MINAGRI, 2007.

The main categories of agricultural spending, according to official classifications, have been – in order of importance – irrigation; productivity improvement and skills development (including preferential credit); rural development; a soil recovery programme; R&D, training and extension; sanitary and phyto-sanitary standards; and marketing and promotion. About half of these expenditures are made at the sectoral level, while the other

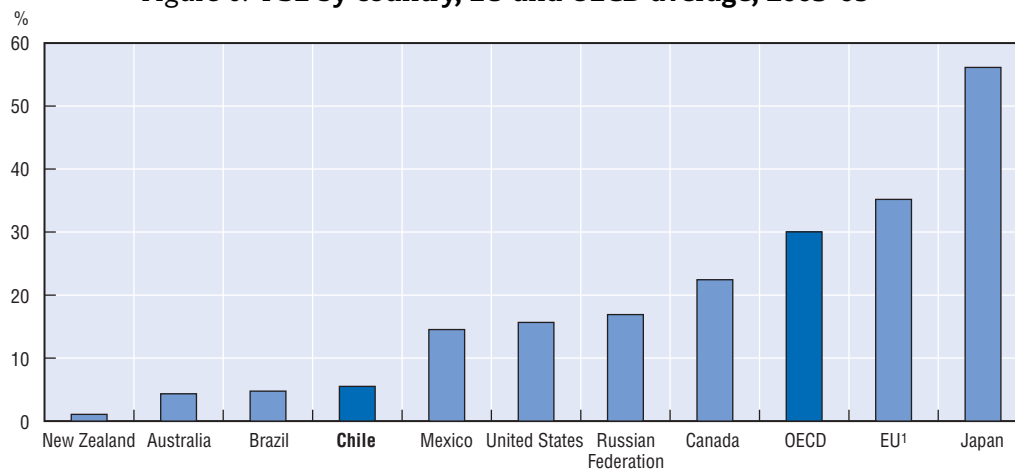
half comprises specific payments to farmers. A variety of agencies are responsible for these expenditures, with payments to small farmers, which account for about 30% of all outlays and half those of MINAGRI, made by a dedicated agency, the Institute of Agricultural Development (INDAP).

Programme areas cut across the three areas of policy objective: for example investments in infrastructure and irrigation, management skills and standards have a general impact on competitiveness. In each case, there is a specific element aimed at small farmers. Similarly, the Soil Recovery Programme seeks to improve resource utilisation but is also constructed to foster the competitiveness of small farmers in particular.

The division of responsibility across different government agencies makes for challenges in ensuring policy coherence. For example the Ministry of Public Works (MOP) and the Ministry of Agriculture (via the National Irrigation Commission, CNR, and INDAP) both spend money on irrigation. Within MINAGRI, the Soil Recovery Programme is jointly administered by SAG and INDAP, with the domain of intervention depending on whether the beneficiaries are large and medium scale farmers (in which case they fall under the responsibility of SAG), or smallholders (under INDAP). The issue of coherence has become more important as the scale of government spending has increased.

The use of public policies to address these three areas of policy objective is reflected in the OECD calculations of support to agriculture. In general, support provided to producers is low when compared with other OECD countries, with an average %PSE (producer support as a share of gross receipts) of 5% in 2003-05 that is comparable to the estimates for Australia and Brazil, and somewhat higher than for New Zealand (Figure 6).

Figure 6. PSE by country, EU and OECD average, 2003-05

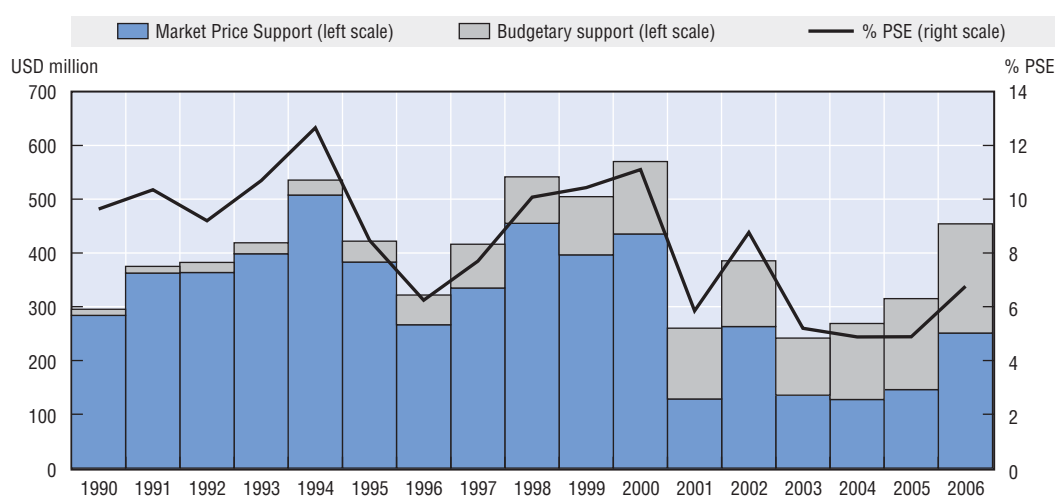


1. EU15 for 2003; EU25 for 2004-05.

Source: OECD, PSE/CSE database, 2007.

Market price support has fallen to very low levels, reflecting the limited use of tariffs and other trade restrictions.<sup>3</sup> This has been counteracted by rising budgetary payments made specifically to farmers since the mid-1990s, with these payments dominating producer support in recent years. On balance, the PSE has trended downwards slightly since the restoration of democracy in 1990 (Figure 7).

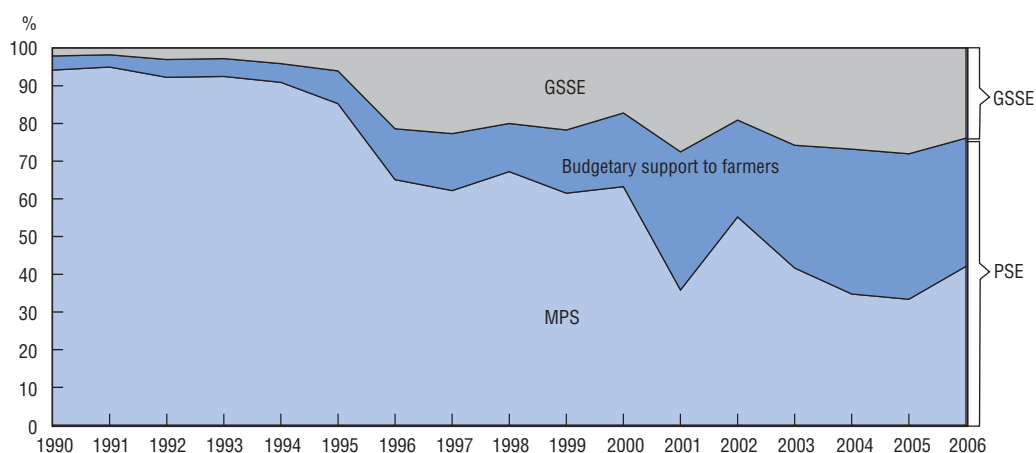
Figure 7. Level and decomposition of the PSE, 1990-2006



Source: OECD, PSE/CSE database, 2007.

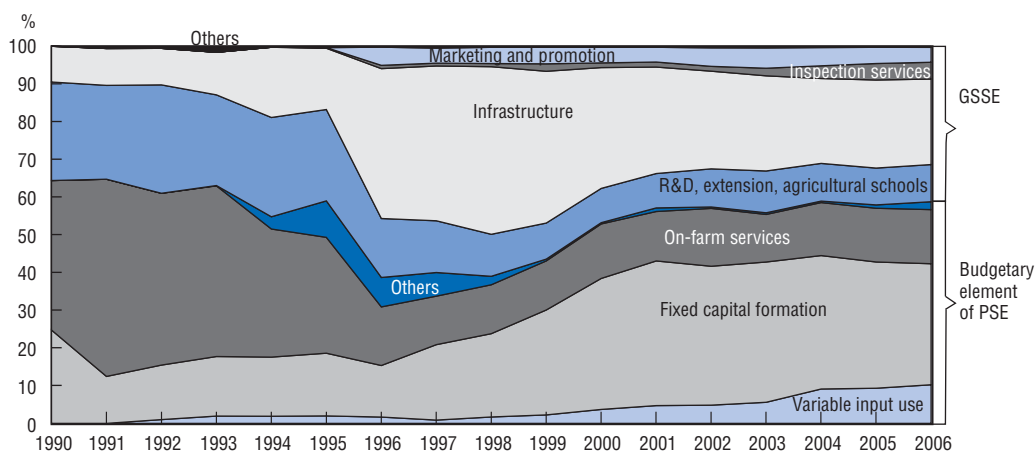
Agricultural policies that consist of payments to farmers are one component of total budgetary spending on the sector. Payments to the sector as a whole, but not specifically to farmers, included in the GSSE, have increased in parallel with those made to farmers (Figure 8). As a result, total support to agriculture, as measured by the TSE, now splits fairly evenly between the three components: market price support, payments to farmers, and the GSSE. The division between payments to farmers and to the sector as a whole has been roughly half and half for the past 15 years (Figure 9). Spending on infrastructure dominates the GSSE while fixed capital formation dominates the budgetary component of the PSE. In a number of cases in Chile, GSSE expenditures are the off farm equivalent of producer-oriented programmes (such as the provision of farm level infrastructure, irrigation and inspection services).

Figure 8. Decomposition of the TSE, 1990-2006



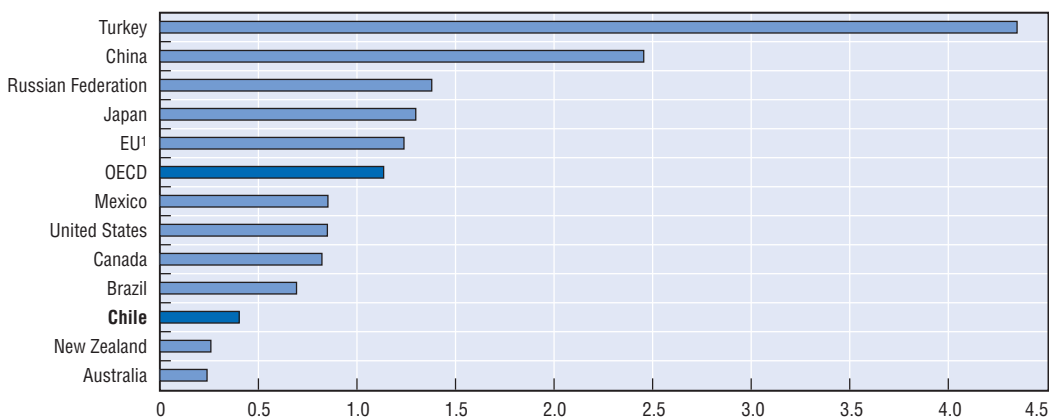
Source: OECD PSE/CSE database, 2007.

Although budgetary expenditures have risen rapidly, support to the agricultural sector imposes a much milder burden on the economy than in most OECD countries. The TSE

Figure 9. **Decomposition of budgetary allocations in PSE and GSSE, 1990-2006**

Source: OECD, PSE/CSE database, 2007.

accounted for 0.4% of GDP between 2003 and 2005, compared with an average share of 1.2% in OECD countries (Figure 10). The main reason for this difference is that market price support has declined to very low levels in Chile, whereas it still dominates producer support in most OECD countries. The share of the GSSE in total support was 26% over the same period, as compared with an average of 17% in OECD countries. Since the GSSE contains investments in areas that may be considered to be public goods, this suggests a more productive use of taxpayers' money than is the norm in OECD countries.

Figure 10. **Total Support Estimate in Chile and selected countries, 2003-05 average, as per cent of GDP**

1. EU15 for 2003; EU25 for 2004-05.

Source: OECD PSE/CSE database, 2007.

Spending on public goods has complemented the benefits of trade openness. These policies include spending on infrastructure by CNR and MOP; the specification and enforcement of standards by SAG; promotion by PROCHILE; and R&D by the National Institute for Agricultural Research (INIA), the Foundation for Agrarian Innovation (FIA) and through Fundación Chile. The reason for the success of these policies is that they have provided investments that the private sector alone could not have undertaken. In many

cases, public-private interactions (e.g. in the development of standards and inspection services, and the development of venture capital) have been a key ingredient of the success. In addition, the government has invested significantly in addressing a number of environmental concerns, including the loss of native forest and corresponding reduction in biodiversity, growing water demand for agriculture, and the erosion and desertification of national soils. SAG and INDAP jointly administer the Soil Recovery Programme, while another MINAGRI agency, the National Forestry Service (CONAF), implements reforestation and forest protection programmes.<sup>4</sup>

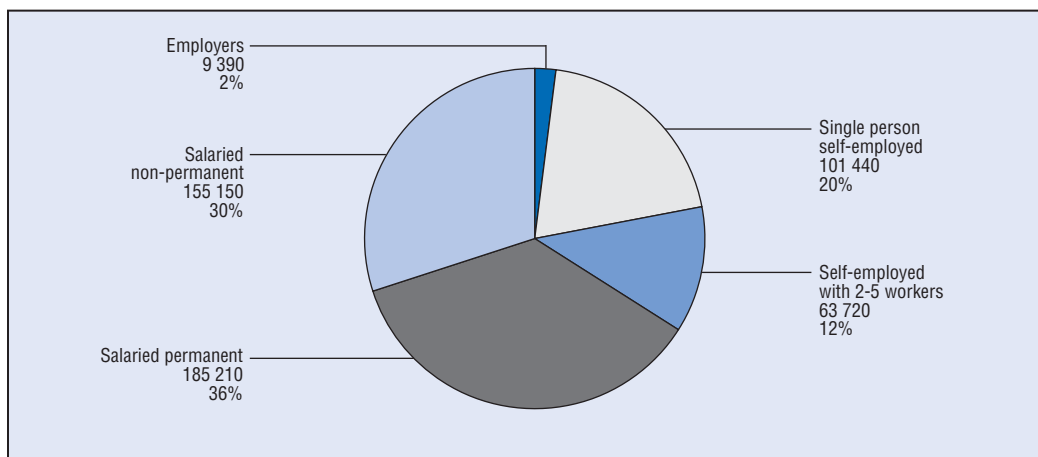
However, the fact that money is spent on public goods that the market would underprovide does not itself guarantee that policies are effective. Indeed, given the large number of programmes that Chile has in place, there is a need for a more thorough evaluation of performance. Some agricultural programmes are evaluated upon the request of the Treasury, but these evaluations focus more on gauging the implementation and reach of programmes than how effective they have been relative to their ultimate objectives. With agricultural policies increasingly being implemented by agencies other than MINAGRI, there is also a need for closer co-ordination.

The half of government spending on agriculture that is made directly to farmers is focused on smallholders. According to the 1997 Agricultural Census, there were 278 000 smallholders in Chile (corresponding to a definition that determines eligibility for support), of which 102 000 were subsistence farmers and 176 000 were market-orientated.<sup>5</sup> These smallholders accounted for 84% of the farms in Chile, but only about 30% of the value of production. The remaining medium and large scale farms do not receive any direct support from the government. The strategic objective is to integrate smallholders systematically into commercial structures. Although operationally some programmes target market-orientated producers, there is no explicit targeting on the basis of potential competitiveness. Such a refocusing appears necessary, given that the reach of INDAP – the government agency with responsibility for smallholder development – is limited to 40% of the eligible smallholder constituency, and that INDAP is legally constrained in the size of operations that it can lend to, with an upper limit that rules out supporting some potentially competitive medium-sized operations.

### 3. Strategic options for more inclusive agricultural development

As a matter of strategic emphasis, it is important to note that two-thirds of agriculture dependent households are not farm households but salaried agricultural workers (Figure 11). Moreover, salaried-worker families have a higher incidence of poverty than the self-employed and, when headed by non-permanent workers (mainly seasonal), poverty rates are even higher. For the other one-third, comprising mostly self-employed farm households, it is equally important to recognise that while their total incomes have improved, most of those gains have come from higher off-farm incomes, with farm incomes themselves showing little change.

The corollary is that many of the policies needed to boost the incomes of agriculture-dependent households are those that help raise earning potential generally, and lie outside the realm of agricultural policies. It is important that agricultural policies are framed within an overall context of policies that are appropriate for the sector and the households that depend on it. A correspondence between development pathways for agriculture-dependent household and relevant policy instruments is described in Table 1. The

Figure 11. **Numbers of agriculture-dependent households, by category, 2003**

Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

development pathways are described in the columns, and the policy instruments in the rows. The first column (improving competitiveness within agriculture) applies to farm households, but the others are valid for both farm households and salaried worker households. Note that the development pathways (columns) are not mutually exclusive: for example, one household member can enhance the farm's competitiveness while another provides off-farm income. Also, the instruments (rows) do not exhaust all possible policies, but focus on those with persuasive arguments.

For salaried workers, the key policy areas are likely to be investments in human capital (notably education), regional policies to help build a diversified economy with both skilled and unskilled job opportunities, and labour market reforms to raise employment opportunities and wage incomes. For farm households, only a minority have operations that are likely to be commercially successful in the long term, and it makes sense that agricultural policies should focus on this constituency. For the majority, income diversification and finding employment outside the sector are likely to be more important, and the priorities are similar to those for salaried agricultural workers. Agricultural policies may have a role, but they are not the foremost determinant of development opportunities. Among subsistence farmers and seasonal workers, coverage by social safety nets is important, and has mostly been achieved.

Agricultural policies designed to help farmers become more competitive need to be not just targeted on the potentially viable, but weighed against the alternative of providing support in ways that do not distort markets and household decisions. Given that, from an inter-generational perspective, the majority of farmers will improve their incomes by diversifying their income source or exiting the sector, the presumption should be in favour of non-farm measures that do not deter such initiatives.

There is nevertheless evidence of unexploited development opportunities for smallholders in hitherto less developed regions. In the southern regions, where most of the land cultivated by small farmers is located, there is evidence of unexploited agricultural potential. The main impediments to exploitation of those resources appear not to have been land quality or even land size, but other elements such as weak infrastructure and poor management skills. Case study research for Region VII suggests that more farmers in

Table 1. **Strategic framework for more inclusive agricultural development**

Policy instrument	Development pathway				
	Help farmers become more competitive within agriculture	Diversify income sources		Leave the sector for off farm work	Safety nets for those unable to adjust
		Within agriculture	Outside agriculture		
<b>Investment in human capital</b>	Minor effects of formal education for this generation; technical training more appropriate for productivity.	Can help farm family members and rural workers move into skilled jobs	Important for farm family members and rural workers	Important for managing inter-generation change	
<b>Investment in infrastructure</b>	Helps with market integration	Helps improve local job opportunities		Can ease migration decisions for offspring	
<b>R&amp;D and extension</b>	INIA and private sector important; most gains have been from adoption and adaptive research.	Can expand agricultural employment (e.g. fruits and vegetables).			
<b>Credit</b>	Should focus on correcting market failures	Indirect impacts			
<b>Labour market reforms</b>		Important for raising employment opportunities and wage incomes			
<b>Cash transfers (possibly conditional)</b>				Conditional school attendance may complement investments in schools	The most important policy for those unable to adjust
<b>Regional policies</b>	Important for improving market integration	Expanded non-farm activity would raise farm wages	Important for building a diversified rural economy with wider job opportunities		
<b>Develop producer associations</b>	Mixed success so far, except for input co-operatives.	Indirect impacts			
<b>Land policies</b>	Need to encourage rental markets and facilitate land purchases by small farmers			Restrictions on land sales make it difficult for farmers (notably indigenous) to liquidate assets	

that region could be competitive if those constraints were eliminated by suitable investments, for example in infrastructure and research and extension.

Further provision of public goods could help ensure that a greater share of the benefits of agricultural growth extend to some smallholders. Such investments, because they impose few distortions to decisions at the margin, are unlikely to crowd out the development of other activities and potential income streams. In allocating such public goods, there is a need for some discrimination, for example at the regional level. On the other hand, the government cannot (and should not try to) judge at the individual level who will succeed and who will not. In practice, this should mean limited recourse to sector-specific household level expenditures, such as on on-farm infrastructure.

An important area where policies are implemented at the individual level is credit. In providing more targeted credit, the aim should be to correct market failures rather than allocate on the basis of farm size. This is not primarily a question of interest rate subsidies, but of providing marginal incentives for banks to engage with small borrowers, as is done through INDAP's Financial Coordination Subsidy (BAF) and Fund of Delegated Cash Management (FAD) programmes. Under these programmes, smallholders borrow at

commercial interest rates, but banks are compensated for the banks' transactions costs of dealing with smallholders. There is also evidence that other lenders (*e.g.* Banco Estado) may have a comparative advantage in making small loans, as they have the requisite infrastructure, with monitoring capabilities throughout the country. Loans at commercial interest rates, effected through commercial banks, have much higher repayment rates than those made by the state at subsidised rates.

For smaller farmers with the management skills and resource endowments needed to access global value chains, there may be organisational initiatives (both horizontally among farmers, and vertically along the value chain) that can help them make the transition to being competitive producers. Producer associations and co-operatives have a mixed record in Chile, partly due to the lack of an associative tradition, but there have been some successes when the pre-requisites have been in place such as the specification of a business model with strict accounting procedures, the provision of essential services to members and a clear policy environment.

There are few formal restrictions on the operations of land markets, but there is little renting of land, due to the high transactions costs that larger farmers incur when negotiating with smaller ones. This puts a brake on the consolidation of land into more productive units, thus impeding agricultural investment and making it more difficult for uncompetitive farmers to diversify out of the sector. In the case of indigenous farmers, there are strict restrictions on land sales and on rental and sharecropping arrangements. This policy is motivated by concerns that go beyond conventional economic criteria, but nevertheless limits the already low potential of indigenous farmers and the incentives for exploiting improved non-farm opportunities.

Finally, regional policies have an important role, as it is easier for agriculture to develop when other sectors are succeeding too, and the development of infrastructure is keeping pace. The design of regional policies may influence the targeting of agricultural policies, which calls for co-ordination across ministries and may imply some decentralisation of agricultural policy implementation.

In conclusion, Chile has made important progress in raising incomes and reducing poverty, and more recently in narrowing income inequality too. Those benefits have extended to agricultural and rural families, although improved farm incomes have not been the main driver. Chile has eschewed trade protection in its attempts to improve competitiveness and draw smallholders into commercial structures, and producer support is low in comparison with most OECD countries. Instead, the main emphasis has been on matching policy instruments to objectives and providing the investments (many of which are public goods) that farmers need.

As a further refinement, there is a case for a more explicit targeting of farm policies to potentially competitive farmers, with non-agricultural policies being used to help other farmers and agriculture-dependent households progressively diversify their incomes or exit the sector, and social welfare programmes providing safety nets for households that do not have the potential to adjust to structural changes in agricultural markets. In this way, agricultural policies could be more effectively integrated into Chile's broader strategy for balanced economic development.



**Notes**

1. The Gini coefficient fell from 0.58 in 2003 to 0.54 in 2006 (CASEN, 2003, 2006). A gini coefficient of 0 equates to perfect income equality (everyone has the same income), while a coefficient of 1 corresponds to complete inequality (one person has all the income).
2. Under proposals before Congress, the tariffs for wheat and wheat flour will be set at the MFN rate of 6% plus specific tariffs of USD 30 per tonne in the case of wheat and USD 47 per tonne in the case of wheat flour. Since this will raise protection beyond the level deemed to be necessary, Chile proposes to grant tariff-free access to wheat exporting countries with which it already has preferential trade agreements, subject to prices exceeding a threshold level. In addition tariffs levied on imports from those countries, as under existing provisions, are due to be phased out by 2015.
3. The 2006 market price support estimates for wheat and sugar are higher than can be explained by the applied tariffs, and appear to be due to delayed arbitrage between domestic and international markets.
4. Forestry policy in Chile is under the responsibility of MINAGRI. However, forestry policy is not covered by the OECD's classification and measurement of agricultural support.
5. Full results of the 2007 Agricultural Census are pending.



## *Chapter 1*

# **The Policy Context**

## 1.1. Introduction

Chile was a pioneer of liberalising reforms. The reforms introduced by the military government were swift and dramatic, and broke down rigidities associated with decades of import substitution policies. Resources shifted into more competitive sectors, and, with time, consistently stronger growth rates were achieved. However, the implementation of reforms was uneven, the process of adjustment was far from smooth and there were concerns about the social costs of liberalisation. Since the restoration of democracy in 1990, successive governments have adhered to orthodox macroeconomic policies, but attempted to balance this with a more pro-active social agenda. Over the last 20 years, Chile has recorded impressive income growth and the incidence of poverty has fallen dramatically. However, low incomes remain a concern, and – despite some recent improvement – the country’s distribution of income remains among the most unequal in Latin America and indeed the world. Agriculture as a whole has clearly benefited from improved macroeconomic stability and from the liberalised policy environment, but remains vulnerable to outside shocks, especially exchange rate fluctuations. The sector also remains a significant locus of poverty and underdevelopment.

As Chile looks to the future, major questions hang over the sector’s strategic role in raising incomes to the levels enjoyed in high income OECD countries, and the role of agricultural policies in stimulating underdeveloped parts of the economy. This chapter considers agriculture’s strategic role in promoting growth and in tackling underdevelopment, poverty and inequality. It also provides the context for an assessment of how well current agricultural policies are performing and a consideration of ways in which they might be reconfigured (Chapter 2), and a specific consideration of the mix of agricultural and non-agricultural policies that can best address the problem of underdevelopment in agricultural communities and rural areas (Chapter 3).

The structure of the chapter is as follows: Section 1.2 provides core information on agriculture’s strategic role in the Chilean economy. Section 1.3 describes the broad sweep of Chile’s experience with liberal policies, focusing on the ways in which policies have evolved since the initial reforms following the military coup in 1973. Section 1.4 focuses more specifically on how agriculture was affected by these reforms and the structural changes they induced. Section 1.5 sets out the main policy challenges. These include the continued need to diversify the country’s export base, and to tailor specific development policies to the needs of underdeveloped farm and rural households.

## 1.2. Agriculture’s role in the Chilean economy

Agriculture’s strategic importance to the Chilean economy is shaped by a combination of factors, including the overall level of economic development, and basic structural conditions such as climate and topography, and the suitability of the land for agricultural production. These factors determine the broad parameters within which agricultural policy is made.

### General characteristics of the Chilean economy

Chile is an upper middle income country. Its per capita GDP, which averaged USD 11 493 in PPP terms in 2003-06, exceeds those of all Latin American countries except

Table 1.1. **Income and population: comparative indicators, 2003-06 average**

	GDP, PPP (current USD)	GDP (current USD)	Population, total	GDP per capita, PPP
	USD billion	USD billion	Million	Current USD
Luxembourg	29	35	0.5	62 579
United States	12 054	12 054	295.0	40 840
Norway	187	271	4.6	40 491
Ireland	156	191	4.1	38 035
Iceland	10	14	0.3	35 534
Switzerland	262	357	7.4	35 326
Netherlands	551	607	16.3	33 814
Denmark	181	248	5.4	33 533
Australia	673	675	20.2	33 307
Austria	271	295	8.2	33 039
Canada	1 049	1 049	32.1	32 654
United Kingdom	1 952	2 121	60.0	32 521
Belgium	337	358	10.4	32 254
Sweden	289	349	9.0	32 104
Finland	167	188	5.2	31 963
France	1 905	2 054	60.6	31 401
Japan	3 828	4 423	127.7	29 979
Germany	2 436	2 724	82.5	29 536
Italy	1 693	1 710	58.2	29 065
<b>OECD average</b>	<b>1 114</b>	<b>1 121</b>	<b>1 162.7</b>	<b>29 010</b>
Spain	1 132	1 067	42.9	26 366
New Zealand	103	98	4.1	25 171
Greece	252	214	11.1	22 739
Korea	1 034	742	48.2	21 464
Portugal	220	177	10.5	20 867
Czech Republic	206	116	10.2	20 163
Hungary	178	102	10.1	17 633
Slovak Republic	83	44	5.4	15 505
Poland	526	278	38.2	13 791
Argentina	526	170	38.6	13 620
<b>Chile</b>	<b>186</b>	<b>109</b>	<b>16.2</b>	<b>11 493</b>
South Africa	506	220	46.6	10 852
Mexico	1 088	732	102.6	10 600
Russian Federation	1 490	694	143.5	10 392
Uruguay	33	15	3.3	9 912
Brazil	1 552	792	185.1	8 379
Turkey	576	327	71.7	8 028
Colombia	321	109	44.6	7 183
Ukraine	312	77	47.2	6 620
China	8 377	2 121	1 300.2	6 437
Venezuela	167	131	26.3	6 318
Peru	163	76	27.8	5 878
Paraguay	28	7	5.8	4 730
Ecuador	55	35	13.1	4 193
India	3 601	752	1 087.1	3 307
Bolivia	25	9	9.1	2 761

Source: World Bank, World Development Indicators, 2007.

Argentina, is similar to the levels in Russia and South Africa, but lower than in all OECD countries except Mexico and Turkey. Notwithstanding two decades of rapid growth, per capita incomes are still less than half the OECD average (Table 1.1).

The economy is similar in size to several smaller OECD countries, including the Czech Republic, Norway and Portugal. As per capita incomes catch up to developed OECD country levels, while the population grows at a modest rate of just under 1% per year, the size of the economy is likely to converge towards those of countries with similar population levels, such as the Netherlands.

The country's economic growth since the restoration of democracy in 1990 has been the fastest in the region, although it has not been as prodigious as the rates recorded in East Asia (Table 1.2). Rapid growth has enabled per capita incomes to double over the last 15 years. On current trends, incomes in Chile will match the current OECD average in 15 years.

Table 1.2. **Relative economic growth (average % change in real GDP per year)**

	1961-69	1970-73	1974-82	1983-90	1991-94	1995-98	1999-2002	2003-06
Argentina	4.11	3.29	1.07	-0.40	9.09	3.66	-4.87	8.88
Bolivia	3.20	4.57	1.89	0.66	3.96	4.76	1.78	3.89
Brazil	5.90	11.52	4.88	2.53	2.76	2.49	2.13	3.38
<b>Chile</b>	<b>4.37</b>	<b>1.35</b>	<b>2.44</b>	<b>5.63</b>	<b>8.24</b>	<b>6.97</b>	<b>2.32</b>	<b>4.90</b>
Colombia	5.08	6.83	4.23	4.09	3.88	2.81	0.53	5.06
Ecuador	3.96	8.71	5.10	2.27	2.93	2.58	1.52	5.19
Guyana	3.66	1.32	0.16	-2.64	7.64	4.35	1.22	1.21
Mexico	6.78	6.59	6.15	1.33	3.56	2.65	2.79	3.28
Paraguay	4.27	5.99	8.32	2.95	3.38	2.36	-0.70	3.71
Peru	5.25	4.57	3.42	-1.42	4.83	4.33	2.31	5.90
Uruguay	1.30	0.26	2.62	1.22	5.35	3.43	-4.68	6.90
Venezuela	4.81	4.40	1.69	1.46	3.43	2.60	-1.94	7.80
Sub-Saharan Africa	4.63	5.24	2.95	2.02	0.48	3.69	3.29	5.23
Middle East and North Africa	..	6.34	4.58	2.77	3.55	4.52	3.56	4.50
<b>Latin America and Caribbean</b>	<b>5.27</b>	<b>6.70</b>	<b>3.97</b>	<b>1.60</b>	<b>4.23</b>	<b>3.00</b>	<b>0.97</b>	<b>4.60</b>
East Asia and Pacific	3.77	8.43	6.39	7.96	10.47	7.13	7.11	9.06
South Asia	4.22	2.06	4.25	5.75	4.61	5.81	4.76	8.19
Europe and Central Asia	..	..	..	..	-6.19	1.85	3.87	6.55
OECD 25 <sup>1</sup>	8.20	9.89	10.36	6.96	4.46	4.68	4.56	5.31

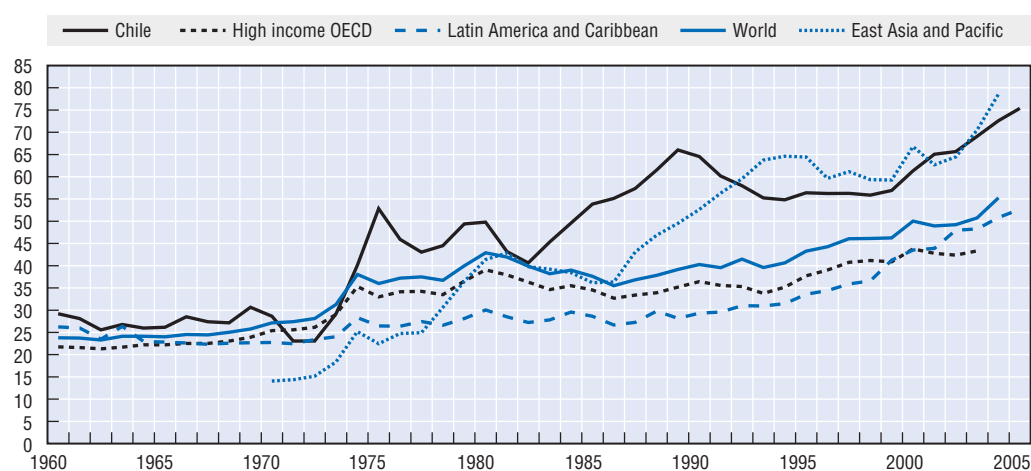
1. All OECD countries except Czech Republic, Hungary, Korea, Poland and Slovak Republic.

Source: World Bank, World Development Indicators, 2007; OECD, Quarterly National Accounts database, 2007.

Underpinning Chile's strong economic performance has been a record of sound macroeconomic management and institutional and structural reforms that have led to the emergence of a market-oriented economy. Since the abandonment of import substitution policies following the military coup in 1973, the economy has, notwithstanding some policy reversals in the 1980s, become progressively more open, with a ratio of exports plus imports to GDP of about 75% that is higher than anywhere outside East Asia (Figure 1.1). For the past ten years, the ratio of FDI to GDP has averaged 6-8%, which is also higher than the OECD average and any Latin American country. In 2005, the stock of FDI reached 65% of GDP, while the OECD average was 27%.

Years of strong growth have led to a dramatic reduction in the incidence of poverty. Using a poverty line that corresponds to twice the cost of a basic food basket, the incidence

Figure 1.1. Trade openness (% GDP, 1960-2005)



Note: For each country, openness is measured as the sum of exports and imports as a ratio of GDP. The country group measures are the simple average of all countries in that group.

Source: World Bank, World Development Indicators, 2007.

of recorded poverty fell by nearly two-thirds, from 38.6% in 1990 to 13.7% in 2006. Over the same period the proportion of the population in extreme poverty, i.e. with incomes lower than the cost of one basic food basket, fell from 12.5% to 3.2%. In 2003, poverty was slightly higher in rural areas (20.0%), while the incidence of extreme poverty was also more pronounced (6.2%).<sup>1</sup> On the other hand, Chile does not have significant dollar-a-day poverty (as recorded by the World Bank), whereas such absolute poverty is still a significant problem in many Latin American countries (Table 1.3). These advances have been matched by improvements in social indicators, including enrolment in primary education, youth literacy, infant mortality and life expectancy, with these indicators reaching levels close to those recorded in advanced economies. Infant mortality, which stood at 78 children per 1 000 live births in 1970, had fallen to 17 children by 1990 and 7.6 by 2004. Life expectancy at birth has similarly climbed steadily and in 2004 stood at 78 years. Despite these successes, Chile's income distribution remains about as unequal as anywhere in Latin America or indeed the world, although there was some improvement between 2003 and 2006, with the Gini coefficient falling from 0.58 to 0.54.

The agricultural sector has played a key role in Chile's economic success. For much of the past 20 years, agricultural growth has matched growth in the rest of the economy, enabling the sector's share of national income to remain roughly constant and defying the general experience that agriculture's importance to the economy declines with economic development. Since the mid-1990s, agriculture's share of GDP has slipped back to just under 4%, a ratio that is lower than the average in countries with similar per capita incomes, but understates the sector's relative importance once the relatively high degree of value added is factored in.<sup>2</sup>

Chile's agricultural and agro-industrial sector has been extremely successful in adding value to the production of primary commodities, thus leveraging the benefits of favourable climatic conditions (e.g. for high value crops). Indeed processed food products have become the most important sub-sector within the manufacturing sector (ahead of chemicals and non-ferrous metals), accounting for 30% of manufacturing GDP and a similar share of total GDP to agriculture itself (Figure 1.2). Much of the increase in value added has been in

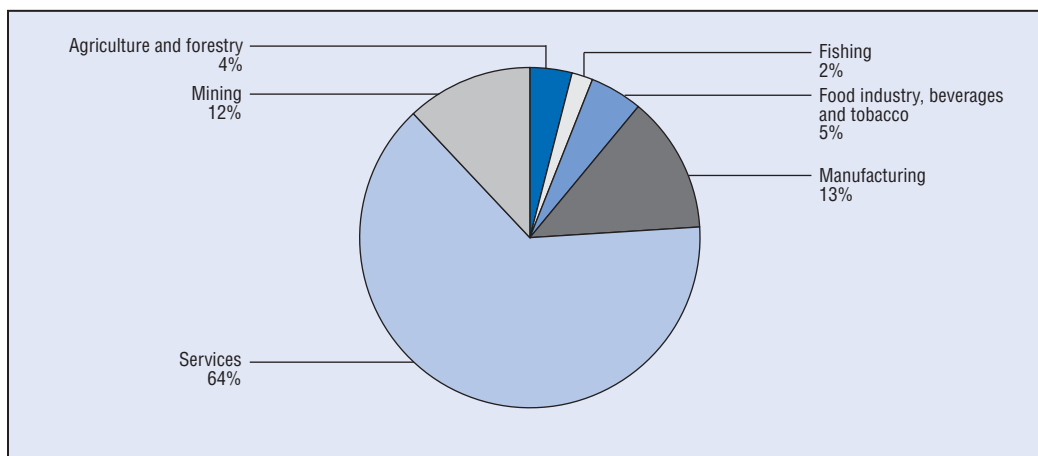
Table 1.3. **Poverty and income inequality: comparative measures**

	Percentage of population living below USD 1 a day in 2001	Percentage of population living below USD 2 a day in 2001	Income share held by highest 20%	Income share held by lowest 20%	Gini Coefficient <sup>2</sup>
	1993 PPP	1993 PPP	Latest year <sup>1</sup>	Latest year <sup>1</sup>	2001
Argentina			55.4	3.1	
Urban	3.3	14.3			0.52
Bolivia	14.5	34.6	63.0	1.5	0.45
Brazil	8.2	22.4	61.1	2.8	0.59
<b>Chile</b>	<b>0.9</b>	<b>9.2</b>	<b>60.0</b>	<b>3.8</b>	<b>0.58</b>
Colombia	8.1	22.3	62.7	2.5	0.58
Ecuador	18.0	41.0	58.0	3.3	0.54
Mexico	9.9	26.3	55.1	4.3	0.55
Paraguay	13.9	28.8	61.9	2.4	0.57
Peru	18.1	37.8	56.7	3.7	0.50
Uruguay			50.5	5.0	
Urban	0.2	4.3			0.45
Venezuela	15.4	32.7	52.1	3.3	0.50
China			51.9	4.3	
Rural	26.5	71.0			0.36
Urban	0.3	6.5			0.33
India			45.3	8.1	
Rural	41.8	88.4			0.28
Urban	19.3	60.5			0.35
South Africa	10.7	34.1	62.2	3.5	0.58
Turkey	1.2	12.8	49.7	6.0	0.40

1. 2004 data for Argentina, Brazil, Mexico, China and India; 2003 data for Chile, Colombia, Paraguay, Peru, Uruguay, Venezuela and Turkey; 2002 data for Bolivia; 2000 data for South Africa; 1998 data for Ecuador.

2. Gini Index is a measure of inequality between 0 (everyone has the same income) and 1 (richest person has all the income). According to the 2006 CASEN, Chile's Gini coefficient was 0.54 in 2006.

Source: World Bank, POVCAL, World Development Indicators, 2007.

Figure 1.2. **Shares of GDP by sector, 2002-05**

Source: Central Bank of Chile, 2007.

exportable commodities, with the consequence that agriculture and related products accounted for 29% of merchandise exports in 2002 and 2003, although this share has slipped back in recent years as a result of the copper boom. Since the initiation of reforms,



there has been a huge increase in the sector's export orientation. The share of agricultural trade (i.e. exports plus imports) in agricultural GDP averaged just 10% between 1960 and 1970. This share rose to more than 30% during the period of military government, reached 60% between 1990 and 1998, and has averaged more than 80% since 1999 (Valdés and Jara, 2007).<sup>3</sup>

In recent years, pork, poultry and dairy products have provided further sources of rapid export growth. In the longer term, however, while the agricultural sector may continue to grow it is not likely to be a permanent exception to the general axiom that agriculture's economic importance diminishes as the economy advances.

So far, agriculture growth has been generated within a subset of the agricultural economy, and has eluded many poorer farmers, notably subsistence farmers and those producing import competing products such as wheat, sugar, meat and dairy products. While agriculture is unlikely to grow as strongly in the next 15 years as it has done in the last 15, that is not to say that there are not important new opportunities, or that the best prospects for all so far unsuccessful farmers lie outside the sector. The options for fostering more inclusive agricultural development are considered in Chapter 3. In part these depend on the structural characteristics that shape Chile's development prospects.

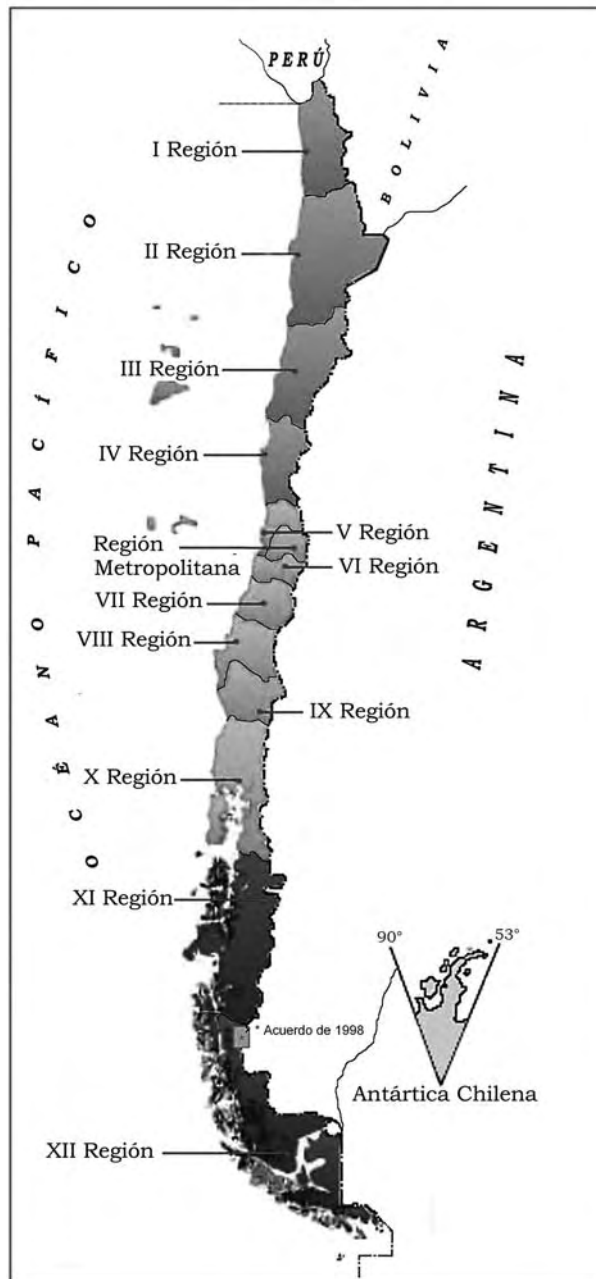
### **Structural characteristics**

Chile's unique geography has had important implications for the evolution of economic activity. The country stretches over 4 630 km from north to south along the south-west coast of South America, yet its width never exceeds 430 km (Map 1). To the east, the high Andean peaks reach up to 6 800 m above sea level, forming a natural border with Bolivia and Argentina (Map 2).

Chile's remarkable stretch of latitude, and equally remarkable range of altitudes, is associated with a diversity of climates. From the standpoint of agriculture, only a limited part of the country is suitable for farming. By far the most productive area is in the Central Valley, from south of the Atacama desert at latitudes from around 33°S to 37°S, and across the intermediate depression between the coastal mountain range and the Andes. This area has a Mediterranean climate of wet winters and warm dry summers, and is in effect a southern hemisphere mirror of northern California. To the north, the Atacama desert contains the country's copper reserves. The climate here is extremely dry, supporting only prairie scrub further north and on the Andes, some of which is suitable for sheep raising. To the south, the climate is wetter, and similar to parts of New Zealand, being suitable for forestry, livestock and dairy production, as well as some annual crops. In the extreme south is Patagonia, which is sub-arctic and rainy, with mountain and tundra vegetation, and supports sheep and wool production. West of the Central Valley, a large number of artificial forests have been planted, some annual crops are cultivated and there is some sheep-raising.

Natural resources, first nitrates and then copper, have dominated Chilean exports and had an important impact on the economy's development. The sheer importance of these endowments (nitrates accounted for about a quarter of GDP from the 1890s until into the 1920s) has contributed to financial instability and hindered the development of a diversified economy. In recent decades there has been greater success in developing non-mineral exports. In 1975 non-mineral exports made up just 30% of total exports; a share that rose to over 60% before the recent copper boom. But even here, the most important non-mineral exports still derive from natural resources, notably forestry and wood

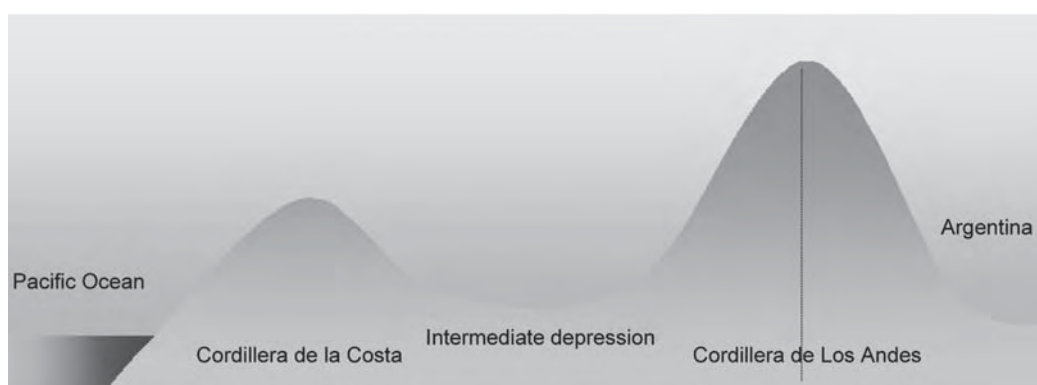
Map 1. Chile



products, fresh and processed fruits, fish culture (especially salmon) and fishmeal, seafood, and wine. The recent boom in the copper market has meant that copper accounted for more than 30% of exports in 2004-05 and more than 50% of exports in 2006. The importance of natural resources to the overall economy has also contributed to the country's fractious political history, as these resources have generated concentrated revenue streams and are partly responsible for the high degree of income inequality.

Chile faces significant natural obstacles to the development of both foreign and domestic markets. In the first place, the size of the domestic market is limited by the country's relatively small population. For some manufactures the minimum efficient scale of production may

Map 2. Chile



exceed the size of the domestic market and many capital goods need to be imported. A second problem is that transport costs tend to be high, both for domestic shipments and for international trade. Overland logistics are difficult, with roads over the Andes often closed in winter. Chile's main markets are also far away, with shipping times of 19 days to New York, 20 days to Los Angeles and 31 days to Rotterdam (Larrain, Sachs and Warner, 2000).

### Agricultural conditions

Of Chile's 76 million ha, just 15 million ha are devoted to agriculture – a similar figure to New Zealand, which has just one-third of Chile's total area (Table 1.4). As with New

Table 1.4. Land use patterns, 2003 (million ha)

	Total area	Agricultural area	Permanent pasture	Arable and permanent crops	Arable land	Permanent crops <sup>1</sup>	Agriculture, value added (% of GDP) <sup>2</sup>	Employment in agriculture (% of total employment) <sup>3</sup>
							2005 or latest year available	2005 or latest year available
Argentina	278.0	128.7	99.8	28.9	27.9	1.0	10.4	1.3
Bolivia	109.9	37.1	33.8	3.3	3.1	0.2	15.7	4.9
Brazil	851.5	263.6	197.0	66.6	59.0	7.6	9.8	19.8
<b>Chile</b>	<b>75.7</b>	<b>15.2</b>	<b>12.9</b>	<b>2.3</b>	<b>2.0</b>	<b>0.3</b>	<b>4.1</b>	<b>12.5</b>
Colombia	113.9	45.9	42.1	3.9	2.3	1.6	12.5	21.6
Ecuador	28.4	8.1	5.1	3.0	1.6	1.4	6.3	9.1
Paraguay	40.7	24.8	21.7	3.1	3.0	0.1	26.8	31.5
Peru	128.5	21.2	16.9	4.3	3.7	0.6	9.4	0.7
Uruguay	17.6	15.0	13.5	1.4	1.4	0.0	11.4	4.5
Venezuela	91.2	21.6	18.2	3.4	2.6	0.8	4.5	10.7
China	959.8	554.9	400.0	154.9	142.6	12.2	13.1	44.1
India	328.7	180.8	11.1	169.7	160.5	9.2	18.6	66.7
South Africa	121.9	99.6	83.9	15.7	14.8	1.0	3.1	10.3
Australia	774.1	439.5	391.6	47.9	47.6	0.3	3.4	4.0
New Zealand	27.1	17.2	13.9	3.4	1.5	1.9	5.0	8.2
United States of America	962.9	409.3	233.8	175.5	173.5	2.1	1.2	2.5

1. New Zealand: the "Permanent crops" category includes planted production forests on farms.

2. Chilean data includes forestry. 2004 data for Argentina, Bolivia, China, Uruguay; 2003 data for Australia, USA, Venezuela; National sources for New Zealand.

