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Reviews of National Policies for Education

Tertiary Education in Chile

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Foreword

Significant progress has been made in the reform of tertiary education in Chile since the OECD review of 2004. As a society, Chileans value education and it is a subject of frequent and intense public debate and successive governments have responded to social demand through reforms to basic, secondary, and tertiary education. The tertiary education sector has been and remains dynamic in important ways and Chile has been successful in moving from an elite to a mass tertiary education system, while maintaining education quality. This joint OECD and World Bank report provides an overview of the impressive forward thinking and steadfast application of reform in Chile as the country prepares itself for accession to the OECD.

Against the background report prepared by the Chilean authorities for the OECD Thematic Review of Tertiary Education and information supplied in meetings in the course of sites visits (Santiago, Arica, Antofagasta, Concepción, Iquique, La Serena, Talca, Temuco, and Valparaíso), the examiners' report covers the full range of tertiary education in Chile. The report gives an analysis of the achievements of the last decade and the challenges that Chile faces in the quest of providing a world class system for its citizens in the light of the economic, social and political context of the country. The review provides an in-depth study and recommendations on access and equity; the relevance of the system; its governance and management; research and development; and financing. The final chapter brings together, in the form of a synthesis, the specific recommendations of each chapter and sets out how policies can and should be addressed.

This review of tertiary education policy was undertaken within the framework of the programme of work of the OECD Directorate for Education in partnership with the World Bank. The financing for the review was provided by the government of Chile and the World Bank.

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See also Ministry of Education of Chile (2007), *OECD Thematic Review of Tertiary Education: Country Background Report for Chile*, Santiago. http://dx.doi.org/10.1787/478236220760, also available at www.oecd.org/edu/tertiary/review

Acronyms and Abbreviations

	Spanish	English
AFD	Aporte Fiscal Directo	Direct public grant
AFI	Aporte Fiscal Indirecto	Indirect public grant
AGCI	Agencia de Cooperación Internacional	Agency for International Co-operation
AR	Arancel de Referencia	Reference fee
BB	Becas Bicentenario	Bicentenary scholarships
BEA	Beca de Excelencia Académica	Academic Excellence scholarships
BDP	Beca para estudiantes Destacados que ingresan a Pedagogía	Scholarships for outstanding students to study pedagogy
BJGM	Becas Juan Gómez Millas	Juan Gómez Millas scholarships
BNM	Beca Nuevo Milenio	New millennium scholarship
CAE	Crédito con Aval del Estado	State guaranteed loan system
CDD	Convenios De Desempeño	Performance agreements
CFU	Crédito Fiscal Universitario	University public credit
CNES	Comisión Nacional de Educación Superior	National higher education commission
CNA	Comisión Nacional de Acreditación	National accreditation commission
CNAP	Comisión Nacional de Acreditación de Programas de Pregrado	Commission for the evaluation of undergraduate programmes
CONAP	Comisión Nacional de Programas de Postgrado	Commission for the evaluation of postgraduate programmes
CSE	Consejo Superior de Educación	Higher council of education
CFT	Centro de Formación Técnica	Technical training centre
CONICYT	Comisión Nacional de Investigación Científica y Tecnológica	National commission for science and technology
CORFO	Corporación de Fomento de la Producción	Chilean economic development agency
CPR	Confederación de la Producción y del Comercio	Chilean confederation of production and business
CRUCH	Consejo de Rectores de las Universidades Chilenas	Council of rectors of Chilean universities
DIVESUP	División de Educación Superior del Ministerio de Educación	Higher education division of the Ministry of Education

DFL	Decreto con Fuerza de Ley	Decree with legal force
FC	Fondo Competitivo	Competitive fund
FDI	Fondo de Desarrollo Institucional	Institutional development fund
FIAC	Fondo de Innovación Académica	Academic innovation fund
FONDAP	Fondo de Áreas Prioritarias	Centres for excellence in priority areas
FONDECYT	Fondo Nacional de Desarrollo Científico y Tecnológico	National fund for scientific and technological development
FONDEF	Fondo de Fomento al Desarrollo Científico y Tecnológico	Fund for the promotion of scientific and technological development
FUAS	Formulario Único de Acreditación Socioeconómica	Single socio-economic accreditation form
FSCU	Fondo Solidario de Crédito Universitario	University credit solidarity fund
ICM	Iniciativa Científica Milenio	Millennium scientific initiative
INGRESA	Comisión Administradora del Sistema de Créditos para la Educación Superior	Commission for the administration of higher education credits
IP	Instituto Profesional	Professional institute
ISI		International science index
JCE	Jornada completa equivalente	Full time equivalent (FTE)
JUNAEB	Junta Nacional de Auxilio Escolar y Becas	National committee for student support and scholarships
KAWAX		STI observatory
LOCE	Ley Orgánica Constitucional de Enseñanza	Organic constitutional law on education
MECESUP	Programa de Mejoramiento de la Calidad y Equidad de la Educación Superior	Higher education improvement programme
MINEDUC	Ministerio de Educacion	Ministry of education
NEM	Notas de EnseñanzaMedia	Secondary education report
PAA	Prueba de Aptitud Académica	Academic aptitude test
PSU	Prueba de Selección Universitaria	University entry test
RICYT	Red de Indicadores de Ciencia Y Tecnología	Ibero-American network of science and technology indicators
SIES	Sistema de Información de la Educación Superior	Higher Education Information System
SNAC	Sistema Nacional de Aseguramiento de la Calidad de la Educación Superior	National quality assurance system for higher education
SOFOFA	Sociedad de Fomento Fabril	The Chilean federation of industry
STI		science, technology and industry
UAFI	Unidad de Aporte Fiscal Indirecto	Indirect public grant unit

Executive summary

Chileans value education; they see it as the most important and surest path towards continued prosperity. They make great efforts, as individuals and as a society, to have access to and take advantage of high quality educational opportunities. The numbers of young Chileans continuing to tertiary education has grown continuously for the past four decades, and will most likely continue growing for decades more. The economic, social, and personal benefits of more and better education continue to accrue in Chile, along with the desire to keep expanding and improving the national education system.

It is therefore no surprise that education has a prominent place in public policy discussions. Successive governments have responded to social demand and led drives to reform basic, secondary, and tertiary education. Within this context, the government invited the Organisation for Economic Co-operation and Development (OECD) and the World Bank to collaborate on this Review of Tertiary Education in Chile. The collaboration is timely given Chile's imminent accession to full membership of the OECD and its decades-long partnership with the World Bank in tertiary and general education reform.

The review team was impressed by many aspects of tertiary education in Chile. The massive growth in enrolment in past decades has not strained the institutional framework excessively or caused a general decline in quality. The expansion phenomenon appears to have stimulated, or at least been accompanied by, some bold policy innovations. The tertiary education sector has been and remains dynamic in important ways. Chile's success in moving from an elite to a mass tertiary education system, while maintaining education quality, is due in large measure to its willingness to implement new policy approaches.

While recognising Chile's past successes, the review team was united in the view that a second generation of reforms is now needed. The Chilean tertiary education system can be said to have negotiated the challenges of expansion with reasonable success. It should now address the more difficult and fundamental problems that keep it from being recognised as a world

class system. These problems have to do, *inter alia*, with unequal access for aspirants from different backgrounds and income groups, marked segmentation between university and non-university institutions, inflexible curricula and outdated classroom practices, overly long degree programmes, backward-looking institutional financing practices, a research system lacking focus and funding, and persistent deficiencies in information and accountability for results.

Several of these problems are multi-faceted, and the review has sought to deal with their various dimensions. For example, the length of university degree programmes is seen as a problem: i) for equity, because it raises the financial and opportunity costs of getting a degree; ii) for relevance, because it unnecessarily delays students' entry into labour markets and disproportionately emphasises theoretical content rather than more professionally pertinent material; iii) for quality, as it helps maintain a focus on number of hours spent in study rather than on competencies acquired; iv) for system governance, because it helps sustain the belief that a (longer) university degree must be more valuable than shorter non-university degrees; v) for financing, as it depresses graduation rates and erodes the internal efficiency of institutions; vi) for research, because students who average 7 or more years to obtain their first degree may be dissuaded from pursuing advanced degrees; and vii) for transparency and accountability, because the persistence of high drop-out rates appears at least partially responsible for the reluctance of institutions to analyse and share detailed data on key indicators such as enrolment and graduation rates.

Some programmes and institutions have taken the lead in addressing these issues. The Higher Education Improvement Programme (MECESUP – *Programa de Mejoramiento de la Calidad y Equidad de la Educación Superior*) has promoted curriculum reform; and individual institutions have shortened the path to advanced degrees in some cases. Ensuring that the critical reform initiatives are scaled up throughout the system is part of the challenge facing the Government of Chile.

The review seeks to be frank in its assessment of the current situation and in its analysis of the areas requiring second generation reforms. The report offers concrete recommendations, sometimes a choice of options to address problems identified; though the details of implementation are of course for Chile's tertiary education policy makers and stakeholders to decide.

In keeping with the inter-relatedness of reform challenges, the order of the chapters in the review does not reflect any judgments on the relative importance of the issues they discuss. The review begins with a

comprehensive factual summary of the Chilean system of tertiary education, noting its antecedents and context.

The issues of **access and equity** typify how Chile's policy efforts now need to focus on a second generation of reforms. Clear progress has been made in improving the access to tertiary education for poor but qualified students. In the span of one generation, enrolment rates for students from the two lowest income quintiles have risen by a factor of five. However, access and equity issues are not limited to just participation; they involve the ratios of aspirants to admitted students by income group, the relative success of male versus female students, participation of students by income and type of institution, and the distribution of student aid, *inter alia*. The Government has ambitious goals for access and equity based on its recognition of the equal distribution of talent throughout the population. Achieving these goals requires analysis and action on the above-mentioned issues.

The problems have their roots in the severe segmentation of Chilean society which is reflected in the differences between secondary schools. Schools attended by children from wealthy families consistently provide better secondary graduation rates, preparation for university entrance and university success. Students from low income groups and from municipal schools take Chile's principal university admissions test, the *Prueba de Selección Académica* (PSU) in large numbers but do worse than would be predicted from their secondary school graduation rates. Female students are not represented in universities in the proportion in which they obtain their school-leaving certificates. In a country where tertiary education is relatively expensive, student aid is not available to many needy students. Students from low income backgrounds are less likely to graduate and more likely to pay the full cost of their studies.

Across the OECD, success in solving equity and access problems varies. Chile's situation may be roughly comparable to that of Portugal which has struggled to provide full access. The review team notes that the Chilean Government has some way to go towards the achievement of its own objectives – equity with access, correcting inequalities and guaranteeing all young people with talent the right to attend higher education. It recommends consideration of earlier and more intensive "positive discrimination," moves towards more multi-dimensional admissions testing and criteria for allocating places to students, and more attention to completion rates and time taken to graduate.

Recommendations for reforming student aid include expanding scholarship and loan opportunities further, ensuring that all scheme conditions are equitable and appropriate bearing in mind the diversity of students and institutional missions; and aiming to ensure that no qualified

student in prevented by financial need from entering or completing any form of tertiary education. The team also recommends merging all the current scholarship schemes into a single programme and merging the two current loan schemes into a single scheme on the CAE model, ideally introducing an income-contingent element.

The review team found that employers generally profess significant misgivings about the **relevance** of the knowledge, competencies, and skills that university graduates bring to the labour market. Employers also seem to lack the regular, systematic input into universities' curriculum content, teaching practices, or institutional governance that would enable them to argue for changes. This may explain why graduates in Chile take relatively longer to find jobs than their counterparts in OECD countries. Employers claim to be happier with the quality of graduates from the non-university institutions, the Professional Institutes and Technical Training Centres, but unhappy with the quantity, which they see as insufficient to meet the country's economic needs. Despite these views, wage differentials between university and non-university tertiary graduates remain substantial.