3. 2006 data for Chile. 2003 data for Argentina, Australia, Colombia, Ecuador, New Zealand, Paraguay, Peru, South Africa, Uruguay, Venezuela; 2002 data for Brazil, China, USA; 2000 data for Bolivia.

Source: FAO, FAOSTAT database, 2007; World Bank, World Development Indicators, 2007.

Zealand, most of this land is allocated to pasture, with just 2.3 million ha devoted to crops. For those areas where agricultural production is feasible, however, the climate is ideal, and especially suitable for wine growing and temperate horticulture (OECD, 2004).

The vast majority of area planted to crop is in four regions (VI to IX) (Table 1.5). In the 1990s, planted area declined in three of these four regions, Araucanía (IX) being the exception. Between 2000/01 and 2005/06, the only region to see an increase in planted area was O'Higgins (VI), where maize area expanded by 50% in response to higher demand from the livestock sector. Across the country as a whole, the area planted to crops is 23% lower than at the start of the 1990s.<sup>4</sup>

Table 1.5. **Regional land allocation**

Region	Annual crops				Accumulated changes			
	Planted area, ha				Between 1990/91 and 2000/01		Between 2000/01 and 2005/06	
	1990/91	2000/01	2005/06	2005/06 share %	Ha	%	Ha	%
IV Coquimbo	12 506	10 930	9 430	1	-1 576	-12.6	-1 500	-13.7
V Valparaíso	23 665	12 890	10 920	1	-10 775	-45.5	-1 970	-15.3
VI O'Higgins	141 403	95 040	104 750	14	-46 363	-32.8	9 710	10.2
VII Maule	192 384	141 480	125 240	17	-50 904	-26.5	-16 240	-11.5
VIII Bío Bío	221 520	184 010	166 160	22	-37 510	-16.9	-17 850	-9.7
IX Araucanía	253 256	283 000	240 570	32	29 744	11.7	-42 430	-15.0
X Los Lagos	66 712	68 520	67 780	9	1 808	2.7	-740	-1.1
XIII Metropolitana	56 809	23 570	24 910	3	-33 239	-58.5	1 340	5.7
TOTAL	968 255	819 440	749 760		-148 815	-15.4	-69 680	-8.5

Source: ODEPA, 2007.

Despite this trend, the output of most crops has increased over the same interval, as a result of structural change and significant improvements in yields (discussed later). Indeed, strong growth in the agricultural sector and related industries has been an important feature of the country's economic development since the mid-1980s. The following section describes the main economy-wide and sectoral reforms that have shaped the agricultural sector's development and considers their impacts on the agricultural sector.

### 1.3. The impacts of economic reforms

Chile's economic policies have varied between phases of free market mercantilism on the one hand, and decades of strongly interventionist measures on the other. A major achievement of the past 20 years has been that, following a turbulent economic history, a coherent set of economic policies has emerged. The ideological schisms that previously dominated policy discourse have been quietened by economic growth and the generation of sufficient funds for the country to tackle social issues. Chile now has an essentially open market economy, complemented by public initiatives to enfranchise those who have previously been excluded from the benefits of economic growth. The remainder of this section chronicles how Chile's economy has evolved to where it is now.

#### **Pre-reform policies**

From independence in 1818 until the Second World War, successive governments followed mercantilist and free market policies. In the middle of the 19th century, Chile

became one of the world's leading producers of copper. Following the War of the Pacific (1879-83), nitrates (from mines in acquired areas) emerged as the country's dominant source of export revenues. The nitrate boom enabled Chile to become one of the most prosperous countries in Latin America, but at the same time the vagaries of the export market contributed to financial instability.

Chile was faced with a crisis when the demand for nitrates collapsed during the First World War, following the invention of a synthetic substitute by German scientists. Gradually, copper replaced nitrates as Chile's main export commodity. However, the economy was weakened further by the 1930s depression, and then by a breakdown of markets during the Second World War. The combination of vulnerable export markets, financial instability and concentrated income streams led to a prolonged period of experimentation with import substitution industrialisation (ISI) policies.

As elsewhere in Latin America, ISI policies met with some initial success. But they did not produce a sustainable expansion of the manufacturing sector, failing under the weight of restrictions and controls. ISI policies were particularly difficult to make work in Chile, as the small size of the domestic market could not support a large degree of internal specialisation. Nor did ISI policies succeed in insulating the economy from external shocks. Acute overvaluation of the domestic currency, while keeping input costs down, precluded the development of a successful non-traditional (that is, non-copper) export sector. Between 1964 and 1970, the government of Eduardo Frei Montalva attempted to redress some of the underlying problems, for example by adopting a crawling peg exchange rate in order to boost non-copper exports. Yet from 1950 to 1970, Chile's economic performance was the poorest among Latin America's large and medium-size countries.

In September 1970, Salvador Allende, heading a coalition dominated by the socialist and communist parties, was elected president of Chile on a populist platform. The government's response to weak growth and high inflation was a radical experiment that involved the nationalisation of key industries, including the copper mines, and the control of prices and public sector wages.

Despite the weak state of the economy, Chile had run current account surpluses through most of the 1960s, and accumulated substantial foreign exchange reserves (approximately USD 400 million). This meant that it was possible for the government to achieve brief success with populist policies. Real incomes jumped and inequality declined sharply. However, these policies were based on the flawed premise that inflationary pressures could be contained by reducing structural bottlenecks and eliminating monopoly pricing, and that macroeconomic fundamentals such as the money supply and the fiscal deficit could be ignored.

From 1971 onward, the economy deteriorated rapidly. By 1973, inflation was running at more than 500% per annum, price controls had led to the emergence of a large black market economy, and industrial output declined. The country's budget deficit exceeded 20% of GDP and foreign exchange reserves were almost exhausted. This led to a politically tense period, and prompted the military coup led by General Augusto Pinochet in September 1973.

### ***The military government's free-market reforms***

After the military took over the government, a series of dramatic economic reforms were initiated, with the aim of transforming Chile into an open market-oriented economy.

From an economic point of view, the Pinochet era can be divided into two periods. The first, from 1973 to 1982, corresponds to the period when most of the reforms were implemented, but macroeconomic stability was not consolidated. This period ended with the international debt crisis and the collapse of the Chilean economy. From then on the emphasis was on sound macroeconomic management as a precursor to export expansion and economic growth, while structural reforms took a backseat.

Chile's reforms included privatisation, trade liberalisation, financial deregulation and labour market reforms (OECD, 2007b). Starting in 1974, Chile adopted unilaterally an open trade regime characterised by low and uniform import tariffs with few exchange or trade controls. The uniform tariff was set at 90% in 1975, falling to 20% by 1977 and to 10% in 1979. There was some policy reversal, with the tariff raised to 35% following the debt crisis, but the uniform rate declined again to 15% by the end of military rule in 1989.

Following redenomination of the currency in 1975, the exchange rate was used as an anti-inflationary tool.<sup>5</sup> Under a crawling peg system, the peso was devalued more slowly than Chile's relative rate of inflation, with the consequence that the real exchange rate rose. The adoption of a fixed exchange rate in 1979 accentuated the overvaluation of the peso and, in conjunction with the loss of control of the financial sector, contributed to the financial crisis of 1982-83. In 1984 the government returned to a crawling band system, and let the exchange rate depreciate to a competitive level.

The government instituted reforms to the banking and financial sector with mixed success. The liberalisation process began with the sale of banks back to the private sector, the freeing of interest rates, the relaxation of some restrictions on the banking sector (*e.g.* reduced reserve requirements and freer entry into the sector), and the creation of new financial institutions. In June 1979, the government decided to begin liberalising the capital account by lifting restrictions on medium- and long-term capital movements. This led to a massive inflow of foreign capital. With real interest rates reaching over 60%, low domestic savings and a lack of supervision of the banking system, an unprecedented volume of bad loans accumulated. A number of banks went bankrupt, were placed temporarily under government control, and were then re-privatised. By 1992, after monetary authorities had learned the hard way the importance of bank supervision, Chile's financial sector had become stable and dynamic.

The government also instituted changes to labour practices that were strongly opposed by opponents of the military regime. The government curtailed the power of unions in several ways: a number of unions were disbanded and the government abolished the "closed shop" system, whereby once the majority of workers had chosen to join a union all workers were obliged to join. In addition, wage negotiations were decentralised to the enterprise level. However, a system of wage indexation was introduced in the first year of the regime and retained until 1982, which meant that the gains in flexibility were less than might otherwise have been the case.

The military government also kept a tight rein on budgetary expenditures. Through a radical cut in expenditures, the fiscal deficit was slashed from 24.6% of GDP in 1973 to 2.6% of GDP in 1975. The budget was kept under control for the next ten years and, from 1986 onwards, the government maintained a fiscal surplus, despite the costs of resolving the banking crisis. The fiscal burden was considerably alleviated by the creation of a private pensions system in the early 1980s, although there were significant transition costs. The combination of stronger growth rates and fiscal surpluses reduced the public debt

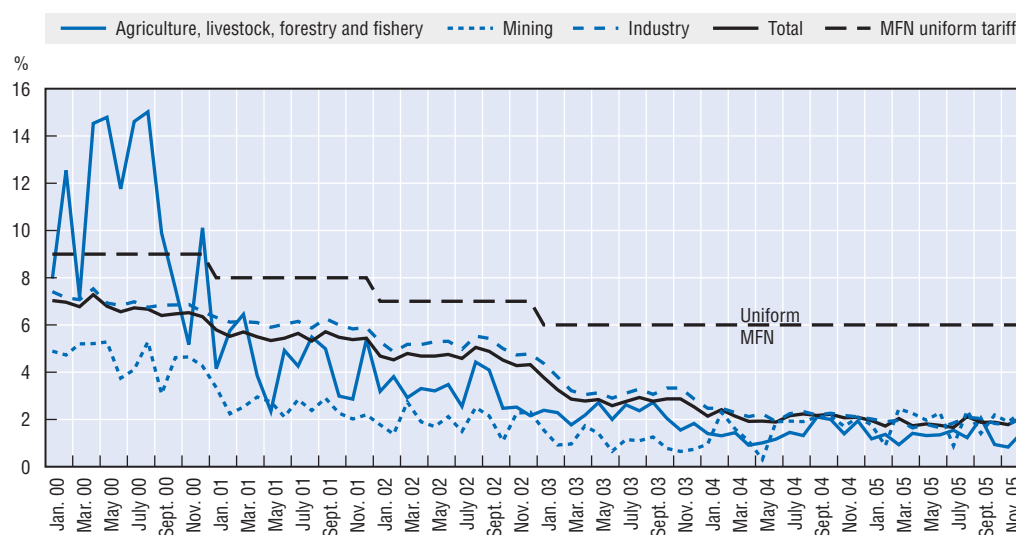
throughout the remainder of the decade, and helped bring down the country's external debt from a peak of over 120% of GDP in 1985 to 60% by 1990.

### Policy changes since the return to democracy

The main tenets of prudent macroeconomic management and a commitment to open markets were retained by the Aylwin government following the restoration of democracy in 1990. Structural reforms, including labour-market flexibility, had ceased to be associated with the authoritarian government and had become more generally accepted by the population. The new emphasis was on upscaling social programmes, and broadening the basis of the country's growth, but without endangering hard-earned macroeconomic stability.

The government has continued to open the country's markets, first by unilaterally lowering tariffs and then by concluding a series of free trade agreements. The uniform tariff system was maintained and currently stands at 6%. Figure 1.3 shows the evolution of Chile's MFN tariff since 2000. This is well within the country's WTO ceiling binding commitment of 25% (31.5% for some agricultural goods).

Figure 1.3. **Applied tariffs, adjusted for trade preferences, 2000-05**



Note: Calculations account for both *ad valorem* and specific duties.

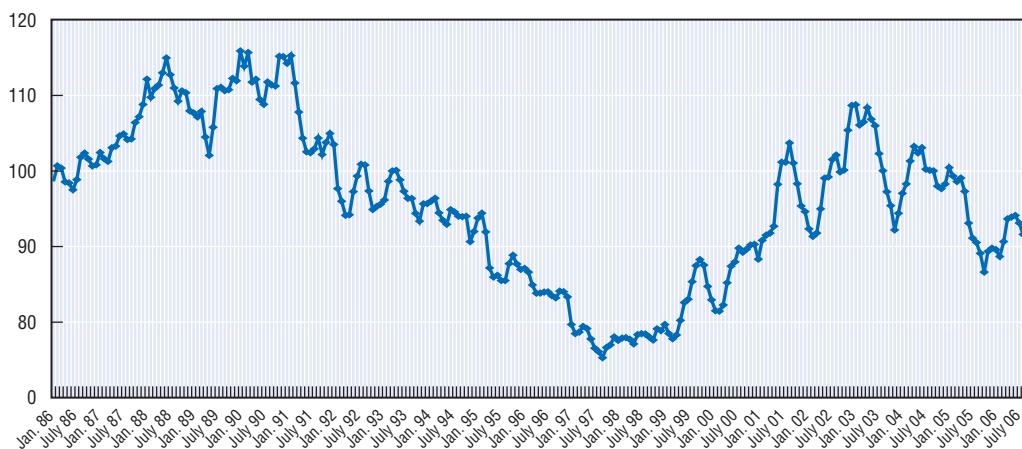
Source: Becerra, 2006.

Since 1990, an active policy of negotiating Free Trade Agreements (FTAs) and Economic Cooperation Agreements (ECAs) has been pursued as a complement to unilateral liberalisation.<sup>6</sup> This has lowered the average tariff levied by Chile still further, to just 2%, and means that applied tariffs taking account of preferences are typically much lower than the MFN average (Figure 1.3). A small side effect of these agreements (given such low tariffs) is that they have compromised somewhat the neutrality of the country's tariff system. In addition to furthering tariff reductions, Chile's trade agreements have also locked in reforms in other areas, notably with respect to regulatory policies.

The government continued with the crawling band exchange rate system through the 1990s, which resulted in a rising real exchange rate for much of the decade. The peso

was fully floated in September 1999, and fell considerably following the Asian crisis. The exchange rate has climbed again since 2003, as the economy has recovered and copper revenues have strengthened (Figure 1.4). In general, the diversification of the country's export base (notwithstanding the recent surge in copper exports), the wider range of trading partners and, most recently, reform of the Copper Stabilisation Fund, so that funds can be invested in foreign securities, have made the economy more resilient to exchange rate shocks (OECD, 2005a).

Figure 1.4. **Real exchange rate, average 1986 = 100**



Note: An increase in the index represents a depreciation of the real exchange rate.

Source: Central Bank of Chile, 2007.

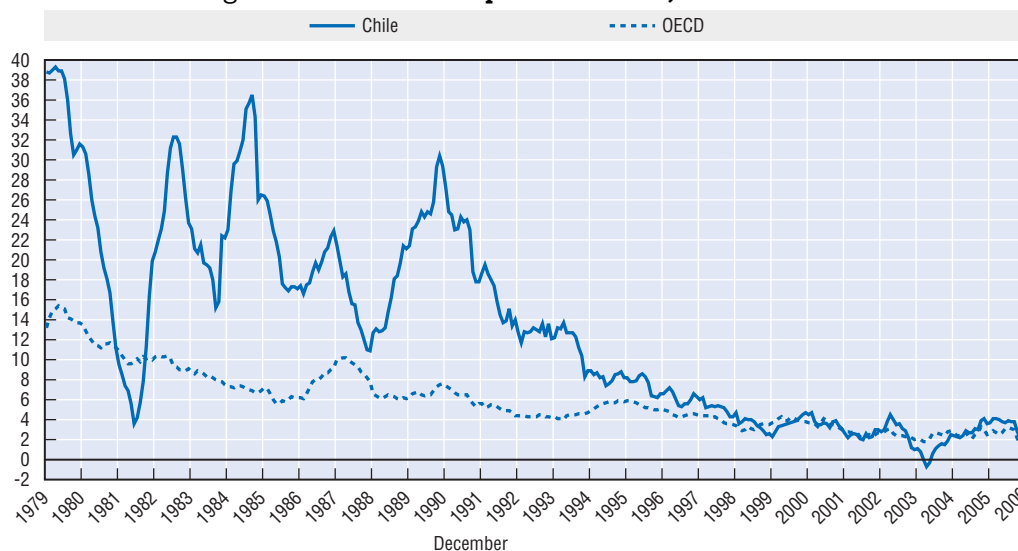
The government has also conducted a credible fiscal policy, maintaining budgetary surpluses until the sharp cyclical downturn in the late 1990s. Since 2000, the government has allowed fiscal policy to be more counter-cyclical by targeting a structural (as opposed to an actual) surplus of 1% of GDP.<sup>7</sup> This informal rule has locked in the benefits of credibility built up in the late 1980s and 1990s, and allowed the government to smooth public spending in the face of output cycles and copper price shocks. Although the government ran an actual deficit from 1999 to 2003, the structural balance met the required target from 2001. Moreover, these deficits have been more than offset by healthy surpluses in 2004 and 2005 (4.7% of GDP) following the cyclical upturn in the economy and the sharp rise in the copper price.

Structural reforms initiated by the military regime have been modified but not repudiated. For example, some changes to labour laws were introduced in 1991. These changes restricted the causes for firing employees, increased the compensation that firms had to pay to lay off employees, and restricted employers' recourse to lockouts. These changes marked a break with the authoritarian regime but without undermining the improved flexibility.

The government has also succeeded in maintaining monetary credibility since the adoption of a floating exchange rate. Inflation has converged on the OECD average and has been stable over the last few years, even in the face of global and regional volatility, and large swings in the copper price and real exchange rate (Figure 1.5) although it is poised to exceed the target ceiling of 4% in 2007, mainly as a result of higher food prices.



Figure 1.5. Consumer price inflation, 1979-2006

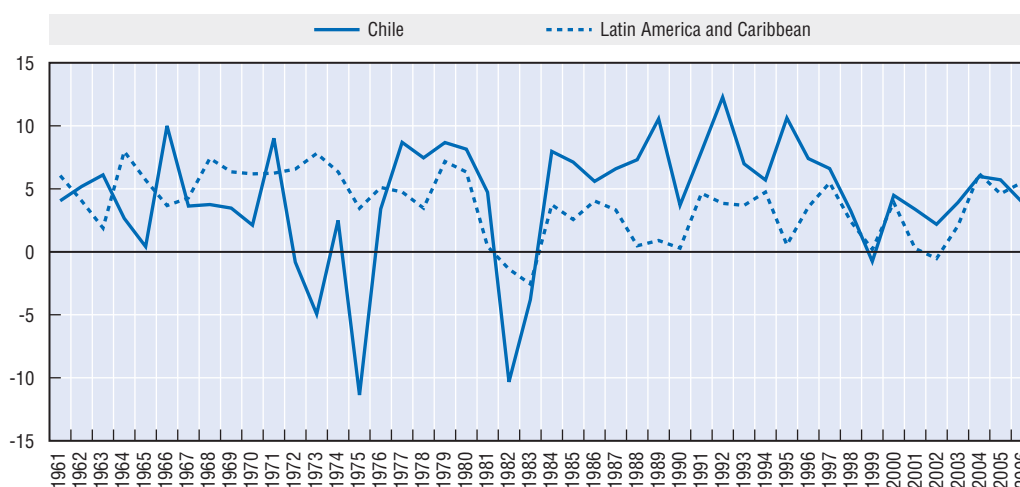


Source: Central Bank of Chile, 2007; OECD, MEI database, 2007.

In the last two years the economy has recovered quickly, aided by buoyant commodity prices, notably for copper. The ratio of private investment to GDP rose to 25% in 2004, well above the average during Chile's "golden age" of rapid GDP growth. Note that the performance of GDP has been strong and relatively stable since the debt crisis, both by historical standards and in comparison with other Latin American countries (Figure 1.6). Unemployment, which rose to 10% following the Asian crisis, has also come down to less than 8%, although increased labour force participation, especially by women, has until recently outpaced job creation.

In the longer term, however, the economy is still handicapped by structural weaknesses that slow the reduction of the income gap with OECD countries. Most importantly, there is a need to accumulate human capital by broadening the level and quality of education. Labour productivity, outside successful sectors such as mining and

Figure 1.6. Real GDP growth, 1961-2006



Source: Central Bank of Chile, 2007; World Bank, World Development Indicators, 2007.

some agribusiness activities, is an area where Chile lags the most. Educational attainment has improved dramatically, with, for example, enrolment in secondary education doubling between 1990 and 2002 to 28%; but remains low in comparison with OECD countries. A second priority is to boost innovation. R&D intensity is comparatively low, at 0.7% of GDP, and is financed primarily by the government. This is about one-third of the average R&D intensity in OECD countries, where most of the funding comes from the private sector. Moreover, the innovation mix favours R&D over knowledge diffusion and technology-based entrepreneurial skills. The latter may be more important in agriculture, where adapting existing technologies and providing extension may offer higher returns than R&D. Further needs are to strengthen pro-competition regulation, and to ensure greater flexibility in the labour market, in order to reduce labour informality and raise labour force participation (OECD, 2005a; OECD, 2007b).<sup>8</sup>

### ***Agricultural policy developments***<sup>9</sup>

Between the late 1950s and the mid-1960s, agriculture was subservient to the needs of macroeconomic policy (control of inflation, the reduction of the budget deficit, and the improvement of net foreign exchange earnings). Industrialisation was seen as the key to prosperity.

The government fixed the prices of basic products (wheat, bread, rice, sugar, oilseeds, beef and milk) and suppressed marketing margins in order to curb inflation. Except for a brief period of trade liberalisation in 1961, when the government tried to attract foreign investors, it also maintained a protective system of tariffs, quotas and import licences. The attempt to control the supply chain led to contradictory policies. For livestock producers there were incentives such as credit for milk producers and state aid for the construction of slaughterhouses; at the same time there were constraints such as rationing (“meatless days”). There were efforts to promote the export of fruits, while rail transportation was subsidised for wheat, cattle and feed shipments. In 1960, a marketing board for purchases and sales was established, beginning with wheat and by-products, with its authority later extended to all products. The board was also conferred with a monopoly on imports.

From 1965 until the military coup in 1973, the same basic instruments were used to administer a more explicit agricultural policy focused on self-sufficiency. To encourage production, the government allowed the prices of farm products to rise more quickly than those of non-agricultural goods; while to reduce marketing margins it intervened in marketing channels, increasing storage and processing facilities, improving transport systems, holding food security stocks of staples, and operating marketing boards to control prices. During this period there was an attempt to foster fruit and wine production in the Central Valley, and to transfer livestock and milk production to the southern regions. To facilitate these developments, the Economic Development Agency (CORFO), in conjunction with the Ministry of Agriculture, provided long-term credit and invested in fruit storage facilities, slaughterhouses and dairy plants. This enabled sectoral growth to reach 5% per year – more than double the average over the ISI period.

When the military took power in 1973, economy-wide reforms took priority over sectoral policy changes. As part of the early introduction of a radical trade liberalisation programme, almost all non-tariff barriers were eliminated and tariffs on most imports were reduced rapidly. Except for wheat, milk and oilseeds, most of the previous price controls were lifted, and marketing board and price control agencies were closed. Legal ceilings on interest rates were raised and then removed, and preferential rates for

agriculture were abolished. Government expenditures on agriculture also fell dramatically. During the period 1980-83, the government spent one-third of the amount it spent on the sector in real terms during the period 1965-74 (Hurtado, Muchnik and Valdés, 1990). There were several delays in the implementation of reforms, which impeded adjustment in the agricultural sector. There was a slow elimination of price controls for some products, and reform of land and water rights took longer than expected.

A second phase of reforms began in 1984, following a deep recession. A price stabilisation mechanism was established for wheat, sugar and oilseeds, based on a variable levy, commonly referred to as price bands [referred to as the Price Band System (PBS)]. A scheme of minimum customs valuations for milk and derivatives was introduced. This was seen as a way of offsetting the impacts of increases in the exchange rate.

The main tenets of agricultural policy remained in place following the return to democracy. Price band systems remain in place for wheat, wheat flour and sugar, although these are due to be phased out by 2014 under a modification of the PBS Law enacted in 2003. The wheat and wheat flour price band system are to be reformed further in order to comply with a May 2007 WTO Dispute Settlement Body finding.<sup>10</sup> Occasionally, safeguards have been applied on a few products, most recently milk and wheat flour. More generally, FTAs have reduced the mean agricultural tariff to less than 2%, which is about the same as the average in other sectors, and just one-third the MFN rate of 6%.

From the standpoint of import-competing producers, Mercosur is the most important trade agreement. Chilean producers of wheat, maize, oilseeds and beef face competitive pressures from farmers elsewhere in South America. The majority of the country's wheat, milk, and maize comes from Argentina, while meat and oilseed products are supplied by Argentina, Brazil and, to a lesser extent, Paraguay and Uruguay. Other trade agreements, notably with the European Union (2003) and the United States (2004) have been more important for exports. With an agreement with China recently concluded (2006), Chile has almost exhausted the potential for concluding significant new FTAs. However, these agreements will have considerable implications for agricultural policy due to their extensive implementation and monitoring procedures. These extend to the regulatory framework of sanitary and phyto-sanitary questions, environmental impacts, technology generation, and the special case of small farmers (credit extension and productivity enhancement).

### **Land reform**

Land reform began in the early 1960s, under the Alessandri administration (1958-64). The initial reforms were limited, based on voluntary sales at market prices, and oriented towards the promotion of small-scale farms. Reforms gathered pace under the government of Eduardo Frei Montalva (1964-70), when Chile's overall agricultural policy was centred around modification of the country's land tenancy system (Díaz, 2007). Not only was land redistributed, but other policies and institutions were introduced to fit the new vision for Chile's agricultural economy.

To support the process of land reform, a specialised agency, the Agricultural Reform Corporation (CORA – Corporación de la Reforma Agraria) was created and, in an effort to establish the new farms as viable units, the agricultural research institute INIA was set up. INDAP, which was established in 1962, was charged with supporting the smallholder sector

through literacy schemes, the promotion of farmer co-operatives and unions, and through technological transfers and loans.

The nature of the land reform process changed in 1967, when a more ambitious programme was introduced, based on expropriations, with partial compensation provided by the state, and oriented towards the establishment of large, co-operative farms. A private producer with greater than 80 hectares of irrigated land (or its equivalent) was subject to land expropriation. Under Salvador Allende (1970-73), the expropriation-based land reform programme was expanded to the south of the Central Valley and to mountainous areas, with a view to the creation of semi-collectivised, large operations.<sup>11</sup>

Between 1964 and 1973, CORA expropriated and subsequently redistributed 5 809 estates of almost 10 million ha, corresponding to 59% of Chile's agricultural farmland (Bellisario, 2007). Of these estates, 24% were expropriated by the Frei government, with the remaining 76% expropriated by the Allende administration. In terms of area, 36% of the area was expropriated under Frei and 64% under Allende, the more even proportions indicating that not only did expropriations gather pace, but also that they were extended to smaller properties.

Starting in 1974, the military government began wrap up agrarian reform by distributing land to establish family farms with individual ownership. In a period of three years, 109 000 farmers and 67 000 descendants of the Mapuche (Chile's main indigenous community) were assigned property rights to small farms. Although 33% of properties (corresponding to 30% of expropriated area) were returned to their former owners, 41% was assigned to peasant households. The remainder was either auctioned (16%) or transferred to public institutions (10%). CORA was abolished at the end of 1978 and by the end of military rule virtually all land had been assigned. Reforms to the legislation that regulated land rentals and land subdivisions in 1980 added flexibility to the rural land markets, as did the separation of water rights from the land itself, and the legal possibility of transferring water titles independently of land transactions.

Since the return to civilian rule in 1990, the fundamentals of the country's land tenure system have not been revisited. There have been no land appropriations and land policy is limited to incentives to enable indigenous farmers to purchase land (see Chapter 2).

The emergence of a successful but relatively concentrated agro-food sector, the associated decline in the number of small farm households, and the relative increase in seasonal wage earning employment within agriculture and agribusiness have been linked to a reversion to pre-reform economic structures (Bellisario, 2007). However, the general development whereby labour is released from farming corresponds to a pattern of development that most developed OECD countries have themselves experienced. The implications of these structural changes, and possible policy responses, are considered in Chapter 3.

#### Box 1.1. Chile's forestry sector

Analysis of the forestry sector falls outside the general remit of the OECD's agricultural policy analysis. In Chile, however, the forestry sector falls within the Ministry of Agriculture's mandate, and there are several policy issues that are of joint concern, notably those related to land use, the environment, and the prospects of smallholders. Accordingly, some general features of the sector and government policies are presented here.

### Box 1.1. Chile's forestry sector (cont.)

Chile's forestry sector is of considerable economic importance. It is the country's second largest export sector after copper mining, with an export share of 13% in 2005. It exports to a wide range of markets, with the most important being the United States, Japan, Mexico and China. Nearly half the sector's exports are in the form of pulp and paper. Forestry is a major employer, providing jobs for an estimated 133 000 people in 1995, of which 45 000 jobs were in forestry directly, 34 000 were in primary industries such as pulp and paper, 38 000 were in secondary activities such as furniture, and 17 000 were in services (INFOR).

Forested area has grown rapidly in recent years, from 300 000 ha in 1970 to 2.07 million ha in 2005. The majority of plantation forests are Radiata Pine (1.5 million ha) and Eucalyptus (380 000 ha). The sector has benefited from easy access to its main markets, as a result of its numerous FTAs, and from government support. Under a 1974 law, the state covers 75% of the net planting costs of any new plantation, while CORFO provides incentives to foreign and domestic investors in the forestry sector.

There have been some concerns about the extent to which this growth is inherently reconcilable with other objectives, including protection of the country's eco-system and biodiversity; the sustainable use of native forest; the resolution of land tenure conflicts; and the provision of viable development opportunities for smallholders.

On the question of natural resource management, a recent OECD review of Chile's environmental policies concluded that the country's forestry activities – including those undertaken by large scale plantations – were mostly undertaken in a sustainable manner. The review noted that generalised mismanagement of the sector in the past (prior to 1960) had degraded native forests, but that in general plantations are beneficial for the environment as they sequester carbon, improve water retention, reduce erosion, and increase the amenity value of degraded hills and plains. Moreover they are being developed on previously eroded land as opposed to native forests, and are reducing the demand for firewood from native forests (OECD, 2005b).

To reduce land tenure conflicts, the government has instituted a policy of returning land to the Mapuche people. This policy has been expensive, as the price paid to forestry companies covers the commercial value of their operations and has resulted in a high price per hectare (Moreno, 2002).

The sector has had some difficulties in providing growth opportunities for small and medium-sized enterprises, which struggle with access to finance and in negotiating with monopsonistic buyers. However, SMEs account for about 80% of employment in the sector. According to the 2003 CASEN survey (which contains somewhat different totals from those estimated by INFOR), 72 801 people made their living directly from forestry, of which 1 444 (2%) were employers, 9 193 (13%) were self-employed, and 61 164 (85%) were salaried workers. In general, employers and self employed earned somewhat less than their counterparts in the agriculture and fisheries sector; but salaried workers in the forestry sector reported higher mean and median incomes than workers in agriculture and fisheries. This suggests that smaller forestry operations face significant obstacles to their economic viability, but that employment on large forestry operations may be an attractive opportunity for poorer rural households. The issue of development opportunities for smallholders is explored in Chapter 3.

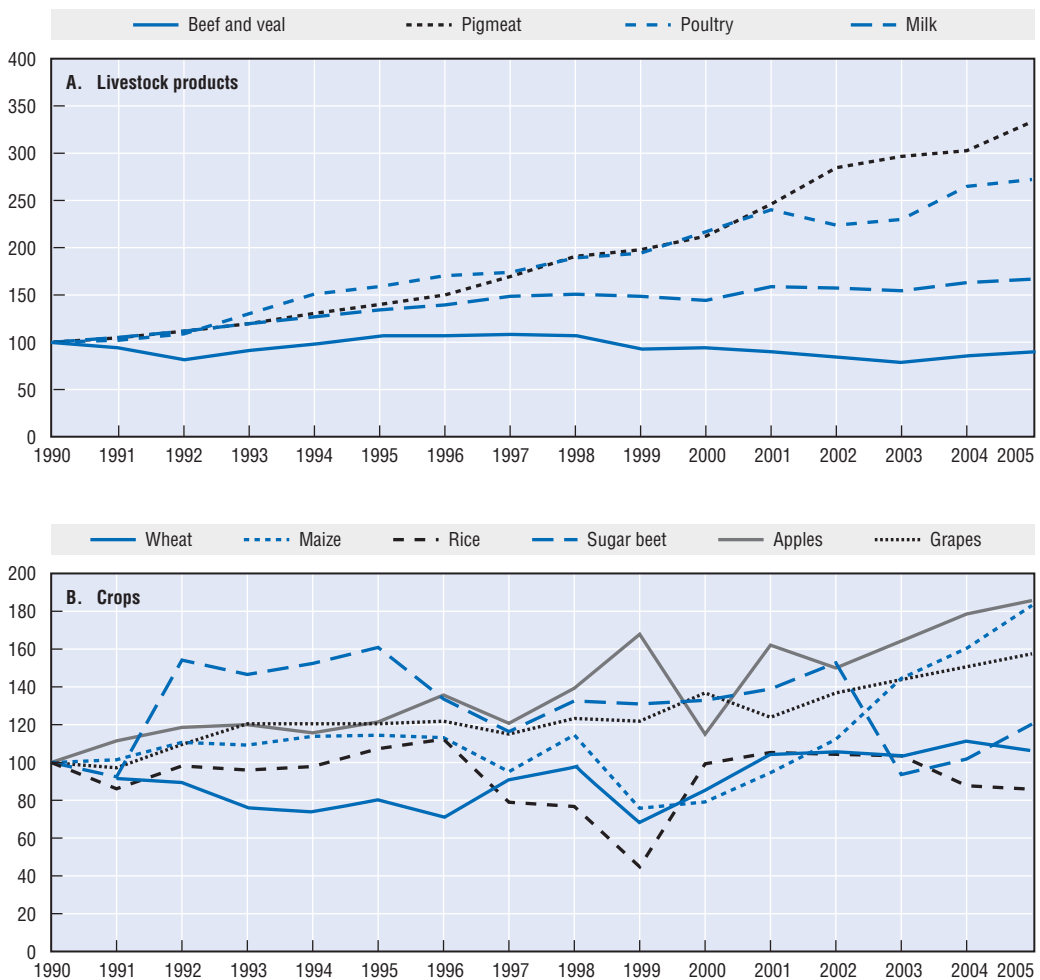
## 1.4. Structural changes in the agricultural sector

### Production, factor use and productivity

The agricultural sector responded swiftly to economic reforms, growing more quickly than the overall economy between 1984 and 1990. That trend was reversed as the gains from shifting resources into sectors in which Chile has a comparative advantage were realised, and income growth led to a natural reduction in the share of income that households spend on food, although agriculture's share of national income has now stabilised. Through the 1990s, there was a continued shift of resources away from products in which Chile is not competitive (*e.g.* wheat, beef and milk) in favour of competitive exportables (especially pigmeat and poultry, temperate fruits and vegetables, and, more recently, high quality meat and dairy products).

Since 1990, livestock output has grown more quickly than crop production (Figure 1.7). The doubling in livestock output over this 15 year period exceeds that of even the most dynamic crops (fruits and more recently maize). Most notably, the output of pigmeat and poultry has more than trebled. These products are mainly destined for the domestic market,

Figure 1.7. Output indices for crop and livestock products, 1990 = 100



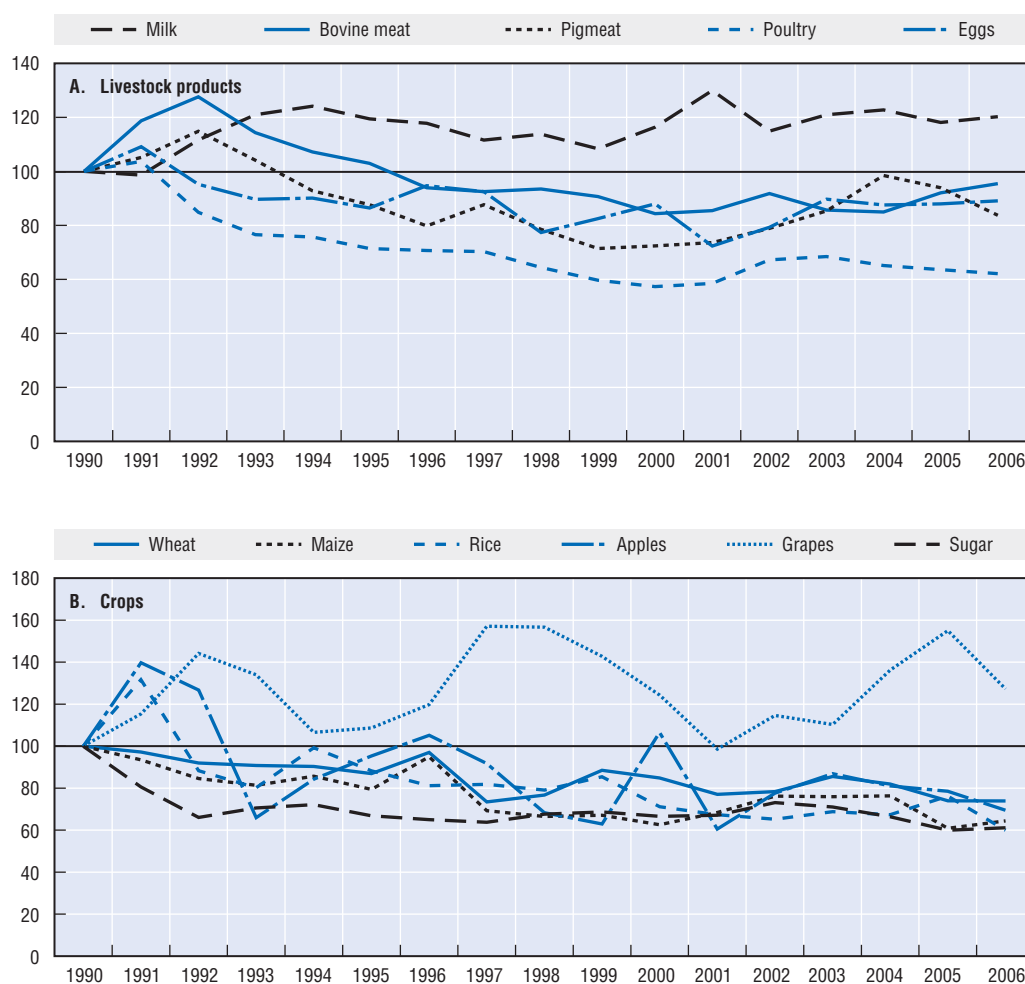
Source: ODEPA, 2007; FAO, FAOSTAT database, 2007.

which has expanded rapidly, although there has been a growing exportable surplus in each case. Milk production has increased more slowly, rising by 70% between 1990 and 2005, despite being the only livestock product to show rising real prices, while the production of cattle meat has actually declined as a result of particularly sharp falls in real prices.

Among crops, the production of exportable higher value products has increased most. Output of apples and grapes nearly doubled between 1990 and 2005. On the importable side, the output of wheat declined in the 1990s but has since recovered to pre-1990 levels. Maize production was weak through the 1990s, but almost doubled between 2001 and 2005, as yields improved and the growth in livestock production boosted the demand for feed. Wine production continues to increase, while the expansion of fruits has slowed, due primarily to a decrease in world prices for the bulk of the fruit exports (Valdés and Jara, 2006).

The relative strength of livestock production reflects comparatively high domestic prices compared with crops, where real prices have declined significantly for all crops except grapes (Figure 1.8). Most of the gain has come from increases in animal numbers

Figure 1.8. **Real wholesale price indexes for main agricultural commodities, 1990 = 100**

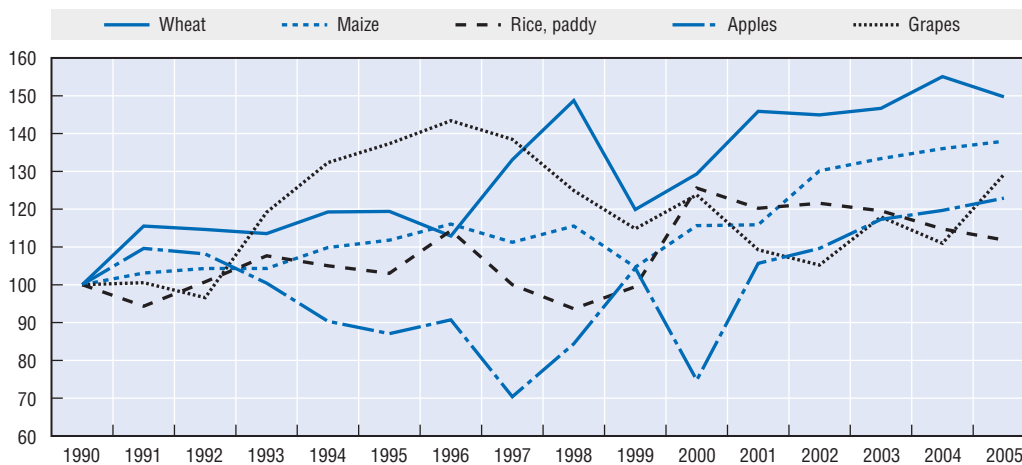


Source: ODEPA, 2007; FAO, FAOSTAT database, 2007.

rather than improved productivity. This contrasts with the majority of crops, where improved yields rather than increased acreage have been the dominant factor.

The overall area planted to crops declined by 23% between 1990/01 and 2005/06 (Table 1.5). This has been more than offset by improvements in yields. Reflecting competitive pressures, yields for import-competing crops such as wheat and maize have increased sharply, and more rapidly than yields for exported commodities such as fresh fruits, which were already competitive anyway (Figure 1.9).

Figure 1.9. **Yields for selected crops, 1990-2005 (1990 = 100)**



Source: ODEPA, 2007; FAO, FAOSTAT database, 2007.

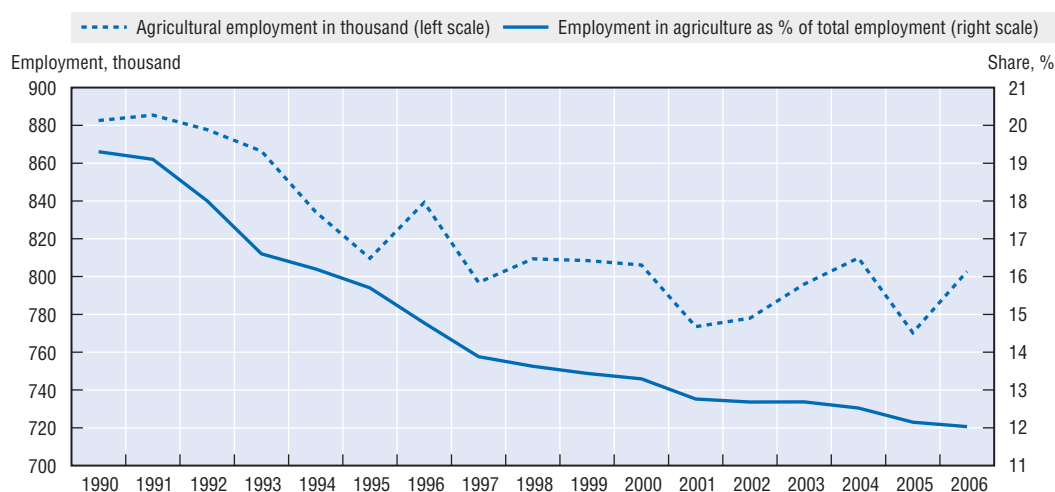
These improvements in yields are largely a consequence of more inputs being applied. The use of fertiliser, which grew rapidly during the second phase of military rule, continued to increase following the return to democracy, with the result that fertiliser use in Chile is now higher than in any other South American country. Virtually all Chile's crop area is fertilised, with rates of nitrogen, phosphate and potash (NPK) use of approximately 330 kg/ha for maize, 200 kg/ha for wheat and 540 kg/ha for sugar beets. In Argentina, by contrast about 70% of the wheat area and 40% of the maize area is fertilised, with about 75 kg/ha applied in each case (IFA, 2002). Other factors contributing to improved yields have been an increased use of machinery, an expansion in irrigated area, and the introduction of new varieties of crops.

At the same time, the number of people working in agriculture has declined in absolute terms and as proportion of overall employment, with the fraction of the working population employed in agricultural activities declining from 19% to 12% between 1990 and 2006 (Figure 1.10). This substitution of capital for labour may be partly attributable to changing relative prices: for example, whereas the price of fertiliser increased by 130% between 1990 and 2006, wages increased by 300% over the same interval.

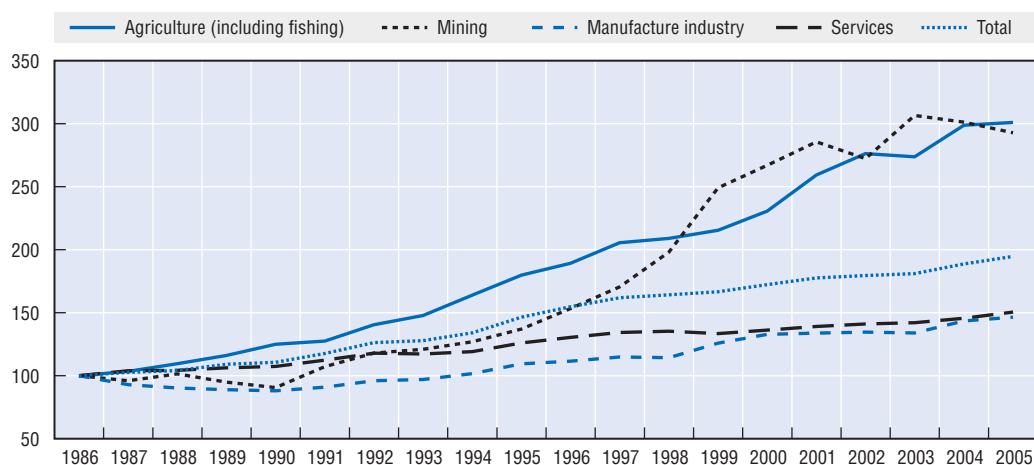
Changes in factor proportions in turn partly explain the dramatic increase in labour productivity, as measured by value added per employee (Figure 1.11). Over the last 20 years, labour productivity in agriculture (and also in mining) has grown twice as fast as labour productivity in manufactures or services.

Improved yields and labour productivity appear to be largely the result of capital deepening. Overall gains in productivity, i.e. that part of output growth not accounted for by



Figure 1.10. **Evolution of employment in Chilean agriculture, 1990-2006**

Source: ODEPA, 2007; World Bank, World Development Indicators, 2007.

Figure 1.11. **Labour productivity by sector (value added per employee, 1986 = 100)**

Source: Central Bank of Chile, 2007.

the growth in inputs, are captured by Total Factor Productivity (TFP) estimates. TFP estimates are sensitive to the methodology used, and need to be interpreted cautiously. Using an accounting relationship (that applies Brazilian cost shares for all Latin American countries), Evenson (2003) estimates that agricultural TFP in Chile grew by an average of 1.6% per year between 1982 and 2001, with growth rates of 2.2% for crops and 1.0% for livestock. The overall average is considerably lower than that for the Southern Cone countries (3.1%) or Latin America and the Caribbean as a whole (2.25). Using a different methodology (based on Data Envelope Analysis), Coeli and Rao (2003) provide productivity indices for 93 countries including Chile. They estimate that, between 1980 and 2000, TFP increased at a below average rate of 1.1% per year, with all the gains attributable to technical change, as opposed to improved efficiency in the use of inputs. Focusing on Chile alone, however, Vergara and Rivero (2006) find more positive results. Decomposing growth at the sectoral level for a more recent period, 1996-2001, they find that agricultural TFP growth averaged 5.9% per year, exceeding the gains in all other sectors except mining.

## Trade

Agriculture makes an important contribution to Chile's overall trade balance, with agro-food exports accounting for about a quarter of all exports (Table 1.6). This share is considerably higher than the cumulative share of agriculture and the food industry in GDP – which has averaged 9% over the past ten years, or 11% if fisheries are included.

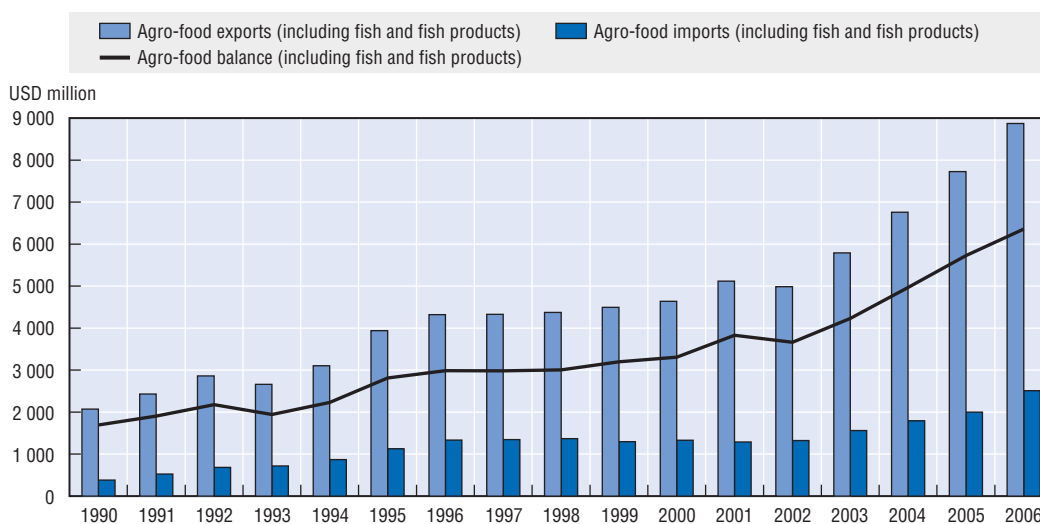
Table 1.6. **Chile's agro-food trade and total trade, 1990-2006 (USD million)**

	1990-94	1995-99	2000-04	2003	2004	2005	2006
Agro-food exports (including fish and fish products)	2 626	4 291	5 459	5 793	6 758	7 727	8 870
Agro-food imports (including fish and fish products)	636	1 294	1 459	1 562	1 790	1 999	2 511
Agro-food trade balance	1 990	2 997	4 000	4 230	4 968	5 728	6 359
Total exports	9 614	15 689	21 071	20 077	30 895	38 596	55 881
Total imports	9 124	16 160	17 583	17 376	22 401	29 857	34 726
Share of agro-food exports in total exports, %	27	27	26	29	22	20	16
Share of agro-food imports in total imports, %	7	8	8	9	8	7	7

Source: UN, UN Comtrade database, 2007.

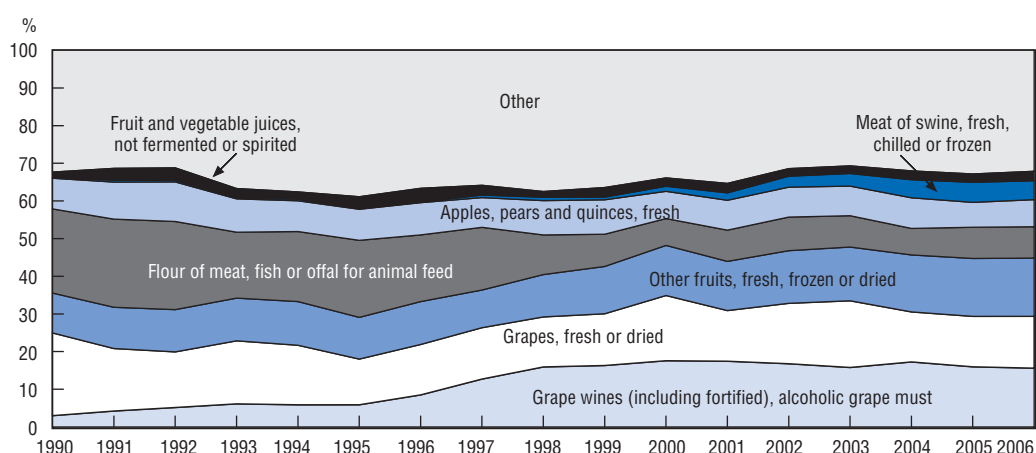
Agro-food exports have grown much more rapidly than agro-food imports in recent years, with the net surplus exceeding USD 6 billion (Figure 1.12). This growth has come from developing new markets abroad and successfully expanding sales of high value items such as fresh fruits, wine and fish and fish products. The most recent sources of growth have been pigmeat and poultry, and speciality fruits (dates, figs, and avocados) (Figure 1.13).

Figure 1.12. **Evolution of Chile's agro-food trade, 1990-2006**



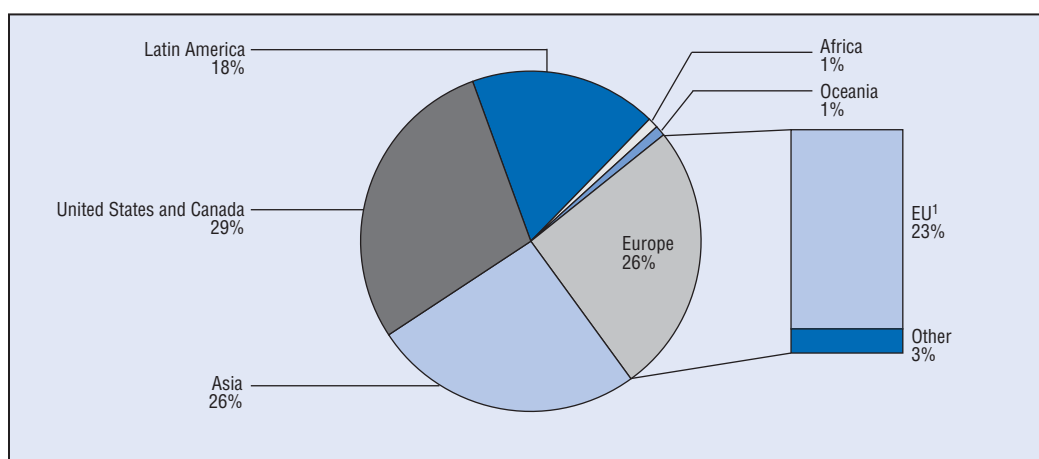
Source: UN, UN Comtrade database, 2007.

Chile has succeeded in diversifying the destinations of its exports. In the four years to 2006, 29% of agro-food exports went to the United States and Canada, 26% to Europe and 26% to Asian countries (Figure 1.14). Latin American markets are relatively less important, with a combined share of 18%. The main reason for this low share is that Chile's exports are mostly high value products such as fruits, or products with considerable value added,

Figure 1.13. **Commodity shares in Chile's agro-food exports, 1990-2006**

Note: Fish and seafood products excluded.

Source: UN, UN Comtrade database, 2007.

Figure 1.14. **Chile's agro-food exports by region of destination, 2003-06 average**

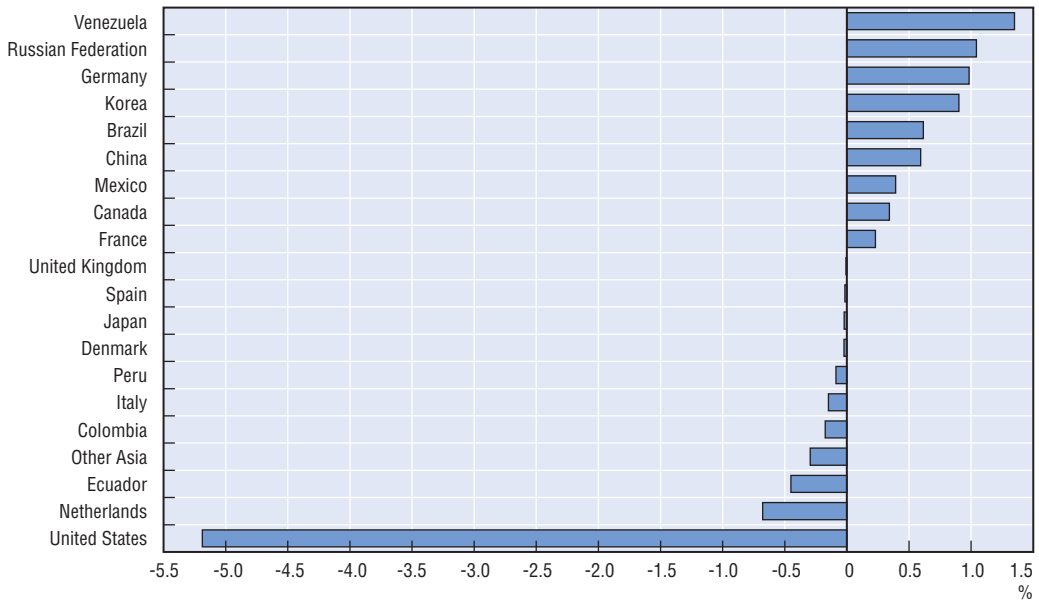
1. EU15.

Source: UN, UN Comtrade database, 2007.

notably wine, for which the demand is stronger in high income countries. In recent years there have been some new growth markets, such as Korea and Russia, while the United States market has become less important (but has nonetheless increased in absolute terms) (Figure 1.15). There has been only a small increase in the share of exports going to the world's biggest growth market, China, although that may change following the recent conclusion of a free trade agreement. One constraint on this market is China's own comparative advantage in labour intensive products such as fruits and vegetables, although this factor is mitigated by the fact that Chile's products arrive in China's off-season.

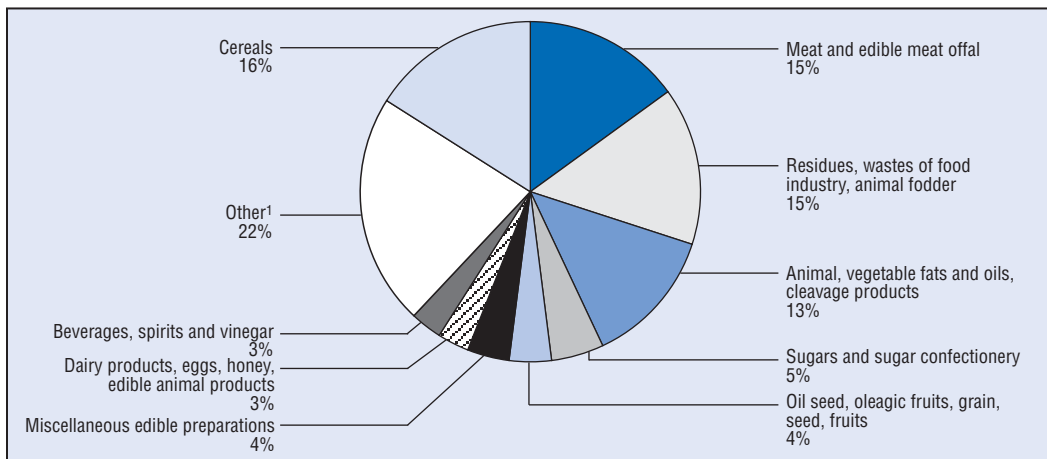
The growth in agro-food imports has been less dynamic. Chile imports a large share of its domestic consumption of cereals (principally wheat), oilseed products (both oil and meal), beef and sugar (Figure 1.16). More than three-quarters of these supplies come from other Latin American countries, with Argentina and Brazil collectively accounting for well

Figure 1.15. **Changes in export shares of agro-food products to Chile's major export destinations between 2003 and 2006**



Source: UN, UN Comtrade database, 2007.

Figure 1.16. **Chile's agro-food imports by product, 2003-06 average**



1. Commodities with a share below 3% each of the total.

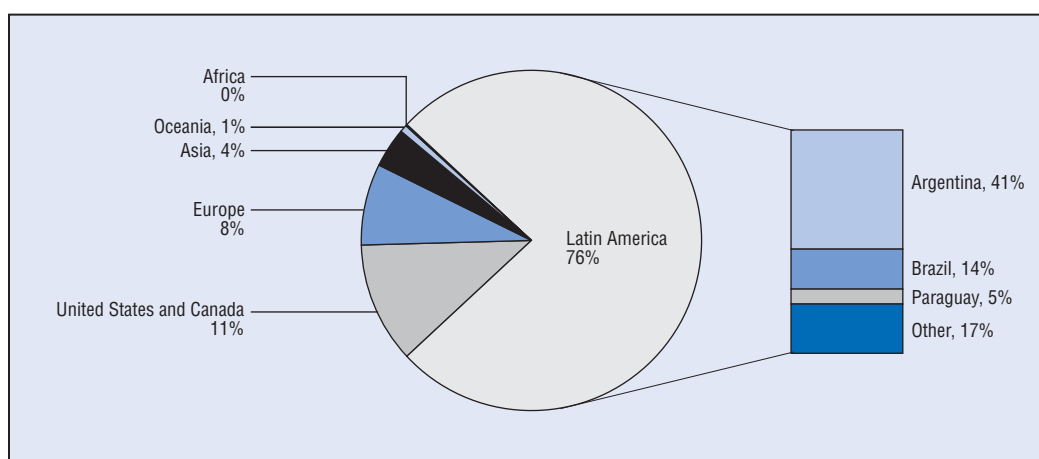
Source: UN, UN Comtrade database, 2007.

over half (Figure 1.17). Argentina is the main supplier of wheat and beef, while Brazil supplies sugar and oilseed products.

### Changes in the structure of agriculture

#### Farm structures

Changes in the production mix have had important implications for the structure and location of farm operations. The most recent Agricultural Census available was conducted in 1997, although results of the 2007 Census were becoming available as this study was being finalised. Some summary information is provided in Box 1.2.

Figure 1.17. **Chile's agro-food imports by region of origin, 2003-06 average**

Source: UN, UN Comtrade database, 2007.

### Box 1.2. Preliminary results from the 2007 Agricultural Census

In overall terms, Chile's agricultural area (including planted forests) increased by 1.3% between 1997 and 2007, to 37.1 million ha. With limited additional land available, Chile's total area appears to be close to its peak, and has been relatively constant at 36-37 million ha for the past 30 years. Farm numbers decreased by 11% between 1997 and 2007, with the implied average size of operation increasing from 84 ha to 109 ha. (Table 1.7).

Table 1.7. **Number and area of agricultural and forestry operations by type, 1997 and 2007**

	Number of farms			Area (ha)			Average size (ha)		
	1997	2007	% change	1997	2007	% change	1997	2007	% change
Individual producers	282 204	242 211	-14.2	13 020 124	11 095 218	-14.8	46	46	-0.7
Associated producers <sup>1</sup>	25 802	26 743	3.6	3 520 965	1 903 980	-45.9	136	71	-47.8
Corporate farms <sup>2</sup>	7 523	10 604	41.0	6 282 145	9 117 808	45.1	835	860	3.0
Publicly owned farms	717	379	-47.1	1 904 041	6 248 179	228.2	2 656	16 486	520.8
Indigenous and historical communities	276	439	59.1	1 775 089	2 110 172	18.9	6 431	4 807	-25.3
<b>Total</b>	<b>316 522</b>	<b>280 376</b>	<b>-11.4</b>	<b>26 502 364</b>	<b>30 475 357</b>	<b>15.0</b>	<b>84</b>	<b>109</b>	<b>29.8</b>

1. Associated producers are farm associations without legal contracts, and communal producers.

2. Corporate farms are limited companies and other societies with legal contracts.

Source: Elaborated by ODEPA and OECD using preliminary results from the 2007 Agricultural Census and the 1997 Census results.

Over the past ten years, there has been an important shift in the structure of farm ownership, with a decline in the number farms operated by individuals (-14%) and a similar fall in the area accounted for by these farms (-15%). This implies little change in average size of individual farms (46 ha). At the same time, there has been a 41% increase in the number of corporate farms, and a similar rise in area (45%); with the average size of these operations increasing slightly to 856 ha. The main cause of increasing farm sizes has therefore been the rise of corporate farming rather than changes in the scale of either individual or corporate farms. Indeed, whereas corporate farms occupied less than half the area taken by individual farms in 1997, by 2007 the ratio was up to 82%.

### Box 1.2. Preliminary results from the 2007 Agricultural Census (cont.)

It is important to bear in mind that these figures include forestry plantations, which tend to be larger than crop and livestock farms. Forestry plantations accounted for 18% of total agricultural and forestry area in 2007 and the average size of these operations was 321 ha. The implied average size of non-forestry operations was 91 ha (compared with 109 ha for all operations). Another factor influencing these results has been the increase in the area operated by publicly owned farms. Total agricultural and forestry area declined in regions V to IX, but increased in regions to the north and south. Excluding forestry plantations, the number of operations declined in all regions except Region VIII, which now contains more farms than any other region.

Only a minority of Chile's agricultural land (2.1 million ha) is cultivated, with this area falling by 7.6% between 1997 and 2007 (Table 1.8). However, this decline masks important regional differences: cultivated area increased by 60% in region IV and by 18% in region V, but fell to varying degrees in regions VI to X. The area allocated to vineyards increased by 58% to 129 000 ha, and area covered by fruits by 38% to 129 000 ha. All other crops except seeds and flowers showed declines in cultivated area, with cereals area falling by 26%. There was a slight decline in area under pasture; yet while cattle numbers decreased by 9.2%, there was a 5.2% increase in sheep numbers and a 71.6% increase in the number of pigs. In a separate study, Anriquez (2003) reports that the number of dairy producers is declining by about 3% per year, as the average size of operations increases. According to ODEPA, 2 500 milk producers (18% of the total) account for 86% of milk received by processing plants; while 800 producers (6%) account for 60% of processed milk (Oficina de Estudios y Políticas Agrarias, ODEPA, 2003).

Table 1.8. Agricultural and forestry land use in Chile, by activity, 2007 (ha)

		1997	2007	Difference	Change (%)
Cultivated soils	<b>Total</b>	<b>2 303 262</b>	<b>2 129 363</b>	<b>-173 898</b>	<b>-7.6</b>
	Annual and permanent crops <sup>1</sup>	1 403 782	1 307 369	-96 413	-6.9
	Permanent and rotation forages	454 173	402 010	-52 163	-11.5
	Fallow	445 307	419 984	-25 323	-5.7
Other soils	<b>Total</b>	<b>34 335 096</b>	<b>34 983 087</b>	<b>647 991</b>	<b>1.9</b>
	Improved pasture	1 018 446	1 052 567	34 121	3.4
	Natural pasture	12 083 350	11 162 179	-921 171	-7.6
	Forestry plantations <sup>2</sup>	2 226 014	2 655 317	429 303	19.3
	Native forest and thicket <sup>3</sup>	12 524 103	11 728 076	-796 027	-6.4
	Infrastructure <sup>4</sup>	347 664	239 843	-107 821	-31.0
	Sterile and other unusable soils	6 135 519	8 145 105	2 009 586	32.8

1. Includes annual forages.

2. Include forest and ornamental plant nurseries.

3. Include natural and native forests and thicket.

4. Does not include greenhouses.

Source: Elaborated by ODEPA using preliminary results from the 2007 Agricultural Census and the 1997 Census results.

Changes in the type of farm operation, location of production and the product mix have been associated with changes in technology. A 17.8% decline in the use of gravitational irrigation (a reduction of 171 000 ha) was more than offset by the rapid emergence of micro irrigation, which increased by nearly 300% from 62 000 to 247 000 ha. The use of mechanical irrigation also increased from 31 000 to 57 000 ha.

### Supply chains

One important determinant of structural change at the farm level has been increased concentration on the buyer side, and greater vertical co-ordination through contracts and integration in agro-processing. The structural implications at the farm level are difficult to

discern directly, pending more complete results from the 2007 Agricultural Census. Nevertheless there is evidence to suggest that smaller farmers are finding themselves under increased competitive pressure.

In the first place, a larger proportion of food sales are accounted for by supermarkets, with which smaller farmers find it difficult to engage. This is because they have greater difficulty in matching the requirements of supermarkets, either because they cannot produce on the required scale, or because they cannot meet specific standards set by retailers with respect to farming practices (e.g. standardisation) or post-harvest activities (packing, storage, handling and transportation). In addition, supermarkets face lower transaction costs when buying from a smaller number of relatively large suppliers. Supermarkets share of the food distribution sector increased from 49% to 62% between 1994 and 2001. Their share of sales increased particularly rapidly for food products, with local sales of most product categories declining by 20-25% over the same interval. Although these changes have been both rapid and profound, the penetration of supermarkets in Chile remains lower than elsewhere in Latin America: whereas the top ten supermarkets accounted for 66% of all Chilean food sales in 2002, the equivalent share in Brazil was 70%, while in Argentina, Colombia and Mexico the shares were all over 90% (ODEPA-UC-RIMISP, 2002). Following the departure of Carrefour and Ahold, all supermarkets in Chile are domestically owned, whereas in 2002 multinational accounted for 37% of supermarket sales in Brazil and 78% in Argentina.

There is also evidence of increased concentration on the processor side, which poses similar problems for small farmers. For example, Muchnik and Saavedra (2002) note that for milk and milk powder, two firms accounted for 58% of the market in 2004, while four firms accounted for 79%. In the case of apple juice processing, the two-firm concentration ratio was 64% in 2001 and the four-firm ratio 90%.

More generally, vertical integration, both upstream and downstream from the farm gate, means that (with the exception of potatoes) markets in Chile no longer correspond to the stylised model with many market participants whose activities are determined by spot prices generated by open markets (Foster and Vargas, 2000).

These developments do not mean that all food production and distribution is destined to occur on a massive scale. Within the supermarket sector, 23 hypermarkets (with a surface area exceeding 10 000 m<sup>2</sup>) accounted for 25% of area, while 631 smaller supermarkets (10 000 m<sup>2</sup> or less) had a market share of 75%. The importance of supermarkets in retail sales also varies among commodities. For crops, the share was relatively low in 2001 (3.3% for tomatoes, 4.0% of green maize, 4.8% for potatoes and 8.5% for apples). The proportion was higher for dairy products (22.4% for cheese, 29.9% for yoghurt and 39.5% for milk) and higher still for beef (45-60% according to different sources).

Similarly, there is evidence that some small farmers have managed to participate in the country's largest wholesale market, Lo Valledor, although most traders prefer to buy from medium and large scale farmers. These markets are often integrated, for example offering finance to regular suppliers and providing guaranteed outlets to retailers (Dirven and Faiguenbaum, 2004), which implies significant opportunities for farmers who can become recognised suppliers. Moreover, it does not appear that traditional markets are headed for extinction. Local markets appear to charge higher prices than supermarkets in middle class neighbourhoods, but offer a higher quality product; while in poorer areas, they offer a cheaper product with a better quality-price relation.

Organic agriculture also offers opportunities for smaller scale agriculture. So far, organic production has been of relatively minor importance, with unofficial statistics (provided by private certification companies) suggesting that in 2006 organic farms accounted for 48 043 ha, of which only 7 689 ha were cultivated with crops (less than 0.5% of cultivated crop area). The rest was mainly grassland. Vineyards accounted for 2 443 ha, apples 775 ha and olives 730 ha. Almost 90% of organic production is for exports markets, with a production value of USD 25 million in 2006. Measures to improve opportunities for organic producers include a certification scheme operated by the Agriculture and Livestock Service (SAG), and an initiative by the Economic Development Agency (CORFO) to promote quality and, relatedly, organic farming.

Nevertheless, small scale producers often face scale problems that can only be overcome by consolidation, or through forming associations and pooling production. In general terms, these structural changes offer opportunities for some small to medium scale farmers, but represent a significant threat for many more, as the gap between small scale and commercial production widens. It is important to gauge which farmers can potentially bridge this gap – an issue that is addressed in Chapter 3.

### **The environment**

In 1990 sustainable development became an explicit objective of governmental policies and in 1994 the *Comisión Nacional del Medio Ambiente* (CONAMA) was established as the institution with responsibility for environmental policies, reporting to the Ministry of the Interior. Since the creation of CONAMA under Law 19.300 *Ley de Bases Generales del Medio Ambiente*, LBGMA, some progress has been achieved, including urban water treatment, the decontamination of coastal shores, the implementation of good agricultural practices, better agricultural pest and diseases management control, a reduction of pollution from mining activities, progress in certification systems, and reduced air pollution in urban areas. Nevertheless, there still are several environmental pressures that need to be addressed. These include the continuous productive pressure on natural resources, in particular the important reduction of the native forest which implies an important lost in biodiversity, growing water demand for agriculture and for urban areas, overexploitation of the ocean ecosystem, the erosion and desertification of national soils, and the high environmental costs in energy production (Sotomayor, 2007).

One environmental problem that interacts directly with agriculture is the soil erosion resulting from deforestation, overgrazed land, and the use of inadequate crop and irrigation practices. By 2002 47.3 million hectares were eroded, equivalent to 60% of national area, located mainly in regions I, VIII, IX and VII. The loss of soils was 23% due to deforestation and loss of organic matter, 19% from hydro-erosion, 17% from urban and industrial expansion, 16% a result of chemical degradation, and 11% due to wind erosion, with other factors making up the remainder. One side-effect of reform that policy makers have to contend with is the increased use of capital inputs relative to land and labour. In particular, the use of fertiliser and pesticides has increased significantly, as prices have fallen relative to those of other inputs.

Deforestation of native forests is another important issue. Approximately 13.4 million ha – equivalent to 17.8% of national territory – are covered with native forest (CONAF, 2007). It is estimated that native forest has been lost in regions X and VII at average annual rates of 1.1% and 2.7% respectively, and that only a minority of native forest is managed with sustainable practices (Sotomayor, 2007).



The Ministry of Agriculture has a long history of environmental policies, but it was not until 1990s that policies started to focus on a sustainable development and more direct efforts were made to protect, recover and preserve the environment. MINAGRI agencies, such as SAG, INDAP and CONAF, are the main executers of environmental programmes, including the Soil Recovery Programme, reforestation programmes, and the recuperation and protection of native forest (Sotomayor, 2007). Chile's agri-environmental policies are described in Chapter 2.

### ***Rural poverty and migration***

As noted earlier, poverty rates in Chile have more than halved over the past 15 years. While the incidence of rural poverty is higher than the incidence of urban poverty, both have declined at similar rates. A similar observation can be made about changes in relative rates of poverty among agricultural and non-agricultural households, with higher rates of poverty among agricultural households, similar rates of decline across both groups and hence little closing of the income gap. According to CASEN data, the rate of poverty among agricultural households (defined according to the principal occupation of the head of household) declined from 38% to 20% between 1990 and 2003, while among non-agricultural households the decline was from 33% to 12% over the same period. The incidence of extreme poverty also declined swiftly for both categories, falling from 13% to 5% for agricultural households, and from 10% to 2% among non-agricultural households.<sup>12</sup>

Despite these similarities, it is important to bear in mind that not all rural households are agricultural and not all urban households are non-farmers – about 5% of urban households work in agriculture while nearly half of rural households (49%) are employed in non-agricultural activities. Moreover, the distinction between what is rural and what is urban is becoming increasingly blurred. Incomes have grown somewhat more slowly for agricultural households than they have for non-agricultural households, and among agricultural households at a similar rate across income quintiles. This suggests that the economy's structure of growth has raised incomes across the board, but not been pro-poor, nor contributed to reducing the country's income inequality.

It is difficult to discern the role that agricultural growth has played in these developments, given that non-agricultural growth raises the incomes of agricultural households (and, conversely, agricultural growth affects the incomes of non-agricultural households). A study by López and Anríquez (2004) has sought to establish econometrically the relative importance of the three channels through which agricultural growth can affect poverty: changes to the farmer's own income; via higher wages for agricultural employment; and through lower food prices. The main finding of this study are that the agricultural growth has a strong effect on poverty (with the poverty headcount falling by 7.3% in response to a trend growth rate of 4.5%) and that the dominant effect comes from the tendency of agricultural growth to raise unskilled wages. The effects via food prices and own-farm income are relatively unimportant.

One reason for these findings may be the deeper structural trend that militates against poorer farmers who operate alongside a competitive commercial sub-sector. While agricultural growth can raise farm incomes directly, agricultural supply increases are often associated with cost reductions that lower prices. Those costs reductions can originate either domestically or from overseas. But for farmers that do not share in those cost reductions, for example because they do not have access to technology or because they cannot adopt the minimum efficient scale, net income is necessarily put under pressure.

This may explain why the main benefits of agricultural growth to poor farmers come indirectly through development of the commercial agricultural sector.

### 1.5. Policy challenges

Over the past 20 years, the Chilean economy has enjoyed the strongest growth rates in Latin America. The key to this performance has been sound macroeconomic management, institutional and structural reforms, and trade openness. These basic tenets of economic policy have been retained by successive governments since the return to democracy in 1990.

The agricultural sector, in conjunction with related downstream activities, has played a key role in this economic success, both benefiting from stability and reforms, and making an important contribution, via rapid export growth. Moreover, the growth of agricultural and agribusiness exports has accelerated in recent years, as new exports, such as pork, poultry and dairy products have added to earlier growth sectors such as wine and fresh fruit.

Despite this important contribution, primary agriculture's share of GDP stands at less than 4%, a similar share to that in many developed OECD countries, albeit one that increases considerably once downstream sectors such as wine and fruit processing are factored in. At the same time, agriculture's share of employment is much larger, at about 12%. The difference in these two ratios points to the dual structure of the agricultural sector, where a competitive export-oriented sector co-exists alongside an underdeveloped sector of semi-subsistence farmers with relatively low value added.

Chile's agricultural growth is likely to continue, as the remaining impediments to growth are alleviated. Most of those impediments afflict the economy in general and are not unique to the agricultural sector. They include weak human capital (in particular, low educational attainment), which has implications for farm management and entrepreneurial skills; and a low R&D intensity and weak diffusion of knowledge. A more recent factor, as a result of the strong copper price, has been a high exchange rate. The easing of these constraints should enable growth to continue in absolute terms, and may enable a share of that growth to be enjoyed by some of the country's poorer agriculture-dependent households, either by drawing them into commercial structures directly or offering them employment opportunities on larger agribusiness operations.

However, it is important to recognise that agriculture's share of GDP will not rise to match the sector's share of employment – in all OECD countries the tendency has been precisely the opposite. Moreover, in the long term, it is unlikely that the agricultural sector can itself provide the basis for the 2.5 fold increase in annual per capita incomes that would bring living standards up to the current OECD average (in PPP terms) of USD 29 000. As a small economy, Chile is relatively open, with a share of exports in GDP of 40%. If that ratio is to be maintained at higher income levels, as it probably needs to be, then per capita exports would have to rise to USD 12 000. These sorts of returns cannot be generated by labour-intensive farming and require much greater diversification of the economy.

Such observations should not be equated with an “anti-agriculture” policy prescription, although many policies relevant to the sector are likely to not be agricultural policies. First, a number of key investments, notably in human capital, may be helpful for those seeking greater success within agriculture, while also producing transferable skills enabling them to exploit opportunities outside the sector. Second, there are important

investments in public goods, such as physical infrastructure, and R&D, that can help sustain and improve the sector's competitiveness. Similarly, there is a clear role for policies and programmes that are linked to other objectives, such as protection of the environment. Nevertheless, many policies, notably those that focus on improving the productivity of small-scale farmers involve trade-offs. The nature of these trade-offs is examined in Chapter 3.

With relatively little border protection, most of Chile's agricultural policies involve budgetary expenditures. The country's strong record of growth, helped in recent years by buoyant copper prices, has generated the economic resources with which to undertake a wide range of investments, and Chile has a correspondingly ambitious agricultural policy agenda. Chapter 2 measures and evaluates the support that Chile provides to its farm sector, with a view to determining whether appropriate choices are being made.

## Notes

1. According to the 2006 CASEN survey, the incidence of rural poverty was lower than the incidence of urban poverty for the first time, although the comparison needs to be interpreted cautiously, as Chile adopts a particularly narrow definition of rurality (Valdés and Foster, 2007).
2. The agriculture and agro-food sector's share of GDP is about 9%.
3. These ratios exclude forestry and fisheries.
4. Crop production in regions not included in Table 1.5 is negligible.
5. The peso replaced the escudo, with the rate of conversion set at 1 000 escudo = 1 peso.
6. Trade agreements were signed with Latin American countries first: Mexico (1991, revised in 1998), Andean Community countries (1993-98), Mercosur, of which Chile is an Associate Member (1996), and with the Central American Common Market (1999). Agreements have also been signed with Canada (1997), the European Union (2002), the European Free Trade Association (2003), New Zealand-Singapore-Brunei (2005), Korea (2003), the United States (2003), India (2002) and China (2005), Japan (2007). Negotiations are ongoing with Australia and other countries. The nature of these trade agreements is discussed in Chapter 2.
7. The structural balance measures fiscal revenue at the level it would reach if GDP growth and copper prices were at their medium-term trend levels, which are taken to be 5.3% and USD 1.21/lb respectively.
8. The OECD *Economic Survey of Chile* (2007a) recommends that regulations on full-time work be modified such that working time can be reduced by any number of hours, and not by as much as one-third, a limit that triggers special provisions.
9. This section draws heavily on Valdés and Jara (2006) and Foster and Valdés (2006). The recent and current policy environment in Chile is described in detail in Chapter 2.
10. See Chapter 2, Box 2.3, for details.
11. For a discussion of the details of Chile's agrarian reform, see Valdés (1978) and Jarvis (1985).
12. These data are discussed in more detail in Chapter 3. An agricultural household is defined here as one where the household head reports his or her main activity to be in agriculture.



## *Chapter 2*

# **Policy Evaluation**

## 2.1. Introduction

Since the restoration of democracy in 1990, successive governments have kept faith with the broad commitment to open markets, notwithstanding some significant exceptions in import-competing agricultural sectors. At the same time, the Chilean government has been increasingly active in adopting policies to boost competitiveness, help poorer and less competitive farmers, and protect the country's environment and natural resource base. Thus while Chile's agricultural trade policy is essentially liberal, the overall approach to policy making is by no means *laissez-faire*.

This chapter seeks to gauge how effective Chile's agricultural policies are in attaining their objectives. A general principle of policy design, and one agreed to by OECD countries, is that the most effective policies are those that target their objectives directly (OECD, 2002; OECD, 2007c). Policies that distort production and trade are typically less effective because they are not targeted to specific objectives, and their effects on target variables, such as farm household incomes or the environment, are indirect and comparatively small. Chile's position as a competitive exporter of agricultural products, and the low level of tariff protection it provides to most import competing commodities, immediately suggests a low degree of trade-distorting protection. At the same time, a range of policies have been introduced that do not require accompanying border measures and are linked to the articulated objectives of policy. The next question therefore pertains to whether Chile's targeted policies have been successfully designed and implemented.

In order to evaluate Chile's agricultural policies, we first classify and measure them according to the OECD's standard methodology for measuring support to producers and the agricultural sector in general (this includes the computation of PSEs and TSEs). This methodology is employed for OECD countries and an increasing range of economies outside the OECD area.<sup>1</sup> The analysis should confirm more precisely the extent to which Chile has moved away from distorting policies. At the same time, the classification of policy instruments according to the way in which they are implemented forms the basis for a more qualitative assessment of agricultural policy performance, and motivates Chapter 3's more specific consideration of policies that can address the development needs of small farmers and other agriculture-dependent households.

The structure of this chapter is accordingly as follows. Section 2.2 describes the main objectives that have guided agricultural policy design since 1990, the instruments that have been used to address these objectives, and the government agencies with responsibilities for their implementation. Section 2.3 describes the operation of agricultural trade policies in more detail, while Section 2.4 focuses on domestic policies. Section 2.5 presents the measurement and evaluation of support to agriculture, and provides some observations on policy performance. Section 2.6 presents the conclusions and policy implications of the analysis.

## 2.2. The agricultural policy framework

### **Agricultural policy objectives**

For the first ten years of the military government, there was little active state intervention in the agricultural sector. From the mid-1980s onwards, however, there was a growing perception that there were active measures that the government could undertake to improve competitiveness and thereby stimulate production and exports, principally by providing public goods that had hitherto been neglected, and by remedying market failures. On the other hand, there was little practical concern about the development needs of poorer farmers, and a neglect of environmental and resource use issues.

Since the restoration of democracy in 1990, agricultural policy has centred around three main groups of objectives: first, the inherited goal of increasing competitiveness; second, achieving more balanced agricultural development by better integrating poorer less competitive farmers into commercial supply chains; and finally reconciling these objectives with goals related to conservation of the environment and the sustainable use of resources. While the specific articulation of objectives has changed from one government to the next, these broad areas have provided a common focus of policy concerns. There has been some overlap, in that programmes targeted towards poorer farmers have focused mainly on improving their competitiveness, while smallholders are seen to have an important role to play in the pursuit of environmental objectives (such as reforestation). There has also been a subtle evolution in the emphasis given to these concerns.

There have been four governments since the return to democracy, each formed under the Concertación coalition of political parties. The first government of Patricio Aylwin (1990-94) had to manage the transition from military rule. During this period, policy objectives fell into two categories. The first articulated aim was that of supporting the country's competitive agriculture, through the transformation, modernisation, and diversification of agricultural production. The second was one of reconciling agricultural development with equality, through the incorporation of small and medium-scale farmers into the country's more competitive agriculture, and through the development of poor rural areas. The main policy instruments applied during these years involved the transfer of technology and the provision of credit.

The second government, under Eduardo Frei Ruiz-Tagle (1994-2000), continued with these broad objectives, with an added emphasis on integrating the agricultural sector more effectively into value chains. The Frei government started scaling up a range of programmes brought in under the previous government and introduced new programmes in the areas of irrigation, soil recovery, plant and animal health improvement, market development and promotion, innovation and technology improvement, the development of managerial skills, and forestry development. These policies continue to be important.

The Frei presidency was succeeded by that of Ricardo Lagos (2000-06). The Lagos government similarly specified an objective of generating the conditions for a profitable and competitive agriculture, which would extend to small and medium-scale agriculture. This period was marked by a new focus on achieving such objectives within a framework of environmental, economic and social sustainability. There was also a considerable emphasis on the promotion of agricultural exports, through programmes such as the Agricultural Export Promotion Fund and the Export Promotion Programme for Small-Scale Agriculture.

In 2006, Michelle Bachelet was elected president. Her government further rearticulated the country's agricultural policy objectives, with stated aims of (1) transforming Chile into an international agro-food and forestry superpower; (2) promote a more inclusive development for the support small-scale family agriculture (AFC); (3) modernising public agricultural institutions; (4) generating new sources of energy; and (5) ensuring a sustainable use of natural resources and protecting biodiversity. These objectives are broadly similar and compatible with those that were inherited, although the specific emphasis on generating new sources of energy is new. The policies used to pursue these objectives, which include new and inherited instruments, are discussed in Sections 2.3 and 2.4.

### **Institutional arrangements**

There are three different institutional arrangements through which agricultural policies are implemented. First, there are policies that are financed and implemented by the Ministry of Agriculture (MINAGRI) and subsidiary agencies. Second, there are policies that are financed by MINAGRI but implemented by non-MINAGRI agencies. Third, there are policies that are financed and implemented by ministries other than MINAGRI. Box 2.1 provides a summary of the various institutions with responsibility for agricultural policies, within this framework, while Chart 2.1. shows the organisational structure and the allocation of all MINAGRI expenditures in 2006.

#### **Box 2.1. Institutional arrangements for agricultural policies in Chile**

##### **1) Policies financed and implemented by the Ministry of Agriculture (MINAGRI)**

The Ministry of Agriculture (MINAGRI) is responsible for the design, implementation, administration and regulation of national policies related to agriculture, livestock, forestry, food, and rural development. MINAGRI is organised into an under-secretariat and ten agencies. Five agencies (INIA, FIA, INFOR, FUCOA, and CIREN) are managed through the under-secretariat (SUBSE). The other five – INDAP, SAG, CONAF, CNR, and ODEPA – are decentralised institutions with individual budgets.

##### ***Under-Secretariat of Agriculture (Subsecretaría de Agricultura, SUBSE)***

SUBSE's mission is to contribute to improving the competitiveness, sustainability and fairness of the agriculture and forestry sectors, by means of an efficient organisation of the Ministry of Agriculture in terms of articulating, monitoring and co-ordinating the policies, programmes and projects that are executed directly by the ministerial agencies or implemented by agreements with other institutions.

##### ***National Institute for Agricultural Development (Instituto Nacional de Desarrollo Agropecuario, INDAP)***

INDAP is the main agency providing support to small-scale agriculture. Its aim is to improve the competitiveness and market orientation of Family Agriculture (Agricultura Familiar Campesina, AFC). In order to carry out this mandate the institute contributes to financing the investments and operational capital of small-scale producers. It also co-finances technical assistance and management programmes for smallholders, and implements general assistance programmes for poor farmers.



### Box 2.1. **Institutional arrangements for agricultural policies in Chile** (cont.)

#### **Agriculture and Livestock Service (Servicio Agrícola Ganadero, SAG)**

SAG is responsible for protecting, maintaining, and improving the sanitary conditions of livestock and agricultural production; protecting, preserving, and improving the natural renewable resources used in agriculture; and controlling the inputs and outputs for agricultural production, according to legal regulations and standards.

#### **National Forest Service (Corporación Nacional Forestal, CONAF)**

CONAF's mission is to preserve and increase the country's forestry resources. CONAF manages a programme for recovering eroded soils and promotes the creation of a renewable resource for small and medium-sized owners of forest areas. At the same time, it controls the enforcement of regulations concerning the use of forests. It also has a forest-fire control programme and manages a national system of protected areas.

#### **National Irrigation Commission (Comisión Nacional de Riego, CNR)**

CNR co-ordinates all the institutions with irrigation activities, and implements its own irrigation and drainage policies, programmes and projects. It also manages the funds available for promoting the construction of private irrigation and drainage projects; and promotes public actions oriented to agricultural development and training in the areas that benefit from irrigation projects.

#### **Office of Agricultural Policies and Studies (Oficina de Estudios y Políticas Agrarias, ODEPA)**

ODEPA is a centralised public institution that provides and maintains regional, national and international information useful for policy making. ODEPA advises the Ministry of Agriculture on policies related to production and international trade. It also provides services such as legal advice, evaluation and monitoring of the budget of the Ministry's agencies, and co-ordination of international technical assistance and co-operation programmes.

#### **National Institute for Agricultural Research (Instituto Nacional de Investigaciones Agropecuarias, INIA)**

INIA's mandate is to create, adapt and transfer technological knowledge. Its actions are framed within a Research and Development concept, implying that research projects are started with a final, achievable product in mind. Nevertheless, it also performs some research projects in basic science.

#### **Foundation for Agrarian Innovation (Fundación de Innovación Agraria, FIA)**

FIA promotes innovation in Chilean agriculture by financing the development of programmes and projects that are oriented to the industrial transformation and commercialisation of agricultural and forestry products. It also promotes the co-ordination of sectoral innovation efforts, and provides extension services.

#### **Forestry Research Institute of Chile (Instituto de Investigación Forestal de Chile, INFOR)**

INFOR's mission is to carry out research projects, prepare statistics, and transfer scientific and technological knowledge related to the sustainable use of forest ecosystems, the management of its resources and the commercialisation of its products. It supports the development of small and medium-sized forest owners, and technological innovation among small and medium-sized wood-product companies.

#### **Foundation for Agricultural Communication, Training and Culture (Fundación de Comunicación, Capacitación y Cultura del Agro, FUCOA)**

FUCOA is in charge of the communications of the Ministry of Agriculture and its agencies.

**Box 2.1. Institutional arrangements for agricultural policies in Chile (cont.)****Natural Resources Information Centre (Centro de Información de Recursos Naturales, CIREN)**

CIREN's function is to compile, update, maintain and integrate statistics and cartographic information related to the country's natural resources; and to provide timely and useful information for the analysis of different sub-sectors.

**2) Policies financed by MINAGRI but implemented by Non-MINAGRI agencies****PROCHILE**

PROCHILE is part of DIRECON (Directorate for International Economic Relations) and its mission is to promote Chilean exports. For this purpose, PROCHILE undertakes studies to guide and train entrepreneurs; supplies international trade information; organises and participates in international trade shows and commercial missions for entrepreneurs; develops programmes for incorporating small and medium-sized companies into international trade; and administers funds for the promotion of exports.

**Economic Development Agency (Corporación de Fomento de la Producción, CORFO)**

CORFO's mission is to promote the "development" of national production. It promotes management improvements, innovation, the generation of capital, and the creation of new businesses.

**Fundación Chile**

Fundación Chile is a private non-profit organisation that introduces innovations and develops human resources in key areas of the Chilean economy.

**3) Policies financed and implemented by other ministries**

These are agencies with programmes that reach the agriculture sector, but where resources do not originate from MINAGRI.

**Social and Solidarity Investment Fund (Fondo de Solidaridad e Inversión Social, FOSIS)**

FOSIS is a decentralised public agency under the supervision of the President of the Republic, with whom it interacts through the Ministry of Planning (MIDEPLAN). FOSIS finances activities that contribute to poverty reduction.

**SENCE, Servicio Nacional de Capacitación y Empleo**

SENCE is a decentralised public agency that promotes the competitiveness of enterprises and individuals through training programmes.

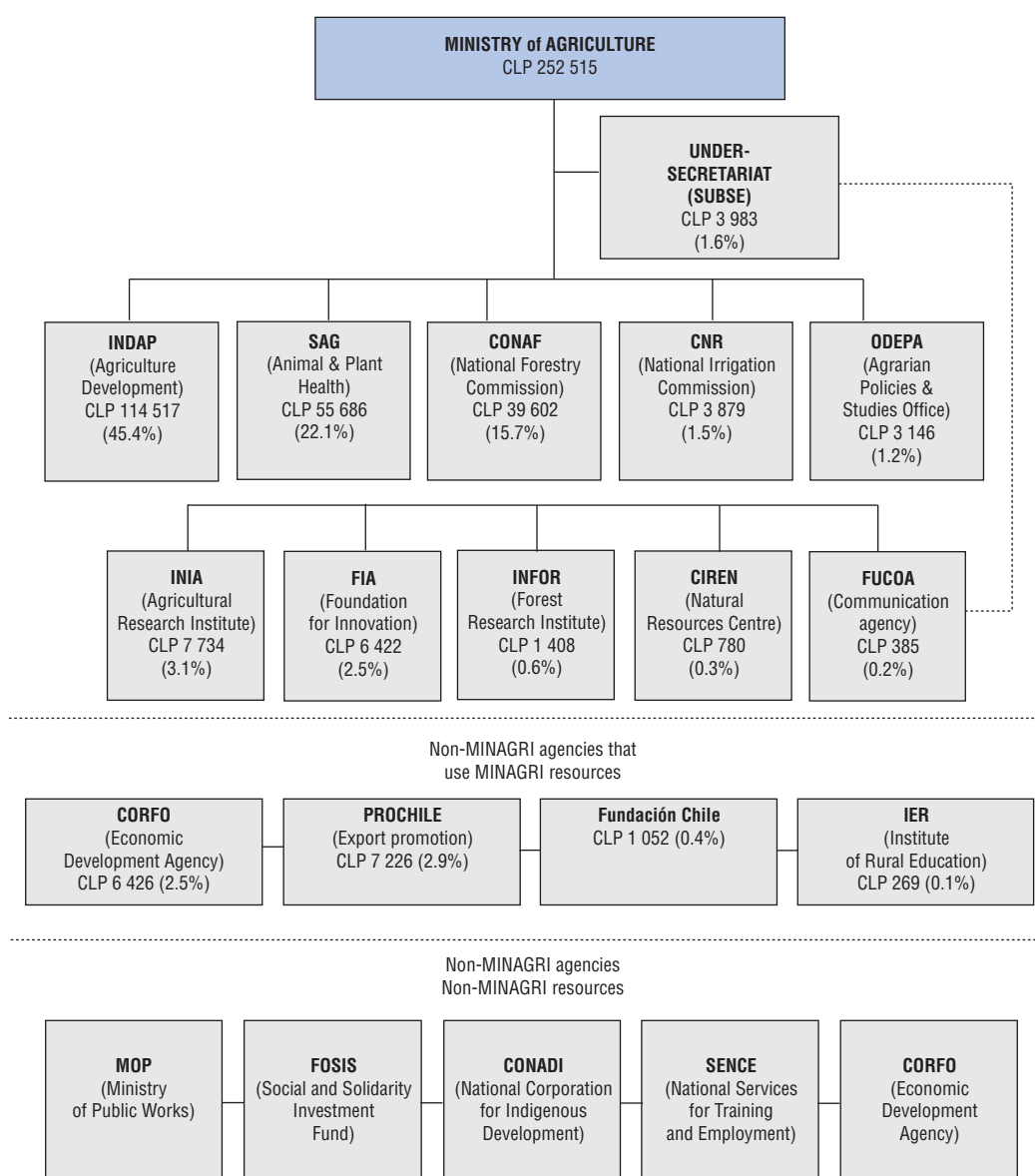
**CONADI Corporación Nacional de Desarrollo Indígena – MIDEPLAN – Ministry of Planning**

CONADI is part of MIDEPLAN and promotes, co-ordinates and executes state initiatives for the development of indigenous people.

**MOP, Ministry of Public Works**

MOP implements a number of agricultural infrastructure and irrigation projects.

Chart 2.1. **Organisation of agricultural policy making institutions and allocation of MINAGRI's total executed budget for 2006 (million CLP)**



Source: MINAGRI, 2007; DIPRES, 2007.

## 2.3. Agricultural trade policies

Chile has a very open trade policy, with a virtually uniform MFN tariff of 6%. Moreover, the conclusion of a wide range of preferential trade agreements has led to many exporters into Chile benefiting from tariff-free access for a majority of tariff lines. In the case of agricultural products, this has led to an average applied tariff of less than 2% (Becerra, 2006), a rate that is slightly lower than the average for manufactured goods. The only products which have been afforded more protection than the MFN rate are those covered by the country's price band system (PBS) – wheat, wheat flour, sugar (and previously edible oils) – and those for which contingency measures have been applied. Safeguards have been applied for wheat and wheat flour, sugar and fructose, and dairy products, while anti-dumping

measures have recently been applied against Argentine exports of wheat flour. In short, trade protection has been concentrated on a narrow group of import-competing products.

### **Changes in the trade policy paradigm**

Chile undertook unilateral trade reforms under the military government. All non-tariff barriers were eliminated; there was a gradual reduction in tariff rates, which were consolidated into three levels (with a maximum of 60%); the exchange rate was unified and the currency was devalued to offset the effects of tariff reductions (ECLAC, 2002). Tariff reforms continued, with a uniform tariff of 10% reached by 1979. There was some slippage on these reforms following the debt crisis of the early 1980s, with the flat tariff raised to 20% in mid-1983 and 35% in September 1984, but by the time the country returned to democracy in 1990 tariff protection was again mostly uniform across sectors, with a standard rate of 15%.