The review team suggests that immediate measures are needed to raise the attractiveness and prestige of technical tertiary education, and diminish the stark segmentation between university and non-university institutions. A potential step in this direction could be the establishment of a national qualifications framework to facilitate progression from one degree type to another, to allow credit for previous academic and job-related experiences and competencies, and to ease transitions between areas of study. The transition toward a national qualifications framework would benefit from including a review of all tertiary curricula, to make them more flexible and address excessive study hours and theoretical content in degree programmes.

Chile has made some notable advances in providing prospective students with information on the future value of degrees, especially through the *Futurolaboral* website. The quality of the information is often adequate, although more needs to be done to make this information "user-friendly" to the intended beneficiaries. Chilean universities have also been keen to pursue internationalisation in the form of international partnerships and student and academic exchanges; but there has been no serious strategic effort to add an international dimension to university curricula or to equip students with the skills required by a modern, global knowledge-based society, so higher education is not yet contributing as it should to improving the country's international competitiveness.

In considering the overall **vision for the tertiary system**, and its **governance and management**, the review finds that the law continues to reserve for universities the right to grant *licenciatura* degrees for the 18 so-

called learned professions and in some cases control rights to practise these professions. This monopoly maintains a hierarchy of prestige between tertiary institutions and contributes to classroom practices and degree requirements that have more to do with the past than with the future. The team recommends that artificial barriers to mobility be removed, that accreditation rather than legal status of the institution determine the value and prestige of a degree, that Chile adopt a broad three-cycle framework of Bachelors, Masters and PhD degrees similar to that of the Bologna process, and that the educational functions in tertiary education be separated from the licensing of professionals.

The review team found that the rationale for restricting membership in the *Consejo de Rectores* (CRUCH) has similarly outlived its usefulness. The roles that the CRUCH currently plays in representing the interests of Chilean higher education institutions, and carrying out important functions such as the admission of students, would be better accomplished by a group or groups representing all accredited institutions. Other agencies in the system (the Higher Council of Education, the National Accreditation Council (CNA) and the Student Loans Board) were found to have well-defined and complementary functions. However the review suggests that MINEDUC/DIVESUP commission regular strategic planning exercises, to ensure that all the agencies and institutions involved in the system are co-ordinating their efforts for the country's good.

With respect to institutional management, the review notes that, compared to best international practice, Chile's public universities give a major role in institutional decision-making to academic staff, but very little influence to external partners. It also recommends reforms that would permit public universities to recruit rectors from outside, encourage them to adopt modern management practices and free them from cumbersome civil service controls and regulations.

In examining tertiary education **quality**, the review team was duly impressed with Chile's recent progress, and particularly with the successful introduction and consolidation of a comprehensive, peer review based quality assurance system. The team's visits confirmed the impact of accreditation in changing institutional cultures by putting and keeping the issue of quality on the agenda of management, faculty and staff. Further benefits are expected as practices and cultures of quality assurance deepen. However, to realise its full potential, continued attention to and improvement of the quality assurance system is warranted. It would, for example, be beneficial for the CNA to make clear to tertiary institutions that quality, properly understood, means making relevant knowledge and skills accessible to all those the institution has a mission to serve; thus quality should be assessed by reference to each institution's particular mission.

Also, the CNA could usefully promulgate more in-depth criteria for peer reviewers, while avoiding regression to a control or "check list" mentality. More in-depth criteria could help to reduce some of the unwarranted latitude and discretion that currently gives an arbitrary flavour to some accreditation decisions, and could foster more consistently reasoned assessments.

As part of greater clarity and definition in accreditation criteria, ways should be found for the quality assurance system to have greater impact on teaching and learning practices in the classroom. The accreditation process in Chile can contribute more than it currently does to raising standards for teaching and learning, encouraging the use of competency-based teaching approaches and enhancing the participation of employers in curriculum and course design, thereby leading to higher graduation rates and greater graduate success in labour markets. The review also recommends ways of boosting the quality and effectiveness of the teacher training conducted by some tertiary institutions; this could make a real difference to students' preparation in schools and so to their success on entering tertiary education.

The review's efforts to assess the role of **research and development (R&D)** within the tertiary system were hampered by a lack of reliable and consistent data. This in itself is an area for concern and improvement. The sound data available, plus the review team's contacts with stakeholders, reveal a system that produces a commendable amount of high quality research in selected areas, and that performs above the regional average and closer to the OECD average on some indicators. Recent initiatives to increase base funding for highly selected research groups and to promote centres of research excellence are commended. At the same time, the Chilean research system is underfunded and lacking in coherent strategic focus.

More specifically, national policy does not strike an adequate balance between funding basic science and supporting strategic priority areas. Research funding instruments, particularly those of the National Commission for Science and Technology (CONICYT*, Comisión Nacional de Investigación Científica y Tecnológica*), are numerous, fragmented, and overlapping; they could be made more efficient if they were consolidated into fewer, larger, and more targeted programmes. Curtailing the proliferation of new funding instruments would also lend greater stability and predictability to research funding, and hence facilitate more predictable career trajectories for researchers. In addition, research policy in Chile should foment a greater diversity of models for universities to pursue. Many were found to be following a "one size fits all" model based on the classic definition of a research university, rather than seeking a comparative advantage in research that is more closely compatible with the particular mission of their institutions, or has a particular regional relevance. Also,

recent improvements notwithstanding, Chile continues to produce low numbers of PhDs relative to OECD comparators, and for longer-term cost-effectiveness would be well advised to continue to build high-quality domestic PhD programmes. This recommendation is also relevant to the Government's new programmes aimed at increasing doctoral training abroad; strong domestic programmes are essential to the retention of the highest quality human capital, regardless of where it is trained. To achieve these ends, increases in public investment in research are necessary, alongside other reforms.

In the area of **finance**, the team recognises that Chile has achieved a sophisticated financing infrastructure and derived benefits from its diversity and innovation. The successful management of the transition from an elite to mass system owes much to these achievements. However, despite recent successful efforts to increase public spending per student, it remains low by both regional and OECD standards; and as education is also more expensive in Chile than in most comparator countries, this puts a large and excessive burden on students and their families. Given the goals of further expansion with increases in quality and relevance, there is a compelling case for further increases in public funding levels.

Increased public funding, however, will be most effective if it is preceded or accompanied by restructuring of how institutions are financed. The review team recognises that the funding infrastructure is intended to allow Chile to pursue several policy goals at the same time, these including quality (through competition for top students); a focus on research; and improved equity and access. But funding allocations are still dominated by historical considerations rather than performance, which undermines the goals some of these instruments were designed to achieve.

The team's main finance recommendations include: design of a long-term vision for tertiary education funding; aiming to double public investment in tertiary education and research over the next few years; transforming the Direct Public Grant (AFD – *Aporte Fiscal Directo*) to make it more performance-based and possibly (depending on which of three options is chosen) available to more institutions; eliminating the Indirect Public Grant (AFI – *Aporte Fiscal Indirecto*) in its present form; expanding the use of performance contracts; and confirming a competitive funding mechanism such as the MECESUP programme or an equivalent as the Government's principal channel for investment funding.

With respect to **information, transparency, and accountability,** the review notes the existence of various information systems for students, including a comprehensive database on the future labour market value of tertiary degrees. Although further efforts are needed to ensure this

information is user friendly, it is by and large adequate for its purposes. Of greater concern to the team was the lack of comprehensive, reliable information for policy purposes. It is surprising to find, as Chile enters the OECD, that competing versions exist for such basic figures as tertiary enrolment. Data problems reflect failure to appreciate the need for institutions to report fully on all aspects of their activities, rather than just their use of public resources. The review team applauds the efforts of the Ministry of Education (MINEDUC) to eliminate these problems through the creation of the Higher Education Information System.

The current situation allows some institutions that are *de jure* not-for-profit to engage in de facto profit-making activities. The review team suggests that Chile would be better served by allowing for-profit universities, while requiring comprehensive, reliable information from institutions, and establishing appropriate tax and other policies that differentiate between for-profit and legitimately non-profit educational activities.

The review team believes that the package of recommendations in this report – if effectively implemented – offers Chile a road to reform that will achieve the Government's ambition of creating an accessible, high quality, innovative tertiary education system.

Chapter 1. Overview

This chapter gives a description of the national context for the review, including the Chilean education system as a whole and how Chile fares in international education comparisons. It describes the tertiary education system, covering such aspects as its purpose and objectives; recent history and development; principal national agencies; types of tertiary institution; the make-up of the student population; access and admission to tertiary education; tertiary curricula; tertiary education and the labour market; the system's regional role; funding and staffing; quality assurance; governance; internationalisation; and research and development. The chapter concludes by listing the recommendations concerning higher education in OECD's 2004 review of Chile's National Education Policies.

About Chile

Chile is a long narrow country, 4 300 km from north to south and between 90 and 435 km from east to west. Its land mass of nearly 757 000 square kilometres makes it the eighth largest in South America. The country's extraordinarily diverse terrain includes the Andean mountains, the world's driest deserts, lush pastures and vineyards, volcanoes, fjords and lakes.

The population is around 16.4 million,[1] growing at over 1% per annum: life expectancy in Chile is 78. Population density averages 22 per square kilometre but 87% of the population live in urban areas.

According to the Census of 2002, about 70% of Chileans consider themselves to be Catholic, around 15% Evangelical, while 8.3% do not belong to any religion. Around 4.6% declare that they belong to an ethnic or founding population: more than 80% of these are Mapuche, followed by Aymara, Rapa Nui or Pascuenses (Easter Islanders), the Atacameñas,

1. OECD Economic Survey of Chile 2007.

Quechuas and Collas communities in the north, and the Kawashkar or Alacalufe and Yámana or Yagán communities in the Austral channels.

Chile is a republic with a democratic government, headed by the President, who is both head of state and head of government. The centre-left Coalition of Parties for Democracy (*la Concertación de Partidos por la Democracia*) has held power ever since the ousting of Pinochet's military dictatorship in 1990. It is now led by Michelle Bachelet Jeria, the first woman to occupy the Presidency. Legislative power is held by the National Congress, made up of 120 Deputies and 38 Senators, all elected by popular vote.

The country is divided into 15 regions. Over 40%[2] of the population lives in the Metropolitan Region (*Región Metropolitana* or RM) which includes the capital, Santiago, the 5th largest city in Latin America. The regions, in turn, are divided into provinces (53) and municipalities (*comunas,* 346).

Economy and society

Chile has Latin America's most successful economy. The country saw strong growth in the 1990s, practically doubling its output between 1987 and 1998.[3] Though growth then slowed it picked up again from 2004. The *OECD Economic Survey of Chile*, published in 2007, records that in 2006 Chile's GDP was USD 145.8 billion, its per capita GDP USD 8 875, its average annual real growth over the past 5 years 4.3% and its unemployment rate 7.8%. The Economic Survey congratulated Chile on strong economic performance, exemplary macroeconomic management, robust public finances and low, albeit recently rising, inflation. The World Bank puts Chile in the upper middle income group of world countries.

Chile enjoys great natural wealth. In 2006 exports represented 39.8% of GDP, comfortably exceeding imports at 24.6%.[4] In that year copper made up more than half of export value;[5] salmon, fruit, wine and other minerals also contributed significantly.

The benefits of national wealth and economic success are not, however, distributed equally among the population. Chilean society is highly unequal.

2. Country Background Report.

3. Country Background Report.

4. *OECD Economic Survey of Chile 2007*.

5. O*ECD Economic Survey of Chile 2007*.

In terms of the difference between the percentage of national wealth held by the poorest and richest quintiles of the population, the World Bank ranked it the 9th most unequal country in the world in 2002,[6] though national statistics suggest some improvement since.[7] Within Latin America only Brazil is more unequal. This is less because Chile's poor are poor – the percentage of the population so classified has dropped from 40% in 1990 to 14% in 2006[8] – than because Chile's rich are rich, particularly the top 10%.

Inequity is more visible, and harder to shift in the short-term, because citizens of Chile have traditionally bought from household income services which in many OECD countries are publicly funded and available to all. Universal services have a socially levelling effect, though there may of course be sound economic reasons why Chile does not provide them. For some services there is a free option but the free service is generally considered inferior and many families pay; this is true, for example, of pre-primary, primary and secondary schooling. Other services have to be bought because there is no alternative – for example, Chile has minimal state-funded pensions (which also affects academics' willingness to retire) and healthcare (poor health is known to depress educational achievement), though reforms are now under way in both areas.

Chile in the international context

A mark of its economic strength is that Chile ranked 26 out of 131 countries on the World Education Forum (WEF) Global Competitiveness Index 2007,[9] above Spain and some way above all other Latin American countries. The 2007 Index is based on 12 'pillars'. Chile ranked particularly high on the 3rd pillar, macro-economic stability, on which its overall rank was 12, and on the 7th pillar, labour market efficiency, on which its overall rank was 14.

The country did less well in the areas most relevant to this report: the 4th pillar, health and primary education (overall rank 70), the 5th pillar, higher education and training (overall rank 42) and the 12th pillar, innovation (overall rank 45). And the WEF found that the third greatest problem for doing business in Chile (after restrictive labour regulations and inefficient government bureaucracy) is the inadequately educated workforce.

6. World Development Indicators (WDI) database.

7. Country Background Report.

8. MIDEPLAN 2004 and OECD *Economic Survey of Chile* 2007.

9. World Economic Forum Global Competitiveness Report 2007-8, October 2007.

The Forum's report identified particular areas within the pillars that dragged down Chile's overall rating, labelling them 'competitive disadvantages'. These included both the quantity (coverage) and the quality of education at all levels. Primary enrolment ranked 79, secondary enrolment 53 and tertiary enrolment 41. The quality of primary education ranked 102, the quality of secondary and tertiary education and training ranked 78 and the quality of science and maths education at secondary level and above ranked 107. The quality of scientific research institutions ranked 51, the capacity for innovation 50 and university-industry collaboration 43. The only competitive advantage WEF identified within the education and innovation pillars is the quality of Chile's management schools, ranked 19.

The Government of Chile is committed to improving national education performance, learning from international experience. Not content with having one of the most highly-regarded education systems in South America, Chile aims to raise its education system to the standards of OECD highly developed countries. An OECD partner country since 2001, Chile participated in PISA (the Programme for International Student Assessment) in 2000, 2003 and 2006 and hosted the OECD's Global Education Forum in 2005. Published OECD reports on Chile include a major report on National Education Policy (2004), a review of Innovation Policy (2007) and an Economic Survey (2007). Chile has now been accepted for full OECD membership. The country has also benefited from World Bank support for a range of important education, training and research projects, described in later Chapters.

International education comparisons

OECD's 2007 *Education at a Glance* publication gives figures for 30 OECD member states and 6 partner countries. These show that:

- Chile had an upper secondary graduation rate of 73% in 2005, below the OECD average of 82%, but just better than Spain and New Zealand and significantly better than Mexico's 40%. Chile's figure represents significant progress even since 2004, when the rate was 66%, and dramatic progress since 1995, when it was 46%.
- In 2004, tertiary graduates comprised 13% of the population aged 25-64, half the OECD average, but Chile's rate is steadily improving and catching up OECD countries. 18% of the population aged 25-34 are tertiary graduates compared to an OECD average of 32%; this 18% equals Mexico's rate and is higher than the rates of Italy and the Slovak Republic (16%), the Czech Republic (14%), Turkey (12%) and Brazil (8%).

- However, the proportion of Chile's population currently enrolled in education at all levels is a surprisingly high 28%, a figure beaten only by Israel, Ireland and Mexico. In the absence of evidence of lifelong learning, this figure implies excessively long tertiary courses and/or that significant numbers of those enrolled fail to graduate.

- Chile's entry rates to tertiary education are also higher than might be expected from figures for graduates in the population. *Education at a Glance* shows 2005 gross entry rates (all entrants, regardless of age, as a proportion of population at the typical age of entry) of 48% to Type A and 37% to Type B courses.[10] The OECD averages are 54% and 15%. However Chile's gross entry rate figures are not entirely comparable with the net entry rates given for most other countries, which are confined to new entrants actually in the relevant age group. Chile's figures may well be boosted by students entering for a second or even third time, either to upgrade their qualifications or as drop-outs returning to try again. (*Education at a Glance* also includes tertiary graduation rates and survival rates, but these are not available for Chile).

- Total Chilean spending on education as a proportion of GDP is 6.4% compared to an OECD average of 5.7%. The two diverge solely at tertiary level, where Chilean spending is 1.6% of GDP against an OECD average of 1.2% on Type A courses, 0.4% of GDP against an OECD average of 0.1% on Type B courses. This again implies inefficiencies in the tertiary system.

- While OECD average total education spending is 5.0% public and 0.7% private, Chile's is 3.3% public and 3.1% private. Chile has the lowest public share of any country in *Education at a Glance 2007* – 51.6%, compared to Korea's 60.5% and the US's 68.4%.

- In Chile, spending on pre-primary education is 33.8% private; spending on primary and secondary education is 31.1% private; and spending on tertiary education is a mighty 84.5% private. Within

10. Tertiary type A courses are largely theory-based, designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements and expected to involve at least three years' full-time-equivalent study at tertiary level. Tertiary Type B programmes focus more on practical, technical or occupational skills for direct entry into the labour market, and though generally shorter than Type A are expected to involve at least two years' full-time-equivalent study at tertiary level.

this 84.5%, approximately 83.7% comes from household income, and only 0.9% from other private entities. The comparable figures for Korea are 55.6% from households within an overall 79% from all private sources. For the US the figures are 35.1% from households within an overall 64.6% from all private sources.

- Of Chile's public spending on tertiary education, 65.2% goes directly to institutions, the rest to students in financial support. Only Norway and New Zealand have lower percentages of support to institutions. The OECD average is 81.9%.
- Chile's 34.8% of public funding spent on student support breaks down into 13.8% scholarships/grants, 21% loans. The OECD average of 17.5%, by contrast, includes more scholarships/grants (9.9%) than loans (8.6%). So does the US's 20.7% (15.4% scholarships/grants, 5.3% loans).
- In Chile, female students gain a lower proportion of degrees than the average in OECD countries. The difference is not marked for Type A courses (57% compared to 58%), but is significant for Type B courses (49% compared to 57%) and advanced degrees (38% compared to 43%). These differences are broadly consistent with differences in male/female entry rates.
- When graduates are analysed by field of education, the biggest difference is that Chile's tertiary institutions appear to produce rather more engineers. In Chile 15.6% of Type A graduates and 24.2% of Type B graduates are engineers, compared to OECD averages of 12.2% of Type A graduates and 14.7% of Type B graduates.
- The rate of entry to advanced research programmes is much lower in Chile (0.2% in 2005, the same as Mexico) than the OECD average (2.4%).
- Another source of education comparisons is the results of Chile's 15-year-old students in OECD's PISA study. Fifty-seven countries participated in 2006, when the study focussed particularly on science but also covered reading and maths.
  - Chile's students were ranked around 40th in all three subjects, significantly below OECD averages.
  - Chile did least well in maths, where male students outperformed females by the biggest margin of any participating country. In

reading, however, results had improved significantly since the 2003 study.

– A particularly large variation was noted between the performance of pupils in different schools, suggesting that the quality of Chilean secondary schools varies widely; and a particularly large proportion of this between-school variation could be accounted for by socio-economic differences between the pupils in the different schools.

Chile's education system outlined

Figure 1.1 illustrates the education system in Chile. Compulsory education lasts 12 years, typically starting at the age of 6. Eight years are spent in basic (primary) education. In terms of UNESCO's International Standard Classification of Education, the first six years correspond to ISCED 1, the two remaining years to ISCED 2 (lower secondary).

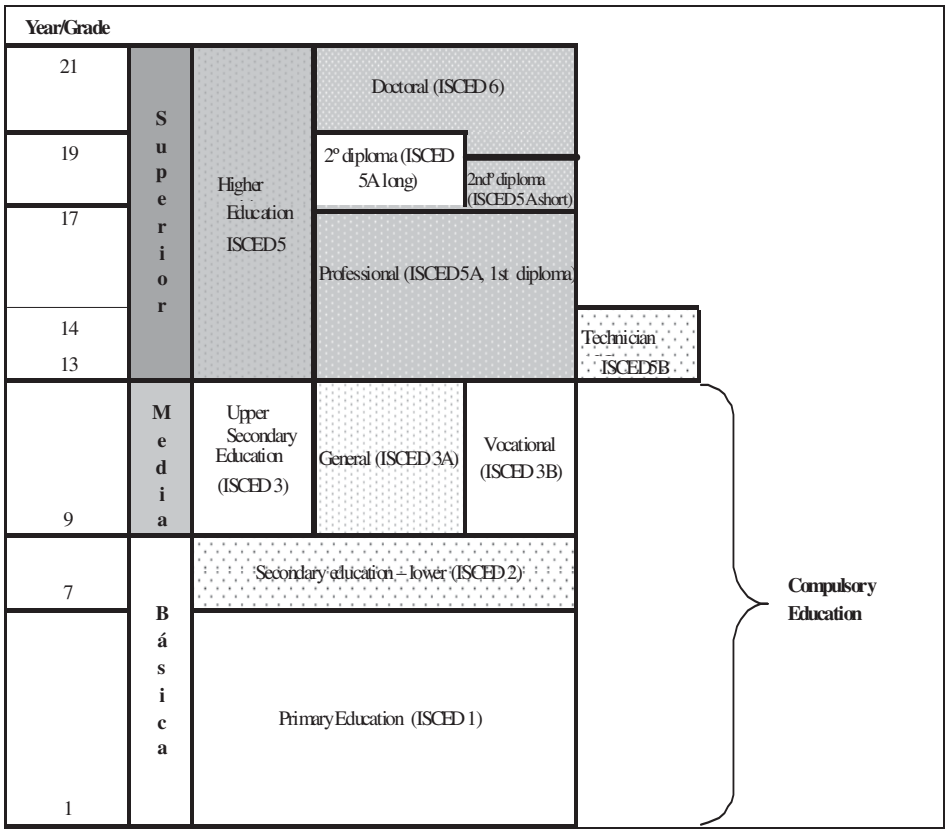
The remaining four years are spent in secondary education, which corresponds to ISCED 3 (upper secondary). After the first two years, pupils are streamed into either humanistic-scientific/general education (ISCED 3A) or technical-professional/vocational education (ISCED 3B). In 2006, 64.5% went into the general stream and 35.5% into the vocational stream.[11]

Having successfully completed secondary education and obtained the necessary certificate, the *Licencia de Educación Media* (Secondary education certificate) for general education or the *Tecnico Medio* for vocational education, school-leavers, typically aged eighteen, may enter tertiary education.

Tertiary education institutions fall into three categories, explained more fully below: Technical Training Centres (*Centros de Formación Técnica* or CFTs), Professional Institutes (*Institutos Profesionales* or IPs) and Universities. Course length depends on which of these is attended. CFT training typically lasts 2 years, (by law, technical degrees require 1600 hours of training), IP professional degree courses 4 years and university degree courses 5 years. Students who choose certain subjects or have to repeat years will take longer. Universities also offer one-year post graduate programmes and diplomas, two year Master's programmes and four-year PhD programmes.

11. OECD *Education at a Glance* 2008, Table C1.1.

Figure 1.1 **Chile's educational system**



Source: MINEDUC, Country Background report

Secondary education and its effect on entry to tertiary education

Secondary schools fall into three categories: municipal, private subsidised and private paying. Municipal schools are run by the 345 municipalities; they do not charge fees. As their labels imply, the private subsidised schools charge, but significantly less than the private paying.

It is generally acknowledged in Chile that by and large the private paying schools educate the most socio-economically advantaged, the private subsidised schools attract middle-income families and the municipal schools cater for the poorer sections of society. Many of the very poorest and the

least academically able will be found in municipal vocational schools or streams.