The civilian government maintained this open trade policy, lowering the MFN tariff to 11% in 1991 and then reducing it progressively to 6% by 2003. The price band system for wheat, wheat flour and sugar is the notable exception and has meant that tariffs for these products have exceeded the MFN (and occasionally the bound) rate. The operation of the PBS, and modifications that have occurred in the light of the WTO's Dispute Settlement Body's (DSB) findings, are described below.

As a complement to unilateral reform, the Chilean government has brokered a series of trade agreements that, by offering better than MFN access, have further reduced the degree of protection. In general, preferential trade agreements have been seen as a practical way of improving Chile's market access in a protectionist world. Chile has sought agreements with all its major trading partners in order to minimise the effects of trade diversion. Given the country's low tariffs and the limited use of other protectionist instruments, Chile's Free Trade Agreements (FTAs) and Economic Cooperation Agreements (ECAs) have often had "WTO plus" characteristics, covering areas such as investment, trade remedies, intellectual property and competition policy.<sup>2</sup> They have also included dispute settlement procedures. Table 2.A1.1 lists Chile's trade agreements, while Box 2.2 provides summary details on the agriculture-specific components. The key point to note here is that most of these

#### **Box 2.2. Agricultural elements of Chile's trade agreements**

Chile has FTAs with Canada, China, Costa Rica, El Salvador, Japan, Korea, the European Free Trade Association (EFTA), Mexico and the United States. In addition, Chile has concluded ECAs with Bolivia, Colombia, Cuba, Ecuador, MERCOSUR, Peru, and Venezuela; association agreements with the European Union and New Zealand-Brunei-Singapore, and a Partial Scope Agreement with India. These agreements collectively account for the vast majority of the country's exports and imports. For countries with which Chile has an FTA, most tariff lines are covered and the average tariff levied is less than 1% (WTO, 2003).

Chile's Free-Trade Agreement with **Canada** (CCFTA) was signed in 1996 and entered into force in 1997. Most agricultural tariffs were eliminated by January 2003. However, Chile retained its duties on dairy, poultry, and egg products, and Canada retained its out-of quota tariffs on the same products. Some Chilean agricultural tariffs were subject to a phase-out period of up to 17 years. These included pork meat, vegetable oils, beef meat, potato products, corn flour, sugar and certain sugar products, milling wheat, and wheat flour. Since the agreement entered into force, its dispute settlement mechanism has been used to investigate Chile's safeguard measures on wheat and wheat flour, sugar, and edible vegetable oils.

### Box 2.2. **Agricultural elements of Chile's trade agreements** (cont.)

The FTAs with **Costa Rica** and **El Salvador** entered into force in 2002. Immediate duty-free treatment, granted by Chile to imports from Costa Rica and El Salvador, covered 83.4% of the tariff lines. Chilean goods that do not benefit from duty-free access to these countries include live animals, meat products and tobacco. Goods from Costa Rica and El Salvador that do not benefit from duty-free treatment include vegetable oils, sugar and wheat flour.

The FTA with **Mexico** has been in place since 1992; the two parties decided to expand the scope of the original agreement, and a new FTA was signed in 1998, coming into force a year later. The agreement establishes provisions in several areas, including SPS measures. Goods excluded from duty-free treatment by both parties include various dairy products, wheat and wheat flour, edible vegetable oils, sugar and tobacco products. The agreement's dispute settlement mechanism has been used to investigate Mexico's import regime for apples.

Negotiations on a FTA with the members of the **European Free Trade Area** (EFTA) were concluded in 2003, with the Chilean government indicating that the agreement would provide duty-free access for about 90% of imports originating in EFTA members. The agreement contains provisions on public procurement, investment, trade in services, SPS measures, technical regulations, and dispute settlement.

The FTA with **Korea** was ratified in 2003 and contains provisions on customs procedures, safeguard measures, anti-dumping and countervailing measures, SPS measures, technical regulations, investment, trade in services, movement of natural persons, competition, government procurement, intellectual property rights, and dispute settlement. Chile granted immediate tariff-free access to 67% of its tariff lines, while Korea will introduce immediate duty-free treatment on 87% of its tariff lines. All other goods were to obtain tariff-free access within five, seven, ten or thirteen years. Chile permanently excluded sugar, wheat, and oilseeds, and Korea permanently exempted rice, apples, and pears.

The FTA between Chile and **China** was signed in 2005 and entered into force in October 2006. The agreement provides a free trade area in a period of ten years, with some exceptions (3% of tariff lines exported to China) mainly in the agricultural sector (i.e. rice, wheat, wheat flour, sugar). The agreement provides a framework for trade in goods, unfair business practices, safeguard measures, dispute settlement, customs valuation, technical regulations, SPS measures, and bilateral co-operation. Chapters on investment and trade in services are under negotiation.

The FTA with **Japan** entered into force in September 2007. The agreement provides a free trade area in a period of 15 years, with some permanent exceptions (12% of tariff lines exported to Japan) and temporary exemptions (for 3% of tariff lines). The agreement contains provisions on trade in goods, dispute settlement, customs valuation, technical regulations, SPS measures, business promotion measures, public procurement, intellectual property and trade in services.

The Free Trade Agreement with the **United States** was signed in 2003 and entered into force in 2004. The FTA eliminated most tariffs immediately and provided commitments for duty-free bilateral trade in all products by 2014. The agreement provides a framework for trade in goods, investment, intellectual property, public procurement, trade in services, electronic commerce, labour rights, and environmental regulations.

### Box 2.2. **Agricultural elements of Chile's trade agreements** (cont.)

The ECA between Chile and **MERCOSUR** was signed on 25 June 1996 and entered into force on 1 October of the same year. Goods featuring in the general list were granted duty-free treatment as of January 2004, with complete liberalisation for the other goods to be reached by 2014. Tariff preferences are generally expressed as a percentage of respective MFN tariffs. The agreement contains provisions on market access in goods, unfair business practices, safeguard measures, dispute settlement, customs valuation, technical regulations, SPS measures, export promotion measures, and intellectual property. Since the agreement entered into force, its dispute settlement mechanism has been used to address a complaint by Argentina concerning Chile's import regime for edible vegetable oils.

Chile's Association Agreement with the **European Union** was signed in late 2002 and came into force in 2003. Chile granted duty-free treatment to about 91% of all tariff items originating in the EU. The agreement provides a framework on several issues affecting agriculture, including SPS measures. Its annex contains two side-agreements on trade in wines and on alcoholic and flavoured beverages. These side agreements include provisions on the protection of geographical indications and denominations, quality indications, trademarks, and labels.

A Partial Scope Agreement was signed with **India** in 2006 and entered into force in August 2007. The agreement provides preferences for 98% of Chilean exports to INDIA (178 tariff lines) and for 71% of Indian exports to Chile (296 tariff lines).

Chile has a Partial Scope Agreement with **Bolivia** (signed in 1993), which provides reciprocal trade preferences, but no commitments to liberalisation. It has ECAs with **Colombia** (1993), **Ecuador** (1994), **Peru** (1998); and **Venezuela** (1993). In each case the aim is to create a free trade area, and there are no permanent exemptions from tariff liberalisation, with the exception of the agreement with Ecuador. These agreements include regulations regarding rules of origin, safeguard measures, unfair trade practices, taxation, investment, government procurement, maritime and air transport, and dispute settlement.

Chile's Agreement with **Peru**, which entered into force in July 1998, provides for the gradual elimination of tariffs by July 2003. However, 329 tariff lines, mostly agricultural products, have a phase-out period of 18 years. Both parties have agreed to limit the use of export subsidies. The agreement also contains provisions on SPS measures, technical regulations, taxation, intellectual property, and customs valuation.

agreements include some exemptions from reforms on either side, and that agriculture is the main area in which those exemptions have been applied. The only agreements without exemptions are those with Colombia, MERCOSUR and the United States.

In addition to these trade commitments, Chile is a beneficiary of the Generalized System of Preferences schemes of Bulgaria, Hungary, Japan, and New Zealand, and participates in the Global System of Trade Preferences among Developing Countries (GSTP). With fewer formal implications, Chile is a member of the Asia-Pacific Economic Community (APEC), whose members are committed to achieving free trade in goods and services among developed members by 2010 and among all members by 2020. Chile committed itself to achieving free trade by 2010. It is also a founding member of the Cairns Group of 18 agricultural exporting countries.

Chile's unilateral trade liberalisation and its pursuit of preferential trade agreements have meant that WTO rules have not been a significant constraint on policy formation, with the notable exception of protection on products covered by the price band system

(see below). Under the URAA, Chile bound most of its tariff lines at 25%, although some agricultural products (including dairy products, wheat and wheat flour, oilseeds and edible oils, and sugar) were bound at 31.5%. Following renegotiations in the light of the WTO finding against the PBS, the bound rate for sugar was increased to 98%. Under Chile's preferential agreements, sugar, wheat, and vegetable oils face higher tariffs than other products and are subject to longer phase-out periods.

### **The price band system**

The idea behind Chile's price band system was to provide producers of eligible crops with some insurance against price risk. Under the PBS, floor and ceiling prices are established around an international reference price. When the reference price is below the lower threshold, a specific duty is applied in addition to the applied tariff. When the reference price is between the lower and the upper threshold, only the applied tariff is applied. When the reference price is above the upper threshold, a rebate is deducted from the amount of the applied tariff. Between 1998 and 2000 world prices were sufficiently low that the duty levied on PBS products exceeded the bound tariff of 31.5%.

In 2001, Argentina argued successfully at the WTO that Chile's PBS was not in conformance with the tariffication requirements of the URAA. In particular, the WTO ruling upheld that the PBS contravened Article 4.2 of the Agreement, which maintains that "Members shall not maintain, resort to, or revert to any measures of the kind which have been required to be converted into ordinary customs duties, except as otherwise provided under the Agreement's special safeguards provisions".

As a result, the PBS was modified. The mechanism for vegetable oils was discontinued. The bound tariff for sugar was renegotiated and raised from 31.5% to 98%, and as a consequence Chile was obligated to open tariffs rate quotas of 60 000 tonnes for refined sugar. Finally, the reference price and threshold calculations were changed for wheat, wheat flour and sugar, with limits imposed such that the payable duty would not exceed the bound tariff rates (31.5% in the case of wheat and wheat flour, and a revised rate of 98% in the case of sugar). In the case of wheat and wheat flour, a 1.5% reduction in duties was specified for each year until 2014, after which the PBS would be abolished. Details on the operation of the PBS and changes that were made in the light of the WTO dispute settlement process are provided in Box 2.3. The new system for wheat was challenged by Argentina, and in December 2006 the WTO's Dispute Settlement Body ruled that the modified PBS was still in contravention of WTO rules. Chile appealed against this decision, but that appeal was rejected in May 2007. As a result, further changes will need to be made to wheat policy. At present these changes carry few economic consequences, as in 2003, 2004 and 2006 a rebate was applied to the MFN tariff.

Estimates of the value of these price interventions are revealed in the market price support calculations that form an integral part of the PSE measurement exercise.

The *ad valorem* equivalents (AVEs) of duties applied under the PBS have been calculated for wheat and refined sugar by ODEPA. These calculations take the MFN tariff and then add (subtract) the AVE of the duty (rebate) applicable under the PBS. In each case, the reference for calculating the AVE of the specific duty (rebate) is the corresponding import unit value. The AVEs are calculated on a monthly basis, and the simple average for 12 months is reported. In addition, the tariff collected during the year is divided by the annual import unit value to give a weighted average.

### Box 2.3. Changes to Chile's price band system

Implementation of the PBS involves three elements: i) the calculation of floor and ceiling prices; ii) the determination of extra duties (rebates) which are applied on top of the MFN tariff in order to keep prices within the price band; and iii) the application of the resulting net duty to imports. The operation of these elements was changed in 2002 following the findings of the WTO panel.

The PBS was originally applied to wheat, wheat flour, edible oils and sugar. Following the WTO ruling, the system was discontinued for edible oils and modified for the other products. In order to bring the PBS into line with the DSB's 2002 recommendations and rulings, the following changes were made:

For wheat, the floor and ceiling prices were set at USD 128 per tonne and USD 148 per tonne respectively. This contrasts with the previous system where floor and ceiling prices were calculated on the basis of prices over the previous 60 months. From 2008 to 2014, these floor and ceiling prices are to be reduced by 1.5% per year, after which the system will be discontinued.

For sugar, floor and ceiling prices were set at USD 310 and USD 339 per tonne respectively, to be reduced by 2% per year from 2008 to 2014. This contrasts with a system whereby reference prices were calculated on the basis of international prices over the previous 120 months.

In the case where the reference price is below the floor price, the extra duty charged in addition to the applied MFN tariff is equal to the difference between the floor price and the f.o.b. reference price multiplied by one plus the *ad valorem* duty (6%). When the reference price exceeds the price ceiling, a rebate is provided equal to the difference between the two prices again multiplied by one plus 6%. As before, specific duties on wheat flour are 1.56 times those applied for wheat.

A further requirement is that duties applied under the price band system shall not exceed the bound rate of 31.5% in the case of wheat and wheat flour and 98% (the re-negotiated rate) in the case of sugar.

Other specific changes included reference prices established by Law, which are Trigo Pan Argentino (f.o.b. Argentina) from 16 December to 15 June, and Soft Red Winter Wheat No. 2, quoted f.o.b. in the Gulf of Mexico from 16 June to 15 December. In the case of sugar, the relevant prices are NY future price No. 11 for raw sugar, and London future price No. 5 for white sugar.

For wheat and wheat flour, relevant duties are determined six times per year as opposed to weekly. For each announcement, daily prices are averaged over 15 days. There then follows a five day announcement period, and two months of application. For sugar there are 12 determinations of duties and rebates on the basis of a five day announcement which reflects prices in the preceding month. The schedules for calculating duties and rebates, announcing them, and then implementing them are set out in Table 2.A1.2.

After the WTO verdict in May 2007, two elements characterise the proposed reform:

1. *Legal modification.* Since the PBS is defined by Law (article 10 of Law 18.525), parliamentary approval is necessary for any changes. Under the proposal before parliament, the PBS mechanism is to be replaced with a specific tariff of USD 30 for wheat and USD 47 for wheat flour per tonne. This overall tariff will be the 6% MFN tariff plus these specific rates. In *ad valorem* terms, the final tariff will depend on international prices.
2. *Preferential access.* Given that the legal modification elevates protection, a bilateral protocol will be created that will grant tariff-free access to imports of wheat and wheat flour subject to certain conditions of price. This will guarantee present conditions of access (0% tariffs for wheat, based on the high international prices). If prices fall, tariffs will activate automatically for imports of wheat and wheat flour (Table 2.A1.3). Additionally, the protocol establishes that tariffs will decrease year by year under the same measures established by the FTA with the USA, to zero in January of 2015 (Table 2.A1.3). This protocol will be applicable to all partners with preferential treatment (Canada, Central America, USA, P4, Peru, EU and MERCOSUR).



For wheat, the AVE exceeded the MFN tariff for most years in the 1990s and exceeded the bound rate of 31.5% from 1998 to 2000. As world prices have strengthened, rebates have been offered in three of the past four years, meaning that the actual duty paid has been less than the MFN rate of 6% (Table 2.1).

**Table 2.1. Wheat protection under the price band system, 1990-2006**

Ad valorem tariff (%)	Ad valorem equivalent of duty payable under PBS		Total tariff		
	Simple average (%)	Weighted average (%)	Simple average (%)	Weighted average (%)	
1990	15.0	3.7	42.6	18.7	57.6
1991	13.0	10.3	31.5	23.0	44.2
1992	11.0	7.7	9.1	18.7	20.1
1993	11.0	5.5	7.8	16.5	18.8
1994	11.0	5.1	3.7	16.1	14.7
1995	11.0	-2.2	-4.3	8.8	6.7
1996	11.0	-7.2	-6.4	3.8	4.6
1997	11.0	3.6	1.3	14.6	12.3
1998	11.0	36.2	41.2	47.2	52.2
1999	10.0	44.9	44.3	54.9	54.3
2000	9.0	41.4	41.5	50.4	50.5
2001	8.0	16.0	17.2	24.3	25.2
2002	7.0	4.0	2.4	10.6	9.4
2003	6.0	-1.0	-2.0	4.5	4.0
2004	6.0	-4.0	-3.4	2.4	2.6
2005	6.0	3.0	1.8	9.2	7.8
2006	6.0	-2.0	-1.4	3.9	4.6

Source: ODEPA, 2007.

For sugar, protection has been higher than for wheat in most years, but has come down sharply since 2003 as a result of strong world prices. A deduction from the MFN rate was made for the first time in 2006 (Table 2.2).

**Table 2.2. Sugar protection under the price band system, 1990-2006**

Ad valorem tariff (%)	Ad valorem equivalent of duty payable under PBS		Total tariff		
	Simple average (%)	Weighted average (%)	Simple average (%)	Weighted average (%)	
1990	15.0	-8.0	-3.8	7.0	11.2
1991	13.0	0.0	0.0	12.7	12.7
1992	11.0	8.5	4.5	19.5	15.5
1993	11.0	13.3	16.8	24.3	27.8
1994	11.0	0.2	-1.5	11.2	9.5
1995	11.0	-10.2	-10.6	0.8	0.4
1996	11.0	0.2	-0.6	11.2	10.4
1997	11.0	17.0	17.9	28.0	28.9
1998	11.0	42.3	39.4	53.3	50.4
1999	10.0	66.9	69.4	76.9	79.4
2000	9.0	57.3	58.5	66.3	67.5
2001	8.0	31.0	27.2	39.2	35.2
2002	7.0	39.0	31.6	45.5	38.6
2003	6.0	42.0	42.1	48.4	48.1
2004	6.0	38.0	34.7	43.6	40.7
2005	6.0	14.0	13.4	20.3	19.4
2006	6.0	-5.0	-5.1	0.7	0.9

Source: ODEPA, 2007.

### Other trade policy measures

Chile applies few trade policies other than the *ad valorem* tariffs described above. Those additional measures are summarised below:

- **Tariff quotas.** The only tariff quota maintained by Chile is for sugar. This was introduced in 2002 following Chile's WTO renegotiations following the Appellate Body's finding against the PBS, and occurred in parallel with the bound tariff being increased to 98%. The quotas are maintained on refined sugar, with an out-of quota rate of 6% plus the duty payable under the PBS and an in-quota rate of 0%. The quota of 60 000 tonnes annually is allocated on a first-come first-served basis. 21 000 tonnes are reserved for Argentina, 16 700 tonnes for Guatemala; 9 700 for Brazil; and 12 600 for other countries. When the price band was modified in 2003, two more tariff rates-quotas were opened: 15 000 tonnes for HS items 1701.91 and 1701.99 and 30 000 tonnes for item 1701.9100. In 2006 quotas were not used because the PBS resulted in a deduction from the MFN rate and almost all imported sugar paid no duty. An additional quota of 45 000 tonnes for industrial use sugar was opened, on a unilateral basis, with Bolivia, Colombia, Costa Rica and El Salvador.
- **SPS restrictions.** Chile's desire to protect its natural isolation from plant and animal diseases has led to strict SPS controls. SAG is responsible for all issues related to plant and animal health and has been notified to the WTO as Chile's national enquiry point. SAG is also responsible for negotiating bilateral certification agreements.
- **Safeguards.** Since the enactment of safeguard legislation in 1999, safeguard measures have been applied to wheat, sugar, edible vegetable oils, fructose and fructose syrup, and powdered and liquid UHT milk.
- **State Trading Enterprises.** Chile has notified Comercializadora de Trigo (COTRISA) as a state trading enterprise. COTRISA purchases wheat from Chilean producers on a non-discriminatory basis and does not usually engage in import or export transactions (WTO, 2003). Its effects on policy have come through implementing the PBS, rather than its existence as an STE *per se*.

### Export promotion

Export promotion in Chile is undertaken by PROCHILE, the Export Promotion Bureau, which is part of the General Directorate of International Economic Affairs (*Dirección de Relaciones Económicas Internacionales*, DIRECON) within the Ministry of Foreign Affairs. PROCHILE provides support to small and medium-sized enterprises so that they can access international markets. PROCHILE has a world-wide network, with trade offices and agencies located in over 35 countries, covering 90% of Chile's export markets. The offices are run by specialised teams that use their market expertise to help Chilean export companies conduct their international operations. PROCHILE also possesses 12 domestic regional offices which foster the development of goods and services suitable for export throughout the entire national territory. These offices – along with regional governments, the private sector, universities and other organisations – work together to identify the range of regional products and services for export and to develop appropriate trade promotion plans (Prochile, 2007).

Through a common agreement with the MINAGRI established in 1996, part of PROCHILE is dedicated to the promotion of agricultural products. Two specific programmes are the Agricultural Export Promotion Fund (*Fondo de Promoción de Exportaciones Silvo-*

*agropecuarias*) and the Export Promotion for Small-scale Agriculture (*Internacionalización de la Agricultura Familiar Campesina*, INTERPAC). The budgetary allocation for agricultural export promotion attributed by MINAGRI to PROCHILE has more than doubled over the last ten years, from less than CLP 3 000 million in 1996 to more than CLP 7 000 million in 2006, representing about 0.2% of the value of agro-food exports (Sotomayor, 2007; Cox, 2007).

Export promotion has been one part of a range of policy and non-policy factors that have helped boost Chile's agro-food exports over the past two decades. Box 2.4 examines the role that the state played in helping the development of three export products in the 1980s and 1990s: wine, blueberries and pork meat.

#### Box 2.4. Explaining the growth of Chile's agro-food exports

Chile's agro-food sector has been the source of several export successes in recent years. It has outperformed the manufacturing sector and made an important contribution to the country's trade performance. In seeking to explain what has prompted the discovery of new export opportunities, a range of factors have been identified. These include trade liberalisation, the attainment of relative macroeconomic and political stability, the encouragement of FDI, extended periods of exchange rate depreciation, and supportive government policies.

Agosin and Bravo Ortega (2006) consider three successes from the Chilean experience, in an attempt to discern the relative importance of these various factors and delineate the role played by the state. The three cases they consider are wine, blueberries and pork meat.

Wine started to be exported in significant volumes in the mid-1980s and is now a major industry with annual exports of around USD 900 million. The majority of these exports go to European markets. The growth of blueberry and pork meat exports is a more recent phenomenon. Blueberries, which are not traditionally consumed domestically, emerged as a significant export in the mid-1990s, with exports growing to an annual average of USD 100 million, mostly destined for the United States. Pork exports have developed even more prodigiously, rising from less than USD 6 million in 1996 to over USD 300 million in 2005. The majority of these exports are taken by Japan and Korea.

A key point made by Agosin and Bravo Ortega is that these exports have grown in the absence of an active government policy. The role of government has been to facilitate rather than direct economic activity. In addition, they note a number of specific features behind each export growth story.

In the case of wine these contributory factors include the adoption of foreign technologies, the switch to stainless steel vats that enabled Chilean producers to bring the quality of their wines up to international standards, the co-ordinating activities of industrial associations and a general growth in world demand. The growth in blueberry exports has taken place as part of a remarkable diversification in fresh fruit exports, which draws on favourable natural conditions including a mild Mediterranean climate and off-season production compared with the northern hemisphere. The main exporting companies (Hortifrut and Vital Berry) have joint ventures in the United States and strong links to specialised traders. Foreign investment played an important role in the development of pork exports. The main buyer, Japan's Nippon Meat, started prospecting for suppliers when FMD hit two of its main suppliers, Denmark and Chinese Taipei. This company buys from the dominant supplier, Agrosuper, which has a vertically integrated structure and low labour costs, which enables it to meet specific demands – notably for speciality cuts – from Asian markets.

#### Box 2.4. Explaining the growth of Chile's agro-food exports (cont.)

All three products have benefited from favourable natural resource, macroeconomic and trading conditions. In each case, however, the government has played an important facilitating role.

- While Chile benefits from naturally favourable SPS conditions by virtue of its physical isolation, **SAG** has played an important role in protecting this endowment, especially in the case of blueberries and pork.
- **CORFO** has sponsored the setting up of producer associations that can assist producers in meeting the quality requirements of foreign markets. This was particularly important in the early stages of the boom in wine exports.
- **Fundación Chile** helped establish a viable export concern for blueberries, helping to compensate for weak private sector R&D and an infant venture capital industry.
- More generally, **PROCHILE**'s promotion activities are considered to have had a significant effect on Chile's exports of food and wine.

Finally, the conclusion of **trade agreements** has had an important impact in each case, with exports of wine to the EU benefiting from a specific agreement within the Economic Association Agreement, and exports of blueberries to the United States and of pork to Japan and Korea covered by free trade agreements.

Producers have argued that the scope of government initiatives is too limited, and that they are typically obliged to pick up the costs of government services, such as inspection. Nevertheless, the government's focus on providing public goods and correcting clear cases of market failure, as opposed to trying to pick sectoral winners, has shown a valuable return.

## 2.4. Domestic policies

### Overview

Chile domestic policy choices have been conditioned by its relatively open trade policy. Thus there has been relatively limited use of price support policies. On the other hand the government's ambitious agenda for agricultural development has led to a wide range of initiatives that involve budgetary expenditures. Budgetary transfers on agricultural policies have more than quadrupled in real terms since 1995 (Figure 2.1). Over this period MINAGRI programmes have been complemented by those of other agencies: one-third of agricultural expenditures are now undertaken by non-MINAGRI agencies.

Figure 2.2 shows the composition of agricultural spending by institution. INDAP, SAG, CNR, and R&D institutions, all part of MINAGRI, collectively account for two-thirds of expenditures. PROCHILE, CORFO (both from Ministry of Economy), the Ministry of Public Works (MOP), SENCE (from Ministry of Economy), FOSIS and CONADI (both from Ministry of Planning) have their own budgets for agricultural spending and also administer programmes that are financed fully and/or partially with MINAGRI's budget. Figure 2.3 breaks down the same spending figures by programme and Figure 2.4. shows the share of agricultural transfers allocated in each programme in 2006. The mapping between institutions and programme areas is given below (note that these categories represent programme areas rather than implementation criteria used in the PSE classification system):

- **Irrigation** programmes are implemented primarily by CNR and MOP, with smaller contributions from INDAP and CORFO. CNR provides subsidies for on-farm improvement

Figure 2.1. Real budgetary transfers on agricultural programmes, 1990-2006

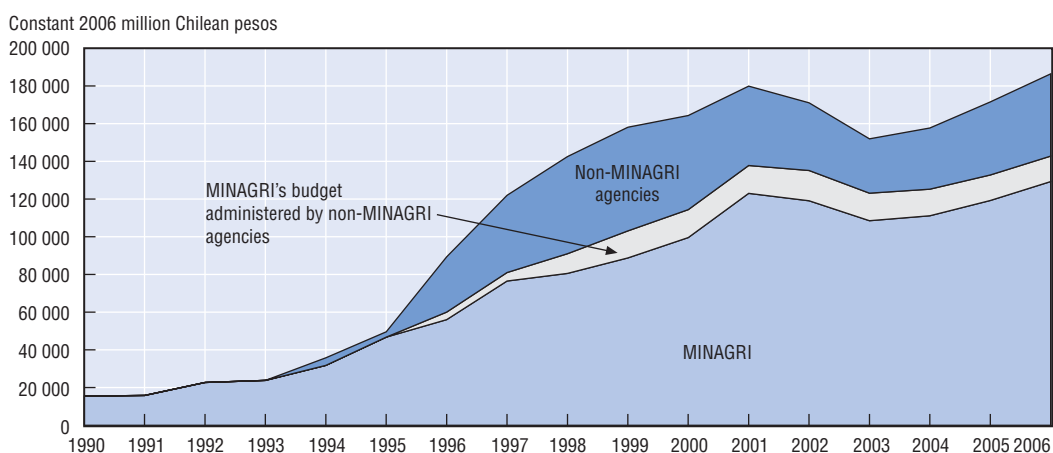


Figure 2.2. Shares of agricultural transfers by institution, 1990-2006

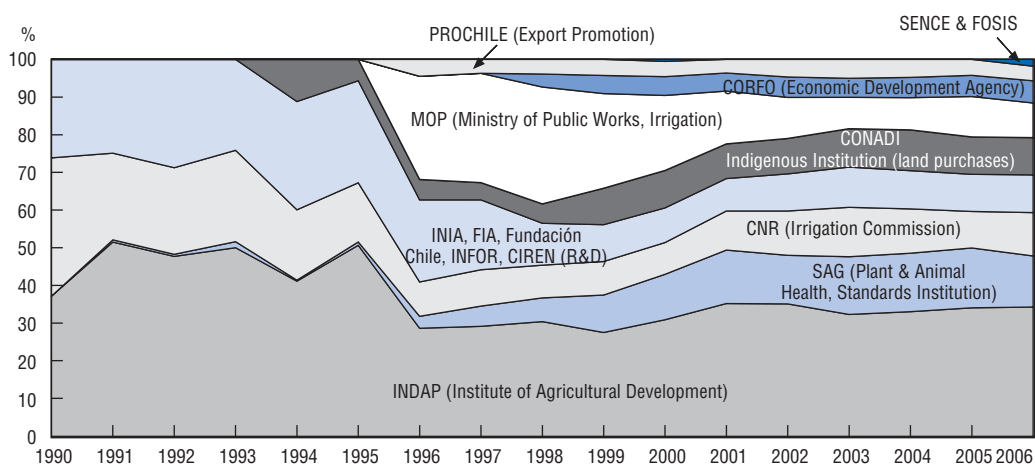


Figure 2.3. Shares of agricultural transfers by programme area, 1990-2006

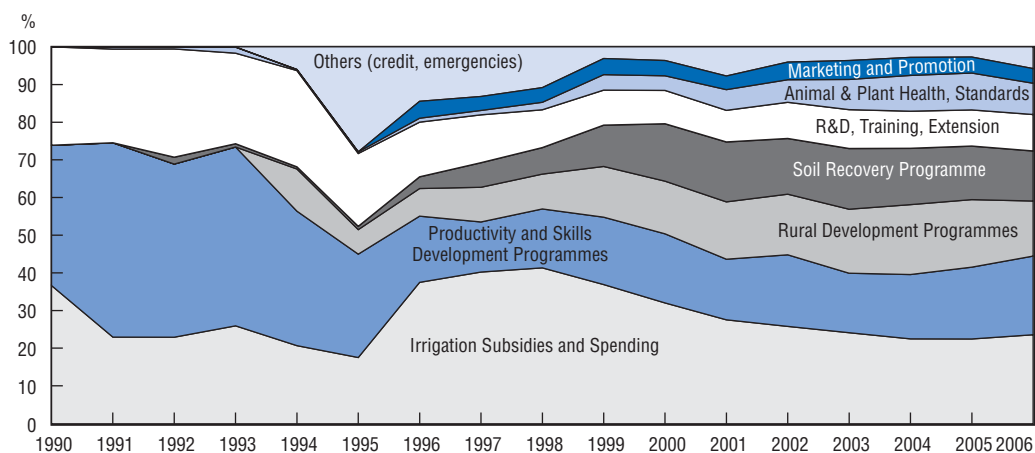
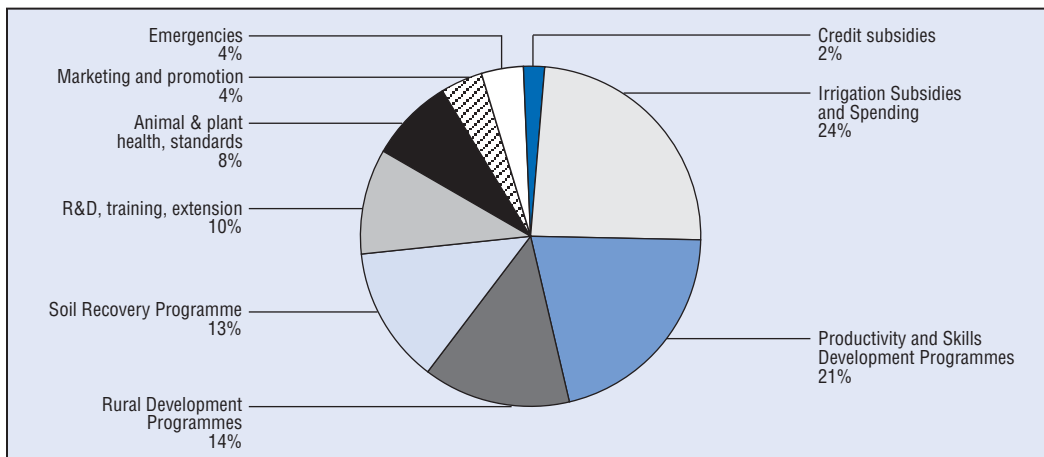


Figure 2.4. **Shares of agricultural transfers by programme area, 2006**

Source: DIPRES, 2007; MINAGRI, 2007.

and makes off-farm investments; MOP makes general (off-farm) investments; while INDAP and CORFO subsidise on-farm irrigation.

- The **Soil Recovery Programme** is implemented by SAG and INDAP, and consists mostly of subsidies for the recovery of eroded and degraded soils.
- **Productivity and skills development** programmes are implemented by INDAP and CORFO through on-farm productive investments and preferential credit.
- **Rural development** programmes are implemented by INDAP with a series of subsidies for the productivity promotion, given through territorial development programmes, limited exclusively to special poor areas, and by CONADI via land purchases for indigenous people.
- **R&D, extension and training** are undertaken by several institutions (INIA, FIA, Fundación Chile, INFOR, CIREN, IER, and FUCOA), with programmes financed either partially or totally by MINAGRI.
- **Animal and plant health, and standards** programmes are implemented by SAG and include both on and off-farm measures.
- **Marketing and promotion** programmes are carried out by PROCHILE with MINAGRI's budget.

These programme areas are discussed in greater detail in the remainder of this section.

### **Price support policies**

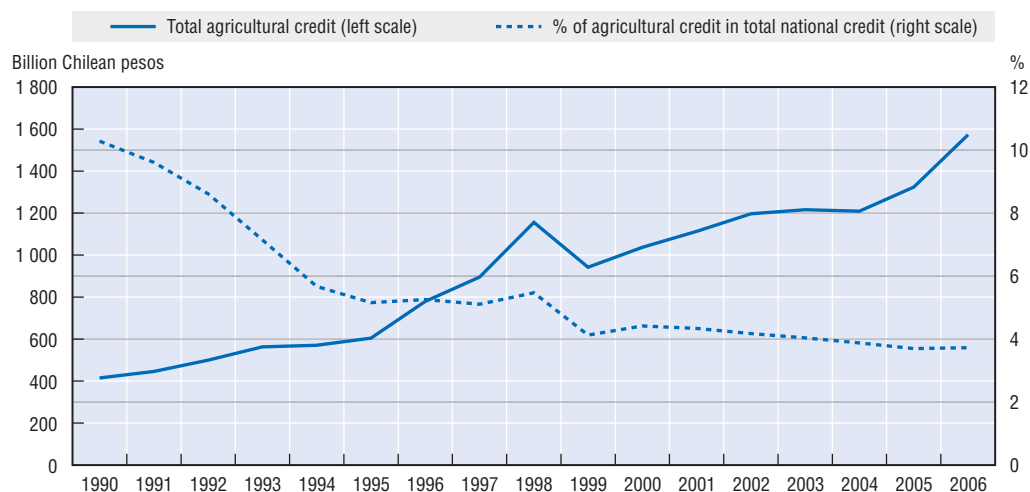
In Chile, price support is provided exclusively through trade protection, as described in Section 2.3. Chile's MFN tariff of 6% provides an upper bound on the protection provided to producers, for all products except those covered by the PBS and those for which contingency measures have been applied. The PBS was introduced in 1983 and originally applied to wheat and wheat flour, edible vegetable oils and sugar. The mechanism was discontinued for vegetable oils in 2001. Since 1999, safeguards have been applied periodically to dairy products, wheat and wheat flour, and sugar, while anti-dumping measures have recently been applied against Argentine wheat. Thus price protection that

goes beyond the applied tariff has been effectively limited to just three product groups: wheat, sugar and dairy.

### Credit policies

At the beginning of the 1970s, the state exerted almost total control over the financial sector. Through institutions such as the Chilean Economic Development Agency (CORFO) and the Institute of Agricultural Development (INDAP), more than 90% of agricultural credit was disbursed at preferential rates. Following the military coup, the role of the private financial sector increased. Between 1973 and 1981, the share of agricultural loans made by the private sector at commercial rates increased to 76%, while the combined share of CORFO and INDAP declined to 24% (Cruz, 1999; FAO, 2006). Nowadays, the duality of Chilean agriculture, in which an export oriented large-scale sector exists in parallel with traditional small-scale agriculture, is reflected in the financial services that are offered. These services, in particular credit, are more developed for large-scale agriculture, with the private sector being the main provider although agricultural credit accounts for a small and declining share of the total amount of credit issued nationally (Figure 2.5). On the other hand, small-scale agriculture struggles to obtain access to credit, and the majority of credit obtained has been provided by the state. In 2006, loans allocated to small-scale farmers through INDAP direct credit and INDAP co-ordinated credit accounted for just 4% of total agricultural credit (INDAP, 2007b; ODEPA, 2007).

Figure 2.5. **Agricultural credit, 1990-2006**

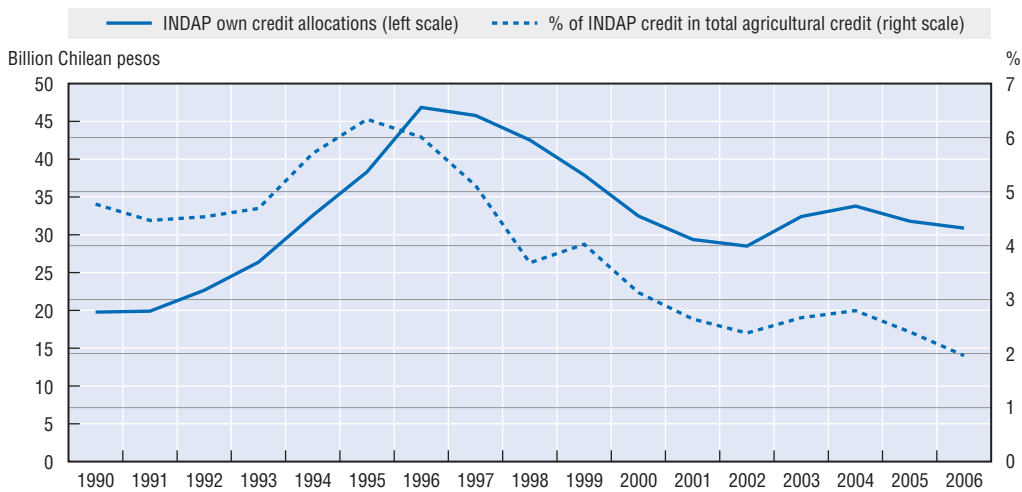


Source: ODEPA, 2007.

### INDAP credit

Since its creation in 1962, INDAP has been the governmental agency in charge of providing financial services for the development of small-scale agriculture. INDAP's importance has changed over time, decreasing during the military regime and increasing since the return to democratic government. INDAP's credit allocations have increased steadily since 1990, from CLP 6 860 million in 1990 (USD 22 million) to CLP 30 000 million in 2006 (USD 57 million). Although INDAP is the state's main agricultural credit institution, its share of national agricultural loans has been minor, and has declined to under 3% in recent years (Figure 2.6).

Figure 2.6. INDAP direct credit, 1990-2006



Source: ODEPA, 2007; INDAP, 2007a.

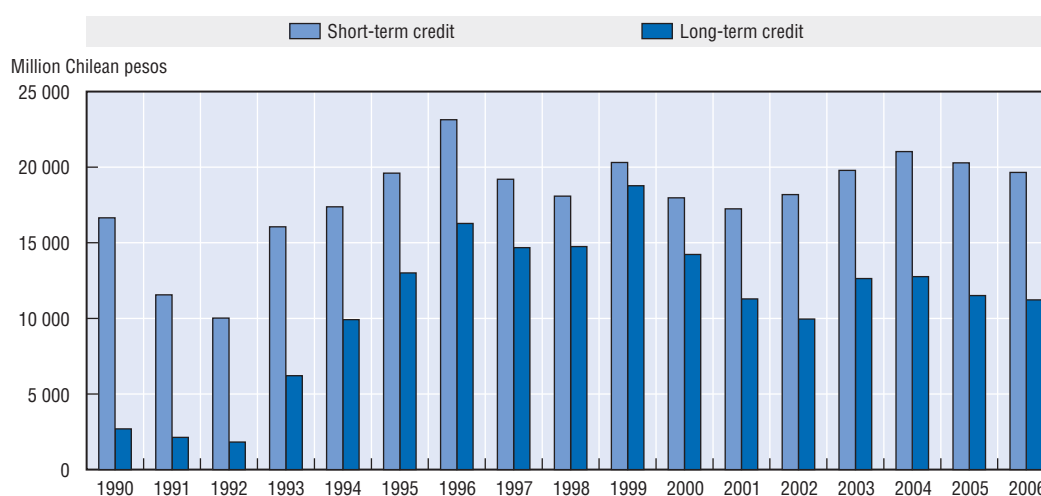
The range of financial services provided by INDAP is limited mainly to short and long term credit. Short term credit is used for working capital (*e.g.* acquisition of inputs, labour, rent of equipment, post-harvesting activities and commercialisation) and the length of loans cannot exceed 359 days. Short term loans are provided to producers of the following crops: garlic, peas, beans, chickpeas, lentils, maize, and sorghum (with a share of 32%); rice, oat, barley, rye, and wheat (with 28%); grassland (17%); and horticultural products (12%); with other crops accounting for the remaining 11%. This commodity focus reflects the activities carried out by small-scale farmers (INDAP, 2004). Long term credit may be extended for up to ten years and is mostly designed to finance investment in fixed assets such as machinery, equipment and infrastructure. Both types of credit are given to small-scale farmers individually or collectively at preferential rates.

In the early 1990s, most loans were of a short term nature, although the share of long terms loans increased through the decade, reaching 45% of all credit by 1999. Since 2001, the share of short term credit has stabilised at around 65% of total credit allocations (Figure 2.7). The number of beneficiaries of short-term loans has averaged about 35 000 households per year.

The number of households benefiting from long-term credit declined from 25 000 (including forestry and irrigation loans) in 2000 to 13 000 in 2006. Long-term credit has three modalities: i) “normal” long-term credit, oriented to the capitalisation of agricultural activities; ii) irrigation credit; and iii) forestry credit, which finances forestation and reforestation. Short-term loans dominate INDAP lending, with long-term loans and loans for forestry declining in absolute and relative terms. The reason for this is that the type of client has changed from small farmer organisations to individual farmers who solicit more short-term loans; while some long-term loans, *e.g.* for irrigation, have been replaced by subsidies.

The average number of farmers receiving direct credit from INDAP is around 45 000 per year (Table 2.3). In 2006, the number of beneficiaries from INDAP credit (whether direct or co-ordinated) was 60 220. This corresponds to about 22% of the total number of farmers constituting the official definition of small-scale family agriculture (*Agricultura Familiar*



Figure 2.7. **INDAP's short and long term credit, 1990-2006**

Source: INDAP, 2007a.

Table 2.3. **Number of recipients of INDAP credit, by type of credit, 2000-06**

	Short-term loans	Long-term credit		
		Agriculture	Forestry	Irrigation
2000	35 073	18 301	1 861	4 798
2001	37 184	17 057	2 479	4 528
2002	35 817	13 288	3 561	4 193
2003	35 855	14 249	4 912	2 851
2004	36 055	13 838	4 594	795
2005	34 167	10 605	1 810	21
2006	33 261	11 731	1 260	24

Source: INDAP, 2007a.

*Campesina*, AFC), estimated at 278 800 exploitations (INDAP, 2007; Censo Agrícola, 1997).<sup>3</sup> More generally, in the same year INDAP's credit and subsidies reached around 116 000 small-scale farmers, corresponding to 42% of farms in the AFC sector (INDAP, 2004; INDAP, 2007).

INDAP has acquired debt as a result of the policy of promoting farmer associations during the mid-1990s. The provision of technical assistance was contingent on the formation of an association, but out of a total of 1 500 farmer organisations with debts with INDAP, just over 400 had real activities and accounting information, while the remainder did not actually exist as agricultural businesses (Cox, 2007). The default rate on INDAP loans peaked at over 30% in 2002, but had come down to 10% by 2006 (INDAP, 2007a). The improvement in the recovery of loans was due to better institutional management and improved macroeconomic conditions. Nevertheless, some policies for rescheduling and writing off agricultural credit debt have been implemented, with a USD 12 million write-off occurring in 2001-02. The latest rescheduling policy was applied in September 2006 and affected 10 000 producers with average debts of CLP 300 000 (USD 150). The main objective of this rescheduling has been to rehabilitate users of INDAP's services.

An important INDAP instrument designed to facilitate smallholders' access to credit is the Financial Coordination Subsidy (*Bono de Articulación Financiera*, BAF), which was

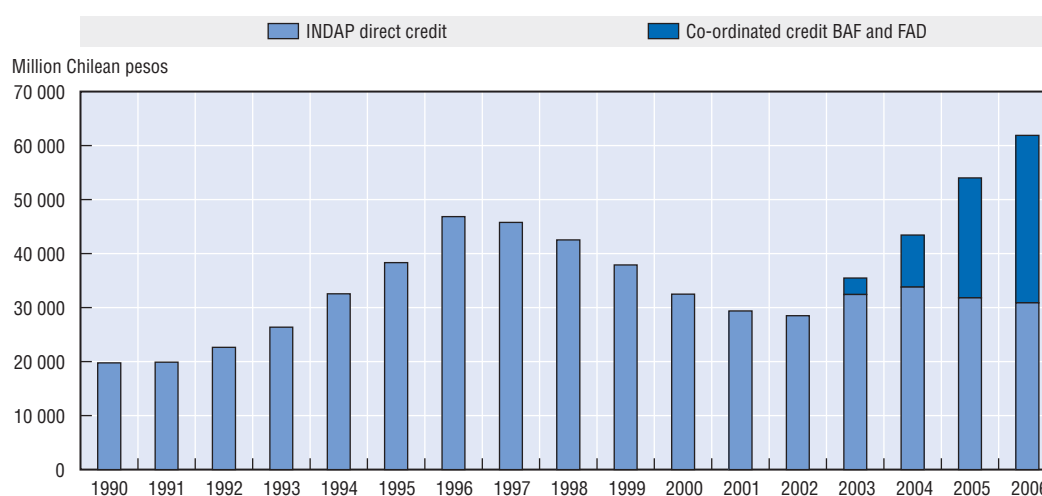
introduced in 1996 and aims to increase the role of the private financial sector. This instrument covers the transaction cost involved in a loan operation and is provided to financial entities that channel credit to small-scale farmers. The subsidy is given through a bidding process to financial institutions that have already confirmed their participation and have allocated loans to farmers; that is, the subsidy is given directly to the financial institution for each agricultural loan being approved to a small-scale farmer. The monetary resources for this subsidy have increased steadily since 2002 (Figure 2.8). By 2005, INDAP had worked with 20 financial institutions: three commercial banks, eight co-operatives (credit unions) and nine foundations (NGOs). The number of annual loans made through this instrument increased from 420 in 1998 to 19 862 in 2006 (INDAP, 2007); in monetary terms this meant that private financial institutions increased their allocations from CLP 682 million (USD 1.3 million) in 1998 to CLP 23 097 million (USD 23.3 million) in 2006. The BAF payment in 2006 was about CLP 1 200 million (USD 2.2 million), equivalent to an average of USD 100 per loan for covering transaction costs and implying a subsidy of about 5% on loans.

In 2003, INDAP developed a further strategy to increase the range of financial services for small-scale agriculture. Based on the assumption that commercial banks have the conditions to reach a greater number of farmers, the Fund of Delegated Cash Management (*Fondo de Administración Delegada*, FAD) was put in place. This fund operates in conjunction with BAF. While BAF is used to compensate for the higher transactions costs required when operating with small farmers, this new Fund compensates banks for the risk of operating with small farmers. The subsidy is determined through an auction system, whereby banks compete for the interest rate they have to pay to INDAP in order to receive the funds to be lent.

One novelty of this instrument is that it has a mechanism of default risk coverage; meaning that INDAP deals with any risk from transactions that were before assumed by banks. With the implementation of this fund INDAP became a second-tier-bank, by providing credit indirectly to farmers. The resources allocated to this instrument almost doubled between 2003 and 2006, from CLP 2 300 million (USD 3.3 million) to more than CLP 4 000 million (USD 7.5 million). Since its creation, 28 941 small farmers have received FAD loans from the banking sector, representing more than half the farmers reached by INDAP annually (INDAP, 2007). The success of these two instruments (FAD and BAF) is observed in the amount of credit given to small-scale farmers by private sector. In 2003, the credit allocated through these instruments was CLP 3 049 million (USD 4.4 million) by 2006 that amount increased up to CLP 31 000 million (USD 58 million), equivalent to INDAP's direct credit allocation in the same year (Figure 2.8).

### **CORFO-COMSA agricultural insurance**

The agricultural insurance programme, COMSA (*Comité de Seguro Agrícola*), was created in 2000. It is financed by MINAGRI and administered by CORFO. Under this programme, a subsidy is given to farmers who take out crop insurance and pay a corresponding premium. The subsidy can pay up to 85% of the premium in case of small-scale farmers, and 50% for medium and large-scale farmers. Private financial institutions offer the agricultural insurance. Risks covered are those caused by climate hazards such as drought, excess or untimely rain, frost, hail, snow, and wind; while the products eligible for the subsidy are cereals, industrial crops, vegetables and legumes. In the past four years, the COMSA subsidy annually has averaged approximately CLP 1 000 million (USD 2 million), equivalent

Figure 2.8. **INDAP direct and co-ordinated allocations of credit, 1990-2006**

Source: INDAP, 2007a.

to around one-fifth of the total budgetary allocation that MINAGRI provides to CORFO, whose remaining subsidies are used for the productivity improvements and skills development programmes.

### **BANCO del ESTADO credit policies**

Banco del Estado (BECH) is a 150 year-old public financial enterprise. Since 2001, BECH has developed a significant presence with micro and small enterprises in the agricultural sector. BECH started to provide credit to small farmers within the bank's micro-entrepreneurs unit, and in 2006 provided CLP 38 811 million (USD 70 million) to a total of 32 000 micro-agricultural clients.<sup>4</sup> For 2007 it planned to reach more than 50 000 farmers. Part of the credit provided to small-scale farmer is encouraged by INDAP's FAD and BAF instruments. Clients can be owners, renters and sharecroppers with at least one year of experience in the activity. In August 2006, the Bank initiated an agricultural credit line for small-scale farmers, focused on financing fruit plantations and land acquisitions. In addition, in 2007 BECH opened an agricultural credit line for sons and daughters of small-scale farmers. For eligibility, the father of the applicant must be a client of BECH. Interest rates charged by BECH are not preferential (Banco Estado, 2007).

### **Productivity improvement and skills development programmes**

There are several programmes designed and financed by MINAGRI that aim to develop agricultural productivity and entrepreneurial and productive farmer capabilities, and fall under the general heading of Productive Promotion (*Fomento Productivo*). INDAP, SAG, CNR, CONAF and CORFO implement most of these programmes. In general, these subsidies are given to farmers, who must participate in national or regional contests in order to qualify for economic support. Besides programmes implemented by MINAGRI, programmes that aim to improve production and productivity exist, which are not limited to the agricultural sector and are applied to the entire economy, usually under the poverty reduction policies umbrella. FOSIS<sup>5</sup>, SENCE<sup>6</sup> and CORFO are among the institutions that design, finance and implement these programmes.

## INDAP

Within the Productive Promotion policy, INDAP has two main initiatives that comprise several instruments. The first initiative consists of Incentives for the Development of Agricultural Investment (*Incentivos para el Mejoramiento y Desarrollo de Inversiones*) and consists of the Programme for the Development of Investments (*Programa de Desarrollo de Inversiones*, PDI); the Soil Recovery Programme (*Programa para la Recuperación de Suelos Degradados*, SIRDS) and the Associative Irrigation Works Programme (*Programa de Riego Asociativo*).<sup>7</sup>

With the Programme for the Development of Investments (PDI), INDAP promotes investment in agricultural productive activities by financing projects which seek to capitalise and modernise the agricultural sector. This programme has increased in importance, with transfers rising from CLP 2 000 million (USD 3 million) in 2001 to CLP 18 000 million (USD 34 million) in 2006. The PDI programme accounts for 10% of all transfers to agriculture and it is currently the most important INDAP programme in terms of the subsidy provided to farmers.

The second INDAP initiative consists of Services for the Development of Productive and Entrepreneurial Capacities (*Servicios Desarrollo Capacidades Productivas y Empresariales*). The goal of this programme is to improve the productive, managerial and entrepreneurial capabilities of small-scale farmers, with a view to their insertion into national and international markets. There are four instruments:

- Technical Assistance Services (*Servicios de Asesoría Técnica*, SAT), which subsidises the acquisition of specialised technical assistance services. The providers of the assistance are private companies paid with this subsidy.
- Managerial Training Centres (*Centros de Gestión*, CEGES) are entities that provide services in areas such as business management, accounting and legal assistance, and are created and managed by farmers' associations. INDAP covers the start up and operating costs of the centres.
- The Agribusiness Integration Programme (*Programa de Redes*, PRORUBROS) finances the horizontal integration of small-scale agribusiness, whether individually or associatively, which produce and commercialise the same product. Some of the sub-sectors are wine, flowers, berries, potatoes, milk, vegetables, beef, lamb, sheep meat, honey and legumes.
- The Organisational Development Fund (*Fondo de Proyectos de Desarrollo Organizacional*, PRODES) provides subsidies to small-scale farmer organisations for the improvement of their managerial and organisational skills and capabilities.

Budgetary resources allocated under this second initiative increased steadily through the 1990s, but have since levelled off.

## CORFO

CORFO (*Corporación de Fomento de la Producción*) was created in 1939 and is Chile's development agency. It provides support for the development of productive activities across all sectors of the economy. CORFO and MINAGRI have worked together since the sixties, and more recently, in 1990s, have jointly implemented policies focused on agricultural productivity development. CORFO has an agreement with MINAGRI, under which CORFO receives MINAGRI resources to be allocated as subsidies to farmers. For CORFO there is no limit on the scale of farmers who can receive support, as is the case with

INDAP. The budgetary allocation to CORFO has averaged just over CLP 5 000 million (USD 8.3 million) in the past four years.

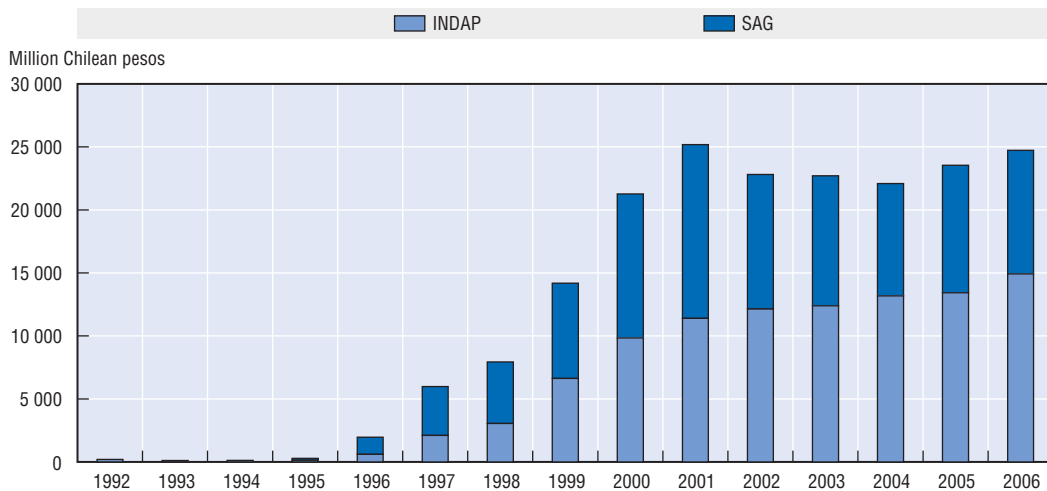
There are five instruments used in this agreement:

- The Partnership Projects for Development (*Proyectos Asociativos de Fomento*, PROFO) consists of a contribution made by CORFO amounting to 70%-80% of the project's costs, carried out by at least five agribusiness companies. Projects must be related to training in managerial and commercialisation, with the aim of increasing agribusiness competitiveness.
- Under the Suppliers Development Programme (*Programa de Desarrollo de Proveedores*, PDP) CORFO contributes up to 60% of the total costs of consultancy, technological transfer, and training projects incurred by agribusiness. Its most important element is vertical supply chain co-ordination through the promotion of contract farming.
- Quality Promotion (*Fomento de la Calidad*, FOCAL) provides financing to agricultural enterprises to help them meet official standards. CORFO funds up to 50% of the cost of consultancies.
- The Irrigation Pre-Investment Programme (*Pre-Inversión en Riego*, PIR) provides assistance for up to 70% of consulting costs, with limits of UF 150 for on-farm irrigation and UF 450 for off-farm irrigation projects.<sup>8</sup>
- Under the Technical Assistance Fund (*Fondo de Asistencia Técnica*, FAT) CORFO provides up to UF 17 (equivalent to USD 602) for diagnosis, and then 50% of the cost up to UF 150 (USD 5 310) for execution of productive projects.

Independent of MINAGRI, there is a wide variety of instruments made available by CORFO to entrepreneurs of any sector, covering areas such as start-up financing and risk capital, long term loans and the promotion of innovation. CORFO's own budgetary spending on agricultural projects has increased over the years; and in 2006 amounted to CLP 4 700 million (USD 8 million), almost the same as the amount received from MINAGRI. This number represents about 8% of total CORFO's transfers (DIPRES, 2007).

### **The Soil Recovery Programme**

The Soil Recovery Programme is one of Chile's most important agricultural policies. It is administered by two of MINAGRI's agencies, INDAP and the plant and animal health and inspection services agency (SAG), with approximately 50% of the total budget allocated to each agency. The part of the budget administered by INDAP is only available to small-scale producers, which is not the case for SAG (evident from Table 2.4). The programme comprises a set of subsidies used to finance activities to recover and/or improve degraded soils. Some of the activities are: phosphate fertiliser applications to restore the natural level of soil fertility; calcium fertiliser applications; establishment and regeneration of grassland; soil conservation; soil rehabilitation and crop rotation. The ultimate aim of the programme is to improve competitiveness through the improvement of the soil conditions of the farm. The budget allocated to this programme has increased notably since the late 1990s, rising from CLP 5 000 million in 1997 (USD 12 million) to CLP 25 000 million in 2002 (USD 36 million). Since 2002, the budget allocated to the programme has been relatively constant, and in 2006 accounted for 13% of budgetary transfers to agriculture (Figure 2.9).

Figure 2.9. **Expenditures on the Soil Recovery Programme, by institution, 1992-2006**

Source: INDAP, 2007a; SAG, 2007.

Table 2.4. **Area and number of farmers benefiting from the Soil Recovery Programme, 2000-06**

	INDAP		SAG	
	Hectares	Farmers	Hectares	Farmers
2000	123 675	38 686	127 089	3 895
2001	117 271	39 255	131 913	4 903
2002	122 840	38 959	130 431	5 566
2003	114 146	35 320	129 344	4 762
2004	115 427	34 629	110 634	3 849
2005	116 349	31 628	111 872	4 004
2006	123 819	32 500	113 725	3 976

Source: MINAGRI, 2000-05; SAG, 2007; INDAP, 2005, 2007b.

Between 2000 and 2005, around 1.7 million hectares were improved, corresponding to 40% of the land with erosion and/or salinity problems (approximately 4 million hectares), and around 30% of total land devoted to agriculture (15 million hectares) (INDAP, 2007).

### **Irrigation subsidies and spending**

Chile's irrigation programmes need to be understood in the context of the country's water management policies, as irrigation accounts for about 85% of national water use (a share that varies significantly by region). These policies were evaluated in the OECD's *Environmental Performance Review of Chile* (OECD, 2005b), the main findings of which are summarised in Box 2.5.

Since the mid-1990s, an ambitious irrigation policy has been implemented through four main programmes: i) large-scale irrigation works carried out by the Ministry of Public Works (MOP); ii) construction and rehabilitation of medium and small-scale irrigation works implemented by MOP; iii) promotion of private investment in irrigation and drainage works carried out by the National Irrigation Commission (CNR) under Law 18.450; and iv) an irrigation programme for small-scale agriculture implemented by

### Box 2.5. Water management policies in Chile

Even though most Chilean water is of acceptable quality, water quality is poor in some lakes, rivers and coastal waters. There is also pressure from mining in the north, salmon farming inputs in the south and farm inputs in rural areas (OECD, 2005b). In the northern regions (I to IV) water resources are scarce and there has been increasing competition among the main water users: mining, intensively irrigated agriculture and drinking water supply. In central Chile (Regions V to IX) the amount of water available from the many rivers crossing the central valley has thus far been sufficient for various water uses and consumption. In the south (Regions X to XII), with numerous fjords and lakes, and low urbanisation, there is also enough water for most uses.

Water pollution from agricultural run-off and from urban and industrial sewage discharges is an important issue in Chile. Irrigation water drawn from the Maipo and Mapocho rivers (Metropolitan Region), the Aconcagua (Region V) and the Cachapoal (Region VI) has been found to be contaminated by heavy metals, including arsenic, copper and molybdenum. The intensity of fertiliser and pesticide use is well above the OECD average. Increases in agricultural exports were long coupled with intensification of production. In the 1980s, nitrogenous fertiliser use rose by 223% and the volume of pesticide imports increased by a factor of eight to nine. Since 1990, reliance on chemicals has been slightly decoupled from the rise in production, with nitrogenous fertiliser use increasing by 28%, pesticide use by 16%, phosphorous fertiliser use by 50% and that of potash fertiliser by 160%. Foodstuffs for export markets must meet the quality requirements of the importing countries. As a result, pesticide use is generally higher on products for the domestic market.

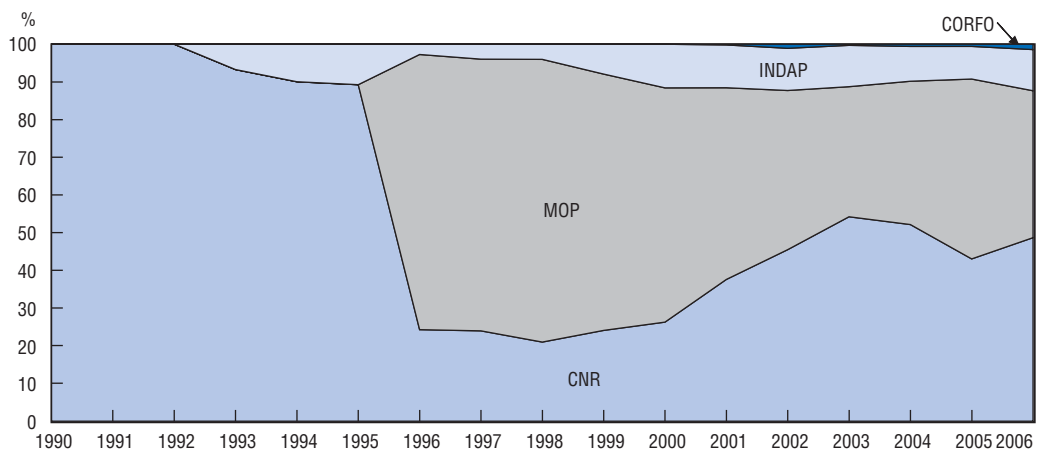
Irrigation subsidies have contributed to water scarcity problems in the centre-north, though efforts are being made to increase cost recovery. The concept that farmers must pay for water was introduced in the late 1990s. This was an important policy shift because water markets enhance water use efficiency. Furthermore, a pioneering nationwide system of tradable water rights was introduced for surface water and groundwater with the 1981 Water Code. However, active trading remains mainly confined to some irrigated areas, water markets have been inactive in most parts of the country, and the effectiveness of markets may be constrained by high transaction costs.

To address these problems, the OECD Review made the following recommendations:

- Reduce the effects of agriculture on water quality and quantity (*e.g.* those related to irrigation, nutrients, pesticides and salinisation).
- Develop an integrated watershed approach to improve water and forest resource management and provide environment-related services more efficiently.
- Improve environmental and health protection in aquaculture (*e.g.* as regards eutrophication, salmon escapes, ecological balance of lakes, antibiotics, epidemiological vigilance, eradication of infectious disease), particularly through strengthened enforcement capacities.
- Complete a precise aquaculture coastal zoning plan; adopt integrated environmental management for coastal areas.

INDAP (Sotomayor, 2007). Recently, the programmes have changed and been merged with others, but they are still managed by MOP, CNR, INDAP, and more recently CORFO. MOP and CNR dominate irrigation spending (Figure 2.10).

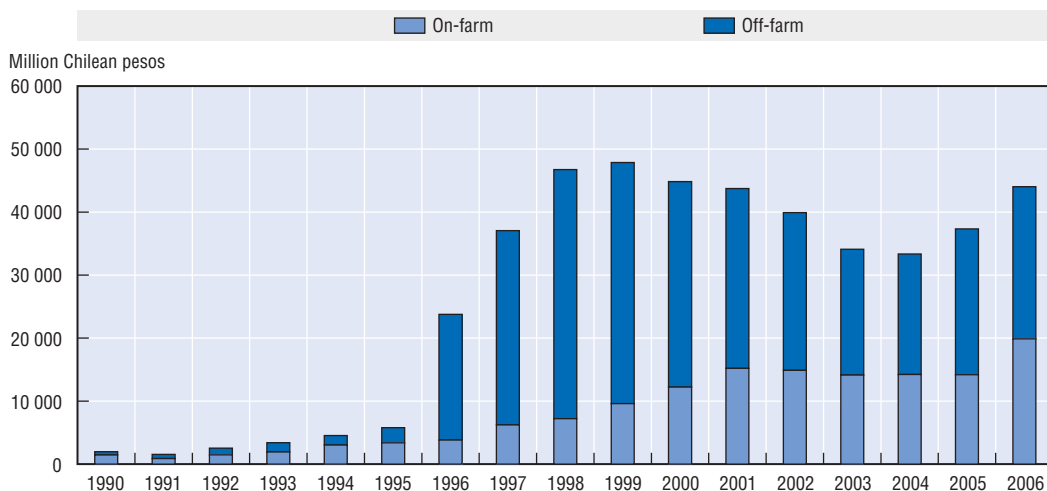
Figure 2.10. Shares of spending on irrigation, by institution, 1990-2006



Source: CNR, 2007; INDAP, 2007a; DIPRES, 2007.

Irrigation programmes have been among the most important of Chile's agricultural policies, accounting for an average of 30% of transfers to the sector since 1990. As with the Soil Recovery Programme, expenditures increased sharply in the mid-1990s, and over the past ten years have averaged about CLP 40 000 million (USD 68 million) per year (Figure 2.11). These expenditures have both on-farm and off-farm components. In the first case, farmers receive subsidies to install or improve existing irrigation systems. In the second, expenditures on irrigation are designed to benefit an entire community, region or area.

Figure 2.11. On and off-farm irrigation spending, 1990-2006



Source: CNR, 2007; INDAP, 2007a; DIPRES, 2007.

## CNR

The National Irrigation Commission (CNR) has three different programmes through which its policies are implemented. The first is Law No. 18.450, Promotion of Private Investment in Irrigation and Drainage Works (*Ley 18.450 Fomento Inversión en Obras Menores de Riego y Drenaje*). This law was created in 1986 and provides subsidies for on-farm



irrigation that are received only once the work is done, a requirement that effectively excludes small-scale farmers with low levels of capitalisation. In order to overcome this problem, a new INDAP programme was created in 1993 (see below), then in 2002 a specific CNR programme was established with the aim of reaching poorer farmers (Sotomayor, 2007). Approximately 40% of the Law's monetary resources are used for off-farm investments. It is estimated that about 1.2 million hectares of agricultural land is irrigated (depending on the drought cycles), corresponding to about 8% of all land devoted to agriculture, and 52% of cultivated cropland, estimated at 2.3 million hectares (CNR, 2006).

The other two programmes implemented by CNR are the Irrigation Development Programme for Poor Areas (*Programa Desarrollo del Riego en Comunas Pobres*) and the Studies and Programmes for Technology Validation (*Estudios y Programas de Validación Tecnológica*). The first has the same characteristics as the Law described previously, except that it is designed for poor small-scale farmers. The second programme evaluates the technical and economic feasibility of irrigation projects. Both instruments are relatively minor in terms of monetary resources.

## MOP

All irrigation spending by MOP consists of off-farm investments. MOP, through its Department of Hydraulic Works (DOH), is in charge of large and medium-scale irrigation works, providing infrastructure at national, regional and district levels. MOP intervention in agriculture began in 1990 and focuses on the construction of irrigation works such as dams and irrigation canals. Between 1990 and 2003, 377 500 ha benefited from MOP expenditures, with most projects used to increase the certainty of irrigation in zones with water restrictions, rather than increase irrigated area (Sotomayor, 2007). MOP's spending in 2006 was CLP 17 000 million (USD 31 million) – about half the level recorded at the end of the 1990s.

## INDAP

INDAP's Associative Irrigation Works Programme (*Programa de Riego Asociativo / Bono al Riego*) provides subsidies to small-scale farmers that are associated or organised for the investment in irrigation or drainage works. Spending rose sharply in the 1990s, to a peak of just over CLP 5 000 million (USD 8 million) in 2000. Allocations declined to around CLP 3 000 million (USD 5 million) in 2004 and 2005, but recovered to nearly CLP 5 000 million (USD 8 million) again in 2006.

## CORFO

CORFO carries out the Irrigation Pre-Investment Programme (*Pre-Inversión en Riego*, PI or PIR). About 70% of the programme is financed from MINAGRI's resources, with the remainder borne by CORFO. The programme covers up to 70% of the *ex-ante* costs of projects such as technical and economic feasibility evaluation.

## **Direct income payments**

Chile provides few direct income payments to farmers and only two programmes were functioning by 2006. These programmes are operated by FOSIS and INDAP.

## FOSIS

The Social and Solidarity Investment Fund (*Fondo de Solidaridad e Inversión Social*, FOSIS) is an institution within the Ministry of Planning and Cooperation (MIDEPLAN) that finances in whole or in part development programmes, projects and special activities that contribute to poverty reduction. A programme executed by FOSIS that aims to improve the income of farmers is the Subsidy for Auto-Consumption Agriculture (*Subsidio para la Agricultura de Autoconsumo*). Through this subsidy, FOSIS provides direct payments to poor small-scale farmers with the purpose of increasing their production for their own consumption. The programme started in 2006 with an initial budget of CLP 1 200 million (USD 2.2 million).

## INDAP

The Support for the Family Agricultural Production (*Bono de producción agrícola familiar*) was the only programme implemented by MINAGRI (through INDAP) that provided direct income payments. The programme had declined in importance since its creation in 2001 and was eliminated in 2006, on the grounds that INDAP's mandate was to develop productive activities rather than provide social support.

## Infrastructure

Agricultural infrastructure is mainly provided by Ministry of Public Works (MOP). For irrigation works, this is done through the Department of Hydraulic Works (DOH), while rural roads are under the jurisdiction of the Department of Highway and Roads Administration. The Wheat Marketing Enterprise (*Empresa de Comercialización de Trigo S.A.*, COTRISA) is the only stockholding infrastructure owned and operated by the State (MINAGRI) (Sotomayor, 2007). Since the reform of the price band system, COTRISA's role has been limited to providing storage and selection services to small-scale producers of grains (Cox, 2007).

## Standards

The Agriculture and Livestock Service (*Servicio Agrícola y Ganadero*, SAG) is the institution responsible for plant and animal health inspection services. Since its creation in 1967, SAG has been in charge of improving the sanitary conditions of the livestock, agriculture and forestry sub-sectors. SAG has six main areas of action: plant health, animal health, protection of natural renewable resources, seeds, laboratories and quarantine stations, and international affairs. Within the animal and plant health area, export certification and inspection activities have played a crucial role in the development of Chile's agricultural exports over the past two decades.

SAG's department of protection of natural renewable resources promotes the sustainable development of agriculture through the protection and preservation of natural resources, as well as the prevention of negative environmental impacts caused by pollution. One of the main instruments of this department is the Soil Recovery Programme described previously. The seeds department is in charge of the certification of seed quality through commercialisation and nursery control and through the registration of protected varieties. The laboratories and quarantine stations are part of a comprehensive national network of laboratories that carry out diagnostics and analysis for the evaluation and certification of sanitary quality of plants, animals and the environment. SAG supervises, validates and defines the techniques used by laboratories, which are mostly outsourced.

The department of international affairs carries out several international negotiations regarding sanitary issues. It also performs control activities within national regions and at international borders.

The total budget of SAG, including transfers and overhead costs, but excluding the Soil Recovery Programme, increased from CLP 4 500 million (USD 15 million) in 1990 to CLP 42 000 million (USD 80 million) by 2006. Most of the programmes and activities implemented by SAG are provided to the sector as a whole, although there are some on-farm services, such as pest and disease controls, the Soil Recovery Programme and the Fund for the Improvement of Sanitary Conditions. The latter provides subsidies to farmers who upgrade sanitary conditions. Subsidies cover up to 70% of the cost of projects and are awarded through competitive bids.

International recognition of SAG has created an atmosphere of trust among farmers, processors, civil society and governmental workers. This credibility has contributed to the eradication of important pests and diseases such as Velogenic Viscerotropic Newcastle disease in 1975; foot and mouth disease in 1981 (FMD); equine infectious anaemia in 1991; fruit fly in 1995; and classical swine fever in 1998. In 2000, the EU recognised Chile as a level 1 risk country for Bovine Spongiform Encephalopathy (BSE), while in 2002 Chile became free of avian influenza (SAG, 2007; Sotomayor, 2007).

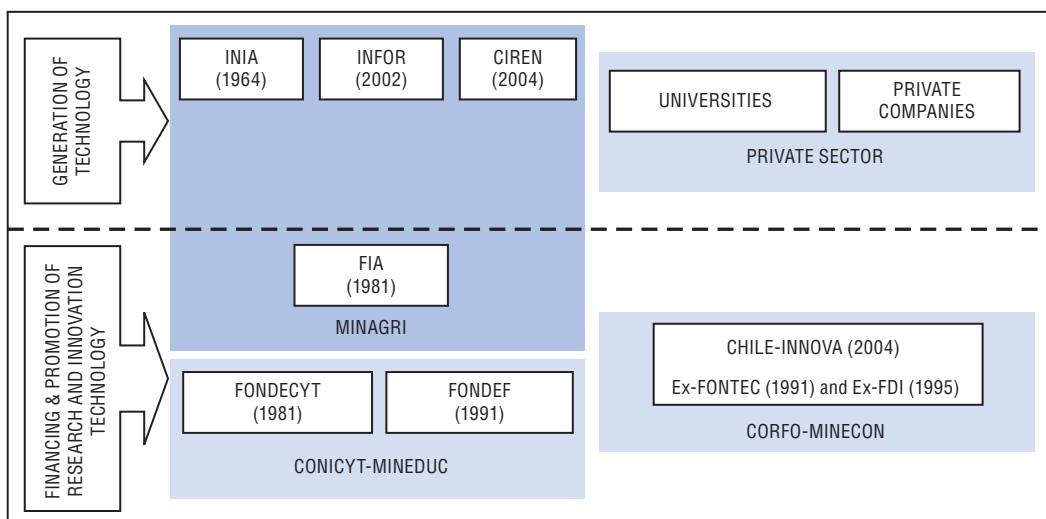
The government has played an important role in facilitating the adoption of different private voluntary standards schemes, notably the Good Agricultural Practices (GAP) scheme, compliance with which Chile's fresh fruit exporters regard as indispensable for access to OECD country markets (OECD, 2006). In 2000, the exporters' association, ASOEX, announced that all fruit produced by its members would meet GAP requirements. Subsequently, the government accredited a national scheme, ChileGap, designed to be consistent with GAP and other major international schemes, and thus enable exporters to access their main markets without having to incur the costs of complying with multiple schemes. Because ChileGap incorporates additional protocols on clean production set by the Chilean government, it is in fact more stringent than most external requirements, such as the EU's EurepGap and PROSAFE.

### **Research and development, education and training**

The Chilean system for the generation and adoption of agricultural technology involves a diverse set of institutions, foundations, universities and private companies, which operate with a high degree of autonomy (Sotomayor, 2007). Under MINAGRI, four institutions have responsibility for agricultural technology: the National Institute for Agricultural Research (*Instituto Nacional de Investigaciones Agropecuarias*, INIA); the Forestry Research Institute of Chile (*Instituto de Investigación Forestal de Chile*, INFOR); the Natural Resources Information Centre (*Centro de Información de Recursos Naturales*, CIREN); and the Foundation for Agricultural Innovation (*Fundación de Innovación Agraria*, FIA). There are also other institutions that receive budgetary contributions from MINAGRI such as Fundación Chile, and the NGO Institute of Rural Education (*Instituto de Educación Rural*, IER). The evolution of MINAGRI's spending on R&D, education and training and extension services has increased over the last two decades, from CLP 2 000 million (USD 4 million) in 1990 to CLP 18 800 million (USD 35 million) in 2006, and accounts for 10% of the total budgetary transfers to agriculture.

INIA, INFOR, CIREN and FIA invested around CLP 147 588 million (USD 263 million) in the period 2002-05, of which 54% was provided by MINAGRI and the remaining 46% by competitive grants (Sotomayor, 2007). INIA, INFOR, and CIREN work on the generation of technology while FIA requests resources for research and innovation promotion. Grants are channelled through different funds administered by the National Commission for Scientific and Technological Research (CONICYT) under the Ministry of Education (MINEDUC) and by the Economic Development Agency (CORFO) under the Ministry of Economy (MINECON). CONICYT and CORFO channels resources FONDECYT, a fund which provides project based support, FONDEF, which supports collaborative research with industries, and CHILE-INNOVA, which undertakes a range of programmes. Chile's system for fostering agricultural technology and innovation is summarised in Chart 2.2.

Chart 2.2. **Chile's agricultural technology and innovation system**



Source: Sotomayor, 2007.

INIA was created in 1964, and is a non-profit corporation under MINAGRI. INIA has ten regional research centres across the country, equipped with laboratories and libraries, and employs around 1 000 people. INIA's mandate is to create, adapt and transfer technological knowledge. Its actions are framed within a Research and Development concept, implying that research projects are started with a final, achievable product in mind. Nevertheless, it also performs some research projects in basic science.

INFOR was established in 1965. It has five regional centres and is responsible for the creation and transfer technology to the forestry sector. Its mission is to carry out research projects, prepare statistics, and transfer scientific and technological knowledge related to the sustainable use of forest ecosystems, the management of its resources and the commercialisation of its products. It supports the development of small and medium-sized forest owners, and technological innovation among small and medium-sized wood-product companies.

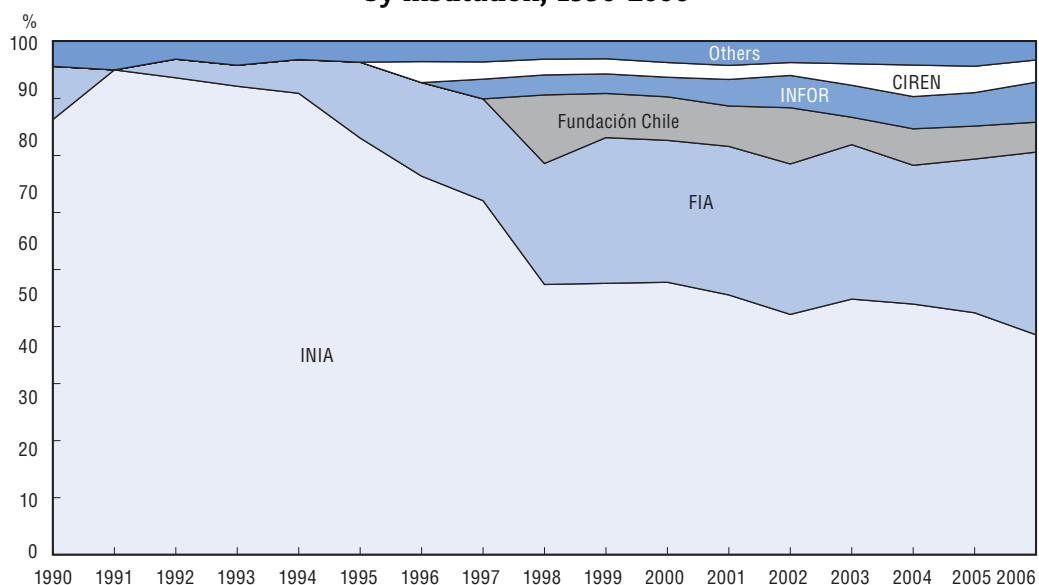
CIREN's function is to compile, update, maintain and integrate statistics and cartographic information related to the country's natural resources; and to provide timely and useful information for the analysis of different sub-sectors. CIREN was created in 1985,

but only in 2003 was an agreement with MINAGRI reached, enabling information related to the agricultural sector to be gathered, processed and disseminated.

FIA was created in 1981 and promotes innovation in Chilean agriculture by financing the development of programmes and projects that are oriented to the industrial transformation and commercialisation of agricultural and forestry products. It also promotes the co-ordination of sectoral innovation efforts, and provides extension services.

INIA and FIA receive almost 80% of MINAGRI's budgetary allocations for R&D. Allocations to Fundación Chile, CIREN and INFOR started about ten years ago, and have remained relatively less important (Figure 2.12).

Figure 2.12. **Allocation of MINAGRI's research and development budget, by institution, 1990-2006**



Source: DIPRES, 2007.

Fundación Chile's role as a non-profit venture capitalist has enabled it to fill institutional gaps in the innovation system. Fundación Chile is the largest private non-profit organisation fostering innovation in Chile. It creates new companies and joint ventures, carries out R&D, adapts foreign technology for product and process innovation for client companies in the public and private sectors, and fosters the creation of technological consortia and the diffusion of technology to small and medium-sized enterprises (OECD, 2006).

Fundación Chile was responsible for the creation of pioneering salmon firms and provision of technological services, that were fundamental for the take-off of the industry in Chile; the establishment of quality control and certification systems for fruit exports; the introduction of new berry species and varieties in Chile; the development of associations in the forestry industry, which led to the implementation of new forestry management models; the development of high quality wine production; and of furniture exports (Fundación Chile, 2007).

Across the economy, Chile's innovation policies have traditionally suffered from several weaknesses. These include a low R&D intensity relative to OECD countries; a limited role played by the private sector, with a reliance on government funding to universities; a shortage of specialised human resources; a lack of financial market mechanisms for providing risk and seed capital; and a dearth of cooperative institutional networks (OECD, 2007d).<sup>9</sup> These weaknesses carry over to the agricultural sector, although the consequences for the sector may not be so severe, insofar as the gains from adapting technologies and providing extension may in some cases exceed the returns to R&D (Foster and Valdés, 2006). A growing awareness of the importance of innovation for the country's future has recently led to the creation of the Innovation Council for Competitiveness, entrusted with providing guidelines for a long term national innovation strategy, and to the introduction of a mining tax to help finance implementation of that strategy (OECD, 2007d).

### **Rural development programmes**

The Ministry of Agriculture, through INDAP, has implemented several programmes with the goal of improving the economic conditions of poor (subsistence) farmers through the enhancement of their agriculture activities. Similarly, the National Corporation for Indigenous Development (CONADI) has implemented programmes that further the development of indigenous farmers. In general these programmes equate rural development with agricultural development in poorer areas. Combined resources from INDAP and CONADI account for 15% of budgetary transfers to agriculture.

#### **INDAP**

INDAP, in co-ordination with other ministries and institutions such as Ministry of Planning (MIDEPLAN) and the Foundation for Women Promotion and Development (PRODEMU), implements four instruments under a programme called Services for the Development of Poor Areas (*Servicios de fomento Sectores Especiales*). These are: i) the Local Rural Communities Development Programme (*Servicio de Desarrollo Local en Comunidades Rurales*, PRODESAL), ii) the Indigenous Development Programme (*Programa Desarrollo Indígena*, ORIGENES), iii) the Rural Women Training Programme (*Programa de Formación y Capacitación para Mujeres Rurales*, PRODEMU); and iv) the Poor Communities Development Project (*Proyecto de Desarrollo de Comunas Pobres*, PRODECOP). INDAP's budget for the Services for the Development of Poor Areas programme increased steadily through the 1990s, but has stabilised at around CLP 10 000 million (USD 18 million) per year, representing 16% of the total INDAP's transfers to agriculture in 2006. PRODECOP projects ended with MIDEPLAN in 2001 and re-started with INDAP funds co-financed by IFAD and World Bank.

PRODESAL's goal is to improve the agricultural productivity of farmers living in poverty, a deteriorated environment, and with scarce productive capital. PRODESAL is executed through rural municipalities with a high incidence of poverty. It comprises a series of subsidies providing technical assistance for primary production, environmental improvement and organisational development. In 2006, the programme was present in 235 municipalities of the country, providing services to 41 200 individuals organised in 359 associations, with an investment of CLP 5 713 million (USD 11 million).

ORIGENES is implemented at the national level with the participation of several ministries. Its aim is to promote the economic, social, cultural, environmental, and legal development of indigenous areas. INDAP is a co-executer of the programme and participates through subsidies for the productive investment and technical assistance of

agricultural, livestock and irrigation activities. In 2006 INDAP's budgetary allocation for the programme was CLP 6 536 million (USD 12 million).

PRODEMU contains a set of programmes designed to promote the participation of poor women in the society. The Foundation has an agreement with INDAP under which the latter provides subsidies for training in different areas of agricultural activities such as technical assistance, managerial aspects, and organisational development. In 2006, INDAP allocated CLP 200 million for the programme, equivalent to around USD 400 000.

PRODECOP was an INDAP programme that provided subsidies for the improvement of productive activities in poor communities within regions VI, VII, VIII (PRODECOP-SECANO) and region IV (PRODECOP IV, recently (2001) renamed the *Programa de Asistencia Agrícola para Sectores Vulnerables de la Región de Coquimbo*). The action areas are productivity enhancement, local and environmental development and local farmer organisation promotion. Subsidies are provided for technical assistance, partial or total financing of productive projects, and training courses.

## CONADI

The National Corporation for Indigenous Development (Corporación Nacional de Desarrollo Indígena, CONADI) was created in 1993 under Law 19.253 which established policies for the protection and promotion of indigenous people. CONADI promotes, co-ordinates and executes state actions for the economic, social and cultural development of indigenous people and their communities. CONADI has two main instruments that directly interact with agriculture. One is the Fund for Indigenous Land and Water (*Fondo de Tierras y Aguas Indígenas*), which carries out land purchases that are given to indigenous people with the purpose to be used for agricultural activities, and is also used for the acquisition of wells and waters rights. There are two ways in which the fund is implemented; the first is through direct subsidies for land acquisition by individuals or communities; the other is through the direct purchases of land by the State, which are given to indigenous people who do not possess land or possess only limited land. The budgetary allocation for land purchases has increased, from CLP 11 000 million (USD 20 million) in 2000 to CLP 17 000 million (USD 33 million) in 2006. Between 2002 and 2006 around 47 000 hectares were bought with the fund (CONADI, 2007).

Once the land is given to farmers, another source, the Fund for Indigenous Development (*Fondo de Desarrollo Indígena*), is used to provide assistance to the families recently installed in new lands. This fund provides technical assistance and financing for irrigation works. The two CONADI instruments account for about 10% of the total transfers to agriculture.

### **Issues concerning the evaluation and co-ordination of agricultural policies**

Most governmental programmes in Chile, including those pertaining to agriculture, are evaluated upon the request of the Treasury or at the initiative of the responsible agency or ministry. Table 2.5 shows those agricultural programmes that have been evaluated upon request and contains an estimation of the share of those programmes in all transfers to agriculture.<sup>10</sup> Note that programmes run on from one year to the next, so a sequential evaluation of policies will not lead to a share of 100%, even if all programmes are at some stage evaluated. The highest share was in 2000 when the Soil Recovery Programme and irrigation expenditures were evaluated.

Table 2.5. **Agricultural programmes evaluated, 1998-2006**

Year	Programmes evaluated upon request of the Treasury	Share of programmes evaluated in total transfers to agriculture (%)
1998	Export promotion (PROCHILE) Productive development-PROFO, Technical assistance-FAT (CORFO) Agricultural Innovation-FIA, Credit-INDAP (MINAGRI) Poor communities productive development-PRODECOP-INDAP (MINAGRI) Land purchases-CONADI (MIDEPLAN)	27
1999	Poor communities productive development-PRODECOP IV Region (MINAGRI) Indigenous development fund-CONADI (MIDEPLAN)	3
2000	Soil Recovery Programme-INDAP-SAG (MINAGRI); Irrigation works (MOP)	35
2001	Irrigation works (MOP) Export inspection services-SAG (MINAGRI)	15
2002	n.a.	–
2003	n.a.	–
2004	n.a.	–
2005	Irrigation subsidies-INDAP (MINAGRI) Services for the development special areas-INDAP (MINAGRI)	7
2006	Agricultural Insurance-COMSA (CORFO) Irrigation-CNR-Law 18.450 (MINAGRI)	12

n.a.: not available.

Source: OECD estimations based on DIPRES, 2007.

Evaluations have tended to focus on gauging the implementation and reach of programmes rather than how effective they have been relative to their ultimate objectives. Such evaluations call for a somewhat different approach, for example one which can distinguish between outcomes for those who are enrolled in programmes and those who are not.

With agricultural policies increasingly being implemented by agencies other than MINAGRI, there is also a need for closer co-ordination, in order to avoid a duplication of policy effort or a gap in intervention. In particular, policies targeting poorer farmers need to be co-ordinated with relevant poverty reduction programmes, such as Chile-Solidario (implemented by FOSIS). Since 2000, ODEPA has co-ordinated national commissions by product (*Mesas Público-Privadas de Cadenas Agroalimentarias*) where agents of a particular supply chain along with public institutions deal with issues that affect the sub-sector's competitiveness. Producers, processors, researchers and MINAGRI professionals participate in commissions. Sub-sectors for which commissions have been convened are the rice value chain, wine, wheat, potatoes, forestry and berries.

## 2.5. Evaluation of support to agriculture

This section provides a quantitative evaluation of the support provided to Chilean agriculture between 1990 and 2006, based on indicators of support developed by the OECD. These measures include the Producer Support Estimate (PSE), the General Services Support Estimate (GSSE), and the Total Support Estimate (TSE). Definitions of these and some other indicators are given in Box 2.6, while Table 2.5 provides a breakdown of support in Chile.

### Market price support

Market price support (MPS) is calculated for ten products that account for 76% of the value of production. The total amount of MPS for the sector is calculated by extrapolating



### Box 2.6. OECD indicators of support

#### Nominal indicators

**Producer Support Estimate (PSE):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. It includes market price support, budgetary payments and budget revenue foregone, i.e. gross transfers from consumers and taxpayers to agricultural producers arising from policy measures based on: current output, input use, area planted/animal numbers/revenues/incomes (current, non-current), and non-commodity criteria.

**Market Price Support (MPS):** the estimated annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level. MPS is also available by commodity.

**Consumer Support Estimate (CSE):** the annual monetary value of gross transfers to (from) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. If negative, the CSE measures the burden (implicit tax) on consumers through market price support (higher prices), that more than offsets consumer subsidies that lower prices to consumers.

**General Services Support Estimate (GSSE):** the annual monetary value of gross transfers to general services provided to agriculture as a sector (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any payments to individual producers.

**Total Support Estimate (TSE):** the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

#### Relative indicators

**Percentage PSE (%PSE):** PSE transfers as a share of gross farm receipts (including support in the denominator).

**Producer Nominal Protection Coefficient (PNPC):** the ratio between the average price received by producers (at farm gate), including payments per tonne of current output, and the border price (measured at farm gate). The PNPC is also available by commodity.

**Percentage CSE (%CSE):** the implicit tax (or subsidy, if CSE is positive) on consumers as a share of consumption expenditure at the farm gate.

**Percentage TSE (%TSE):** overall transfers to farming sector as a percentage of GDP.

**Percentage GSSE (%GSSE):** share of expenditures on general services in the Total Support Estimate (TSE).

the value of support over the remaining 24%. Based on their contribution to the value of production, the ten products for which MPS is calculated are: grapes, poultry, pigmeat, milk, tomatoes, beef, wheat, apples, sugar beet and maize.

In the case of exported products – grapes, poultry, pigmeat, tomatoes and apples – there are no policies in place that support prices to producers above market levels, so MPS for these products is zero. For imported products, MPS is calculated on the basis of the

Table 2.6. **Estimates of support to Chilean agriculture (CLP million)**

	1990-92	2004-06	2004	2005	2006
Total value of production (at farm gate)	1 230 325	3 415 030	3 273 557	3 517 414	3 454 120
<i>Of which share of MPS commodities (%)</i>	60	64	64	62	65
Total value of consumption (at farm gate)	1 227 156	3 630 021	3 491 245	3 712 045	3 686 774
Producer Support Estimate (PSE)	119 849	193 623	163 801	176 289	240 778
Support based on commodity output	115 010	97 578	77 787	81 774	133 172
<i>Market Price Support</i>	115 010	97 578	77 787	81 774	133 172
<i>Payments based on output</i>	0	0	0	0	0
Payments based on input use	4 839	94 104	85 445	93 079	103 787
<i>Variable input use</i>	37	15 757	13 308	15 210	18 753
<i>Fixed capital formation</i>	1 252	55 004	51 633	54 615	58 763
<i>On-farm services</i>	3 551	23 343	20 504	23 254	26 271
Payments based on current A/An/R/I <sup>1</sup> production required	0	1 941	568	1 436	3 819
<i>Of a single commodity</i>	0	0	0	0	0
<i>Of a group of commodities</i>	0	1 109	151	1 436	1 739
<i>Of all commodities</i>	0	833	418	0	2 080
Payments based on non-current A/An/R/I <sup>1</sup> production required	0	0	0	0	0
Payments based on non-current A/An/R/I <sup>1</sup> production not required	0	0	0	0	0
<i>Variable rates</i>	0	0	0	0	0
<i>Fixed rates</i>	0	0	0	0	0
Payments based on non-commodity criteria:	0	0	0	0	0
<i>Long-term resource retirement</i>	0	0	0	0	0
<i>Specific non-commodity output</i>	0	0	0	0	0
<i>Other non-commodity criteria</i>	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0
Percentage PSE	10	6	5	5	7
Producer NPC	1.10	1.03	1.02	1.02	1.04
Producer NAC	1.11	1.06	1.05	1.05	1.07
General Services Support Estimate (GSSE)	2 857	68 021	59 929	68 643	75 492
Research and development	1 989	15 493	13 918	15 164	17 396
Agricultural schools	90	700	673	771	654
Inspection services	0	6 723	4 902	7 126	8 142
Infrastructure	744	37 495	32 856	38 105	41 523
Marketing and promotion	0	7 103	7 069	7 015	7 226
Public stockholding	0	0	0	0	0
Miscellaneous	34	507	509	461	552
GSSE as a share of TSE (%)	2.3	26.0	26.8	28.0	23.9
Consumer Support Estimate (CSE)	-138 146	-183 264	-173 913	-176 400	-199 479
Transfers to producers from consumers	-115 241	-95 692	-77 787	-81 774	-127 516
Other transfers from consumers	-23 118	-87 666	-96 125	-94 626	-72 245
Transfers to consumers from taxpayers	0	0	0	0	0
Excess feed cost	213	94	0	0	282
Percentage CSE	-11	-5	-5	-5	-5
Consumer NPC	1.13	1.05	1.05	1.05	1.06
Consumer NAC	1.13	1.05	1.05	1.05	1.06
Total Support Estimate (TSE)	122 707	261 644	223 730	244 932	316 270
Transfers from consumers	138 358	183 358	173 913	176 400	199 761
Transfers from taxpayers	7 466	165 952	145 942	163 158	188 755
Budget revenues	-23 118	-87 666	-96 125	-94 626	-72 245
Percentage TSE (expressed as share of GDP)	0.98	0.39	0.39	0.38	0.41
GDP deflator 1990-92 = 100	100	255	233	252	281

NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient.

1. A (area planted), An (animal numbers), R (receipts) or I (income).

MPS commodities for Chile are: wheat, maize, apples, grapes, sugar, tomatoes, milk, beef and veal, pigmeat, and poultry.

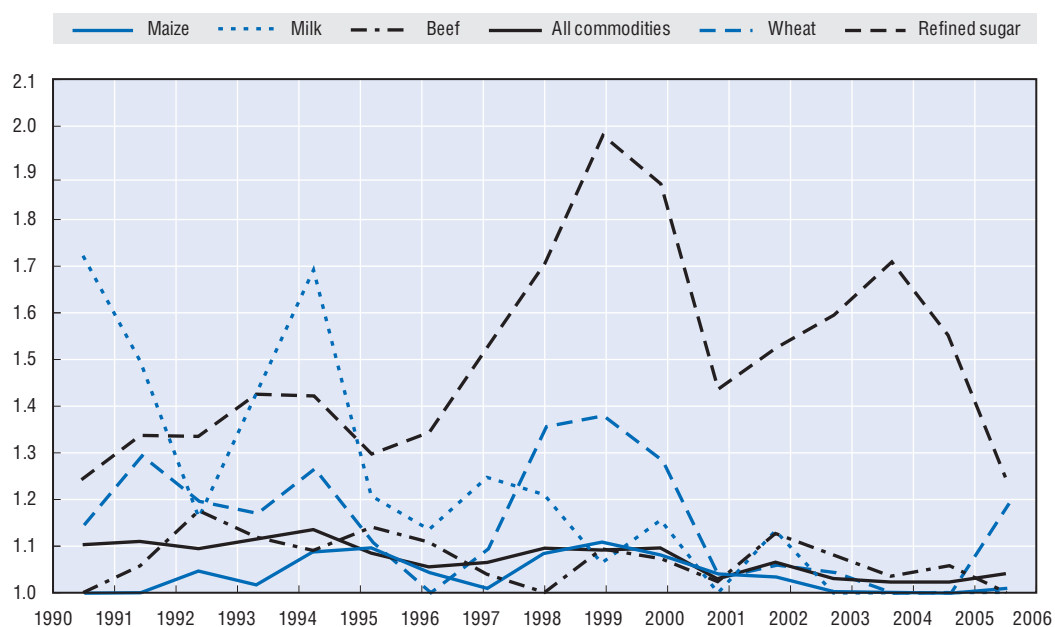
Source: OECD, PSE/CSE database, 2007.

difference between the domestic price and the landed c.i.f. price (adjusted for the cost of getting the product from the border to the domestic market). In the case of milk, which has switched to being a net export, MPS is calculated for those years in which there were net imports. MPS is equal to the price gap times the quantity of production, and captures the effects of policies that insulate producers from international markets. A related indicator is the producer NPC, which in the case of Chile (where there are no output payments) reflects the ratio of the domestic price to the border price, adjusted for the costs of getting the product to the point at which they compete.