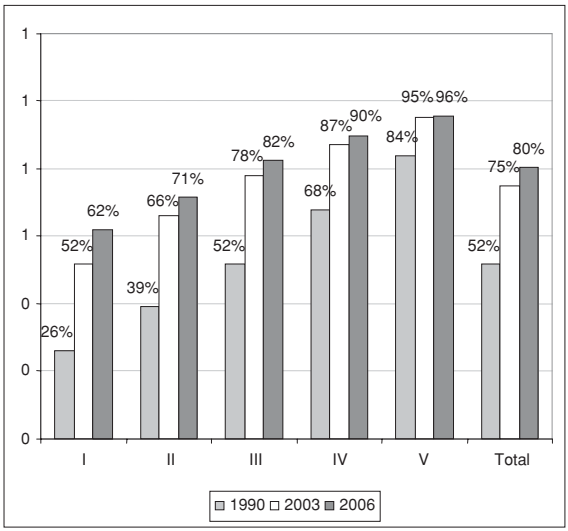
As already noted, Chilean pupils' performance in PISA 2006 showed strong between-school variation, predictable from their socio-economic status. 15-year-olds in private paying schools did significantly better than those in private subsidised schools who in turn did significantly better than those in municipal schools.

The likelihood of completing secondary education successfully also varies according to socio-economic status. Figure 1.2 shows successful graduation by family income quintile. Though the chances of successful graduation more than doubled between 1990 and 2006 for those from the poorest 20% of families, it can be seen that of the population aged 20-24 in 2006, only 62% from the poorest 20% had completed secondary education compared to 96% of those from the richest 20%.

Accordingly, pupils in municipal schools are the least likely to achieve the school-leaving certificate which is the minimum requirement for entering tertiary education. This is a prime cause of differences between income groups in chances of accessing tertiary education, but not the only cause, as Chapter 3 demonstrates. Municipal school pupils who sit the university entrance test, the *Prueba de Selección Universitaria* or PSU, are also least likely to pass it, and to get the highest scores.

The PSU tests mastery of the national curriculum in maths, Spanish and an optional subject or subjects, using multiple choice questions. One reason why municipal school pupils are at a disadvantage is that their schools struggle to teach them the full national curriculum. A large minority of municipal schools fail to teach it all, and those that succeed usually complete the curriculum only just before pupils sit the PSU, whereas private schools typically complete it much earlier, leaving time for intensive PSU preparation. A second reason is that the poorer families whose children attend municipal schools cannot afford to pay the *pre-universitarios* to coach them for the PSU preparation. The *pre-universitarios* are numerous, unregulated and of variable quality, but are believed to attract much business, both from private schools engaging them to coach pupils in school time and from higher income families buying tuition out of school.

Figure 1.2 **Percent of the population 20- 24 who have at least completed secondary education**



Source: MIDEPLAN (2004)

The deficiencies of the municipal schools were highlighted from late April to early June 2006 by nationwide protests of high school students. Among other things, they demanded major reform and upgrading of the public school system to provide high quality free education for all. The students also demanded free public transport to schools, abolition of PSU entry fees and a voice in government policy. The protests became widely known as "the march of the penguins", a reference to the protesters' school uniforms.

The protests peaked on May 30, when 790 000 students marched, and on June 5 when a national strike called by the Co-ordinating Assembly of Grade School Students, the largest in Chilean history, paralysed the Chilean education system. Most universities shut down and the teachers' union went on strike. The justice of the students' cause was widely recognised: some 87% of Chileans polled said they supported the movement and private school students gave it active support.

The President and the Government acknowledged that many of the students' complaints were justified. The Chilean Senate met in special session to hear them and a Presidential Advisory Council was set up, with student representation, to recommend remedies. After much debate, an 'Agreement for the Quality of Education' was signed on 13 November 2007

by all Government and Opposition parties. This agreement[12] indicated that the new principles underlying the Chilean education system will be Quality, Equity, Accountability and Transparency. Specifically, the agreement:

- Recognised that market dynamics will not, in and by themselves, produce a competitive and equitable education system.
- Defined the rights and duties of all stakeholders, including accepting the Government's responsibility for protecting students' rights to a quality education.
- Pledged that the Ministry of Education would define standards of achievement for children and standards of performance for schools, their owners, heads and teachers; set up a Superintendency to protect the rights of students and their families and ensure that schools meet Government requirements; and set up a Quality Agency to collect the best information for diagnosing and solving education problems.
- Undertook to change the system from the current 8 years primary + 4 years secondary model to 6+6, and to forbid selection of students – identified as a major cause of social segregation in the school system – up to 6th grade. (The Government had hoped to eliminate selection altogether but private school owners would not concede the point.).
- Promised to require school owners to have legal personalities, devote themselves exclusively to education and be audited if they receive government subsidies.

The agreement does not however make other changes some commentators think important if a quality revolution is to be achieved. These include giving municipal schools more resources and technical support and stronger management, ending the 'shared financing' system that subsidises some private schools, and improving teachers' initial training, continuing professional development, working conditions and capacity to deliver high quality learning.

However there is government action in some of these areas. For example, the Ministry of Education intends to make a subsidy available to all schools who teach the poorer children. This subsidy will be large enough to bring the budgets of such schools up to the levels enjoyed by the private and private subsidised schools who teach the better-off. To earn the subsidy, the school must produce a teaching quality improvement plan for the next 4

12. As described by Christian Bellei in "Message Magazine", November 2007.

years and evaluate its success thereafter, as well as implementing the national curriculum, devoting sufficient resources to the poorest and working with students' families.

It is too early to say how far the planned reforms will succeed in achieving a step change in the quality of public secondary education. As matters stand, the playing field for entry to tertiary education is far from level between rich and poor, privately-educated and municipally-educated.

Purpose, objectives and standards of tertiary education

The Ministry of Education (MINEDUC) has identified the following as the vital functions of tertiary education in the 21st century:[13]

- Develop society's advanced human capital;
- Supply, at the post secondary level, opportunities for continuous learning;
- Supply information and advanced knowledge;
- Serve as a vital support for a reflective culture and public debate;
- Stimulate regional development.

In 2003 MINEDUC stated the following principal objectives of tertiary education policy, recognising as they did so a number of current problems in the system:[14]

- To develop more and better academics, professionals and technicians. This implies educating growing segments of the population; undertaking profound changes to undergraduate teaching to make it globally competitive, including abandoning rigid curricula; and encouraging the development of the general and cross-cutting competencies essential for 21st century professionals, such as proficiency in English and familiarity with information and communications technology (ICT).
- To expand coverage. In 1990 there were 220 000 young people taking tertiary education courses. By 2005 this had grown to around 600 000 attending pre and post graduate courses in universities, professional institutes and technical training centres. The present

13. Country Background Report.

14. Country Background Report.

goal is that in 2012, when two million young people will be at an age for higher education, one million, or 50%, will attend tertiary education.

- To achieve equity with access, correcting inequalities. Talent is equally distributed among young people: opportunities should be broadened to guarantee the right to attend higher education to all young people with talent.
- To guarantee and improve quality. To achieve the objectives outlined above and to ensure that courses from different institutions are equivalent both nationally and internationally.
- To make information more transparent. This objective applies to information about higher education and its quality, employment possibilities and salary prospects.
- To modernise science and technology policy. The country needs a national, modern science and technology policy which indicates priorities and outlines coherent strategies, together with suitable instruments and programmes. Among the areas needing to be strengthened are public and private investment in science and technology; links between researchers and the private sector; the education of researchers; their role in relation to business; greater and more productive use of knowledge; and the organisation of national and international research and development networks.
- To innovate and introduce more flexibility in curriculum design. Chile's study programmes are long and not adapted to modern labour market circumstances or the demands of a mass tertiary education system. Tertiary education is too strongly segmented; there is a lack of pathways to allow students to move within the system, and curricula structures do not allow credit transfer or recognition of skills acquired at work.

The recent history and development of tertiary education

Until 1980, the tertiary education system consisted of just 8 universities. The two belonging to the State (the University of Chile and the State Technical University) had 65% of all enrolments and a large number of regional campuses. The other six were private, although almost all their

funding was assumed by the public sector. In 1980, total enrolment in higher education was 116 962, about 7.2% of the 18-24 age group.[15]

In the 1980s the military government's reforms allowed the creation of new self-financed private universities, and of vocationally-oriented alternatives to university in the shape of Professional Institutes (IPs) and Technical Training Centres (CFTs). The government decentralised the two large state universities; as a result many of their former branches became new regional universities. They also introduced a new and diversified system of finance for the 8 pre-existing universities, transferring a considerable part of costs to students and their families. Between 1980 and 1990, public contributions to higher education fell by 41% after accounting for inflation.[16]

In 1990, the military government was replaced by a democratic government under the *Concertación* (Coalition) centre-left coalition. Legislation inherited from the military government created the Higher Council of Education (*Consejo Superior de Educación*) to be the organisation responsible for licensing universities and professional institutes. During the 1990s the number of self-financed private universities continued to grow, but more slowly: whereas between 1981 and March 1990 120 new institutions had been set up (40 universities and 80 IPs), between July 1990 and December 2005 only 20 new institutions were approved (10 universities and 10 IPs) and 38 were closed down. *Concertación* governments did not prevent new private universities being founded – as some had feared – but established strong regulations through the implementation of the constitutional law (LOCE) passed on the last day of the military government. The 1981 reform concentrated resources on the state and state-subsidised private universities within the Council of Rectors of Chilean Universities (*Consejo de Rectores de las Universidades Chilenas*, or CRUCH). Direct contributions to these CRUCH universities increased and special investment funding mechanisms were created for them, such as the Institutional Development Fund (*Fondo de Desarrollo Institucional,* FDI). In 1994, the Government established the Fondo Solidario (FSCU), a subsidised student loan scheme with a low annual interest rate and gentle repayment terms, for poorer students enrolled in CRUCH universities,.

In 1997 for the first time the government outlined higher education's major policy directions; these have been followed by subsequent governments. The policy explicitly confirmed quality and equity objectives

15. Country Background Report.

16. Desormeaux & Koljatic, 1990, quoted in *OECD Thematic Review of Tertiary Education: Country Background Report*.

as well as the relevance of regionalisation and internationalisation. As a result, the government, using a World Bank loan, created the Higher Education Improvement Programme (*Mejoramiento de la Equidad y Calidad de la Educación Superior*, or MECESUP). MECESUP aims to help institutions improve their undergraduate and post-graduate education and advanced technology. The programme also aims to strengthen system capacity by establishing quality assurance and improving the regulatory structure and the organisations that co-ordinate the system.

More recent reforms include the introduction, under a 2006 law, of a national system of quality assurance through accreditation of institutions and study programmes. Accreditation is voluntary in the sense that institutions may continue to operate without it; but certain types of student support are available only to students at accredited universities, and certain programmes (such as teaching and medicine) must be accredited if they are to be publicly funded. The 2006 law built on the practice and procedures developed under the former fully voluntary accreditation system originating in the 1990s. Another important reform was the establishment, under a 2005 law, of a second student loan scheme, the Government Guaranteed Loan (CAE) managed in partnership with commercial banks, open to students in CRUCH or accredited non-CRUCH tertiary institutions.

Principal national agencies

The following are the key national players with responsibility for the analysis, design and/or implementation of tertiary education policy in Chile. Their roles will be explained in more depth in Chapter 5.

- The Ministry of Education (*Ministerio de Educación,* MINEDUC) is the principal co-ordinator and regulator, mainly through its Higher Education Division (*División de Educación Superior*, DIVESUP).
- The Higher Council of Education (*Consejo Superior de Educación* or CSE) decides on applications from private institutions for official recognition and licensing as CFTs, IPs or universities; monitors those who are licensed but not yet autonomous; and grants autonomy to institutions which have shown that they deserve it.
- The National Commission for Scientific and Technological Research (*Comisión Nacional de Ciencia y Tecnología*, CONICYT) advises the Government on science and technology and promotes and strengthen related research and development. Among its objectives are to co-ordinate national and regional policies and programmes.