In overall terms, the NPC is low (Figure 2.13). The rate of protection has been less than 10% (i.e. an NPC of 1.1) since 1995, and has declined sharply in recent years, reaching 2% in 2004 and 2005, and 4% in 2006. The decline in the overall NPC reflects reductions in Chile's MFN tariff and the increasing number of countries receiving duty free access for some agricultural products under FTAs. This downward trend has occurred despite an appreciation of the exchange rate since 2002, which lowers the cost of imports expressed in local currency and (pending equilibration of the market) increases the gap between domestic and international prices.

Among imported products, the rate of protection on price band commodities – wheat and sugar – has been much higher than for other commodities. Between 1998 and 2000, support was particularly high and consistent with the observation that Chile's import duties exceeded its bound tariff commitments in those years. In both cases, however, the degree of protection has since declined to very low levels that are similar to the protection offered to other commodities. In 2006 there was an increase in measured support for both commodities that is difficult to reconcile with the rates of tariffs levied under the PBS. These higher numbers may be attributable to a tendency for reference prices (recorded in the form of import unit values) to reflect contracts made months prior to delivery, and in this instance not fully capture the previous year's rise in world and domestic prices.

Figure 2.13. **Nominal protection coefficients for protected commodities, 1990-2006**



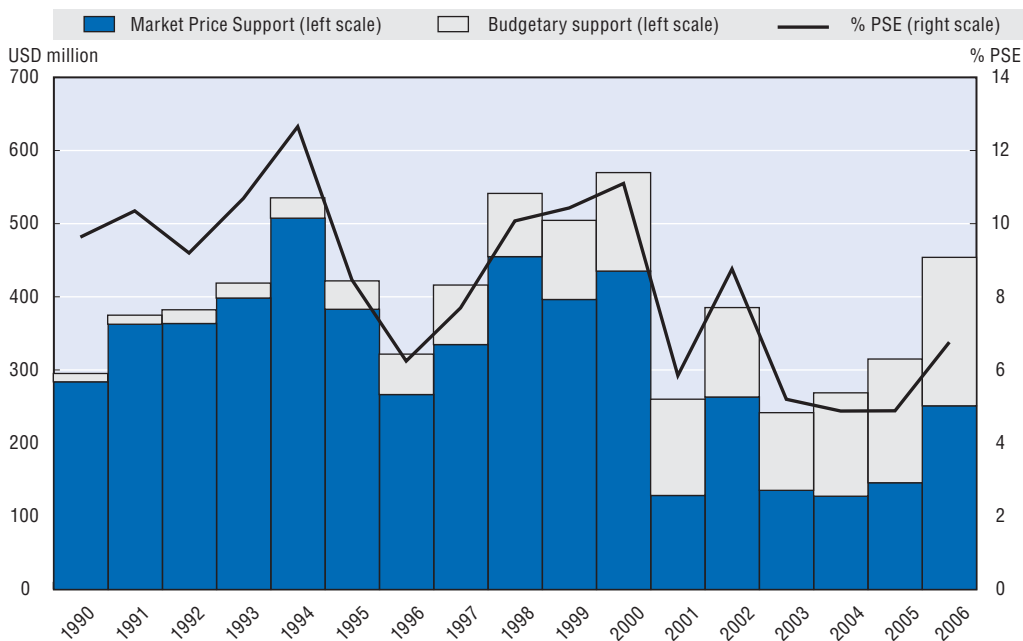
Source: OECD, PSE/CSE database, 2007.

Milk received a high degree of protection in the early 1990s, and was until recently protected more heavily than any commodity not covered by the price band system. Again, however, the extent of protection has been on a downward trend, and has been at zero for the last few years. This reflects structural change within the dairy sector and the emergence of a net export position, with exports exceeding imports in five of the last six years.

### The Producer Support Estimate

As market price support has come down, Chile has scaled up its spending on agricultural programmes. The implications of these two competing tendencies are evident in Figure 2.14, which shows the %PSE and decomposes the PSE into MPS and budgetary support. Budgetary support was very low until the second half of the 1990s, and accounted for only a small share of producer support. In recent years, budgetary support has increased significantly in absolute as well as relative terms. In terms of overall support to producers, the decline in MPS has dominated, with the result that the PSE has declined from about 10% of the value of production between 1997 and 2000 to an average of 5% since then. This is comparable to the rates of support provided in Australia and Brazil, and much lower than the level of support provided in most OECD countries (Figure 2.15).

Figure 2.14. **Level and decomposition of the PSE, 1990-2006**

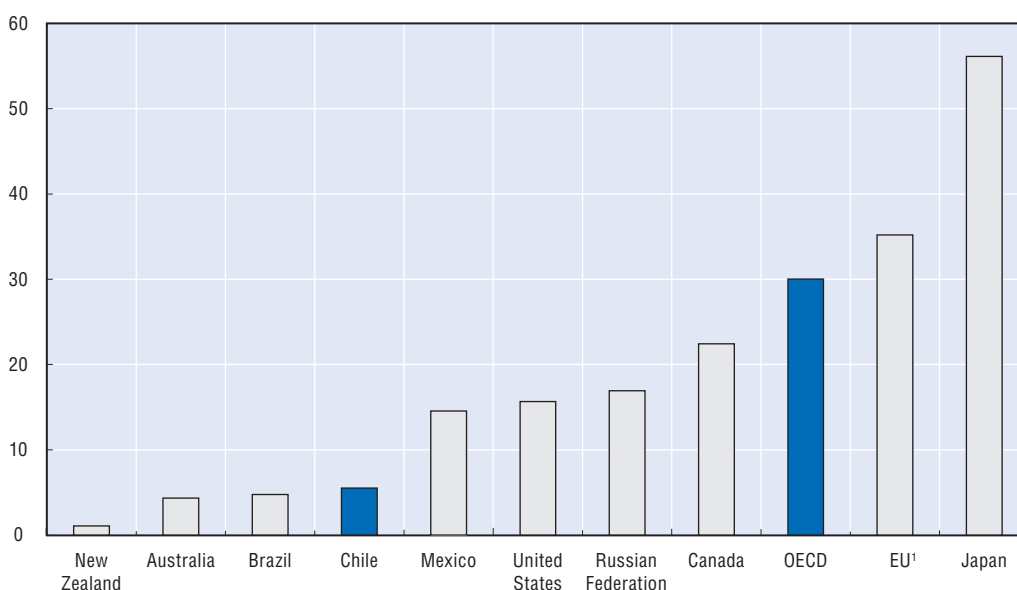


Source: OECD, PSE/CSE database, 2007.

### The Total Support Estimate

Increased budgetary support to producers has been matched by higher spending on general services (as measured by the GSSE). Whereas total budgetary spending – in the form of both transfers to producers (part of the PSE) and to the sector more generally (equal to the GSSE) – accounted for less than 10% of total support in the first half of the 1990s, by 2000 this fraction had risen to more than 80% (Figure 2.16). The proportions of budgetary

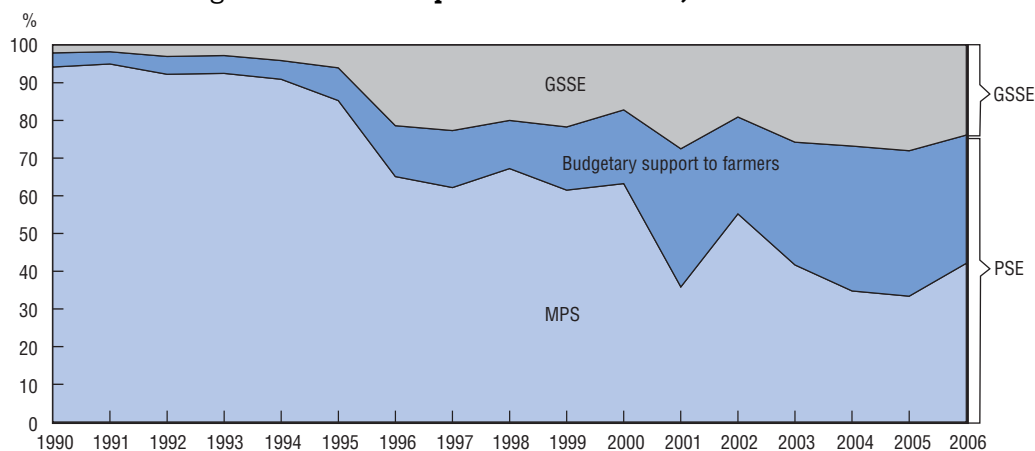
Figure 2.15. PSE by country, EU and OECD average, 2003-05



1. EU15 for 2003; EU25 for 2004-05.

Source: OECD, PSE/CSE database, 2007.

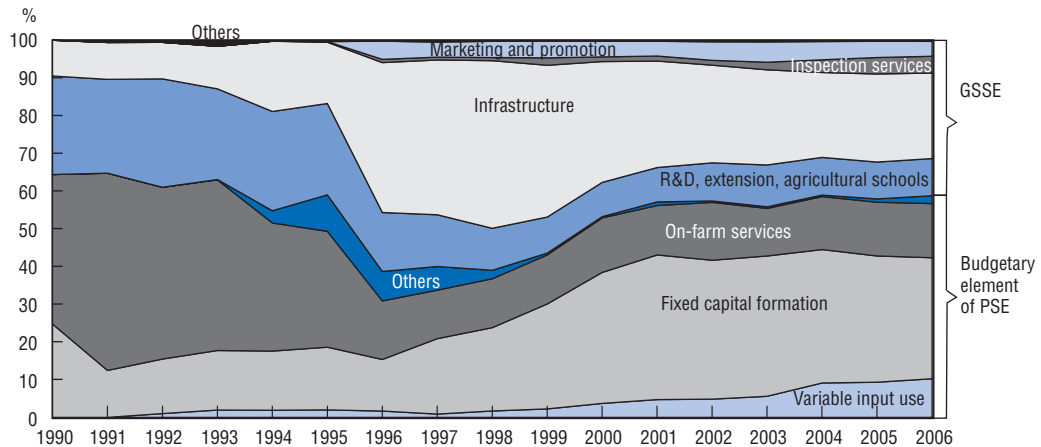
Figure 2.16. Decomposition of the TSE, 1990-2006



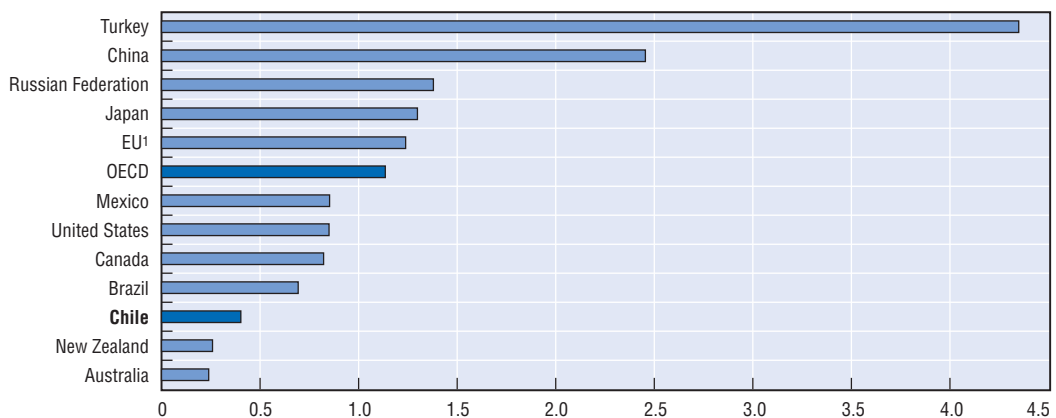
Source: OECD, PSE/CSE database, 2007.

support going into the PSE and the GSSE have stayed roughly constant since 1990 (Figure 2.17). The main reason is that off-farm investments, for example in infrastructure and investment services, have had on-farm counterparts in the form of expenditures on fixed assets and on-farm services (such as inspection). Spending on infrastructure dominates the GSSE, while fixed capital formation dominates the budgetary element of the PSE.

Although budgetary expenditures have risen considerably, support to the agricultural sector imposes a much milder burden on the economy than in most OECD countries. The TSE accounted for 0.4% of GDP between 2003 and 2005, compared with an average share of 1.2% in OECD countries (Figure 2.18). The main reason for this difference is that market

Figure 2.17. **Decomposition of budgetary allocations in PSE and GSSE, 1990-2006**

Source: OECD, PSE/CSE database, 2007.

Figure 2.18. **Total Support Estimate in Chile and selected countries, 2003-05 average, as per cent of GDP**

1. EU15 for 2003; EU25 for 2004-05.

Source: OECD, PSE/CSE database, 2007.

price support has declined to very low levels in Chile, whereas it still dominates producer support in most OECD countries. In addition, the share of the GSSE in total support was 26% over the same period, as compared with an average of 17% in OECD countries. Since the GSSE contains investments in areas that may be considered to be public goods, this suggests a more productive use of taxpayers' money than is the norm in OECD countries.

More than half of Chile's agricultural expenditures are undertaken by three institutions: INDAP (which delivers support to small farmers), SAG (whose mandate covers plant and animal health, standards and inspection services) and CNR (responsible for irrigation). Both SAG and CNR operate programmes that provide support both to the individual producer and to the sector more generally.

## 2.6. Policy conclusions

Chile has had a liberal trade policy for most of the last 30 years, and, with a uniform MFN tariff, has tended not to discriminate among sectors. With the exception of a few

agricultural products, notably wheat and sugar, there has been little protection for agricultural products, and protection for formerly protected products has recently declined to low levels too. Unilateral trade liberalisation has, since the early 1990s, been accompanied by an active policy of negotiating Free Trade Agreements and Economic Cooperation Agreements. This has reduced the degree of trade protection afforded to agriculture to much less than the MFN tariff of 6%, although many of these agreements have singled out agricultural sub-sectors for special treatment. Over the past four years, domestic prices of agricultural commodities have been on average no more than 2% above comparable prices in international trade.

At the same time, the approach to the sector is not *laissez-faire*. Over the past ten years, Chile's budgetary expenditures on agricultural policies have more than trebled in real terms. Yet despite this rise in spending, total support to the sector accounts for about 0.4% of GDP, a ratio which is about a third the OECD average. An important reason for the lower burden is that Chile provides very little market price support, still the dominant form of support in most OECD countries.

As spending on agriculture has increased, so agricultural programmes have become no longer the unique preserve of the Ministry of Agriculture. For example the Ministry of Public Works and the Ministry of Agriculture (via CNR and INDAP) spend money on irrigation. Within MINAGRI, the Soil Recovery Programme is jointly administered by SAG and INDAP, with the domain of intervention depending on whether the beneficiaries are large and medium scale farmers (in which case they fall under the responsibility of SAG), or smallholders (under INDAP). These overlapping mandates make for challenges in ensuring the coherence of policies.

The aims of Chile's budgetary programmes include improving agricultural competitiveness, inserting poorer and less competitive farmers into Chile's commercial agricultural structures, and protecting the country's environment and natural resource base. In terms of improving agricultural competitiveness, there is evidence that government policies have played an important facilitating role, and complemented the benefits of trade openness. These policies include spending on infrastructure by CNR and MOP; the specification and enforcement of standards by SAG; promotion by PROCHILE; and R&D by INIA, FIA and Fundación Chile. The reason for the success of these policies is that they have provided public goods that the private sector alone could not have developed. In many cases, public-private interactions (*e.g.* in the development of standards and inspection services, and the development of venture capital) have been a key ingredient of the success. These policies are reflected in the GSSE, which has accounted for just over a quarter of all support provided to the sector in recent years.

However, the fact that money is spent on public goods that the market would underprovide does not itself guarantee that policies are effective. Indeed, given the large number of programmes that Chile has in place, there is a need for a more thorough evaluation of performance. Some agricultural programmes are evaluated upon the request of the Treasury, but these evaluations focus more on gauging the implementation and reach of programmes than how effective they have been relative to their ultimate objectives.

The widespread use of bidding processes helps reduce the costs of agricultural programmes in Chile, while the requirement that farmers commit their own resources in order to receive support helps improve the chances of generating viable structures. However, these attributes of farm policy may limit the reach of programmes to more

profitable areas and to farmers who are more informed and better organised. The efficiency gains from such methods of intervention therefore need to be assessed relative to any potential costs in terms of programmes not fully reaching the desired set of beneficiaries.

On the objective of inserting smallholders into commercial structures, there have been important investments in a number of key areas. These programmes include measures that are not directed to specific farmers, for example on general infrastructure and irrigation, and are included in the GSSE. Some of these measures are targeted regionally, so that their main beneficiaries are poorer farmers. Even more important, however, has been targeted support delivered (principally by INDAP) to farmers individually in order to improve their productivity. The majority of this support involves the provision of on-farm assets, including on-farm infrastructure, irrigation, soil improvement and inspection services, and managerial skills. These expenditures are the largest component of the PSE, which has averaged 6% of the value of production over the past four years, compared with an average of 30% in OECD countries. Chapter 3 considers the strategy governing these particular policy initiatives.

## Notes

1. Support estimates have recently been calculated for Brazil, China, South Africa and Ukraine.
2. Economic Cooperation Agreements, concluded with other Latin American countries, deal only with trade in goods. FTAs also include services, investments and intellectual property. Partial Scope Agreements, also deal only with trade in goods and contain preferences for an agreed set of commodities. Association agreements may go further than FTAs, for example with agreements on political, labour and environmental issues.
3. In order to access INDAP benefits (credit and subsidies), the applicant must: 1) be a small-scale farmer or peasant (*campesino*); 2) have a maximum of 12 hectares of basic irrigation land, regardless of land tenure; 3) have an asset value not greater than 3 500 *Unidades de Fomento* (UF); 4) have agricultural activities as the main source of income; 5) not have any overdue debt on INDAP loans; 6) in the case of farmer organisations, have a legal corporate identity and carry out activities that have direct benefits for the rural sector. A peasant (*campesino*) is a person that lives and works in the countryside whose main source of income is agricultural/forestry activities, which are carried out personally regardless of the legal status (*e.g.* worker, owner), and whose family's economic conditions must not be better than small-scale farmer conditions. Basic Irrigation Hectares (*Hectáreas de Riego Básico, HRB*), are the area equivalent to the potential production of an irrigated hectare from the Valley of the river Maipo (Metropolitan Region), classified as Class I according to its carrying capacity. To determine the HRB, each hectare is multiplied by a conversion coefficient estimated, based on soil conditions and water availability, for each community and region across the country (INDAP, 2007).
4. A micro agricultural client is defined as those with annual sales no greater than USD 92 500.
5. Programmes implemented by FOSIS include: 1) Chile Solidario (programme of social protection); 2) Subsidies for Economic Activities in Poverty Conditions (*Apoyo a las Actividades Económicas en Condiciones de Pobreza*); 3) Support for Microenterprises (*Apoyos al microemprendimiento*); 4) Chile Emprende, which promotes Territorial Development and is not only implemented by FOSIS but also by CORFO, SENCE, INDAP and SERCOTEC.
6. Programmes implemented by SENCE include: 1) the Tax Rebate for Training Purposes (*Franquicia Tributaria a la Capacitación*), and 2) the National Fund for Training Purposes (*Fondo Nacional de Capacitación*).
7. Given the importance in terms of budgetary transfers of the Soil Recovery Programme and that the Associative Irrigation Works Programme is part of a broader policy; a detailed description of these programmes is provided in subsequent sections.
8. The Unidad de Fomento (UF) is an indexed unit of account used to price items for sale or to specify amounts to be repaid in the future. The exchange rate between the UF and the Chilean peso is



constantly adjusted to inflation so that the value of the Unidad de Fomento remains constant. It was created in 1967, for the use in determining principal and interest in international secured loans for development, subject to revaluation according to variations in inflation. In 2006, one UF was around CLP 18 300.

9. Chile's total R&D intensity – the ratio of Gross Expenditure on Research and Development (GERD) to GDP – stood at 0.67% in 2003, which was less than one-third the OECD average of 2.25% (OECD, 2005a).
10. An important initiative will take place at national level in 2008 when the Treasury will request the evaluation of the most important programmes covering more than 50% of the budget (MINAGRI, 2007).

## ANNEX 2.A1

*Policy Tables*Table 2.A1.1. **Chile's trade agreements**

Country or group of countries	Type of agreement	Signature date	Effective date <sup>3</sup>
European Union	Economic Association Agreement	18 November 2002	1 February 2003
P4	Economic Association Agreement	18 July 2005	Parliamentary proceeding pending
Canada	Free Trade Agreement	5 December 1996	5 July 1997
Central America	Free Trade Agreement	18 October 1999	
China	Free Trade Agreement	18 November 2005	1 October 2006
Costa Rica	Free Trade Agreement	18 October 1999	2002 (Bilateral Protocol)
EFTA <sup>1</sup>	Free Trade Agreement	26 June 2003	1 December 2004
El Salvador	Free Trade Agreement	18 October 1999	3 June 2002 (Bilateral Protocol)
Guatemala	Free Trade Agreement	18 October 1999	Bilateral under negotiation
Honduras	Free Trade Agreement	18 October 1999	Bilateral under negotiation
Korea	Free Trade Agreement	15 February 2003	1 April 2004
Mexico	Free Trade Agreement	17 April 1998	1 August 1999
Nicaragua	Free Trade Agreement	18 October 1999	Bilateral under negotiation
Panama	Free Trade Agreement	27 June 2006	Parliamentary processing pending
United States	Free Trade Agreement	6 June 2003	1 January 2004
Bolivia	Economic Co-operation Agreement No. 22	6 April 1993	7 July 1993
Colombia	Economic Co-operation Agreement No. 24	6 December 1993	1 January 1994
Ecuador	Economic Co-operation Agreement No. 32	20 December 1994	1 January 1995
Mercosur <sup>2</sup>	Economic Co-operation Agreement No. 35	25 June 1996	1 October 1996
Peru	Economic Co-operation Agreement No. 38	22 June 1998	1 July 1998
Venezuela	Economic Co-operation Agreement No. 23	2 April 1993	1 July 1993
Cuba	Partial Scope Agreement	21 August 1998	Parliamentary proceeding pending
Japan	Free Trade Agreement	27 March 2007	1 September 2007
India	Partial Scope Agreement	8 March 2006	16 August 2007

1. The European Free Trade Association (EFTA) is formed by: Iceland, Liechtenstein, Norway and Switzerland.

2. Mercosur is formed by Argentina, Brazil, Paraguay and Uruguay. Chile participates as country associated to the Agreement, as well as Bolivia.

3. The date refers only to the end of the negotiations.

Source: DIRECON, 2007.

Table 2.A1.2. **Announcement of price band duties**

## A. Wheat

Dates for the calculation of reference prices	Publishing dates of reference prices	Period of validity for duties and rebates	Relevant market
26 November-10 December	11-15 December	16 December-15 February	<i>Trigo pan argentino</i>
27 January-10 February	11-15 February	16 February-15 April	<i>Trigo pan argentino</i>
27 March-10 April	11-15 April	16 April-15 June	<i>Trigo pan argentino</i>
27 May-10 June	11-15 June	16 June-15 August	<i>Soft Red Winter No. 2</i>
27 July-10 August	11-15 August	16 August-15 October	<i>Soft Red Winter No. 2</i>
26 September-10 October	11-15 October	16 October-15 December	<i>Soft Red Winter No. 2</i>

Source: ODEPA, 2007.

## B. Sugar

Dates for the calculation of reference prices	Publishing dates of reference prices	Period of validity for duties and rebates
16 October-15 November	26-30 November	December
16 November-15 December	27-31 December	January
16 December-15 January	27-31 January	February
16 January-15 February	24-28 February	March
16 February-15 March	27-31 March	April
16 March-15 April	26-30 April	May
16 April-15 May	27-31 May	June
16 May-15 June	26-30 June	July
16 June-15 July	27-31 July	August
16 July-15 August	27-31 August	September
16 August-15 September	26-30 September	October
16 September-15 October	27-31 October	November

Source: ODEPA, 2007.

Table 2.A1.3. **Wheat and wheat flour tariffs in the bilateral protocol with the United States**

Wheat		Wheat flour	
FOB (USD/TONNE)	<i>Ad valorem (%)</i>	FOB (USD/TONNE)	<i>Ad valorem (%)</i>
< 102	31.5	< 159	31.5
≥ 102 < 110	27.0	≥ 159 < 172	27.0
≥ 110 < 115	22.0	≥ 172 < 179	22.0
≥ 115 < 120	17.0	≥ 179 < 187	17.0
≥ 120 < 126	13.0	≥ 187 < 197	13.0
≥ 126 < 147	6.0	≥ 197 < 229	6.0
≥ 147 < 158	3.0	≥ 229 < 246	3.0
≥ 158	0.0	≥ 246	0.0

Source: ODEPA, 2007.

Table 2.A1.4. **Wheat and wheat flour tariffs established in FTA with the United States**

Year	Maximum tariff (%)
2008	28.9
2009	26.3
2010	23.7
2011	21.0
2012	15.8
2013	10.5
2014	5.3
2015	0.0

Source: ODEPA, 2007.

Table 2.A1.5. **Policies, institutions and programmes**

Policies	Institutions	Main programmes
Productivity improvements and skills development programmes	INDAP, CORFO	<ol style="list-style-type: none"> <li>1. Services for the development of productive and entrepreneurial capacities, INDAP (<i>Servicios Desarrollo de Capacidades Productivas y Empresariales</i>)</li> <li>2. Incentives for the development of agricultural investment, INDAP (<i>Incentivos Mejoramiento y Desarrollo de Inversiones</i>)</li> <li>3. Subsidies for the diversification of economic-productive activities, INDAP (<i>Apoyo a la diversificación de actividades económico-productivas MYPE</i>)</li> <li>4. Livestock improvement programme, INDAP (<i>Desarrollo y Tecnificación Ganadería</i>)</li> <li>5. Transfers from MINAGRI to CORFO to be used in instruments like PROFO, PDP, FAT (<i>Transferencias de MINAGRI a CORFO</i>)</li> <li>6. CORFO own budget allocated in agriculture through instruments like PROFO, PDP, FAT, PIR (<i>Presupuesto propio de CORFO</i>)</li> </ol>
The Soil Recovery Programme	INDAP, SAG	Soil Recovery Programme ( <i>Programa para la Recuperación de Suelos Degradados</i> ) INDAP and SAG
Irrigation subsidies and spending	CNR, MOP, INDAP, CORFO	<ol style="list-style-type: none"> <li>1. Law 18.450 (<i>Ley 18.450</i>)</li> <li>2. Irrigation Development of Poor Communities, CNR (<i>Programa Desarrollo del Riego en Comunas Pobres</i>)</li> <li>3. Studies for the Feasibility of Irrigation Works (<i>Estudios y Programas de irrigación</i>), CNR</li> <li>4. Large-scale irrigation works (<i>Grandes obras de irrigación</i>) MOP</li> <li>5. Associative Irrigation Works Programme (<i>Programa de Riego Asociativo</i>) INDAP</li> <li>6. Irrigation Programme (<i>Programa de Irrigación</i>) PI/PIR, CORFO</li> </ol>
Rural development programmes	INDAP, CONADI	<ol style="list-style-type: none"> <li>1. Services for the Development of Poor Areas (<i>Servicios de Fomento para Sectores Especiales</i>) INDAP</li> <li>2. Local rural communities development services (Servicio de Desarrollo Local en Comunidades Rurales) PRODESAL, INDAP</li> <li>3. Indigenous Development Programme/Orígenes Programme, (<i>Programa Desarrollo Indígena</i>) INDAP</li> <li>4. Support for the Training of Rural Women (<i>Programa de Formación y Capacitación para Mujeres Rurales</i>) PRODEMU, INDAP</li> <li>5. Support for the improvement of productive activities in region IV (Proyecto de Desarrollo Rural para Comunidades Campesinas IV Región) PRODECOP IV-INDAP</li> <li>6. Support for the improvement of productive activities in regions VI, VII, VIII (Proyecto de Desarrollo de Comunas Pobres del Secano Regiones VI, VII y VIII) PRODECOP SECANO, INDAP</li> <li>7. Support for the family agricultural production (<i>Bono de Producción Agrícola Familiar</i>), INDAP</li> </ol>

Table 2.A1.5. **Policies, institutions and programmes**

Policies	Institutions	Main programmes
		8. Fondo de Desarrollo Indígena ( <i>Subsidies for Agricultural Productive Activities</i> ), CONADI
		9. Fund for Indigenous Land and Water, Land and Water rights purchases, ( <i>Fondo de Tierras y Aguas</i> ), CONADI
R&D, Training, Extension	INIA, FIA, etc.	1. National Institute of Agricultural Research ( <i>Instituto de Investigaciones Agropecuarias</i> ) INIA
		2. Foundation for Agrarian Innovation (Fundacion para la Innovacion Agraria) FIA
		3. Fundación-Chile ( <i>Fundación-Chile</i> )
		4. Forestry Research Institute ( <i>Instituto Forestal</i> ) INFOR
		5. Natural Resources Information Centre ( <i>Centro de Información de Recursos Naturales</i> ) CIREN
		6. Fund for agricultural communication, training and culture ( <i>Fundación de comunicaciones del Agro</i> ) FUCOA
		7. Institute of rural education ( <i>Instituto de Educación Rural</i> ) IER
Animal and plant health, standards	SAG	1. Fund for the Improvement of Sanitary Conditions ( <i>Fondo de Mejoramiento del Patrimonio Sanitario</i> )
		2. Agricultural and Forestry Export Inspection Programme, ( <i>Inspección de exportaciones agrícolas, forestales, pecuarias</i> )
		3. Export Certification Programmes, ( <i>Certificación de exportaciones agrícolas y pecuarias</i> )
		4. Border Control Inspections ( <i>Programas de controles fronterizos</i> )
		5. Foot and Mouth Disease Transfers Fiebre Aftosa (transferencia)
		6. Brucellosis Bovine Transfer ( <i>Brucelosis Bovina transferencias</i> )
		7. Fruit Fly Transfers ( <i>Mosca de la fruta transferencias</i> )
		8. Seed Programme Transfers ( <i>Programa semillas transferencia</i> )
		9. Fruit Mediterranean Fly Control Region Arica ( <i>Control integrado mosca del mediterráneo Región de Arica</i> )
		10. Livestock development programme-animal health programme ( <i>Programa de desarrollo ganadero sanidad animal</i> )
		11. Plant Health Programme ( <i>Programa de sanidad vegetal</i> )
		12. Seed Programme, labs ( <i>Programa de semillas</i> )
		13. Food Safety Programme, ( <i>Programa de inocuidad de productos agrícolas</i> )
		14. Genetic Improvement Programme ( <i>Programa de mejoramiento genético</i> )
		15. Foot and Mouth Disease Control ( <i>Vigilancia fiebre aftosa</i> )
		16. Brucellosis Bovine Control ( <i>Vigilancia brucelosis bovina</i> )
		17. Fruit Fly Control ( <i>Vigilancia mosca de la fruta</i> )
		18. Labs for Residuals Control ( <i>Laboratorios de control de residuos</i> )
Marketing and promotion	PROCHILE	1. Agricultural export promotion fund ( <i>Fondo de Promoción de Exportaciones Silvoagropecuarias</i> ) PROCHILE/DIRECON/ MINAGRI
		2. Export promotion for family agriculture ( <i>Internacionalización de la Agricultura Familiar Campesina</i> ) INTERPA, MINAGRI
Others	INDAP and SAG	1. Emergencies ( <i>Emergencias</i> ) INDAP, SAG, Under-Secretariat
		2. Subsidy estimation in INDAP's credit ( <i>Estimación del subsidio en el crédito de INDAP</i> )

Source: OECD, PSE/CSE database, 2007.



## *Chapter 3*

# **Development Pathways for Agriculture-dependent Households**

### 3.1. Introduction

Chile's agricultural sector has grown rapidly in the past 20 years. This growth has been associated with important structural changes, notably in the agro-processing sector, the logistics of food distribution, and the system of food retailing (the rise of supermarkets). Not all farmers have been able to adapt to these changes, and as a consequence there has been a widening gap between the country's commercial export-oriented sector and a traditional agriculture that produces staples for own consumption and importable crops such as wheat.

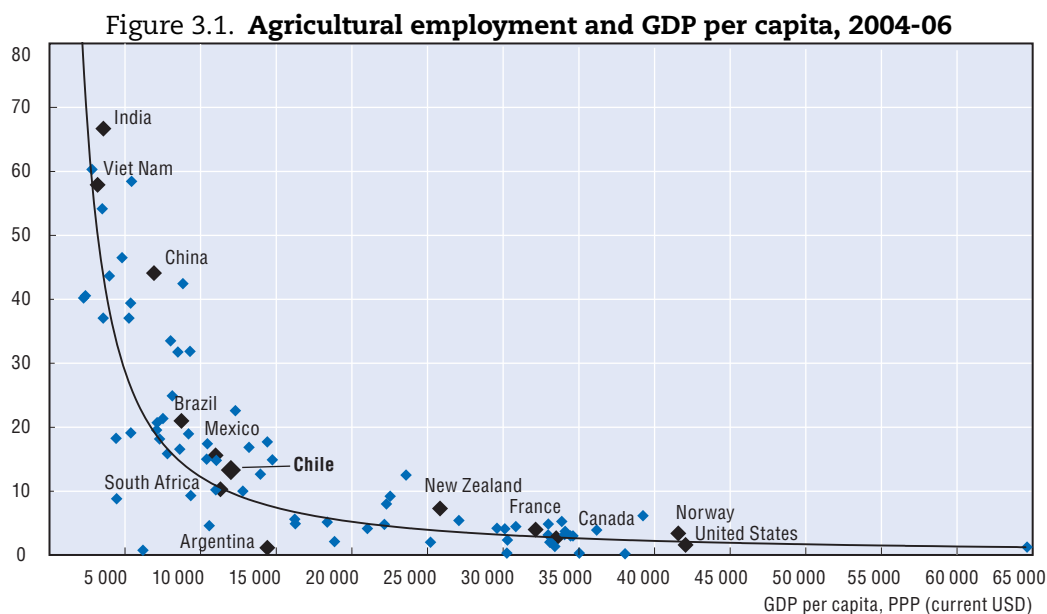
Structural changes in agriculture have had important implications for the rural economy more generally. In the central regions, where fruits and wine production are located, farms with access to irrigation, capital and modern inputs have developed seamless links to agribusiness and become modern enterprises. These enterprises are major employers of unskilled labour. Several other regions have lagged behind, with traditional, often indigenous, semi-subsistence farmers operating on a small scale, without access to modern techniques, and generating low incomes.

The Ministry of Agriculture's response to the growing duality of Chilean agriculture has been a range of production-oriented programmes designed to attain the "competitive insertion into markets of family farms" (MINAGRI, 2007). The main government agency charged with furthering the development of small farmers is INDAP, although other agencies have specific responsibilities, including INIA, Banco Estado, SAG, FOSIS and SENCE. The specific programmes implemented by these agencies were described in Chapter 2. Their overall aim is to improve farmers' technical productivity and quality control, to introduce them to new products, and to link them to new and dynamic markets, where economies of scale can be captured through producer associations (MINAGRI, 2007).

The main concern of this chapter is with how government policies can foster a more inclusive development process. The two core questions we address are: first, what policies are appropriate for agriculture-dependent households? Second, what is the specific role for agricultural policy? The main aim is to determine whether the targeting of suitable policies to relevant constituencies can be enhanced.

In tackling these questions, it is important to acknowledge the heterogeneity of Chilean agriculture, even within the traditional sub-sector. Differences in land endowments, access to inputs, skills and training, as well as demographic factors such as age, gender and ethnicity, mean that opportunities and constraints differ enormously, and that there is no unique policy solution for all small farmers. It is also important to recognise that, for the majority of agriculture-dependent households, the long-term (*i.e.* inter-generational) future lies outside the sector. International experience shows that as economies grow and develop, the share of labour employed in agriculture declines (and gets closer to the sector's share of GDP). Agriculture's share of employment (and GDP) naturally depends on the country's inherent comparative advantage, but in few developed OECD countries does the sector's share of total employment exceed 5% (Figure 3.1). In





Note: For employment, 2002 data for China, 1995 data for India, 2003 data for South Africa.

Source: World Bank, World Development Indicators, 2007.

Chile, agriculture's share of the labour force declined from about 20% in 1986 to 12.5% in 2006. Yet primary agriculture's share of GDP is less than 4% (close to the average in many developed OECD countries). The difference between these two ratios suggests that labour's share of employment will need to decline further in the future.

Accordingly, the focus of this chapter is on identifying policies that can facilitate the adjustment of agriculture-dependent households to more profitable activities, either within or outside the sector. The structure is as follows: in Section 3.2 we specify a typology of agriculture-dependent households with different possible development pathways, and preview a range of relevant policies. In Section 3.3 we describe the characteristics of agriculture-dependent households, with a particular emphasis on their levels and sources of income. We also present information for different regions of the country. In Section 3.4 we identify possible development pathways and match these to suitable policy instruments. The main implications for agricultural policy reforms are summarised in Section 3.5.

### 3.2. A typology of households and development pathways

The focus of this chapter is on lower income households that depend on agriculture for their livelihoods. Within this constituency, we identify two distinct groups: self-employed farm households and salaried agricultural workers. As will be seen, the second group has become increasingly important in view of the rise in labour-intensive agro-food production and exports. The main source of information is the CASEN surveys, which provide information on levels and sources of income, as well as socio-economic factors. The most recent survey available for analysis was the one conducted in 2003, although some summary information – which suggests significant changes in the incidence and profile of poverty – was available for 2006. For structural information, such as land ownership and agricultural production, we are limited to studies based on the 1997 Agricultural Census, as the 2007 was still underway when this study was being prepared.<sup>1</sup>

We define an agriculture-dependent household as one where either the household head declares that his/her main occupation is in primary agriculture, or at least 50% of autonomous income (*i.e.* excluding public transfers and imputed rent) is earned from agriculture. Agriculture-dependent households are then stratified into five categories, comprising three types of farm household and two types of salaried worker. The farm household group contains employers (those with more than five workers), and self employed agricultural households with one and with two to five employees. Salaried workers are classified according to whether or not they are permanent.<sup>2</sup>

Having described the characteristics of these households, we then seek to specify a set of possible development pathways, and the policy instruments that would be most helpful. For farm households, the main pathways we identify are i) becoming more competitive within agriculture (increasing incomes via productivity improvements); ii) remaining within agriculture but improving incomes by diversifying income sources (within or outside the agricultural sector); and iii) leaving farming for salaried work (within or outside the agro-food sector). In addition, it is important to recognise a fourth category of households, comprising those who have little adjustment potential, and for whom adjustment via one of the routes above is likely to be an inter-generational phenomenon. In the case of salaried households, the adjustment issue is one of developing capacities to move onto higher paid work.

To facilitate development along each of these pathways, we identify a range of policies that may be appropriate. Agricultural policies have a significant (but not exclusive) role to play in enabling farm households to become more competitive within agriculture. Examples of policies here include public investments in agriculture (*e.g.* agricultural research and spending on rural infrastructure), and corrections of market failures (such as in the credit market). Non-agricultural policies are of primary importance for non-agricultural solutions (income diversification, exiting the sector), and include measures as investment in education and other sources of human capital, and labour market reform. Such non-agricultural policies may also help farmers becoming more competitive. Finally, non-agricultural policies such as transfer payments and pensions are also more appropriate for the case of farmers who have little or no scope for adjustment. In the case of salaried agricultural households, the key is providing the skills and human capital to move onto higher paid jobs, but in the immediate term labour market and social policies may have an important role. The aim of the analysis in this chapter is to be more specific in matching these generic policy prescriptions to household types and development pathways, and to delineate the specific role for agricultural policies within the overall policy mix.

### 3.3. Characteristics of the agricultural labour force and agriculture-dependent households

#### **Numbers of households**

As of 2003, approximately 790 000 people were employed in primary agriculture, accounting for slightly more than 13% of the country's labour force. This total exceeds the rural labour force (about 710 000) due to the fact that there are large numbers of people employed in agriculture who work in what are officially designated as urban areas.<sup>3</sup> Indeed, only 57.2% of the agricultural workforce lives in rural areas, while on the other hand 63.9% of the rural population is engaged in agriculture (Table 3.1). There are

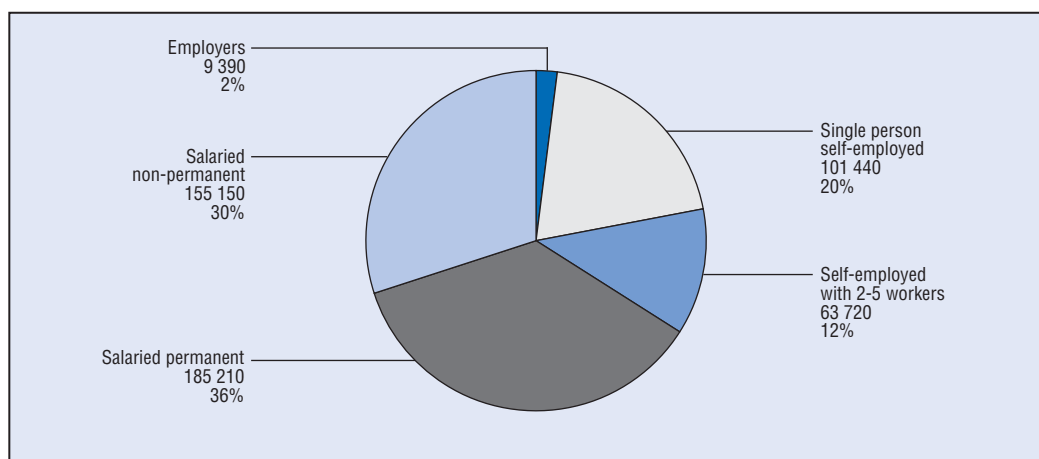
Table 3.1. **Agricultural and non-agricultural labour force by residence and region, 2003**

Region	Agricultural labour force (%)		Non-agricultural labour force (%)		% Agricultural	% Rural	Total labour force
	Urban	Rural	Urban	Rural			
I	4.2	2.9	90.7	2.1	7.1	5.0	163 908
II	3.5	0.5	95.1	0.9	4.0	1.4	191 432
III	11.6	3.9	81.7	2.8	15.5	6.7	95 687
IV	9.7	12.9	69.7	7.8	22.6	20.6	230 720
V	6.9	5.3	84.2	3.5	12.3	8.8	583 492
RM	2.6	1.4	94.4	1.6	4.0	2.9	2 649 229
VI	13.8	19.0	58.2	9.0	32.7	28.0	311 068
VII	9.0	22.3	58.2	10.5	31.3	32.8	352 558
VIII	7.5	10.9	76.5	5.1	18.4	16.0	646 963
IX	6.1	20.1	65.0	8.9	26.1	29.0	287 911
X	8.1	18.7	63.0	10.2	26.9	28.9	392 228
XI	11.8	9.9	70.9	7.3	21.8	17.3	37 411
XII	7.3	2.1	89.1	1.5	9.4	3.6	60 468
Total	5.6	7.5	82.6	4.3	13.1	11.8	6 003 075

Source: Valdés and Foster, 2007, based on 2003 CASEN.

substantial differences among regions. For example, the Metropolitan Region (RM) is a significant agricultural employer, yet more agricultural workers in this region are classified as urban than as rural. In contrast, agricultural labour is predominantly rural in regions VII to X. These shares point to the fact that agricultural policies and rural policies are not the same thing.

According to our definition based on the 2003 CASEN, there are approximately 515 000 agriculture-dependent households, of which 340 400 are salaried wage earners (corresponding to 66.1% of the total); 165 200 (32.1%) are self-employed farm households; and approximately 9 400 (1.8%) are employers (Figure 3.2). In other words, two-thirds of agriculture-dependent households are wage earning employees, a proportion that has been more or less stable for the past 15 years. About 46% of salaried workers are non-permanent, while 61% of self-employed agricultural households contain just a single

Figure 3.2. **Numbers of agriculture-dependent households, by category, 2003**

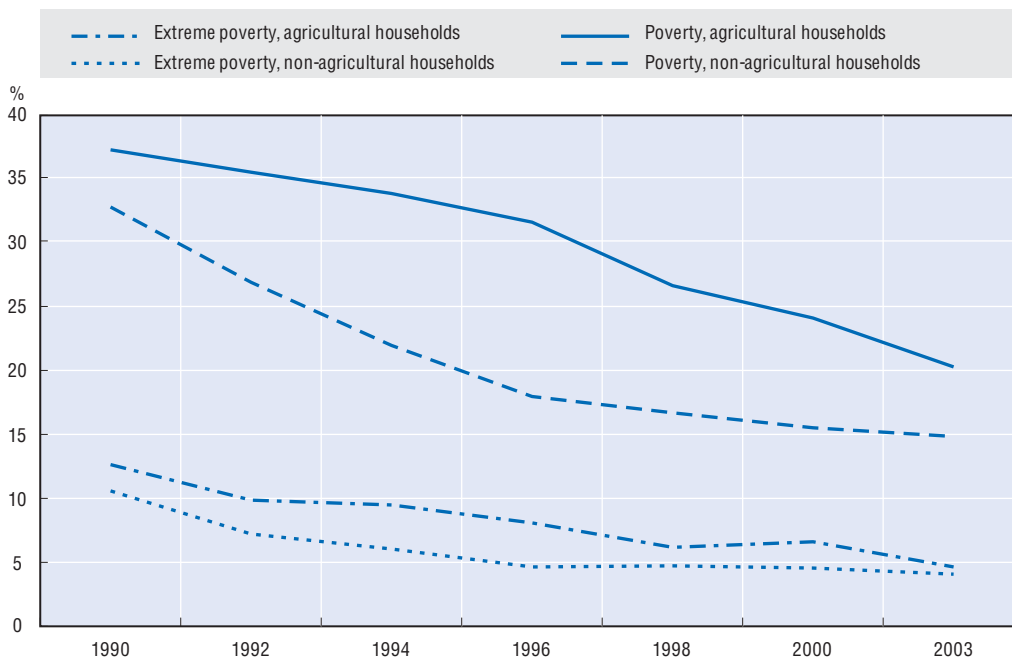
Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

operator. About 60% of self-employed households report no sales, and most of these are in the single operator group. The total of 515 000 families represents about 2 million people, or approximately 13% of the 2003 population of 15.8 million.

### Income levels and composition

The incidence of poverty among agriculture-dependent households is higher than among non-agricultural households (20.7% versus 14.6% in 2003); while the incidence of extreme poverty (“indigence”) is similar (less than 5% for both groups) (Figure 3.3).<sup>4</sup> For both agricultural and non-agricultural households, there has been more success in reducing poverty than in eliminating the small but significant kernel of extreme poverty. According to the official definition of “rurality” the incidence of poverty and extreme poverty among agricultural households is higher in urban than in rural areas. Moreover, the absolute numbers are higher too. Partly this reflects the narrow definition of what is rural, and partly it is a consequence of high-value (labour-intensive) crops being produced in peri-urban areas (Table 3.2). The latest CASEN, from 2006, suggests that there have been significant changes in the level and composition of poverty in recent years. The results of this survey were not available in time for incorporation in this study, but the main findings are summarised in Box 3.1.

Figure 3.3. **The incidence of poverty and extreme poverty among agricultural and non-agricultural households, 2003**



Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

On average, the incomes of non-agricultural households are higher than those of agricultural households, and have increased more rapidly (Figure 3.4). Self-employed agricultural households with two to five workers earn similar incomes to non-agricultural households, but self-employed agricultural households with one worker earn little over half the non-agricultural average, while salaried agricultural workers earn even less

Table 3.2. **Incidence of poverty and extreme poverty, by location and activity, 2003**

	Urban labour force			Rural labour force		
	Extremely poor (%)	Poor (%)	Total	Extremely poor (%)	Poor (%)	Total
Agricultural	4.2	22.2	337 632	3.4	13.2	450 298
Non-agricultural	1.4	9.3	4 897 263	1.4	7.0	252 048
Total	1.6	10.1	5 234 895	2.7	11.0	702 346

Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

### Box 3.1. Poverty changes between 2003 and 2006

The incidence of poverty fell substantially between 2003 and 2006, from 18.7% to 13.7%. The percentage of non-indigent poor decreased from 14.0% to 10.5%, while the percentage of indigent individuals went down from 4.7% to 3.2%. The absolute numbers of poor but not indigent decreased by 24% (to 1 692 200 in 2006) while indigence fell by 28.9% (to 517 000).

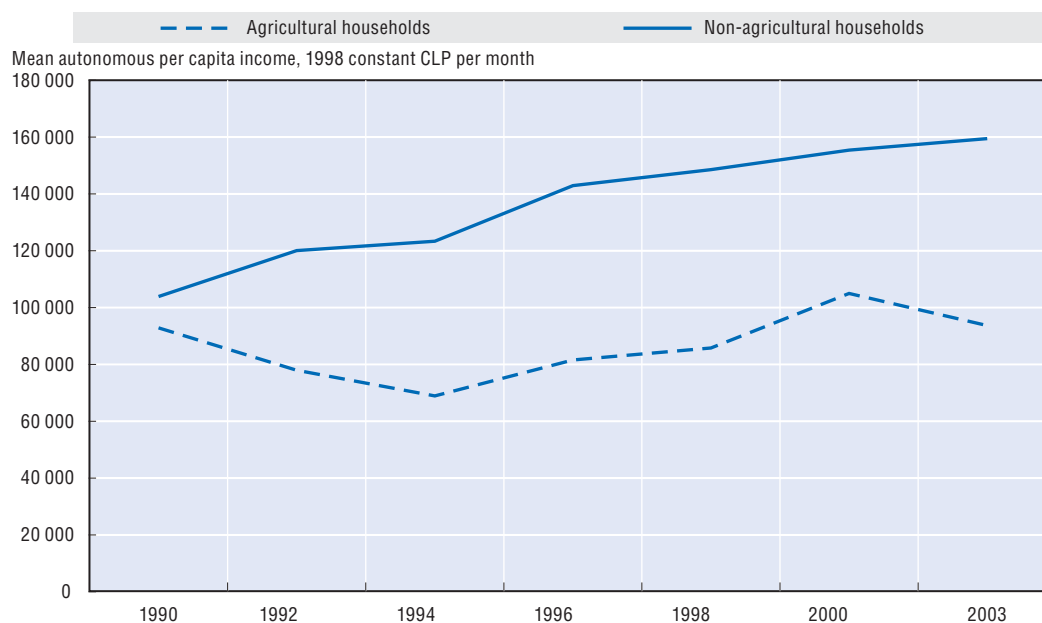
The percentage of *households* that are poor decreased from 11.4% in 2003 to 8.5% in 2006, while the share of indigent households fell from 3.9% to 2.7%. In 2006, there were 370 200 poor but not indigent households, and 118 100 indigent households.

For the first time, the incidence of rural poverty (12.3%) is lower than that of urban poverty (13.9%). However, the rate of indigence is slightly higher in rural areas (3.5% versus 3.2%).

In absolute terms, Chile's poverty remains predominantly urban. At the end of 2006, 88.5% of the poor and 86.1% of the indigent lived in urban areas.

Finally, the incidence of poverty among the indigenous (mostly Mapuche) has started to converge on that of the non-indigenous population. The incidence of poverty among the indigenous decreased from 29.4% in 2003 to 19% in 2006, compared with a reduction from 18.1% to 13.3% for the non-indigenous population.

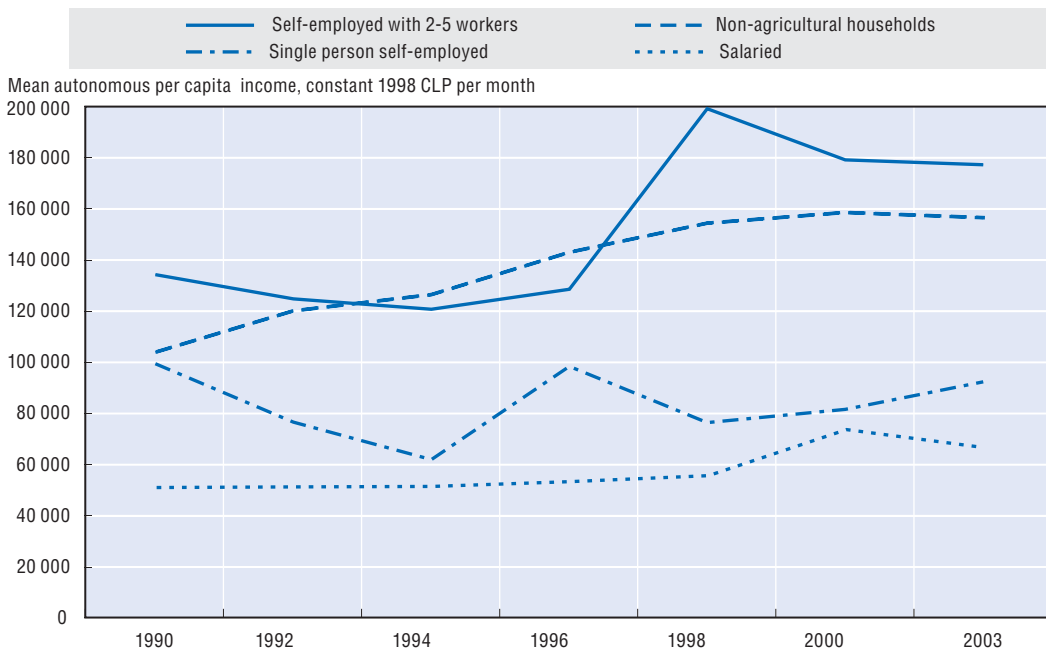
Figure 3.4. **Agricultural and non-agricultural income, 1990-2003**



Source: MIDEPLAN, CASENs, 1990-2003; OECD calculations, 2007.

(Figure 3.5). There has been little convergence between agricultural and non-agricultural incomes since 1990. Agricultural employers (not shown in the graph) continue to earn several times more than the other groups represented; indeed, the income gap has widened in recent years.

Figure 3.5. **Incomes of agriculture-dependent households, by type, 1990-2003**



Source: MIDEPLAN, CASENs 1990-2003; OECD calculations, 2007.

If we decompose the group of self-employed agricultural households, we see that the poverty profile of small farm households with one worker and no off-farm income corresponds closely to that of salaried agricultural workers. For farm households, having diversified income reduces substantially the probability of being poor (Table 3.3). In the case of single-operator farm households, having no off-farm income increases the chances of being extremely poor from 2% to 6%. Note that farmers tend to have a more dispersed distribution of income than salaried workers, which translates into a greater relative indigence among single-operator farm households than among salaried worker households, even though mean incomes are about the same.

Table 3.3. **Poverty profile of self-employed farm households by farm size and income source, 2003**

	1-person farm		2-5 persons farm	
	100% income from agriculture	< 100% income from agriculture	100% income from agriculture	< 100% income from agriculture
Extremely poor	6.2	2	3.2	2.4
Poor	11.3	5.8	11.5	4.2
Not-poor	82.5	92.2	85.3	93.4

Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

### **Regional and demographic aspects**

The data on average incomes across household groups mask important regional differences. The graphs illustrating these differences are contained in Annex 3.A1.

Agriculture makes a particularly important contribution to GDP in regions VI, VII and IX, where its share exceeds 15%. Agriculture's share of GDP is also around 10% in regions IV and X (Figure 3.A1.1).

The sector's share of regional employment is approximately double its share of GDP in each of these major agricultural regions, pointing to the relatively low productivity of labour employed in agriculture (Figure 3.A1.2). This is the origin of relatively low incomes within the sector.

The share of agriculture in regional employment masks a rather different picture in terms of the number of people employed in agriculture in each region. The labour force increases from about 92 500 in region VI to about 106 000 in region VII, with the Metropolitan Region a significant agricultural employer. The absolute numbers are at their highest in regions VII to X (roughly 100 000 in each region) (Figure 3.A1.3).

Even where the absolute numbers employed are similar, the structure of agricultural employment varies considerably across regions. Self-employed households are relatively important in regions VIII to X. Non-permanent (mostly seasonal) work is important in regions VI to VIII, but the pattern is very different to that of permanent salaried work, which is the norm in the Metropolitan Region and region X (Figure 3.A1.4).

In most regions, a third or more of non-permanent salaried worker households are poor. Their situation is typically much worse than that of permanent salaried households, where the highest incidence of poverty is less than 25% (region IX) (Figure 3.A1.5). In each region, the incidence of poverty among self-employed agricultural households is lower still, exceeding 20% in just one region (VIII) and greater than 10% in three (IV, IX and X).

Among salaried agricultural households, the incomes of those with permanent contracts are consistently higher (30% higher or more). The Metropolitan Region stands out, with permanent workers earning twice as much as permanent workers in any other region (Figure 3.A1.6).

Only a small share of self-employed agricultural households are headed by women (less than 10% in nearly all regions). By contrast, more than 10% of salaried agricultural households are headed by women in five regions (IV to VII plus the Metropolitan Region) (Figure 3.A1.7).

In region IX, two-thirds of self-employed agricultural households and one-third of salaried worker households are indigenous (Figure 3.A1.8). Indigenous salaried workers earn similar amounts to other salaried workers, but the same is not true for indigenous self-employed farmers, who earn much less than other farmers in the region.

An increasing number of salaried agricultural workers are employed on large operations (more than fifty workers) (Figure 3.A1.9). Many of these are engaged in non-permanent work.

Salaried agricultural households have slightly more education than self-employed farm households (7.8 years versus 7.1 years for household members older than 15). Non-agricultural households receive much more education, with an average of 10.3 years in 2003. Since salary earning agricultural households have lower incomes, this underlines the fact that education does not automatically boost incomes. Its importance comes from the extent to which it raises the household's chances of making a "quantum" change to

higher paid alternatives. Salaried agricultural household heads are on average younger than self-employed (just over 40 as opposed to over 50), which suggests greater adjustment potential. Both categories have a similar dependency ratio (just over 0.5 for every person of working age). Self-employed farm households were slightly more dependent on public transfers, but these still accounted for less than 5% of household income.

### **Income equations**

Using the CASEN data, Valdés and Foster (2007) estimate income equations for self-employed agricultural households and salaried agricultural workers. The regression results are reported in Annex 3.A2 (the regressions are estimated for both groups separately and for the combined group). The logarithm of total autonomous income per adult equivalent (including remittances, but excluding government transfers and imputed rent) is regressed on a range of socio-economic and other variables, including age of the household head; years of education; gender of household head; dependency ratio; whether the family is indigenous; the dependence on agricultural income; and (in the case of salaried workers) whether employment is permanent or not. Regional effects are also taken into account. The benefit of these regressions is that it is possible to isolate the effects of specific factors, by holding other variables constant. The main findings are as follows:<sup>5</sup>

- If the farm household has no off-farm income, then diversifying income sources is an important way of raising total income. This is important for the 60% of self employed farm households that are out of the market altogether. But simply diversifying income is not associated with raising total incomes for households that already have multiple income sources.
- Education matters, but the effects are not linear. Self-employed households in which the household head has one to six years of education earn on average slightly more than 20% more than those in which the household head has no education. For permanent salaried household heads, the gain is about 30%. The gain in household income from having the head of household have six to ten years education as opposed to no education at all is nearly 40% for self-employed households, and slightly over 40% for salaried households.
- Households headed by males earn more than those headed by females, all other things being equal. In self employed agricultural households, male headed households earn about 20% more than female headed households; in the case of salaried households, the difference is about 10%. Often a female headed household corresponds to a single working mother, which lowers household income even further. Moreover, a household headed by a salaried male working permanently earns on average 50% more than a household headed by a female, salaried but not working permanently.
- Other things being equal, a permanent agricultural worker household earns about 35% more than a non-permanent one. In cases where the household has no income source other than non-permanent salaried work, the household is typically extremely poor. Among households headed by non-permanent salaried workers, 8.4% are indigent, and a third fall below the official poverty line.
- Indigenous households have lower incomes, but the effect is more pronounced for self-employed households than salaried workers. While the head of household being indigenous reduces household monthly income in the case of salaried-worker families by about 5%, the reduction is slightly more than 20% for the self-employed farm family.



- Turning to the regional effects on income, for salaried workers all regions except XI and XII have lower incomes than the Metropolitan Region. The greatest negative impact is found in Regions IV, VII, VIII and IX, and the least impact is found in Regions I, II, VI and XI. For self-employed households, other things equal, all regions except VI have lower incomes than the Metropolitan Region.

### **Structural characteristics of Chilean agriculture**

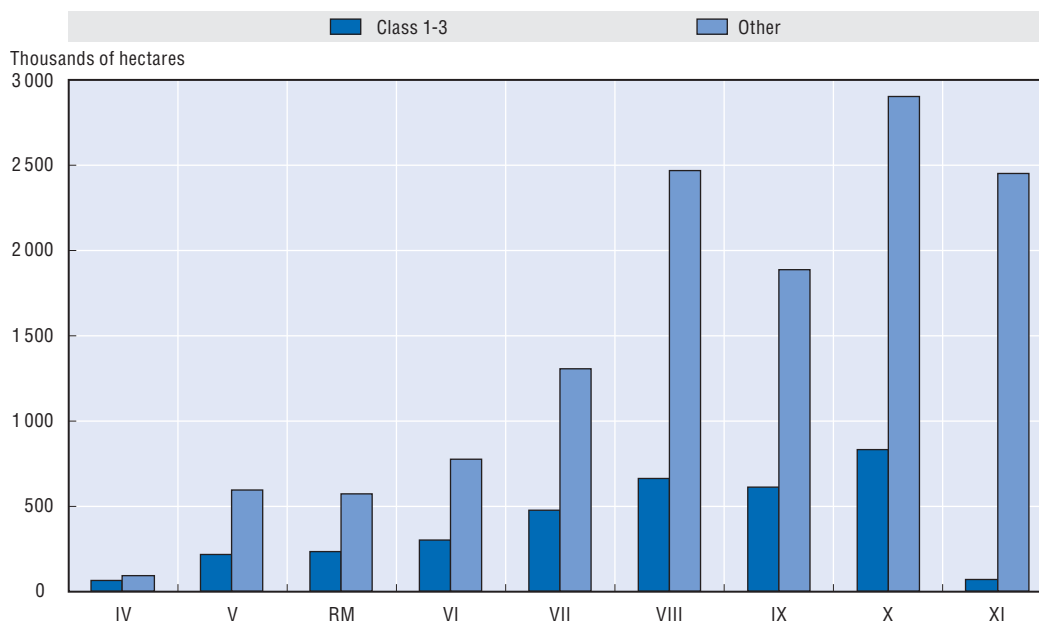
In general, there is a lack of information linking the structural characteristics of farms to the income earnings of related households. Indeed, the analysis in this chapter suffers from data limitations that will only be partially addressed by the 2006 CASEN and the 2007 Agricultural Census. First, the CASEN surveys, the only available household-level data in the country, have not been designed to analyse the agricultural sector and their representativeness of the sector is not ideal. Second, the Agricultural Census lacks information on certain crops (horticulture, fruits, flowers and forestry); does not contain any information on how much farmers sold of what, where and at what price; does not have information on participation in public programmes; and contains little socio-demographic and economic information which would facilitate linking the Census with other datasets (surveys) to estimate, for example, farmer's income.

Nevertheless data from the 1997 Agricultural Census has been reconciled with the 1996 and 1998 CASEN surveys by Melo and Lopez (2006). Their analysis indicates that off-farm income makes up a low proportion of total household income for families headed by persons self-employed in agriculture (farmers). These households produce principally non-tradable and import-competing products. The structural features of small farm households are outlined in Annex 3.A3.

The official definition of "small" farm households is based on multiple criteria, of which area is just one. Other criteria include access to capital and technology, market orientation and agro-climatic potential. In Chile, area is weakly linked to productive potential. There are many large plots with sterile soils which are not cultivated in some mountainous, semi-arid, desert and forestry areas. On the other hand, in areas like the interior valleys of the semi-arid zones, a farm with only 10 hectares of grapes or with even less with flowers can have high revenues and be classified as medium or even large (Apey and Barril eds., 2006). Although most small farms in Chile have little land, physical size is often not the most important driver of enhanced competitiveness; other factors, such as working capital, technology, managerial training and market insertion, play an essential role.

A study of soil quality undertaken by CIREN classified soils into eight classes, according to their suitability for growing different crops. Class 1 includes the most fertile soils, with few restrictions to cultivation. Classes 2 and 3 have few to moderate limitations impeding the cultivation of certain crops and require only moderate conservation practices. Classes 4 and 5 soils have severe limitations and need careful conservation practices, while classes 6 and 7 soils have only grazing and forestry uses. Class 8 soils have no agricultural, pasture or forestry value. If we consider the first three classes as "good" available agricultural land, then we see that central regions have a somewhat higher percentage of good soils but a far lower absolute amount than in regions VII to X. Although agro-climatic conditions are not solely a question of soil quality, this suggests that there is some scope for agricultural intensification (and expansion) in Southern regions, where most of the land cultivated by small farmers is located.

Figure 3.6. Hectares of agricultural land by class and region



Source: CIREN, 2007; OECD calculations, 2007.

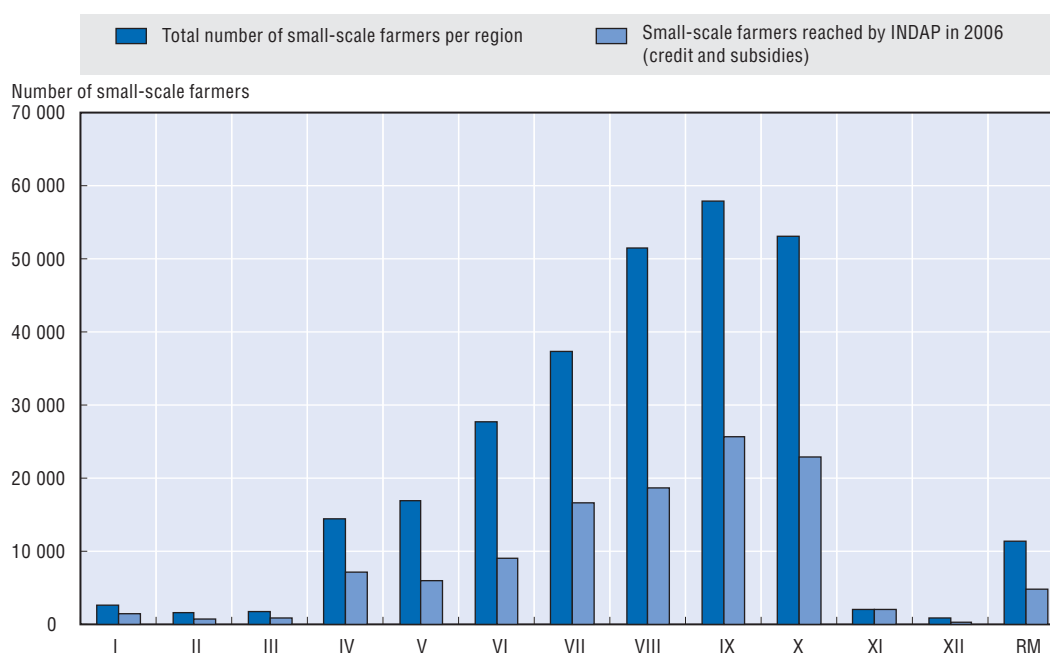
Why has agricultural growth been concentrated among commercial farms in the central regions? The explanation seems most likely to lie in broader aspects of underdevelopment, such as weak infrastructure and a lack of management skills. Diaz (2007) considers the specific constraints to development in one of these regions (VII, Maule), and concludes that there are a number of small scale farmers, who, supported by suitable policies, could profitably switch from growing staples and import-competing crops with inefficient technologies to producing export crops (notably fresh fruits). He further suggests that public policies have not always targeted those with potential, or worked coherently. For example, INDAP's smallholder programmes have restrictive eligibility criteria, and when they do support a potentially viable enterprise, are compromised by a lack of other supporting public investments (e.g. in infrastructure). The findings of this analysis are summarised in Annex 3.A4.

The potential for agricultural growth suggests a facilitating role for government, but does not alter the fact that, over time, more small farm households are likely to diversify out of the sector than become competitive within it. Agriculture in these regions could nevertheless prosper in absolute terms, and offer employment opportunities for some poorer households, while the next generation prepares for higher paid skilled jobs.

### **The reach of smallholder programmes**

The main agency charged with development of the smallholder sector is INDAP. INDAP provides credit and subsidies to smallholders, with a view to facilitating their insertion into commercial structures. The agency's mandate is wide, but its reach is relatively low across regions (Figure 3.7), corresponding in 2006 to 42% of small farmers identified in the 1997 Agricultural Census. To some extent this may be because the smallest and most remote farmers may simply not be aware of their possibility of obtaining INDAP loans. On the other

Figure 3.7. The reach of INDAP programmes, 2006



Source: INDAP, 2007a.

hand, there are other (potentially viable) farmers who do not benefit from INDAP programmes because they marginally exceed the maximum size requirement (Diaz, 2007).

A key pillar of INDAP's policies is the provision of credit. These credit programmes account for one-third of INDAP's transfers and a similar share of the number of smallholders that are reached. INDAP has had a problem with repayments in the past (the default rate on loans to smallholders was 30% in 2002), although the default rate has recently fallen to less than 10%. The other two-thirds of INDAP's support to smallholders is provided in the form of specific subsidies to farmers, either to improve their fixed assets (for example through the Soil Recovery Programme and investments in on-farm infrastructure), provide entrepreneurial and managerial skills, or to develop poor areas (Table 3.4).

Table 3.4. Reach of INDAP programmes (credit and subsidies), 2006

Programme	Number of beneficiaries <sup>1</sup>
Services for the development of productive and entrepreneurial capacities	26 686
Incentives for the development of agricultural investment	49 292
Services for the development of poor areas	47 772
Credit	70 166
Short-term credit	31 954
Long-term credit	12 555
BAF (coordinated credit)	16 257
FAD (coordinated credit)	9 400
TOTAL <sup>2</sup>	193 916

1. Beneficiaries include not only individual farmers but also farmer organisations.

2. The total number of beneficiaries in 2006 was 116 348 (based on RUT, i.e. different individuals/organisations). However, the total here is 193 916, because the same beneficiary can have access to different services.

Source: INDAP, 2007a.

### 3.4. Strategic options for agriculture-dependent households

The premise of this chapter is that different types of agriculture-dependent household will have different potential pathways to improved incomes over the long term, and correspondingly different policy requirements. In setting out policy options that can foster more inclusive agricultural development, the need is to map across the three dimensions of household types, potential development pathways, and associated policy instruments.

In terms of household types, a distinction has been made between farm households (ordered by size, and differentiated by region, income sources and other characteristics), and those in which the head of household or main earner is a salaried agricultural worker (whether permanent or temporary).

In the case of **farm households**, total incomes can be improved by a) enhancing the productivity (competitiveness) of the farm operation; b) supplementing farm income with income from other sources; or c) leaving the farm sector for salaried work, possibly in the agribusiness sector. There is typically some scope for medium term adjustment by the farm operator and family members, but the deeper changes are likely to be through inter-generational career choices. In particular, the children of farmers, given improved education and training, may seek skilled work outside the sector.

For **salaried worker** households, there are two main routes to higher incomes: supplementing farm wages (which may be seasonal) by income from other sources; and finding higher paid work in other sectors. In many cases the adjustment is also likely to be inter-generational and to occur not by the head of household, but by another family member (*e.g.* a son or daughter) finding a job outside the agricultural sector.

In order to assign relevant policies to these household groups, two points need to be underscored. The first is that the salaried worker group is larger than that of farm households, accounting for two-thirds of agriculture-dependent households. Moreover, salaried-worker families have a higher incidence of poverty than the self-employed and, when headed by non-permanent workers (mainly seasonal), poverty rates are even higher. In general terms, this implies that public policies (though not necessarily *agricultural* policies) need to be as concerned with the livelihoods of farm workers as they are with those of farm operators.

The second point is that for the remaining one-third of agriculture-dependent households that are headed by farm operators, agricultural growth has done little to raise the incomes of the majority. Looking forward, it is improbable that large numbers of smallholders can become commercially successful. The corollary here is that agricultural policy should not be biased against poorer farm households that seek to improve their incomes by diversifying their income sources or exiting the sector.

These two observations mean that agricultural policies are likely to be a limited subset of the overall range of policies relevant for agriculture-dependent households. A correspondence between development pathways and policy instruments is described in Table 3.5. The development pathways are described in the columns, and the policy instruments in the rows. The first column (improving competitiveness within agriculture) applies to farm households, but the others are valid for both farm households and salaried worker households. Note that the development pathways (columns) are not mutually exclusive: for example, one household member can enhance the farm's competitiveness while another provides off-farm income. Also, the instruments (rows) do not exhaust all possible policies, but focus on those with persuasive arguments.

For salaried workers, the key policy areas are likely to be investments in human capital (notably education for the young and vocational training for the older), regional policies to help build a diversified economy with both skilled and unskilled job opportunities; and labour market reforms to raise employment opportunities and wage incomes. For farm households, only a minority have operations that are likely to be commercially successful in the long term, and it makes sense that agricultural policies should focus on this constituency. For the majority, income diversification and finding employment outside the sector are likely to be more important, and the priorities are similar to those for salaried agricultural workers. Agricultural policies may have a role, but they are not the foremost determinant of development opportunities.

How then can policies be tailored to the needs of households more precisely and what is the specific role for agricultural policy? In addressing this question, we take the different development paths described in Table 3.5 and discuss some of the specifics of instrument choice.

Table 3.5. **Strategic framework for more inclusive agricultural development**

Policy instrument	Development pathway				Safety nets for those unable to adjust
	Help farmers become more competitive within agriculture	Diversify income sources		Leave the sector for off farm work	
		Within agriculture	Outside agriculture		
<b>Investment in human capital</b>	Minor effects of formal education for this generation; technical training more appropriate for productivity.	Can help farm family members and rural workers move into skilled jobs	Important for farm family members and rural workers	Important for managing inter-generation change	
<b>Investment in infrastructure</b>	Helps with market integration	Helps improve local job opportunities		Can ease migration decisions for offspring	
<b>R&amp;D and extension</b>	INIA and private sector important; most gains have been from adoption and adaptive research.	Can expand agricultural employment (e.g. fruits and vegetables). Indirect impacts			
<b>Credit</b>	Should focus on correcting market failures				
<b>Labour market reforms</b>		Important for raising employment opportunities and wage incomes			
<b>Cash transfers (possibly conditional)</b>				Conditional school attendance may complement investments in schools	The most important policy for those unable to adjust
<b>Regional policies</b>	Important for improving market integration	Expanded non-farm activity would raise farm wages	Important for building a diversified rural economy with wider job opportunities		
<b>Develop producer associations</b>	Mixed success so far, except for input co-operatives.	Indirect impacts			
<b>Land policies</b>	Need to encourage rental markets and facilitate land purchases by small farmers			Restrictions on land sales make it difficult for farmers (notably indigenous) to liquidate assets	

### *Improving the competitiveness of farm households*

In respect of farm households, it is important to have a realistic view of which farmers are likely to succeed within the sector. Although farm numbers are likely to decline, this is likely to reflect the dynamics of structural change, which include a consolidation into fewer more efficient enterprises, rather than the inherent non-viability of farming in existing areas. Indeed, it was suggested in Section 3.3 that there is unexploited agricultural potential in the southern regions, where most of the land cultivated by small farmers is located, and that the main impediments to exploitation of those resources have been other elements such as weak infrastructure and poor management skills. Diaz notes in particular that more farmers in Region VII could be competitive if those constraints were eliminated by suitable investments, for example in infrastructure and research and extension (see Annex 3.A4).

The main role for agricultural policy would appear to be in providing public goods that can improve competitiveness, but impose few distortions to incentives at the margin (such as investments in infrastructure and in R&D). There is already evidence that such policy initiatives have yielded high returns for commercial export-oriented producers (see Chapter 2), and there is scope for those benefits to extend to a broader group of farmers as the sector continues to expand in absolute terms. Such investments are unlikely to crowd out the development of other activities and potential income streams.

The provision of public goods mostly involves spending at the economy-wide or sectoral level as opposed to payments to individuals. In allocating public goods, there is a need for some discrimination, for example at the regional level. On the other hand, the government cannot (and should not try to) judge at the individual level who will succeed and who will not. In practice, this should mean limited recourse to sector-specific, household-level expenditures, such as on on-farm infrastructure. The emphasis of household-specific policies should be on increasing households' available opportunities rather than constraining them to a specific development path. The key here is the development of human capital, notably education and transferable skills. There may also be a role for training and adjustment assistance.

An important area where policies are implemented at the individual level is credit. Access to credit is important for smallholders but INDAP's credit (both co-ordinated and direct) reached only 22% of its officially targeted constituency of smallholders in 2006, and was, by law, not available to potentially competitive producers who are too large to be eligible for INDAP's programmes but too small to receive commercial credit. In general terms, there is a need for more careful targeting. In providing credit, the aim should be to correct market failures rather than allocate on the basis of farm size. This is not primarily a question of interest rate subsidies, but of providing incentives for banks to engage with small borrowers (as is done through the BAF and FAD programmes described in Chapter 2). There is also evidence that other lenders (*e.g.* Banco Estado) may have a comparative advantage in making small loans, as they have the requisite infrastructure, with monitoring capabilities throughout the country.

Some farmers, probably those with superior management skills and the necessary endowment of physical resources have the opportunity to access global value chains. For these farmers, there may be organisational initiatives (both horizontally among farmers, and vertically along the value chain) that can help them make the transition to being competitive producers. Producer associations and co-operatives have a mixed record in

Chile, but may have a role to play. In many cases, small farmers seeking to improve their competitiveness will have to consolidate their operations. However, it is important to recall that often the constraint on competitiveness is not size itself, particularly if producers can form effective associations (Box 3.2).

Rental contracts can help compensate for market failures, provide flexible responses to economic and productive incentives, allow farmers to invest in farming capital, and help the poor and young gain access to land under conditions that are less demanding than those required to participate in land sales markets. Renting land may also be a first step to future land acquisition (Diaz *et al.* 2002). Yet while there are few formal restrictions on the operations of land markets, there is little renting of land. According to the 1997 Agricultural Census, just over 5% of farmers rent the land they cultivate, representing about 3.5% of the total cultivated land. The percentage of sharecroppers is even lower, at about 2% among small farmers. The high share of farms with irregular land titles, which reaches 23% among small farmers and concerns 9% of total cultivated land, impedes the development of rental markets. The highest percentages of rented farms are found in the more productive central regions, which are richer in natural resources and closer to markets. Sharecroppers are concentrated in regions VII and VIII, where agro-environmental conditions are less favourable and there are fewer financial resources. Most of irregular titled farms are found in the southern regions, from region VIII to X, where the majority of indigenous communities are located.

The land rental market is fragmented, with small farmers renting to small farmers and medium-to-large farmers renting to larger farmers. The main reason for this is the higher transaction costs incurred in negotiating with many small farmers as opposed to a single larger farmer. Also, many small farmers cannot afford to rent land that is located a considerable distance from where they live. It is estimated that the price paid by a small farmer can be 40% higher than that paid by a larger farmer (Ramirez, 2002).

The underdevelopment of rental markets puts a brake on the consolidation of land into more productive units, thus impeding agricultural investment and making it more difficult for uncompetitive farmers to diversify out of the sector. In the case of indigenous farmers, there are strict restrictions on land sales and on rental and sharecropping arrangements. Rent and sharecropping contracts cannot be established between indigenous individuals and individuals not belonging to an indigenous community and on land not belonging to the community. Furthermore, in order to rent out land, it is necessary first to obtain the authorisation of the Institute for Indigenous Development, for a maximum duration period of five years. This policy is motivated by concerns that go beyond conventional economic criteria, but nevertheless limits the already low potential of indigenous farmers and the incentives for exploiting improved non-farm opportunities.

Regional policies are an important determinant of the scope for agricultural development. It is easier for agriculture to develop when other sectors are succeeding too, and the development of infrastructure is keeping pace. The benefits are improved market integration for both purchases and sales, as well as increased incentives for business to locate to a developing region as the external economies of scale expand.

### ***Income diversification for farm households and salaried agricultural workers***

There is evidence that income diversification is important for many farm households. For the poorest farm households, which are typically wholly dependent on farm income,

### Box 3.2. The role of producer associations

Associative agreements can provide benefits to producers that they would not be able to realise individually: economies of scale; reduced transaction costs; the ability to negotiate and receive better prices for outputs and inputs; the potential to add value to primary production; and to reach domestic and international markets. Producers may also receive services such as technical advice, technology transfers, business and management advice, and irrigation infrastructure and accounting services. However, efforts to promote producer associations in Chile have met with only limited success. Echenique (2005) found that, among 40 enterprises that were identified by INDAP and other informants as potentially successful examples of farmers' organisations, only 9 were operating sustainably. Those with little working capital, with limited management flexibility and without enough market information for decision making were particularly vulnerable.

The low success rate is explained by several factors including: a weak associative tradition in the country and tendency for producers to "free-ride"; government efforts to accelerate the formation of organisations when the necessary conditions were not in place (leading to excessive dependence on the state); and a lack of technical skills and capacity among managers and administrators. In many cases there has been a lack of a viable commercial model with clear plans on profit generation and capital accumulation, the information systems developed (*e.g.* on prices and climate) have been insufficient for the farmers' decision making, and there has been a lack of formal accounting and control procedures. There have also been natural obstacles such as inherently low margins for producers trying to compete with bigger enterprises or sell to monopsonistic buyers.

However, there are some examples of successes. One of these is the Cooperativa Campesina Intercomunal Peumo Ltda (COOPEUMO). COOPEUMO is located in the O'Higgins region and is one of the largest rural co-operatives with 350 peasant family members. It has benefited from the help of public agencies such as INDAP, CORFO, PROCHILE, Banco Estado, INIA, SENCE and FIA, but has succeeded in graduating from this help and is now financially independent from public resources. COOPEUMO commercialises directly the production of its members, both domestically and internationally, and provides them with a wide range of services. These services include: sales of inputs and building material; credit; technical and managerial assistance; technological advice; information on market conditions, climate etc.; assistance with investment and commercialisation; tax advice and social benefits.

The co-operative itself attributes its success to several factors. First, farmers in the area have a higher potential and have more room to adapt their production, thanks to good natural resources, climate and location. Second, it has a team of experienced professionals (engineers, accountants and administrators) committed to help farmers, a market-oriented approach and over 30 years of experience. Third, it has decentralised and participative structures. Fourth, it sought support from public agencies and from NGOs, without aligning with any political party. Fifth, it was able to meet members' needs in an efficient way. Sixth, its management is transparent and accounting figures are freely accessible to members. Finally, it avoided squandering resources by according too many benefits to managers or writing off members' debts.

The case of COOPEUMO shows that, despite all difficulties, it is possible for farmers to create sustainable and viable co-operatives, but also that, in order to do so, several conditions need to be met. From a policy standpoint, the government may have a facilitating role, but experience suggests that it cannot force the pace, and needs make sure that incentives do not become subsidies that generate a culture of dependency.



this is likely to provide some insurance and is in effect a “coping” strategy. For other farm households, the direct links between off-farm income and total income are less clear, but having one or more family members draw income from outside agriculture may be the start of a successful move into more remunerative activities. The key policies required to help households diversify their income sources are again those that improve human capital.

Seasonal wage work within agriculture is mostly very low paid. In fact, non-permanent salaried agricultural workers have a higher incidence of poverty than all but the poorest of small farm households. The increasing rate of employment on large operations (of more than 50 workers) offers opportunities to some, but these are mostly low-paid jobs and fall short of providing a pathway to development in the broader sense. While unskilled jobs may be important for the poorest farm households, and may have helped reduce agricultural poverty, the ultimate need is for investment in the skills that enable farm families to undertake higher paid non-farm work.

### ***Leaving the sector for skilled employment***

As an issue of public policy, the conditions of salaried work are arguably more important than the development of small scale farm entrepreneurs. Labour market policies have an important role in ensuring that core standards of employment are met. Improved labour market flexibility has been suggested as a way of reducing informality (see Chapter 1), but reforms to labour policies are not likely to alter the fundamental tendency of agricultural jobs (particularly seasonal ones) to be poorly paid. Again, the key would appear to be investment in the education and skills that would enable households to obtain higher wages, typically outside the agricultural sector. Note that agricultural wages in the Metropolitan Region are almost double those in other regions. This may partly reflect cost-of-living differences, but suggest that the shift of labour into skilled jobs may tighten the labour market and raise unskilled wages too.

Regional development programmes may have a role in bringing jobs to people (rather than the other way round) and forestall the problems of migration into the cities. However, as noted earlier, rural policies are not fundamentally agricultural policies (nor *vice versa*). Regional income differences point to the need for public investments in poorer areas. Such regional policies can boost development within and outside agriculture, but without prejudicing individual household decisions.

### ***Indigenous households***

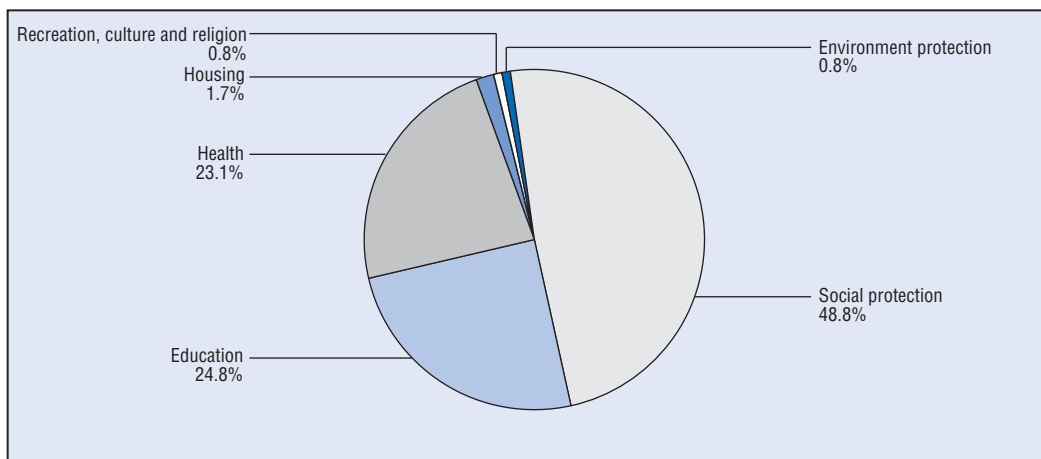
For the special case of indigenous farm families, which account for around 20% of self-employed agricultural households, there is a strong case for a territorial approach in region IX (where the vast majority live). It was noted that indigenous farm households tend to be poorer than other farm households, but the same is less true for indigenous salaried workers. This suggests that indigenous farmers face particular constraints to their development, some of which may be addressed at the regional level, others of which may require investment in human capital. The stimulation of pluriactivity beyond farming, as part of a territorial approach, would likely provide a greater boost to incomes than attempting to improve technical efficiency and production. There are also agriculture-specific constraints such as uncertainties over land rights and poorly functioning land purchase and rental markets (Valdés and Foster, 2007).

### Social policies

The emphasis of the policy discussion has been on household adjustment as a path to development. But many poor households, notably older ones, face severe limitations in their adjustment potential, irrespective of the policies that are in place (for example, post retirement age farmers). Hence there is a strong need for social programmes. These policies can lift households out of poverty even if they cannot deliver “development”. Investments in human capital (notably education) and measures such as contingent cash transfer can ensure that the next generation makes a quantum leap in terms of development. Chile has a comprehensive set of social programmes, which means that agricultural policy does not have to address social issues. This means that economic objectives can be separated from social ones and the performance of policies relative to their objectives can be evaluated more clearly.

Social spending in Chile was around 12.1% of the GDP in 2006, a proportion that exceeds the OECD average of around 10%, and that spending accounted for two-thirds of central government expenditures. Nearly half of all expenditures are on social protection, with the remaining half dominated by spending on education and health (Figure 3.8). A key programme is *Chile Solidario*, overseen by the Ministry of Planning (MIDEPLAN), which provides several forms of support including monthly income support, subsidies for potable water, and specific payments for elder people, children and people with disabilities.

Figure 3.8. **The composition of government social spending, 2006**



Source: DIPRES, 2007.

### 3.5. Conclusions

Analysis of the levels and sources of incomes of agriculture-dependent households underscores the need for a disaggregated approach to the design of agricultural development policies. If the fundamental aim is to improve the long-term incomes of agriculture-dependent households (both farm households and salaried workers) then the basic orientation of policies needs to be towards measures that increase households' earnings potential, but without distorting their decisions on whether that should be within or outside the sector.

For salaried agricultural workers, the most important policies are likely to be non-agricultural. Given that for most agriculture-dependent households the long term (i.e.

inter-generational) future is likely to lie outside the sector, the same is true for the majority of farm households. While agricultural policies do have a specific role they need to be situated within the broader context of economy-wide and regional policies.

The specific role for agricultural policies needs to be centred around improving the competitiveness of potentially viable farm households, with non-agricultural policies and social policies addressing the needs of those with better prospects outside the sector, or who have difficulty in adjusting. In terms of smallholders this means targeted measures to correct the specific market failures they confront and complement broader investments in public goods (such as infrastructure), which improve competitiveness across the sector more generally. For many smallholders however, including those that are potentially competitive within agriculture but could have even better opportunities elsewhere, the highest returns are likely to come from investing in human capital and thereby developing transferable skills.

The government is not in a position to judge which farmers are potentially competitive at the individual level, but a degree of targeting is necessary. One way is to target investments to regions where specific agricultural activities are potentially profitable. A second filter is to require that farmers apply for assistance (rather than simply receive it) and present a substantiated business plan. Recently introduced smallholder credit policies, which focus on correcting underlying market failures, rather than subsidising interest rates, also represent a way of channelling resources to the potentially viable. In general terms, however, the more the government can pay for supportive public investments and avoid farm-specific subsidies, the fewer the distortions to farmers decisions over whether they should invest in the farm or take the opportunity to diversify their income sources or seek out non-farm opportunities.

Such a formulation of agricultural policies would involve a refinement of the criteria for policy targeting, and the limitation of subsidies to the correction of market failures and the provision of public goods. These elements of policy design already exist in Chile, so the changes involved would amount to a change in emphasis rather than a fundamental reorientation.

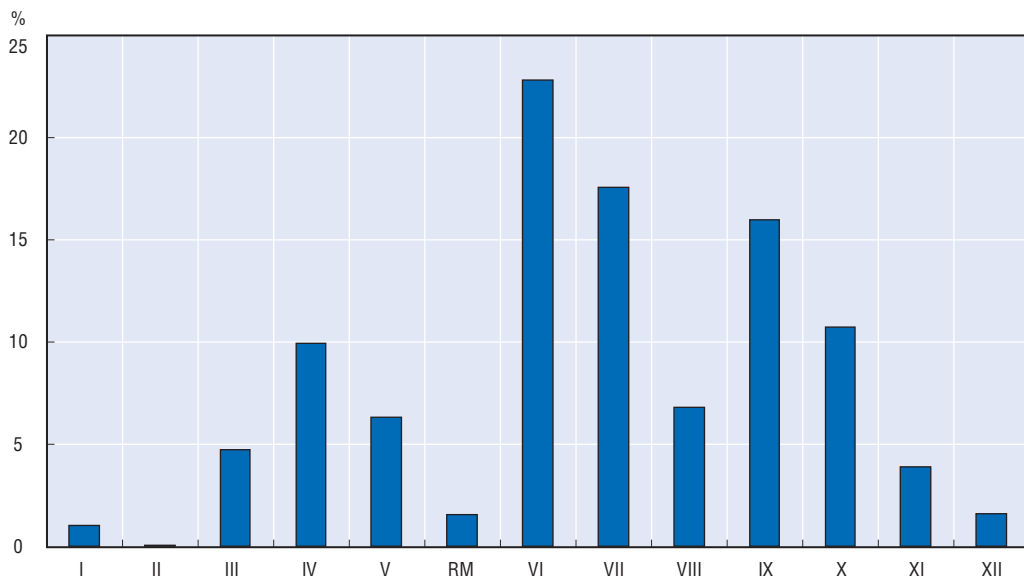
## Notes

1. The latest available CASEN survey is from 2003. Results of the 2007 Agricultural Census were not fully available in time for this study. Note that in the absence of complementary and compatible information on markets and incomes it is not possible to fully link information on farm structures to a description of farm household incomes.
2. The chosen classification reflects the use of the CASEN data on incomes. Classifications based on structural criteria (such as those making a distinction between “subsistence”, “transition” and “consolidated” farms, Melo and Lopez, 2006) are not possible with these data alone.
3. Chile adopts a narrow definition of what constitutes a rural area. The proportion of people living in rural areas almost doubles if one adopts a broader definition based on population density and travel time to a major city (de Ferranti *et al.*, 2005).
4. The extreme poverty line is set at the cost of a basic food basket, while the poverty line is set at twice the cost of a basic food basket in urban areas and 1.75 times the cost in rural areas.
5. For a more detailed interpretation of the regression results, the reader is referred to Valdés and Foster (2007).

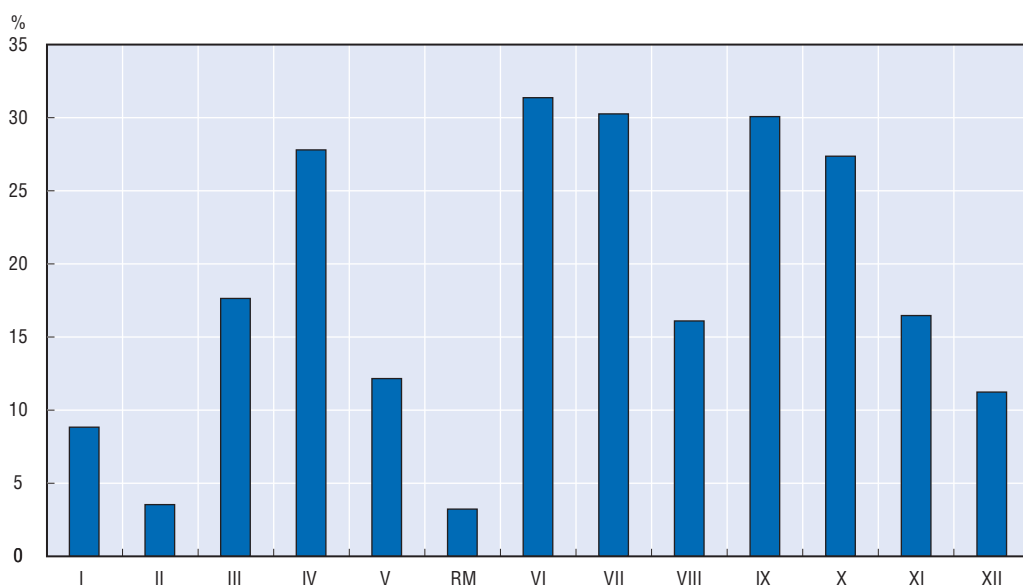
ANNEX 3.A1

*Regional Aspects of Agricultural Incomes in Chile*

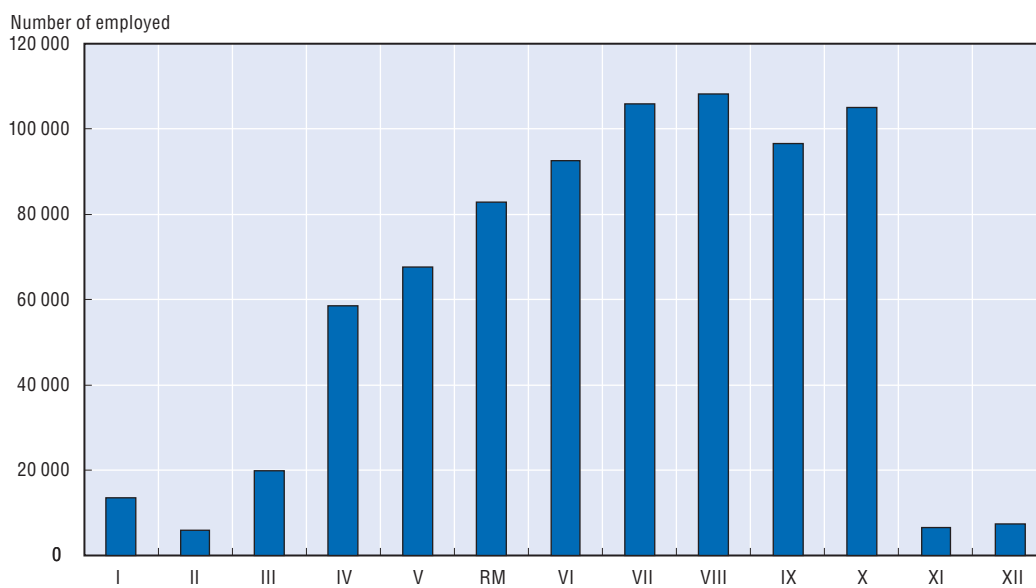
Figure 3.A1.1. **Share of agriculture in regional GDP, 2003**



Source: ODEPA-Chilean Central Bank, 2007; OECD calculations, 2007.

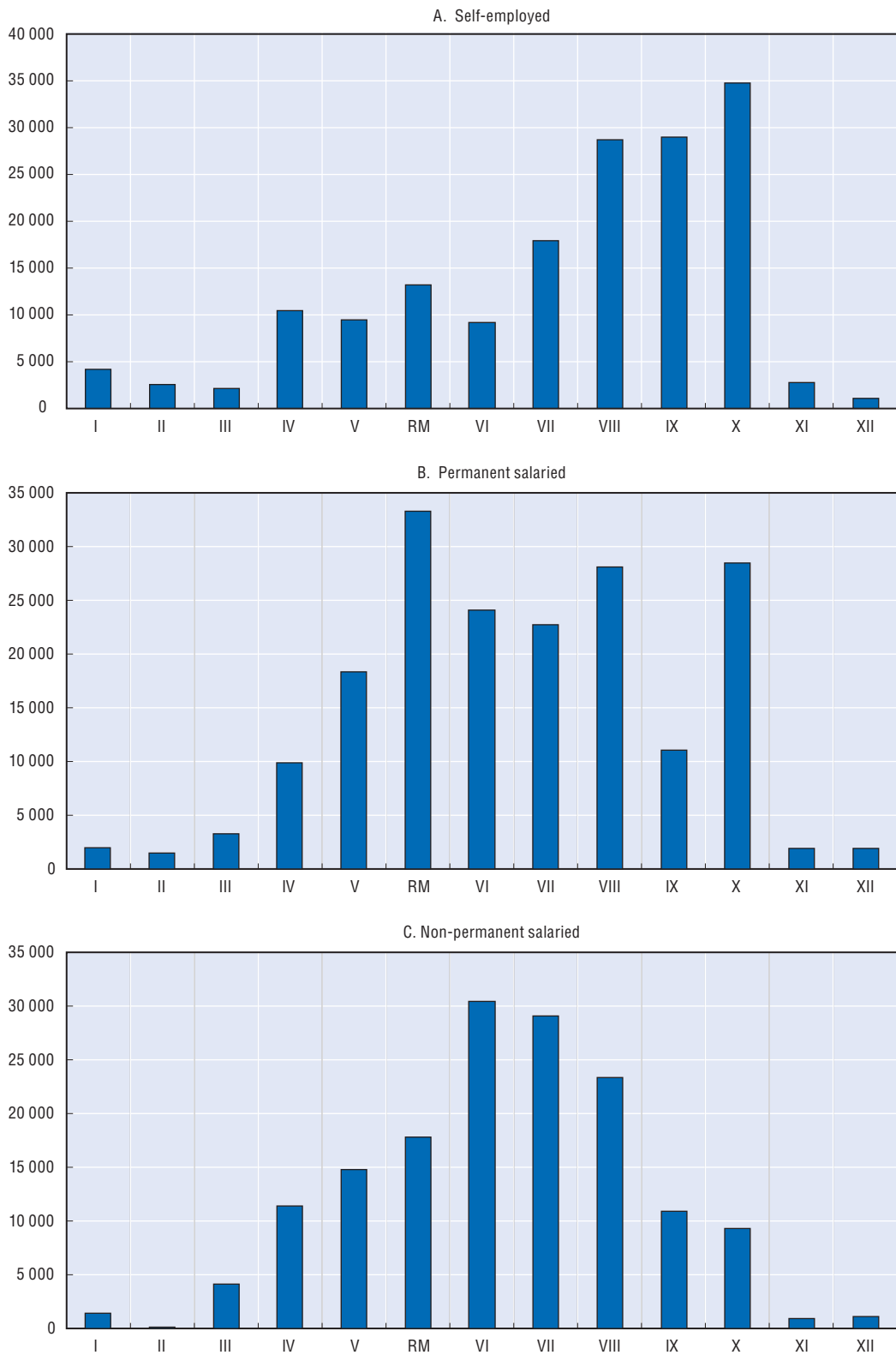
Figure 3.A1.2. **Share of agriculture in regional employment, 2003**

Source: INE 2003 Employment Survey; OECD calculations, 2007.