- The National Accreditation Commission (*Comisión Nacional de Acreditación* or CNA) was formed in 2006 to conduct accreditation processes and co-ordinate the new national system of quality assurance for higher education. This system is described in more detail in Chapter 6. The CNA's principal tasks are to design and develop institutional and programme accreditation, and to help tertiary institutions build up their own capacity for quality assurance and the provision of full and accurate public information.
- The Administrative Commission for the Higher Education Loan System, (*Comisión Administradora del Sistema de Créditos para Estudios Superiores,* INGRESA) has the job of administering state-guaranteed student loans, including verifying that applicants meet the conditions, obtaining bank finance and selling on loan debt.
- The Council of Rectors of Chilean Universities (*Consejo de Rectores de las* Universidades *Chilenas*, CRUCH) was established in 1954. It represents the interests of its member universities and operates the University Entrance Exam (*Prueba de Selección Universitaria,* or PSU).
- The Presidential Advisory Council for Higher Education, which included representatives of all types of tertiary institutions and of students, reported in March 2008. A summary of the Council's main recommendations can be found, with those of the review team, in Chapter 10. Unlike the agencies listed above, the Council has no continuing role, having accomplished the task commissioned by the President.

Tertiary education institutions

Chile has three types of higher education institution.

Universities can grant any kind of academic, professional or technical qualification. They are the only institutions that can grant academic degrees (*licenciatura*) and therefore teach those professions regulated by law which require academic degrees. These professions are: lawyer, architect, biochemist, agricultural engineer, civil engineer, commercial engineer, forest engineer, surgeon, veteriniarian, dentist, psychologist, primary and secondary school teacher and pharmacist. Among universities there are two subtypes:

- Those that receive direct public funding, called traditional universities.

- Those created since 1980 by the private sector and known as private universities.

Traditional universities were established before 1981, except for the three Catholic universities established in 1991 on the basis of three regional branches of Catholic University of Chile. Of the 25 traditional universities, 16 are state universities; 6 are Catholic universities, and 3 are private lay universities. They are all members of the Council of Rectors of Chilean Universities (CRUCH), and so are also called CRUCH universities.

The differences between CRUCH and other universities in terms of their eligibility for direct funding and the support available to their students are explained below, but there is no difference in the degrees they may award. Both types of university focus on Type A, ISCED 5A, first degree courses leading to the *licenciatura*. These courses typically take 5 years, with an emphasis on theory, and provide the qualifications and skills needed to proceed to more advanced research. The great majority of these programmes are full time, although part time programmes are increasing in relative importance.

Universities also offer post-graduate diplomas (*post títulos*) lasting up to a year, and Master's degrees and medical specialisations which last longer. At some universities there is also a small group of higher technical programmes which are Type B, ISCED 5B. Research and postgraduate work is largely concentrated at the CRUCH universities. Though most private universities tend to concentrate almost exclusively on undergraduate teaching, there are some exceptions. By law, all universities must have non-profit status.

Professional Institutes (IPs) award professional or technical degrees. Because they cannot grant academic degrees, they cannot offer programmes leading to degrees in the professions requiring a *licenciatura* before the professional degree. Typically IPs teach four year professional programmes at the 5A level, but they also offer significant numbers of 5B programmes. All IPs are private, self financed and can be for-profit or non-profit.

Technical Training Centres (CFTs) are only allowed to teach technical programmes (ISCED 5B), which normally require between 2 and 2.5 years of study. They are private institutions and can be for-profit or non-profit.

Universities, IPs and CFTs may be autonomous or non-autonomous. When an institution is first established it seeks permission to operate from the Higher Council of Education. Permission will be given under certain conditions. The Council will monitor the new institution and take responsibility for its awards during a period of not less than six years and no longer than eleven years. After that, the Council determines whether the

institution has developed in accordance with its stated objectives. If so, it becomes autonomous. If not, it must be closed down.

In October 2007, there were:[17]

- 192 tertiary institutions, of which 61 were universities, 44 IPs and 87 CFTs;
- 25 CRUCH and 36 Private universities: 32 of the Private universities were autonomous;
- 29 autonomous and 15 non-autonomous IPs;
- 21 autonomous and 66 non-autonomous CFTs.

The student population

In 1990 there were 245 000 undergraduates in Chilean tertiary education. By November 2007 there were over 678 000.[18] In this relatively short period Chilean tertiary education has moved from an elite to a mass system.

Taking as a basis the age group 18-24, gross coverage rates increased from 16.3% in 1992 to around 34% in 2006, according to MINEDUC estimates.[19] According to other estimates based on household surveys, the coverage level was 38% in 2003: it is not clear whether this difference is due to a 'hidden' sector undeclared by the tertiary institutions themselves or a bias in the household surveys. According to UNESCO figures,[20] in 2004 Chile had a gross entry ratio of 24% to 5B courses and 44% to 5A courses. It is generally agreed that by 2010 gross coverage will be greater than 40%.

17. Consejo *Superior* de Educación, *INDICES – 2008.*

18. Consejo Superior de Educación, *INDICES – 2008.* NB These may not give a complete picture of student numbers because 1 university, 11 of 44 IPs and 16 of 87 CFTs did not report their figures.

19. Country Background Report.

20. UNESCO World Education Indicators, quoted by Professor J.J. Brunner in "Chile's Higher Education system: a comparative political economy focus".

Figure 1.3 shows how the growth in student numbers since 1990 has been mainly in private universities, whose students have risen more than tenfold. The growth spurt from 1999 was more due to proliferation of branch campuses by existing universities than to creation of new universities. CRUCH universities have grown steadily, more than doubling their student numbers. Professional Institutes (IPs) fell back somewhat until 1995, but then renewed their growth. Only Technical Training Centres (CFTs) saw their student numbers decline – though they have recovered somewhat since 2005.

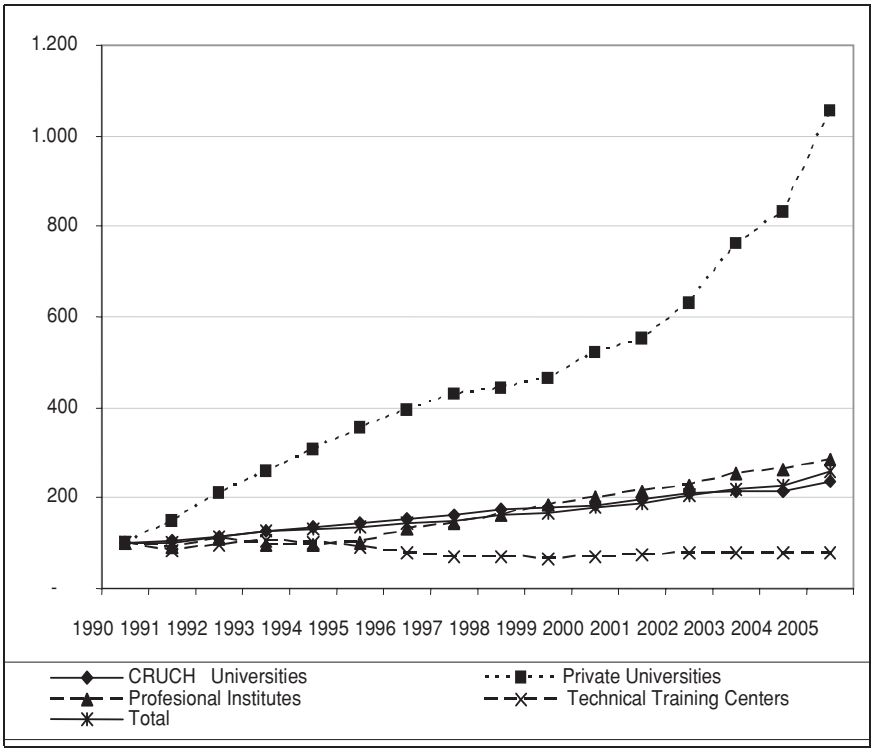
Table 1.1 shows how students were distributed between types of institution and levels of programme in November 2007: 68.8% were at universities, 19.6% at IPs and 11.6% at CFTs. Universities accounted for 67.9% of undergraduate enrolment. Just over half of universities' undergraduate enrolment (50.3%) was at private universities. Of students on 5A programmes, 82.9% were at universities and 17.1% at IPs. Of students on 5B programmes, 11.6% were at universities, 31.7% at IPs and 56.7% at CFTs. For postgraduate programmes, universities have a monopoly. CRUCH universities account for 62.6% of students on these programmes, including 89.2% of doctoral students.

Not shown in Table 1.1 but available from the same source[21] are figures for the 216 772 students who entered tertiary education programmes in 2007: 55% entered universities, 26% IPs and 18% CFTs. CFTs and to a lesser extent IPs might be expected to have higher first year than total percentages because their courses are shorter, but among university entrants, 56% went to private universities. This suggests that current growth is coming not from state or state-subsidised universities but from the private sector universities, IPs and CFTs; and that the Chilean Government will need to look mainly to these institutions to achieve its 50% participation target.

21. Country Background Report.

In 2007, Level 5B undergraduates made up 21.05% of all level 5 students. This means that for each 5B undergraduate there are 4 at level 5A. The tertiary education ratio is however less extreme than the ratio in Chile's adult population, where for each educated 5B adult there are 10 5A educated adults.[22] Chapter 4 on Relevance will discuss how well the current balance of tertiary provision meets the country's needs.

Figure 1.3 **Averaged indices for tertiary undergraduates by type of institution (1990=100)**



Source: Based on MINEDUC (2006)

22. Country Background Report.

Table 1.1 **Tertiary education student enrolment by institution type 2007 (thousands)**

	5B Under-graduate (Tecnico Nivel superior)	5A Under-graduate (Bachillerato, Licenciatura, Profesional, Prof. con Lic., Plan Comun o Ciclo Basico)[1]	Masters	Doctoral	Medical or Dental Postgraduate specialisation	Total
Universities	16 147	432 466	13 872	2 353	1 993	466 831
CRUCH		*222 798*	*7 538*	*2 099*	*1 759*	*234 194*
Private		*225 815*	*6 334*	*254*	*34*	*232 637*
IPs	44 066	89 012				133 078
CFTs	78 826					78 826
Total	139 039	521 478	13 872	2 353	1 993	678 735

Note: 1. Numbers of university undergraduates in each programme type: Bachillerato 4 533, Licenciatura 10 929, Profesional 32 859, Profesional con Licenciatura 372 684, Plan Comun o Ciclo Basico 11 461

Source: Consejo Superior de Educación, INDICES – 2008

Table 1.2 shows the distribution of Chilean tertiary students between study areas at the different types of institution.

Table 1.2 **Tertiary education enrolment by area of study 2007 (thousands)**

Area of study	Universities	%	IPs	%	CFTs	%	Total	%
Administration and commerce	49 103	11	22 292	17	23 201	29	94 596	14
Agriculture and fishing	26 893	6	3 305	2	3 103	4	33 301	5
Art and architecture	30 370	7	16 637	13	2 141	3	49 148	7
Sciences	14 802	3	272	0.2	738	1	15 812	2
Social sciences	52 479	12	10 201	8	1 014	1	63 694	10
Law	32 851	7	7 382	6	6 932	9	47 165	7
Education	79 936	18	14 825	11	4 360	6	99 121	15
Humanities	9 234	2	1 116	1	339	0.4	10 689	2
Health	70 590	16	10 878	8	15 330	19	96 798	15
Technology	82 355	18	46 170	35	21 668	27	150 193	23
Total	446 613	100	133 078	100	78 826	100	660 517	100

Source: Consejo Superior de Educación, INDICES – 2008

In recent years the make-up of the student population has been changing, with more female students, more older students and more who work part-time. Women made up 14.3% of undergraduates in 1990. By 2007 they accounted for 49%,[23] making up 50% of enrolment at CFTs, 43% at IPs and 51% at universities (49% at CRUCH universities). In that year females accounted for 40.2% of postgraduate enrolment and 40.8% of students enrolled for doctorates. Female undergraduates are more likely than males to be studying social sciences (13% v 6%), education (20% v 10%) and health (21% v 9%), far less likely to be studying technology (7% v 38%).

According to a UNDP study,[24] in 1998 22.6% of tertiary students were 25 or older, while by 2003 this figure had increased to 28.4%. Adult participation had grown particularly in the non- university sector, from 22.3% to 30.3%; universities have seen growth from 22.7% to 24.6%. The same study found that many older students work while studying.

As already mentioned, the government aims to achieve 50% participation in tertiary education by 2012. Future growth will be brought about partly by national policies to widen access, partly by demographic change.

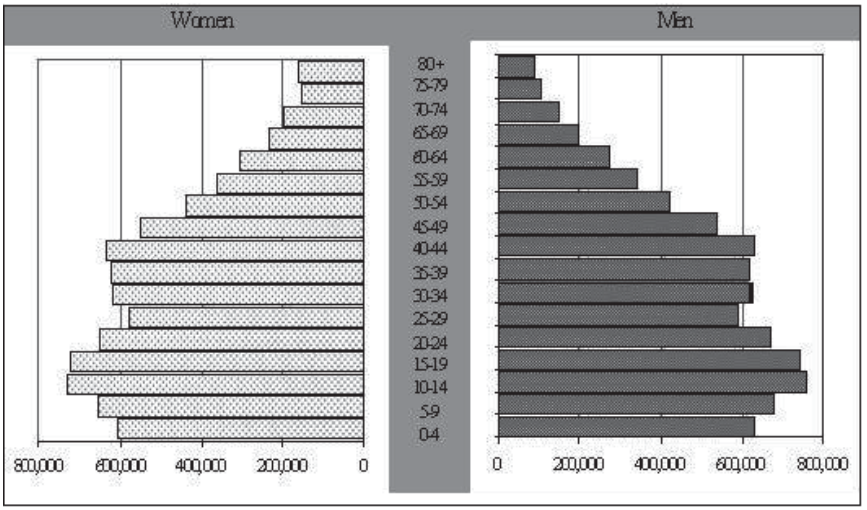
Figure 1.4 shows the current population by 5-year age band.[25] Numbers in the youngest age bands (up to age 10) are decreasing compared to those immediately above them, but the three largest age-bands cover ages 10 to 24. These may be expected to swell numbers seeking to enter tertiary education for many years to come, as may the increasing trend for entry aged over 25. Demographic projections suggest that Chile's total population will grow to 17.9 m in 2015 and 19.1m in 2025. It will remain true however that the most relevant age-group for tertiary education in Chile is those aged between 18 and 24. This group is expected to grow by 12.5% between 2005 and 2015. Meanwhile, the cohort of 18 year old school-leavers will remain practically stable. Figure 1.5 illustrates these projections.

23. Consejo Superior de Educación, INDICES – 2008.

24. 2006 study quoted in Background Report.

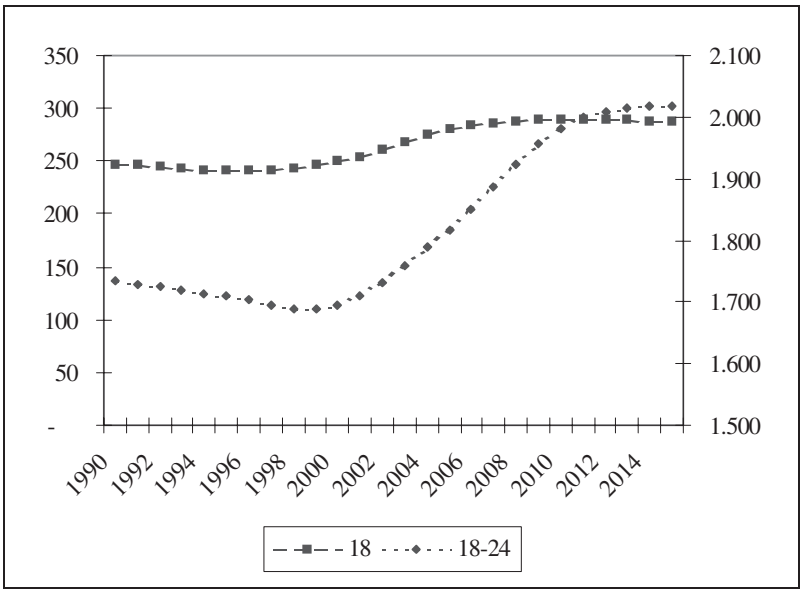
25. Country Background Report.

Figure 1.4 **Population by sex and age group – estimate 2006 (thousands)**



Source: INE (2006)

Figure 1.5 **Population over 18 and between 18-24 years, 1990-2015 (thousands)**



Source: CELADE (2000)

Admission to tertiary education: access and equity

Given Chile's levels of inequality and pronounced differences of income by educational level, fair access to tertiary education is a very important aspiration for large sectors of the population. Concerns that access is not fair were one factor behind 2006's national strikes and protests of high school students.

As already mentioned, the basic qualification for entry to tertiary education is the school-leaving certificate, but while this is necessary for all types of institution, it is sufficient only for CFTs and sometimes IPs. All universities in membership of CRUCH require applicants to sit the *Prueba de Selección Universitaria* or PSU test, and are expected to confine recruitment to those school-leavers who have achieved a minimum score, currently 450. Private universities, some IPs and a few CFTs also take account of PSU scores in recruitment.

Additionally, all currently available government-funded student support schemes (except one scholarship specifically for higher level technicians) require a minimum PSU score, among other conditions. For loans, the score must be at least 475; for scholarships, with one exception, at least 550.

Therefore, virtually all young people who have successfully graduated from school and are considering entering tertiary education sit the PSU. For entry in March 2008, nearly 217 000 did so.[26] This represented an increase of 3% on 2007 which in turn was a 20% increase on 2006.

The University of Chile, acting on behalf of CRUCH, has a unit known as DEMRE, to administer the PSU test and handle its results. Once PSU results are known, students with the minimum score may apply through this unit for places at CRUCH universities. They may give a number of choices, stating their order of preference. In the last two years, according to the unit's figures, CRUCH universities have had more applicants from this multi-preference system than they have places. The unit allocates places in order of total score.

As will be explained in more detail in Chapter 3, this admission system produces an unequal distribution of tertiary places between socio-economic groups. Pupils from municipal schools and poorer households are much less likely than pupils from private schools and richer households to pass the PSU. If they pass, they are less likely to achieve the higher scores that unlock student support and give access to the best universities.

26. 216 881 according to figures from University of Chile (who administer the PSU), given to the review team by La Serena University.

Other causes of inequity include the high cost of studying in Chile (fees average 30% of per capita income, three times as high as in the US, Australia or Japan) and the conditions set for student support. The publicly-financed student support system consists of a number of different loan and scholarship schemes, which will also be described in Chapter 3. First, though many of these schemes are targeted specifically at young people from poorer households, their PSU-dependency limits the numbers they can help. Secondly, most of the schemes appear to have been designed with CRUCH institutions in mind, and students at private universities, IPs and CFTs – two-thirds of tertiary students – are far less likely to be eligible for them.

Tertiary curricula

In Chile, curricula are designed and degrees and diplomas awarded entirely by universities themselves, though professional associations have some influence over curriculum design and degree standards, and some aspects are regulated by law. For example, the law defines a list of 'learned professions', which can only be practised by holders of a *licenciatura* degree; and the law provides that only universities can award this type of degree. The disadvantages of the *licenciatura* system are discussed in Chapter 5.

Academic and professional degree courses in Chile normally last 5 years, more in certain subjects: a civil engineering degree, for example, takes 6 years. Individual students may have to repeat one, two or more years. At one well-respected university visited by the review team the average length of time taken to gain a civil engineering degree was 8 years, even though students entered with very high PSU scores.

MINEDUC and most commentators agree that, despite recent reform efforts, Chile's university degrees are still too long and their curricula too rigid.[27] There is too much emphasis on imparting theoretical knowledge in the classroom, not enough on developing understanding, practical skills and capacity for independent study. University curricula have been insufficiently adapted as Chile moves from elite to mass tertiary education. The needs of today's diverse student body have not been effectively identified and catered for; nor have the demands of a global labour market and the pace of change in the modern world.

27. Country Background Report.

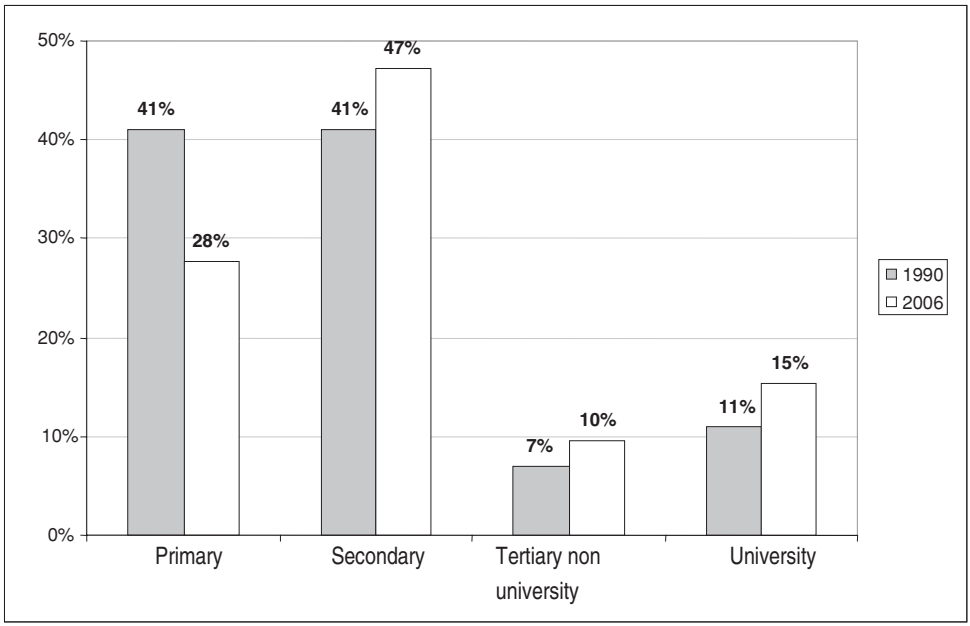
One result is a high level of drop-out, thought to be particularly high for students from poorer families who tend to be less well prepared for university by their secondary schools.

Also notable in the Chilean system is the lack of articulation between courses in the same subject at different types of tertiary institution. If, say, a student has taken a technical engineering course at a CFT and then wishes to go to university to become a professional engineer, s/he may well need to start the university course from scratch: this was the case at one university the team visited, even for students graduating from the university's own CFT. Chile currently has no general system of "ladders and bridges" between qualifications and levels. This issue – also very significant for the labour market – will be discussed more fully in Chapter 4.

Tertiary education and the labour market

Figure 1.6 shows the composition of Chile's labour force by educational level.

Figure 1.6 **Educational profile for the labour force and adult population**



Source: *Country Background Report* authors' calculations from CASEN surveys 1990 and 2006

It can be seen that between 1990 and 2006 the proportion with only primary education decreased substantially and the proportion with tertiary education grew from 18% to 25%. Within this, there was greater growth in the proportion educated at universities.

As these trends are not out of line with trends in tertiary enrolment, Figure 1.6 does not by itself tell us a great deal about the impact of tertiary education on employment prospects. There have been fears that the growth in graduates since 1990 might saturate the labour market and reduce economic rates of return to higher education: but there is no sign of this happening, at least until 2003. The CASEN survey shows a sustained increase in salary returns to higher education, and a reduction for those with only secondary education. Table 1.3 shows rates of return in terms of one additional year of education. The returns shown to higher education have remained consistently around 20% a year, except for 2000 when they were higher. The slightly lower figures in 2003 and 2006 may possibly herald declining rates in future.