Figure 3.A1.3. **Agricultural labour force, 2003**

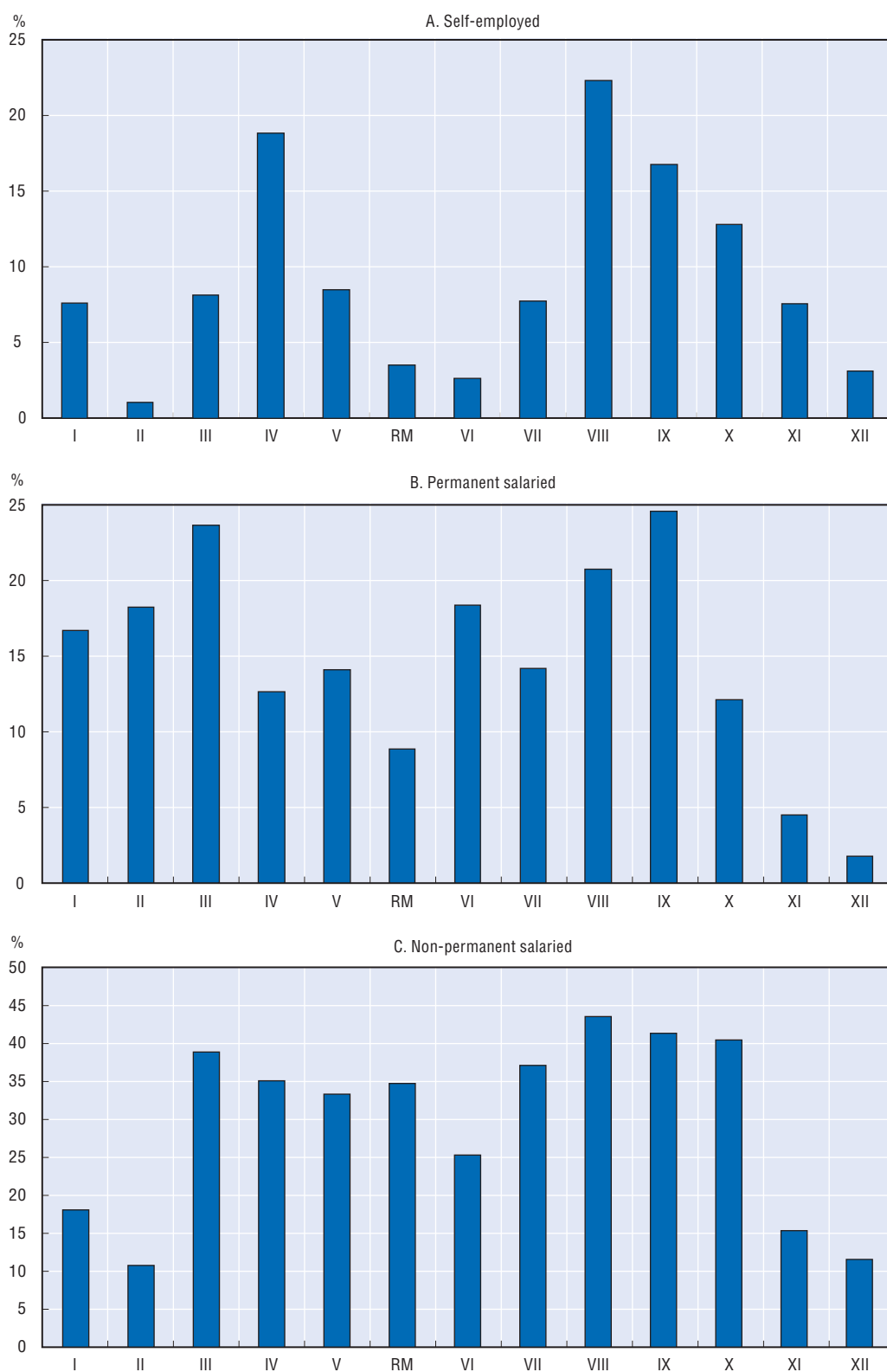
Source: INE 2003 Employment Survey; OECD calculations, 2007.

Figure 3.A1.4. Number of agriculture-dependent households, by region, 2003



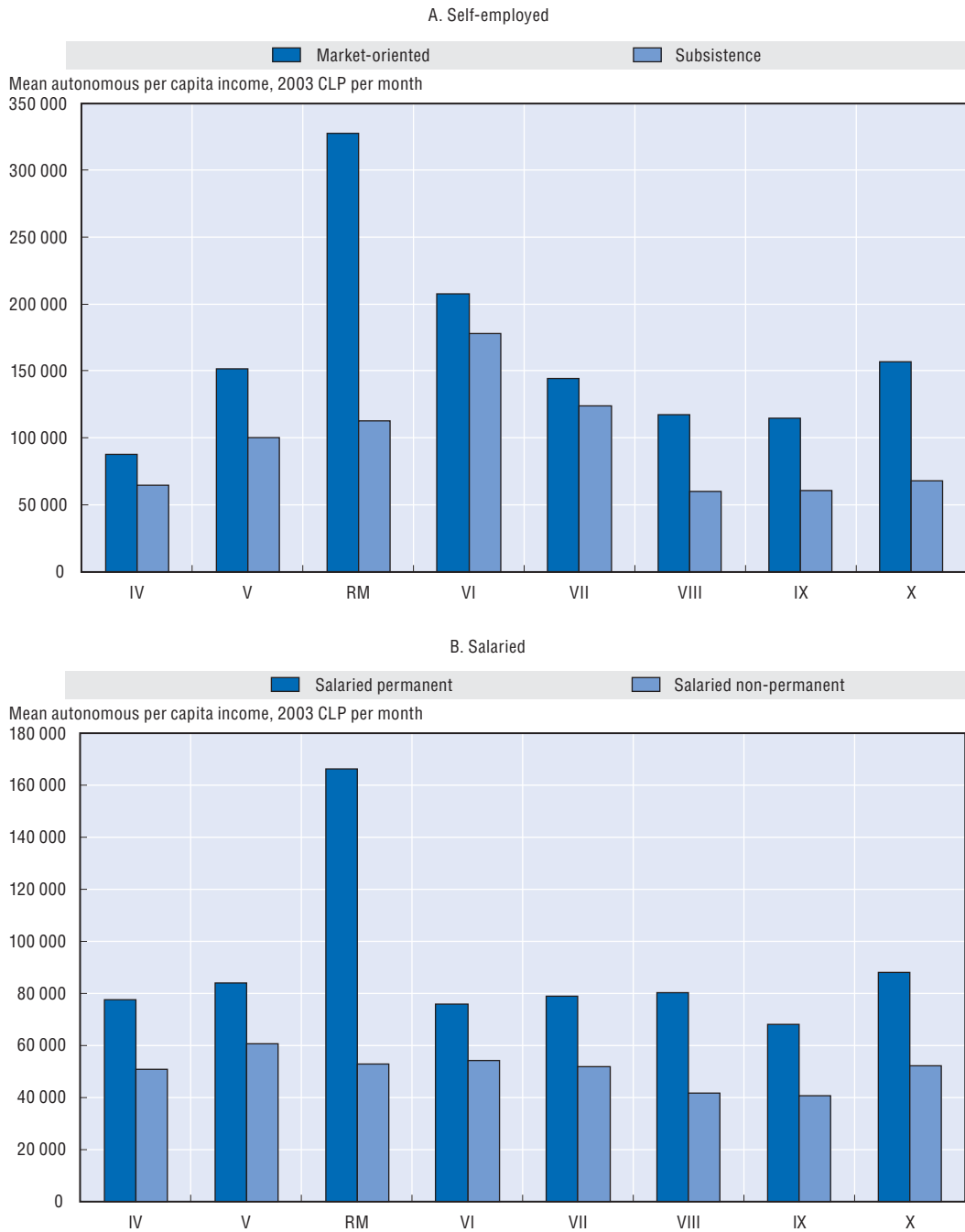
Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

Figure 3.A1.5. **Incidence of poverty among agriculture-dependent households, by region, 2003**



Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

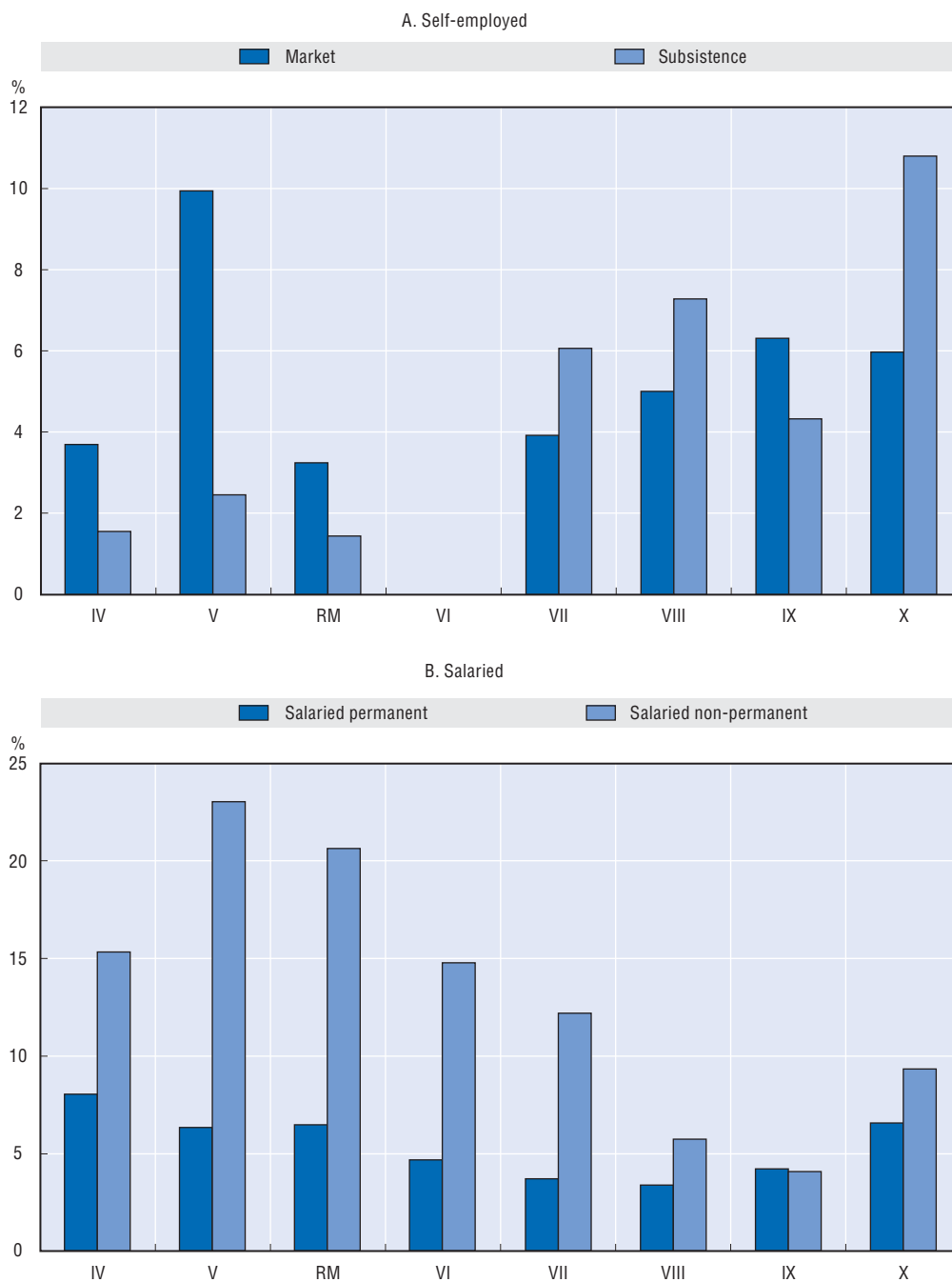
Figure 3.A1.6. **Income of agricultural households, by type and market orientation, 2003**



Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

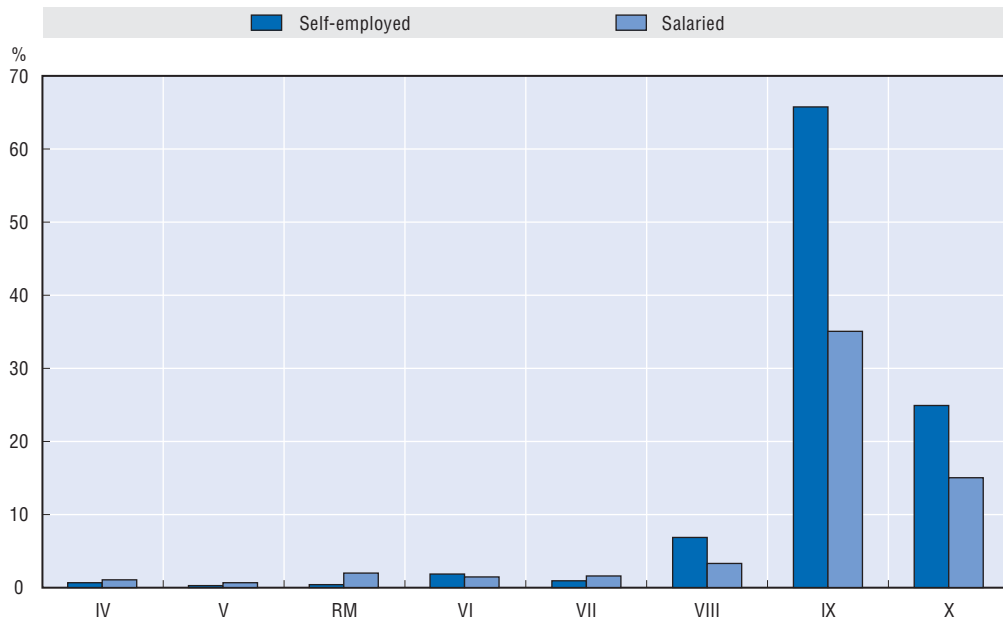


Figure 3.A1.7. **Share of agriculture-dependent households headed by women, by region, 2003**



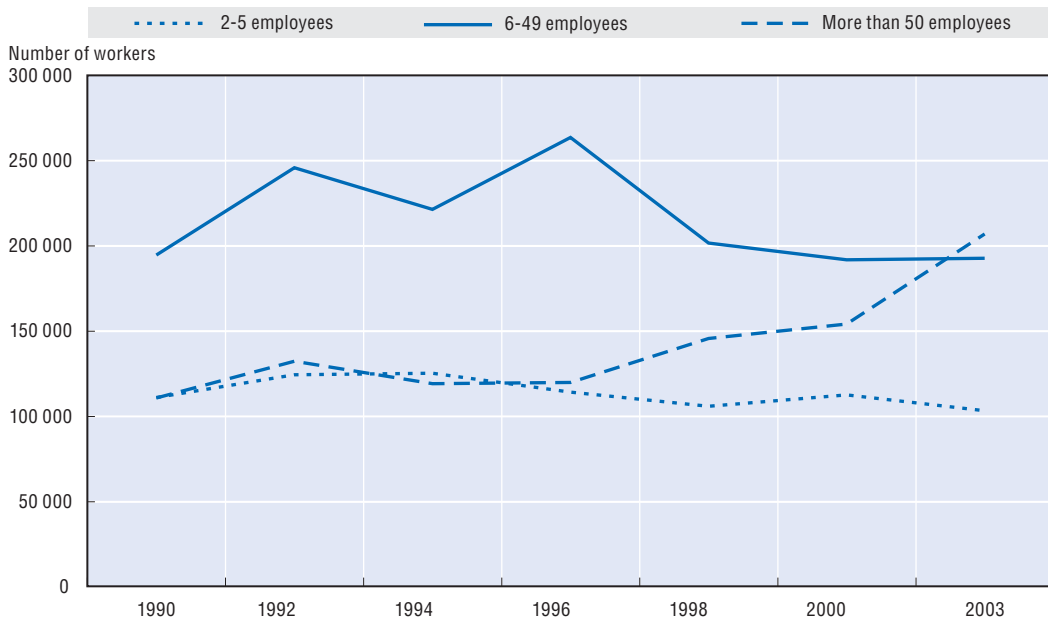
Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

Figure 3.A1.8. **Share of households that are indigenous, by region, 2003**



Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

Figure 3.A1.9. **Number of salaried agricultural workers, by size of farm, 2003**



Source: MIDEPLAN, CASEN 2003; OECD calculations, 2007.

## ANNEX 3.A2

## Determinants of Incomes of Farm Households and Salaried Agricultural Workers

**Table 3.A2.1. Regression of the logarithm of per adult-equivalent autonomous household income in 2003 pesos: self-employed and salaried workers in agriculture**

Household per adult equivalent autonomous income in 2003 pesos	Salaried agricultural worker households			Small farm households (parameter estimate is in addition to salaried)		
	Variable name	Estimate	Standard error	t-stat	Estimate	Standard error
Age of head	-0.00323	0.00055	-5.84	0.01976	0.00091	21.77
Age of head squared	0.00008	0.00001	12.67	-0.00023	0.00001	-23.89
No education of head at all	0.52551	0.00655	80.24	-0.09189	0.01127	-8.16
School, but incomplete basic, head 1 to 6 years	0.25238	0.00345	73.12	-0.10203	0.0061	-16.72
Number of years of schooling of head	0.08835	0.00046	194.02	-0.00646	0.00088	-7.36
If male head = 1	0.09904	0.00383	25.83	0.09468	0.00757	12.5
If indigenous head = 1	-0.04753	0.00476	-9.98	-0.15549	0.00677	-22.97
Dependency ratio	-0.18758	0.00098	-191.23	0.06186	0.00175	35.34
Number of household members	-0.02585	0.00125	-20.76	-0.03363	0.00222	-15.15
Number of members > 14	-0.01796	0.00153	-11.74	-0.00589	0.00266	-2.21
If agric. income > 50% of total autonomous Variable = 1	-0.05004	0.00395	-12.67	0.37223	0.00684	54.45
If agric income = 100% of total autonomous income = 1	-0.40935	0.00253	-161.98	-0.36703	0.00435	-84.43
If urban = 1	0.01698	0.00223	7.62	0.03387	0.00463	7.32
If head declares in other sector = 1	-0.15347	0.00543	-28.28	-	-	-
If head declares inactive = 1	-0.08039	0.00295	-27.23	-	-	-
If single-person farm = 1	-	-	-	-0.08329	0.00337	-24.69
If salaried permanent = 1	0.3156	0.0022	143.66	-	-	-
Constant	11.11	0.0141003	788.26	0.12464	0.02631	4.74
<i>Regional effects</i>						
Region I	-0.0808	0.01098	-7.36	-0.19217	0.01637	-11.74
Region II	-0.01324	0.01846	-0.72	0.02447	0.02289	1.07
Region III	-0.11718	0.00747	-15.7	-0.05749	0.01679	-3.42
Region IV	-0.20601	0.00492	-41.89	-0.23346	0.01016	-22.97
Region V	-0.13181	0.00426	-30.93	-0.17387	0.00987	-17.62
Region VI	-0.09308	0.00376	-24.73	0.06002	0.00979	6.13
Region VII	-0.1913	0.00384	-49.87	-0.11351	0.00882	-12.86
Region VIII	-0.20232	0.00381	-53.15	-0.3824	0.0083	-46.1
Region IX	-0.20265	0.00511	-39.64	-0.17049	0.00941	-18.12
Region X	-0.06844	0.00416	-16.44	-0.2862	0.00848	-33.77
Region XI	0.03489	0.01134	3.08	-0.26782	0.01731	-15.47
Region XII	0.21085	0.01128	18.69	-0.2773	0.0236	-11.75

Note: R<sup>2</sup> = 0.4989, F (55.494039) = 8 943.96, N = 17 893 (7 190 self-employed, 10 773 salaried workers).

Source: Valdés and Foster, 2007, based on CASEN 2003.

Table 3.A2.2. **Regression of the logarithm of per adult-equivalent autonomous household income in 2003 pesos: only self-employed in agriculture**

Variable name	Small farm households		
	Estimate	Standard error	t-stat
Household per adult equivalent autonomous income in 2003 pesos			
Age of head	0.01424	0.00092	15.54
Age of head squared	-0.00013	0.00001	-14.66
No education of head at all	0.42298	0.01125	37.59
School, but incomplete basic, head 1 to 6 years	0.14324	0.00618	23.19
Number of years of schooling of head	0.08056	0.00093	87
If male head = 1	0.1849	0.00817	22.64
If indigenous head = 1	-0.20353	0.00587	-34.69
Dependency ratio	-0.12121	0.0018	-67.49
Number of household members	-0.06837	0.00232	-29.44
Number of members > 14	-0.01107	0.00284	-3.9
If agric. income > 50% of total autonomous	0.32525	0.00695	46.83
Variable = 1			
If agric income = 100% of total autonomous income = 1	-0.77431	0.00435	-177.86
If urban = 1	0.04466	0.00497	8.99
If head declares in other sector = 1	-0.05399	0.01294	-4.17
If head declares inactive = 1	-0.18924	0.00658	-28.78
If single-person farm = 1	-0.08414	0.00412	-20.43
constant	11.29889	0.02832	398.9
Regional effects			
Region I	-0.25052	0.01492	-16.79
Region II	0.01396	0.01657	0.84
Region III	-0.15702	0.01843	-8.52
Region IV	-0.41364	0.01097	-37.7
Region V	-0.27207	0.01102	-24.68
Region VI	-0.01276	0.01118	-1.14
Region VII	-0.28157	0.00982	-28.66
Region VIII	-0.56082	0.00914	-61.38
Region IX	-0.34722	0.00976	-35.57
Region X	-0.3306	0.00914	-36.17
Region XI	-0.21245	0.01601	-13.27
Region XII	-0.02667	0.0254	-1.05

Note:  $R^2 = 0.4516$ ,  $F(28.152242) = 4\,478.45$ ,  $N = 7\,190$  self-employed.

Source: Valdés and Foster, 2007, based on CASEN 2003.

Table 3.A2.3. **Regression of the logarithm of per adult-equivalent autonomous household income in 2003 pesos: only salaried in agriculture**

Household per adult equivalent autonomous income in 2003 pesos	Salaried households		
Variable name	Estimate	Standard error	t-stat
Age of head	-0.00246	0.00049	-4.99
Age of head squared	0.00007	0.00001	13.39
No education of head at all	0.52671	0.00578	91.08
School, but incomplete basic, head 1 to 6 years	0.25278	0.00305	82.93
Number of years of schooling of head	0.08884	0.0004	220.74
If male head = 1	0.10185	0.00342	29.79
If indigenous head = 1	-0.04882	0.00421	-11.6
Dependency ratio	-0.19078	0.00087	-218.75
Number of household members	-0.02161	0.00111	-19.49
Number of members > 14	-0.02447	0.00137	-17.82
If agric. income > 50% of total autonomous	-0.05502	0.00351	-15.66
Variable = 1			
If agric income = 100%	-0.40475	0.00226	-179.45
of total autonomous income = 1			
If urban = 1	0.01844	0.00197	9.36
If head declares in other sector = 1	-0.17942	0.00559	-0.17942
If head declares inactive = 1	-0.03562	0.00312	-0.03562
If salaried permanent = 1	0.31685	0.00194	163.26
constant	11.09208	0.01261	879.98
<i>Regional effects</i>			
Region I	-0.0803	0.0097	-8.28
Region II	-0.01423	0.0163	-0.87
Region III	-0.12204	0.00659	-18.51
Region IV	-0.20458	0.00434	-47.1
Region V	-0.13267	0.00376	-35.25
Region VI	-0.09418	0.00332	-28.33
Region VII	-0.19036	0.00339	-56.2
Region VIII	-0.20412	0.00336	-60.71
Region IX	-0.20256	0.00451	-44.87
Region X	-0.06721	0.00368	-18.28
Region XI	0.03738	0.01002	3.73
Region XII	0.21479	0.00996	21.56

Note:  $R^2 = 0.5205$ ,  $F(28.341795) = 13\ 248.09$ ,  $N = 10\ 773$  salaried.

Source: Valdés and Foster, 2007, based on CASEN 2003.

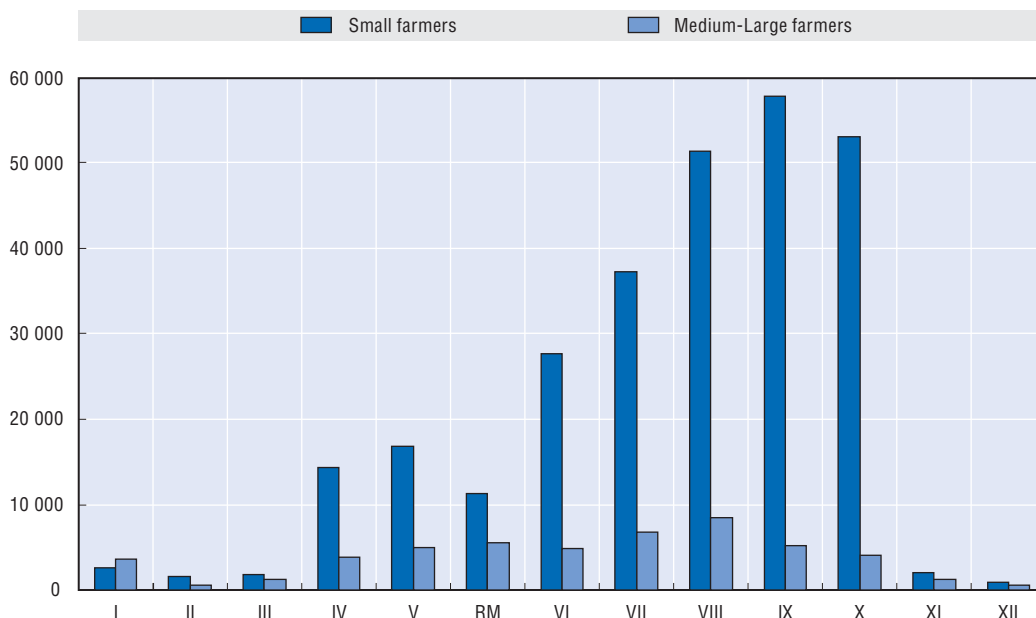
## ANNEX 3.A3

*Structural Characteristics of Chilean Agriculture*

According to the official classification (ODEPA, 2000; ODEPA and INDAP, 2002 and ODEPA and INDAP, 2005) based on the 1997 Agricultural Census, farmers in Chile are divided into three main categories: small farmers (which are further sub-divided into subsistence producers and small farm enterprises); medium-sized farmers; and large farmers. The classification differentiates according to agro-ecological area and accounts for factors such as access to capital and technology, market orientation, as well as cultivated land size and agricultural potential.

A consideration of land size alone would give a misleading picture of the relative capacity of farmers to meet the production requirements imposed by the market. This is because the size of the farm is weakly linked to production potential. There are many large plots with sterile soils which are not cultivated in some mountainous, semi-arid, desert or forestry areas. On the other hand, in areas like the interior valleys of the semi-arid zones, a farm with only 10 hectares of grapes or with even less planted with flowers can have revenues such that this farm is classified as medium or even large (Apey and Barril eds., 2006). Small farmers

Figure 3.A3.1. **Number of farms by type and region (1997 Agricultural Census)**



Source: Apey and Barril eds., 2006.

Table 3.A3.1. **Farm sizes, 1997 (Agricultural Census)**

Hectares	Small farms			Others (medium, large and unclassified)			Total
	Number of farms	%	Cumulative %	Number of farms	%	Cumulative %	
No land	0	0		4 190	8		4 190
< 1	35 464	13	0	7 090	14	8	42 554
1 to 5	83 166	30	13	7 360	15	22	90 526
5 to 10	48 687	18	43	2 878	6	37	51 565
10 to 15	28 000	10	60	2 308	5	42	30 308
15 to 20	17 641	6	70	1 647	3	47	19 288
20 to 40	31 523	11	76	4 972	10	50	36 495
40 to 60	13 185	5	88	2 885	6	60	16 070
60 to 100	10 675	4	92	2 903	6	66	13 578
100 to 200	6 384	2	96	4 606	9	71	10 990
200 to 500	2 785	1	99	4 742	9	80	7 527
500 to 1000	824	0	100	2 072	4	90	2 896
1 000 to 2 000	333	0	100	1 208	2	94	1 541
> 2 000	353	0	100	2 003	4	96	2 356
Total	278 840	100	100	50 865	100	100	329 705

Source: Apey and Barril eds., 2006.

predominate in those regions where mainly import-substituting crops (especially annual crops) are produced, with little or no integration into the market.

Note that farm units, as identified by the Agricultural Census, do not necessarily correspond to households that depend on farm income, or even to households that obtain a large proportion of income from farming. Families with household heads or other family members working in other activities can own multiple farm units that are examined during the Agricultural Census. Some farm units can be classified as large simply by exceeding one of the size thresholds, although they might produce little output or provide little income. Not surprisingly, the Agricultural Census identifies more small farms than would be suggested by the CASENs.

Nevertheless, one can match self-employed agricultural heads of households in the CASEN survey to information in the Census in order to say something about the connection between farm structures and household incomes of farm families. A 2006 study by Melo and Lopez matches surveyed farms from the Agricultural Census with the 1996 and 1998 CASEN household surveys. The basic assumption is that almost all farms are found in the Agricultural Census – it encompasses more than the population of family farms. So if the CASEN interviews a farmer (someone who responds that he or she is self-employed in agriculture) at a date close to the Census, the farmer's production information should be in the Census. There is a very high probability that a CASEN-identified farmer with the same characteristics as someone in the Census (location, age, level of education, number of household members of various ages), would be the same Census person.

The Melo and Lopez study first classifies small farm units as those producing on less than a certain number of hectares, the specific size depending on agro-ecological zone, and those with less than ten employees. Such small farm units are then classified as Subsistence, Transition and Consolidated, based on level of contracted employment. Subsistence farm units contract no employees. Transition farm units contract labour, but

have no administrators. Consolidated farm units hire administrators. Some of the main findings are summarised below:

- The number of small farms units (of all classes) has not changed much over the previous thirty years, although the number of “precarious” operations (squatters and sharecroppers) has declined significantly.
- In terms of crops and pasture land, on average Subsistence farms have 17.1 ha, Transition farms 26.6 ha, and Consolidated farms 65.9 ha.
- Subsistence small farms have an average of 1.8 ha of irrigated land, Transition farms 4.0 ha, and Consolidated farms 7.6 ha.
- Subsistence farms account for 5.2% of the country’s cropland, Transition farms 6.3% and Consolidated farms 1.1%. Their total share of agricultural GDP is estimated at 28%.
- Small farms are geographically concentrated: 65% of Subsistence farms, 53% of Transition farms, and 42% of Consolidated farms are located in the South.
- Small farm production most often emphasised cereals (mainly wheat) and potatoes, although Consolidated farms in the central region also produced fruits and wine grapes. Beef and milk are also frequently produced by smallholders.
- Subsistence farms are heavily concentrated in non-tradables, while Consolidated farms are more export-oriented.
- In 1997, farm household labour income (off-farm) was a low share of household income, ranging from 8% in Consolidated farms to 12% in Subsistence farms.

Melo and Lopez also examined household expenditures from the 1997 INE Santiago budget surveys. Subsistence and Transition farm households are primarily within the second income quintile, and Consolidated households in the third. Food expenditures represent approximately 40% of the total expenditure of Subsistence and Transition households, of which importables (grains and dairy) account for 60%. Non-tradables represent 30% of food expenditures, while non-tradable goods of all types absorb 59% of all expenditures. From these expenditure shares, and the high (and probably increasing) share of tradables, one can infer that changes in domestic agriculture production would probably have less impact on the food costs of these groups than changes in world prices or exchange rates.



## ANNEX 3.A4

## *Constraints to Small Farmers' Competitiveness in Maule Region (Region VII)*

Located just south of the most productive central regions, Region VII is relatively rural. According to the 2002 Population and Housing Census, 33.6% of the population live in rural areas, compared with a national average of 13.4%. Agriculture's contribution to regional GDP is the second highest in Chile, and the sector accounts for more than 30% of regional employment. In 2003, Region VII accounted for about 13.7% of the national agricultural labour force (second only to region VIII). Agricultural unemployment is also among the highest in the country (about 9% in 2003), and seasonal employment is important.

According to our household typology based on CASEN 2003, there are approximately 17 900 self-employed households (of which 71.1% are market-oriented and 28.9% subsistence). This represents 25.3% of all agriculture-dependent households in the region. Maule is also the fourth region in terms of the absolute number of family farms and is home to many salaried worker households in the country, many of which have non-permanent jobs. The incomes of self-employed households are lower than in the central regions, and the incidence of poverty is relatively high.

Although it has less good soils compared to regions to the South, according to the 1997 Agricultural Census, yields of annual and industrial crops are on the high side of national levels for small enterprises and medium and large farmers, but on the low side for subsistence producers. The main export products are found in the primary sector, and totalled USD 288 million in 2004. During the past 15 years Maule has become one of the most important regional producers of raw materials and of forest and agricultural export products. Among agricultural export products, the greatest growth has taken place in the wine industry, fruits, the compotes and jellies, as well as berries for freezing and other fruits for making juice and concentrates.

The country's economic openness has enabled a segment of producers in Maule Region to successfully produce for the international market. On the other hand, those farmers facing agro-ecological constraints or with insufficient physical, financial and human resources, have not benefited. A large number of the latter are family farmers, not capable by themselves of converting to higher-value production. Some with saleable surpluses have received support from INDAP. However, much of the family farm (smallholder) sector employs production techniques that are directed towards self-consumption or the production of modest surpluses, with low capital requirements and little mechanisation. These farmers have not been able to profit from the externalities

generated by government investments and to enter into the modernisation process. Subsistence farmers have tended to complement farming activities with off-farm activities linked to agro-industries, rural tourism, and handcrafts.

INDAP's beneficiaries cultivate 36.2% of the productive area in the Maule Region, of which only a small part is cultivated by subsistence farmers. Currently, INDAP assists around 15 000 producers. Small farmers in the Region have been divided into three broad types by INDAP, according to their relationship with the market: producers who are clearly linked to domestic and international markets, and well connected to the agro-industry; producers whose production is mainly destined to the domestic market, although they might have some links with the exporting sector and the agro-industry, but without this being their main activity; and "multi-activity" producers, considered as the vulnerable segment, for which programmes like PRODESAL, PRODECOOP, INDAP-PRODEMU and ORIGENES have been designed.

INDAP's criteria of eligibility are only weakly targeted towards farmers who are potentially competitive, but need policy assistance in order to develop their integration into domestic and international markets. Moreover, even among those farmers that can be reached by INDAP, there are diverse policy needs. Diaz (2007) identifies four distinct groups:

1. Small entrepreneurs who are overqualified to be INDAP beneficiaries.
2. Small entrepreneurs who are INDAP beneficiaries but who are about to "graduate" from its programmes.
3. Small farmers who are INDAP beneficiaries.
4. Subsistence and part-time farmers who are not INDAP beneficiaries.

Group 1. In this group we find producers who have benefited from the Agrarian Reform or their descendants. They have successfully managed their enterprises, allowing them to capitalise their farms (machinery, productive infrastructure, etc.), and have "graduated" from INDAP's help. Many are enterprising and innovative farmers, with good management capacity and close connections to internal and/or external markets. One of the main constraints to increased competitiveness for this group is access to financial resources, especially credit, because they are not INDAP's clients and do not have easy access to the commercial banking system. In organisational terms, they are not linked to the networks of their peers and do not participate, for a lack of social connections, in other organisations linked to entrepreneurial farming. These barriers prevent them from switching into more profitable permanent crops or export products.

Group 2 consists of producers that are INDAP clients, but who are in the process of "graduating" from the system, i.e. are at the "ceiling" of requirements to benefit from current public support mechanisms. Many produce mainly for local markets and are associated to contract farming. Some may have raw materials such as wine grapes or be associated to the agricultural export system through intermediaries, generally producing some type of berries. They possess many of the features mentioned in the previous category, although they depend more on the public system of technical transfer and credit programmes. These producers have benefited from public investment programmes and have acquired the necessary technical knowledge. However, their connections with the product and factor markets are generally on an individual basis, which does not allow them to attain a solid negotiating position. As a consequence, the most important constraints for this group are a general lack of management skills and negotiating power, as well as a low level of organisational capacity.

Group 3. These producers, despite being INDAP clients, often make a poor use of their productive resources. They are mainly oriented towards the domestic market but have no relation with contract farming. Despite the fact that many of them carry out their productive activities in smallholdings acquired through the Agrarian Reform, their land legal situation is often precarious because their plots are fractioned successions and inheritances, which limits their access to credit and/or to investment promotion programmes in new crops of a permanent type, which require a higher operational and investment capital. As a consequence, they are on the “floor” of INDAP’s requirements and/or in a process of land fragmentation. Many sell their family labour surplus in the seasonal labour market as a way of complementing their income. There are exceptional cases of producers in this group producing crops – generally berries (raspberries or strawberries) – linked to the processing-exporting agricultural industry, although they typically face difficulties in complying with quality standards. Because they have no sale contracts, the marketing of their products is done through middlemen and their potential earnings are lower. Among the constraints that these producers face are a lack of managerial skills; insufficient production inputs (capital, technology, land and water), despite receiving INDAP credit; a productive structure mainly centred on annual crops and with insufficient on-farm infrastructure, which impedes reaching sufficient production quantity and quality; and a lack of managerial and organisational capacity which would facilitate the exploitation of economies of scale.

Group 4. This group includes producers or peasant villagers located in the dry coastal regions or in the pre-Andean zone of the Maule Region. The quality and quantity of the natural resources they possess do not permit them to live from farming activities. They often sell their labour on a temporary/seasonal basis and/or are strongly dependent on remittances. For this group a particular concern is the ageing of the population and the low level of education and vocational training. They also have a very limited productive infrastructure and lack financial resources to increase their productive capacity, producing only traditional crops for self-consumption, without saleable surpluses. They are the poorest and most vulnerable. However, unlike in the Central Valley, these peasants are deeply rooted in their land, in the rural way of life and in farming as economic activity. This makes the government’s task even more difficult. On one hand, these farmers do not possess the resources and skills to become competitive. On the other hand, finding employment outside the sector may not be a realistic objective, at least not in the short term. Particularly vulnerable within this group are young villagers without an agricultural vocation, women and aged people without family support (e.g. widows, old parents whose sons/daughters migrated). The core policy needs for this group are likely to be social safety nets and measures that help the household to diversify its income sources.



## Acronyms and Abbreviations

<b>AFC</b>	Family Agriculture (Agricultura Familiar Campesina)
<b>APEC</b>	Asia-Pacific Economic Community
<b>ASOEX</b>	Chilean Exporters Association (Asociación de Exportadores de Chile)
<b>AVE</b>	Ad Valorem Equivalent
<b>BAF</b>	Financial Coordination Subsidy (Bono de Articulación Financiera)
<b>BECH</b>	Banco Estado – Chile
<b>BSE</b>	Bovine Spongiform Encephalopathy
<b>CASEN</b>	Chile’s Socio-economic Survey (Encuesta de Caracterización Socioeconómica)
<b>CGFTA</b>	Chile’s Free-Trade Agreement with Canada
<b>CEGES</b>	Managerial Training Centres (Centros de Gestión) – INDAP
<b>CIREN</b>	Natural Resources Information Centre (Centro de Información de Recursos Naturales)
<b>CLP</b>	Chilean Peso
<b>CNR</b>	National Irrigation Commission (Comisión Nacional de Riego)
<b>COMSA</b>	Agricultural Insurance Programme (Comité de Seguro Agrícola)
<b>CONADI</b>	National Service for Indigenous Development (Corporación Nacional de Desarrollo Indígena) – MIDEPLAN
<b>CONAF</b>	National Forest Service (Corporación Nacional Forestal)
<b>CONAMA</b>	Chile’s National Commission for the Environment (Comisión Nacional del Medio Ambiente)
<b>COOPEUMO</b>	Cooperativa Campesina Intercomunal Peumo Ltda
<b>CORA</b>	Chile’s Agricultural Reform Corporation (Corporación de la Reforma Agraria)
<b>CORFO</b>	Economic Development Agency (Corporación de Fomento de la Producción)
<b>COTRISA</b>	Wheat Marketing Enterprise (Comercializadora de Trigo) – Chile
<b>CSE</b>	Consumer Support Estimate
<b>DIPRES</b>	Budget Department (Dirección de Presupuesto), Chilean Ministry of Finance
<b>DIRECON</b>	Directorate for International Economic Relations – Chilean Ministry of Foreign Affairs (Dirección de Relaciones Económicas Internacionales)
<b>DNA</b>	Deoxyribonucleic acid
<b>DOH</b>	Department of Hydraulic Works – MOP
<b>DSB</b>	WTO’s Dispute Settlement Body
<b>ECA</b>	Economic Complementation Agreement
<b>ECLAC</b>	Economic Commission for Latin America and the Caribbean – United Nations (Comisión Económica para América Latina y el Caribe – CEPAL)
<b>EFTA</b>	European Free Trade Association
<b>EU</b>	European Union

<b>FAD</b>	Fund of Delegated Cash Management (Fondo de Administración Delegada)
<b>FAO</b>	Food and Agriculture Organisation of the United Nations
<b>FAOSTAT</b>	FAO's Statistical Database
<b>FAT</b>	Technical Assistance Fund (Fondo de Asistencia Técnica)
<b>FDI</b>	Foreign Direct Investment
<b>FIA</b>	Foundation for Agrarian Innovation (Fundación de Innovación Agraria)
<b>FMD</b>	Foot and Mouth Disease
<b>FOCAL</b>	Quality Promotion Programme (Fomento de la Calidad)
<b>FOSIS</b>	Social and Solidarity Investment Fund (Fondo de Solidaridad e Inversión Social)
<b>FTA</b>	Free Trade Agreement
<b>FUCOA</b>	Foundation for Agricultural Communication, Training and Culture (Fundación de Comunicación, Capacitación y Cultura del Agro)
<b>GAP</b>	Good Agricultural Practices
<b>GDP</b>	Gross Domestic Product
<b>GSSE</b>	General Services Support Estimate
<b>GSTP</b>	Global System of Trade Preferences among Developing Countries
<b>HRB</b>	Basic Irrigation Hectares (Hectáreas de Riego Básico)
<b>HS</b>	Harmonised System
<b>ICT</b>	Information and Communication Technology
<b>IER</b>	Institute of Rural Education (Instituto de Educación Rural)
<b>IFA</b>	International Fertiliser Industry Association
<b>INDAP</b>	National Institute for Agricultural Development (Instituto Nacional de Desarrollo Agropecuario)
<b>INE</b>	Chile's National Statistical Office (Instituto Nacional de Estadísticas de Chile)
<b>INFOR</b>	Forestry Research Institute of Chile (Instituto de Investigación Forestal de Chile)
<b>INIA</b>	National Institute for Agricultural Research (Instituto Nacional de Investigaciones Agropecuarias)
<b>INTERPAC</b>	Export Promotion for Small-scale Agriculture (Internacionalización de la Agricultura Familiar Campesina)
<b>ISI</b>	Import Substitution Industrialisation
<b>LBGMA</b>	Chile's Law on the General Bases for the Environment (Ley de Bases Generales del Medio Ambiente)
<b>MEI</b>	OECD Main Economic Indicators
<b>MERCOSUR</b>	Southern Common Market
<b>MFN</b>	Most Favoured Nation
<b>MIDEPLAN</b>	Chilean Ministry of Planning and Cooperation
<b>MINAGRI</b>	Chilean Ministry of Agriculture
<b>MOP</b>	Chilean Ministry of Public Works
<b>MPS</b>	Market Price Support
<b>MYPE</b>	Micro and Small Enterprise (Micro y Pequeña Empresa)
<b>NAC</b>	Nominal Assistance Coefficient
<b>NGO</b>	Non-governmental Organisation
<b>NPC</b>	Nominal Protection Coefficient
<b>NPK</b>	Nitrogen, Phosphate and Potash
<b>ODEPA</b>	Office of Agricultural Policies and Studies (Oficina de Estudios y Políticas Agrarias)

<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>ORIGENES</b>	Indigenous Development Programme (Programa Desarrollo Indígena)
<b>PBS</b>	Price Band System
<b>PDI</b>	Investment Development Programme (Programa de Desarrollo de Inversiones)
<b>PDP</b>	Suppliers Development Programme (Programa de Desarrollo de Proveedores)
<b>PIR</b>	Irrigation Pre-Investment Programme (Pre-Inversión en Riego)
<b>PNPC</b>	Producer Nominal Protection Coefficient
<b>POVCAL</b>	World Bank's software programme for calculating poverty measures for grouped data
<b>PPP</b>	Purchasing Power Parity
<b>PROCHILE</b>	DIRECON's Department, to promote Chilean exports
<b>PRODECOP</b>	Poor Communities Development Project (Proyecto de Desarrollo de Comunas Pobres)
<b>PRODEMU</b>	Foundation for Women Promotion and Development (Programa de Formación y Capacitación para Mujeres Rurales)
<b>PRODES</b>	Organisational Development Fund (Fondo de Proyectos de Desarrollo Organizacional)
<b>PRODESAL</b>	Local Rural Communities Development Programme (Servicio de Desarrollo Local en Comunidades Rurales)
<b>PROFO</b>	Partnership Projects for Development (Proyectos Asociativos de Fomento)
<b>PRORUBROS</b>	Agribusiness Integration Programme (Programa de Redes)
<b>PROSAFE</b>	Product Safety Enforcement Forum of Europe
<b>PSE</b>	Producer Support Estimate
<b>R&amp;D</b>	Research and Development
<b>RIMISP</b>	Latin American Centre for Rural Development (Centro Latinoamericano para el Desarrollo Rural)
<b>SAG</b>	Agriculture and Livestock Service (Servicio Agrícola Ganadero)
<b>SAT</b>	Technical Assistance Services (Servicios de Asesoría Técnica) – INDAP
<b>SENCE</b>	National Service for Training and Employment (Servicio Nacional de Capacitación y Empleo)
<b>SERCOTEC</b>	Technical Cooperation Service (Servicio de Cooperación Técnica) – CORFO
<b>SIRDS</b>	Soil Recovery Programme (Programa para la Recuperación de Suelos Degradados) – INDAP
<b>SMEs</b>	Small and Medium-Sized Enterprises
<b>SPS</b>	Sanitary and Phytosanitary
<b>STE</b>	State Trading Enterprise
<b>SUBSE</b>	Under-Secretariat of Agriculture - Chilean Ministry of Agriculture (Subsecretaría de Agricultura)
<b>TFP</b>	Total Factor Productivity
<b>TSE</b>	Total Support Estimate
<b>UF</b>	Chilean Unit of Account (Unidad de Fomento)
<b>UHT</b>	Ultra-high-temperature (milk) processing
<b>UN</b>	United Nations
<b>URAA</b>	Uruguay Round Agreement on Agriculture
<b>USA</b>	United States of America
<b>USD</b>	United States of America Dollar
<b>WTO</b>	World Trade Organization





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# OECD Review of Agricultural Policies

## CHILE

Chile's agricultural sector has played an important role in the country's economic development, helping to raise incomes and reduce poverty. The sector has benefited from a stable macroeconomic climate and an open trading environment, and exports have grown rapidly, notably for high value products such as wine and fruits. A current priority of the government is to broaden the basis of agricultural growth by successfully integrating the country's smallholders into commercial structures.

This Review measures the level and composition of support provided to Chilean agriculture, and evaluates the effectiveness of current measures in attaining their objectives. The study finds that Chile provides much lower support and protection to its agricultural sector than most OECD countries, even though government expenditures on the sector have trebled in real terms over the past ten years. About half of that spending is on public goods such as infrastructure and irrigation, while the other half consists mostly of measures that seek to make Chile's poorer farmers more competitive.

This report suggests ways in which the effectiveness of these policies might be enhanced, including by systematic evaluation of policy performance, by closer co-ordination across government agencies, and by framing policies for smallholders and salaried farm workers in an economy-wide context, so that agricultural policies can focus on potentially competitive farmers and be effectively distinguished from other development and social policies.

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