Table 1.3 **Return on a year's additional education by type of education (%)**

	Basic	Secondary	Higher
1990	2.9 - 7.8	9.1 - 10.8	20.6 - 25.6
1992	3.6	9.9	22.1
1994	4.2 - 9.7	9.1 - 12.9	20.7 - 27.9
1996	3.2	11.3	21.4
1998	3.6 - 7.7	7.0 - 11.4	21.0 - 28.1
2000	7.0	11.0	29.3
2003	10.2	7.8	19.8
2006	9.5	6.8	19.4

Source: based on Mizala & Romaguera (2004) for1990-2000; www.futurolaboral.cl for 2003 and 2006

Table 1.3 does not distinguish between those who finish their educational stage and those who fail to finish. A 2003 study by Sapelli found that the returns from completing a professional title are in the range of 40-50%. According to the CASEN survey 2003, the income difference between those who complete their studies and those who do not is 26.2% for those who study in CFTs, 10.2% for those who study in IPs and 73.6% for those who go to University. Similarly, a 2002 study by Meller and Rappoport found that a person who completed university studies has twice the possibility of being employed of a person who started but did not finish.

These handsome rates of return to tertiary education largely result from Chile's high income differentials. According to the Background Report

authors' calculations based on the 2006 CASEN survey, someone who completed university education receives nearly 4 times the income received by someone whose education ceased after completing secondary education. There are also significant differentials among completers of tertiary education. A professional educated at a university earns 65% more than one who studied at a Professional Institute and more than twice as much as a higher technician who studied at a CFT.

There is no national source of information to show tertiary graduates' success or otherwise in finding jobs within six months or a year of completing their studies. Few of the universities visited by the review team could produce comprehensive information. Universities generally indicated that individual departments had been collecting information on graduate destinations, which would be brought together more effectively in future – particularly as this is now a condition of accreditation.

Despite the high rates of return described earlier, it is widely acknowledged that tertiary education faces some labour market issues. The first is the quantity and quality of professionals and technicians. One study[28] suggests a 10% deficit in the numbers needed for the country's economic development. The International Adult Literacy Survey[29] suggests that in the areas tested, skills of professionals and technicians in Chile are no higher than those of young people who have completed secondary education in advanced economies. It is however very difficult to compare the skill and knowledge levels of Chile's tertiary graduates with those from other countries, because Chile has not set up a National Academic Recognition Information Centre (NARIC) to make authoritative judgements on international qualifications equivalences, working with the NARICs in other countries.

A second issue is low female participation in Chile's labour force. As noted in OECD's *Economic Survey of Chile*,[30] during the period 1990-2003 male participation remained relatively stable at about 73%, close to the OECD average. Female participation, despite an increase of almost 10 percentage points during this period, reached just 42%. This is low by OECD and even Latin American standards. Also, unemployment is typically higher for females than males; the effective gender gap in labour force participation is higher still when part-time work is taken into account; and

28. Meller and Rappoport (2004), quoted in Background Report.

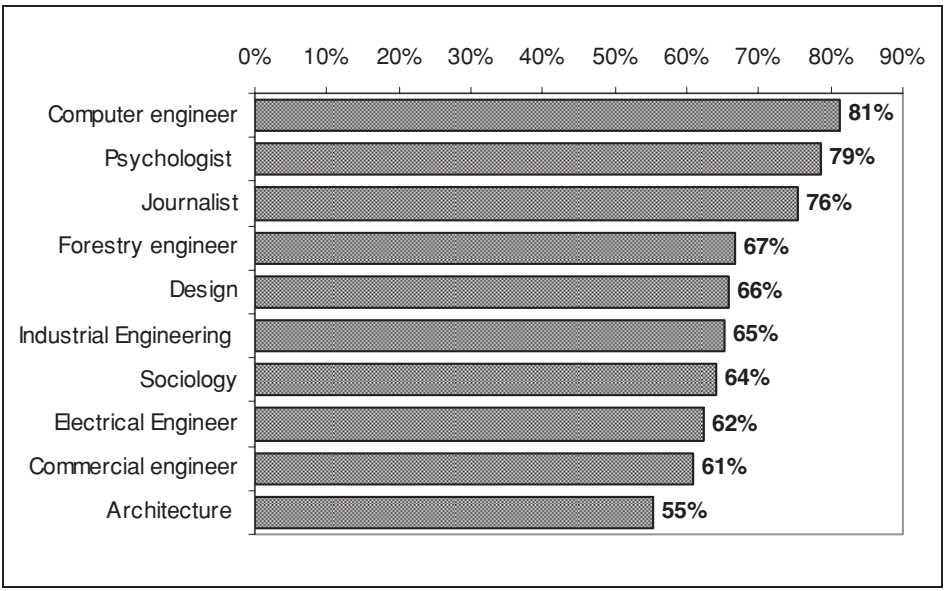
29. Quoted in Country Background Report.

30. OECD 2007.

the gender-earnings gap remains sizeable, even among the best educated individuals.

The OECD *Economic Survey* also found, however, that participation appears to be sensitive to education attainment in Chile, and that university education brings women high rates of return. OECD suggested that fostering labour force participation among females could contribute to raising the economy's long-term growth potential, and reducing poverty and income inequality; and that fostering human capital would contribute to reducing the gender gap in labour supply and employment. This may be taken as a strong signal to Chile to boost the participation of women in relevant tertiary education.

Figure 1.7 **Professions with greater participation of young professionals (25-34 years)**



Source: http://www.futurolaboral.cl cited in *Background Report*

A third issue is that some occupations – shown in Figure 1.7 – already contain a high percentage of young professionals (people between 25 and 34 years of age with degrees). This may reduce the employment prospects of future graduates in these fields. There have also been notorious recent instances of Chilean universities setting up new courses to equip students with specialist qualifications which have almost no market value.

See Chapter 4 for a fuller discussion of tertiary education and the labour market.

The regional role of tertiary education

Chile is divided into 15 administrative regions. Each is governed by a Prefect, the representative of the President of the Republic, a regional Council and a supporting administration responsible to the regional government. There are also Ministerial Regional Secretaries, decentralised organs of the Ministries, but these are subordinate at the regional level to the Prefect.

Until October 2007 there were 13 regions, 12 referred to by their Roman numeral and one – the region surrounding Santiago – by its name (*Región Metropolitana)* or initials (RM). The regions ran in sequence from north to south, I being the furthest north, with the Metropolitan Region of Santiago between V and VI. In October 2007 two new regions became operative. The provinces of Arica and Paranicota, formerly the top third of Region I (Tarapaca), became Region XV (Arica-Paranicota); the province of Valdivia, formerly part of Region X (Los Lagos) became Region XIV (Los Rios).

With apologies to the two new regions, the rest of this report will sometimes talk in terms of 13 regions, because much of the information and evidence in the Background Report and gathered by the team during fieldwork is based on them.

Chile's population is concentrated in the central regions, which have the most favourable climate. The regions located in the extreme north and south of the country (I, II, III, XI and XII), account for more than 60% of the territory but only 9.39% of the population. More than 40% of the population is concentrated in the Metropolitan Region of Santiago (RM). The next most populated regions are VIII (Biobio) with 12.3%, and V (Valparaiso) with 10.2%. Whereas regions II, III, XI and XII have fewer than 5 inhabitants per square kilometre, the RM has 434, followed by V with 104, VIII with 54 and VI with 52. In the RM and region II (Antofagasta) over 96% of the population are urban dwellers; while in regions VII (Maule), IX (Araucanía) and X (Los Lagos) the figure is less than 70%, which implies that many of the population live in rural areas.

There has been no explicit national policy to equalise tertiary education opportunities between the regions, which would in any case be difficult given their very different geography and population density. Regional governments, however, have been keen to achieve equal opportunities for their citizens. They have also encouraged local tertiary institutions to develop regional identities and offer programmes that will strengthen the regional economy.

Notwithstanding the lack of an explicit policy, the growth in tertiary enrolment from 1990 onwards did much to help the spread of tertiary education to and around the regions. Between 1990 and 2006, national tertiary coverage increased from 14% to 34%.[31] Table 1.4 shows how this growth was distributed between regions. All showed increases, although some regions trailed the national average, including region VI (O'Higgins, just south of Santiago) and XI (Aisen). These had only achieved coverage rates of 7% and 9% respectively by 2006, though region XI has the highest annual growth rate of any region.

The regions with the greatest coverage in 2006 were V (Valparaiso), RM (Santiago), I (Tarapaca), II (Antofagasta) and VIII (Biobio). Only these regions had coverage greater than the national average.

Regions differed in the institutional base for their growth. In the RM and region VIII the greatest contribution was made by private universities, whereas in regions I, II, III and XII growth was led by CRUCH universities. As a result, regions vary in the balance of their provision between different types of institutions. For example, in 2007,[32] the two new regions both had over 80% of their tertiary places in universities, whereas in Aisen, 61% of places were in CFTs.

However all regions benefited both from the proliferation of new private institutions, particularly between 1990 and 2000, and of new branches of existing institutions, particularly from 2000. The number of branches grew by 39% between 2000 and 2006, setting up competitive tensions between institutions. As an example, the team visited a university in Arica which had set up a branch in Iquique, and a university in Iquique which had set up a branch in Arica; neither welcomed the other's presence in its home town and there was considerable overlap between the programmes offered. The burgeoning of branches has also raised concerns about quality. On more than one occasion an institution has failed to get accreditation because it could not demonstrate that the acceptable quality assurance standards maintained at the main campus extended equally to the branch campuses.

An important driver of regional growth has been resources from new funding schemes, particularly the Fund for Institutional Development (*Fondo de Desarrollo Institucional* or FDI) and the Competitive Fund

31. Ministry of Education of Chile (2007), *OECD Thematic Review of Tertiary Education: Country Background Report for Chile*, Santiago.

32. *Consejo Superior de Educación, INDICES* – 2008.

(*Fondo Competitiv,* FC), both now part of the MECESUP Programme. Of the total MECESUP funds assigned, 68% went to universities in the regions.

Table 1.4 **Evolution and annual average growth (percentage) of the coverage rate per region, 1990–2006**

Region	Coverage Rate 1990	Coverage Rate 1995	Coverage Rate 2000	Coverage Rate 2006	Difference in % points in coverage 1990-2006	Annual growth rate – coverage, 1990-2006
I	16.35	22.57	25.10	38.59	22.24	5.51
II	16.78	25.96	33.74	35.89	19.11	4.87
III	7.64	9.95	12.78	18.30	10.66	5.61
IV	10.40	18.44	23.13	30.72	20.32	7.00
V	17.87	24.75	34.17	43.07	25.20	5.65
VI	3.28	5.29	5.16	6.98	3.70	4.83
VII	5.54	9.63	13.94	19.99	14.45	8.35
VIII	14.18	18.14	24.74	35.82	21.64	5.96
IX	9.13	16.14	21.30	20.92	11.79	5.32
X	9.89	12.88	17.39	23.13	13.24	5.45
XI	1.10	0.08	3.62	8.75	7.65	13.84
XII	9.75	15.45	23.79	29.82	20.07	7.24
RM	18.57	25.77	33.26	41.28	22.71	5.12
Total	14.36	20.21	26.92	34.27	19.91	5.59

Source: Based on MINEDUC (2006) for enrolment, CELADE (2000) and INE 2006 for population 18-24 years

Other schemes which have provided valuable support for tertiary education's development in the regions include:

- CONICYT's Regional Science and Technology Programme (*Programa Regional de Desarrollo Científico y Tecnológico*), whose objectives have been to support regional research capacity and help create regional research consortia.
- the Lifelong Learning and Training Programme (*Programa Chile Califica, de Educación y Capacitación Permanente*), which promotes the formation of regional networks of institutions which

link different types of technical training for capacity building with priority productive sectors for the region.

Funding of tertiary education

Tertiary institutions receive public funding in the following forms:

- Direct Public Grant (*Aporte Fiscal Directo,* AFD) is base funding available only to CRUCH universities. The amount received depends on their numbers of undergraduates, undergraduate courses, staff with Masters and PhD degrees, competitively-funded research projects and publications. The AFD favours larger, more complex, more research-intensive institutions.
- Public Indirect Grants (*Aporte Fiscal Indirecto,* AFI) reward the institutions which recruit the 27 500 students with the highest PSU scores. These students are divided into 5 bands of 5 500; grants for the top 5 500 are 12 times the size of grants for those ranked between 22 000 and 27 500. The AFI was intended to promote quality by encouraging competition for the best students. In practice it directs public funding to the institutions with established high reputations whose students are most likely to come from better-off families.
- Grants from competitive funds or mechanisms are intended to improve the quality of undergraduate, postgraduate and technical training, research and institutional management. These include the Competitive Fund already mentioned, the Academic Innovation Fund (*Fondo de Innovación Académica*, FIAC), and performance agreements (*Convenios de Desempeño,* CdD). All are supported jointly by the World Bank and the Chilean government under the MECESUP programme.

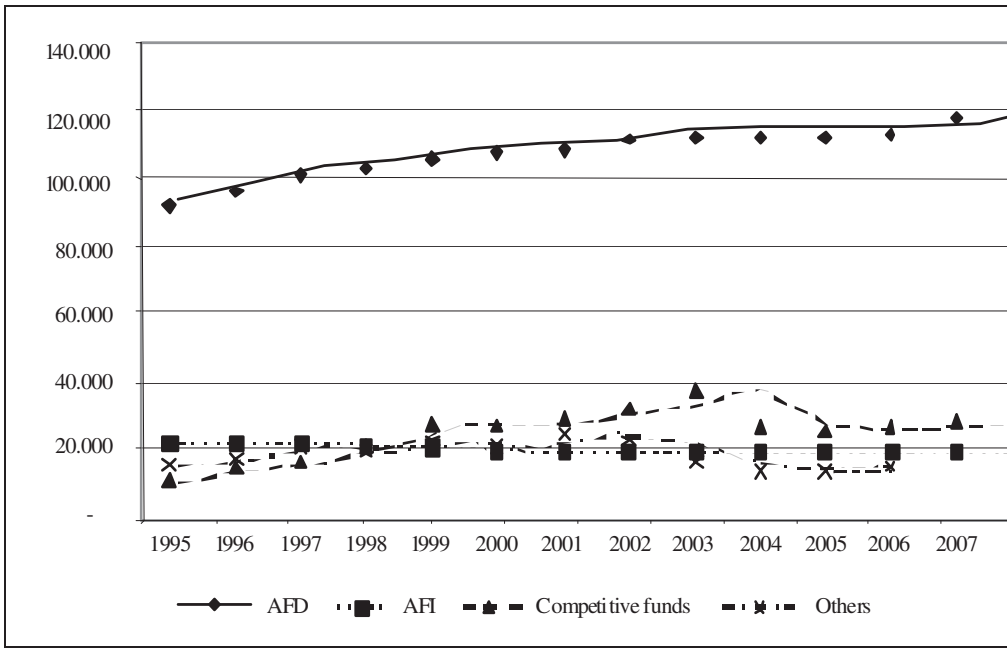
Figure 1.8 shows how funding from these sources changed between 1995 and 2007, after accounting for inflation. It can be seen that the AFD grew by 29%, from CLP 93.9 billion to CLP 120.7 billion, but that the AFI has been effectively frozen. Competitive fund allocations have increased by 178%, from CLP 10.1 billion to a peak of CLP 37.4 billion in 2003, declining to CLP 26.4 billion in 2006 due to the FC project cycle. Funds other than competitive funds, such as the Institutional Development Fund, have been phased out and replaced by competitive funds.

Public policy has been to increase spending through competitive funds while maintaining block grants stable. In 1995 block grants represented 82% of total public contributions to tertiary institutions while in 2003, when FC

flows reached their peak, they represented only 71%. In the future it is expected that competitive funds will increase as the state finances more projects.

Tertiary institutions also receive indirect public subsidy where private donations attract tax breaks. Tax relief at 50% is available on donations for the purchase of furniture, equipment, infrastructure renewal, academic improvement and research projects.

Figure 1.8 **Fiscal contributions to higher education institutions (CLP million 2007)**



Source: MINEDUC, Compendium of Higher Education Statistics (*Compendio Estadístico de Educación Superior*): for years 2006 & 2007 Official budget – quoted in Country Background Report.

Chapter 8 discusses funding and resourcing in more detail.

Tertiary institutions are also, of course, funded by student fees. Table 1.5 shows the size of fees and how these grew between 1995 and 2005, by type of institution. As mentioned earlier, fees are very largely paid for by students and their families (83.7% of all spending on tertiary education in Chile).[33]

33. *OECD Education at a Glance*, 2007.

Table 1.5 **Evolution of average annual fees by type of higher education institution (CLP 2007)**

	1995	2000	2005	Growth 1995 - 2000	Growth 2000 - 2005	Growth 1995 - 2005
CFT	426 820	625 433	704 200	46.5%	12.6%	65.0%
IP	699 764	916 641	882 600	31.0%	-3.7%	26.2%
CRUCH U.	765 962	1 234 310	1 477 093	61.1%	19.7%	92.8%
Private U.	1 146 623	1 498 327	1 698 282	30.7%	13.3%	48.1%

Source: MINEDUC, Higher Education Division

There is however some public funding in the form of scholarships (grants) and state-guaranteed loans. Public spending on scholarship schemes grew by 321% between 1995 and 2007. Over the same period spending on state-guaranteed loans increased by 448%.

There are a number of different scholarship schemes, described more fully in Chapter 3. Most are focused on lower income groups (students in the lowest two income quintiles). Most require a minimum level of academic achievement, usually a PSU score, less often a secondary school grade average. Some are restricted to CRUCH universities, or to CRUCH universities and accredited private institutions; some are open only to students from municipal or private subsidised schools; and one is specifically for Higher Level Technician courses.

Maintenance grants are automatic once tuition fees scholarships are awarded. They consist of food vouchers and cash to cover subsistence.

However, scholarships only cover between 63% and 70% of the actual cost of tuition fees. For the rest, students must take out loans. There are two state-guaranteed loan schemes, one restricted to students at CRUCH universities, both requiring a minimum PSU score; and a new scheme under which students can obtain private bank loans. Chapter 3 considers these.

Staffing of tertiary institutions

In Chile, academic staff are not public officials, though non-academic staff are. There is no standard academic structure, nor are there nationally agreed terms and conditions. Arrangements for hiring, promoting and appraising the performance of academic staff depend entirely on tertiary institutions' own statutes and internal regulations. Dismissing academic staff is not easy and tends to be expensive, but mainly because of the strong influence of representative associations.

There are two types of faculty within universities: 'regular faculty', normally recruited by competition and employed on a permanent, often full-time basis, from which the most prestigious and best known teachers are chosen for administrative responsibilities, participate in university committees and can rise to the highest levels in the academic hierarchy; and 'contract faculty', academics who do not 'own' their positions and are not eligible for faculty privileges. For regular faculty, promotion typically depends on length of experience, student evaluations and the faculty's publications output.

A common practice is contracting staff by hours, almost exclusively for teaching. This type of work can be attractive to academics from other universities as a way of increasing their income or to people from outside the academic world. A broad market has opened up for young professionals and academics from some universities as a result of opening 'special programmes'. These programmes tend to be shorter than the regular ones, operate in the evenings and attract a broad public drawn from young workers seeking to improve their educational credentials or people with a professional title seeking upgrading.

Private universities tend to have a lower proportion of regular faculty than their CRUCH counterparts, as Table 1.6 shows. This is associated with private universities' concentration on teaching rather than research in most cases. Particularly in CFTs and IPs, the contract teaching staff may have to compete with each other for enough class hours to make up an adequate salary.

Table 1.6 **Staff Numbers and Full Time Equivalents (FTE) by academic degree**

		Academic degree					
		PhD	MA	Other	Total	%PhD	%PhD+MA
CRUCH universities	No	3 656	4 676	13 632	21 964	16.6	37.9
	FTE	3 085	3 272	5 729	12 086	25.5	52.6
Private Accredited Universities participating in CAE loan scheme	No	1 280	3 026	7 300	11 606	11.0	37.1
	FTE	507	937	1 692	3 136	16.2	46.1

Source: *OECD Thematic Review of Tertiary Education: Country Background Report for Chile*

CRUCH universities have a higher proportion of teachers with doctorates; though both types of institution show an improvement when FTE is considered. Of the full time academics at the CRUCH universities, 37% have a doctoral degree.

The number of PhDs in the academic workforce in Chile is generally considered too low. National policies to improve the quality of academic staff have concentrated on upgrading this indicator, which has a close relationship to research and development. The goal is that by 2015 half of the full time faculty will have doctorates, which would require the number of PhDs graduating from national programmes to increase to 600 doctorates per year. The government also has the ambitious aim of sending some 3 000 Chileans a year to pursue post-graduate studies abroad.

The review team was made aware of a number of other concerns around academic staffing and training. First, the academic workforce is ageing. The average age of academics is estimated to be around 54. For some CRUCH universities almost half the academic staff will reach retirement age in the next five to six years. Not enough well-qualified new talent is coming through to replace them.

Secondly, many professors who have reached retirement age and whose institutions would prefer them to retire are refusing to do so, mainly because pensions are poor and there is no early retirement scheme. This restricts job and promotion opportunities for younger academics. The problem is particularly acute in the state universities, where it is generally agreed to be unfeasible to retire academics against their will.

Thirdly, the wide range of students already in tertiary education, and the goal of serving 50% of the cohort by 2012, poses new challenges for academic staff in Chile. To meet all these students' needs, academics will need better initial training and continuing professional development in new, more imaginative pedagogic methods and approaches.

Quality assurance

Chile's National Quality Assurance System for Higher Education is based on Law 20.129 of 2006. The key institutions in the system are the National Accreditation Commission (CNA), MINEDUC, the Higher Council of Education (CSE) and the accreditation agencies. The CSE and the CNA are public autonomous institutions with their own resources. The accreditation agencies will be private, national or international, and need to be authorised by the CNA to undertake accreditations. The Law establishes a co-ordinating Committee to safeguard the integrity of the system by overseeing the activities of the different quality bodies.

The National Quality Assurance System has four components:

- Licensing of new higher education institutions, undertaken by the CSE (except, at the time of the team visit, for Technical Training

Centres (CFT); responsibility for CFT licensing will transfer to the CSE from MINEDUC by November 2008).

- Institutional accreditation, under the aegis of the CNA.
- Degree or programme accreditation, carried out by authorised accreditation agencies. The CNA accredits programmes for which there is no authorised agency.
- Information on institutions, their offerings and their quality, under the aegis of the Ministry of Education (Higher Education Information System – SIES)

The licensing process is obligatory for all new higher education institutions. When considering whether a new institution should be granted a license to operate, the CSE evaluates business plans, proposed study programmes and whether the institution has or will have sufficient resources to deliver its plans and programmes.

Once an institution has been approved, the CSE supervises its operation through peer evaluation commissions, examination of students, audits, evaluations and special visits. After the institution has operated under license for at least six years, the CSE considers whether it has developed sufficiently to be granted full autonomy. If the Council decides it has not, the license will be extended for another five years. After this, the CSE's choice lies between granting the institution autonomy and closing it down.

Once it has autonomy, the institution can create new programmes and set up new branch campuses. It can also apply to the CNA for institutional accreditation, and for its programmes to be accredited by specialised accreditation agencies.

Accreditation is only available to autonomous institutions. The CNA uses peer-review-based procedures developed by its forerunner, the *Comisión Nacional de Acreditación de Pregrado* or CNAP, which promoted accreditation on a wholly voluntary basis.

Institutional accreditation must focus on institutional management and undergraduate teaching and learning. In addition, institutions can elect to be accredited in areas related to their mission statement, such as postgraduate instruction, research, links with stakeholders (*vinculación con el medio*) or continuing education. Accreditation is most valuable to both for the marketing and reputational benefits and because students can then access some of the state-subsidised scholarship or loan schemes.

Programme accreditation can be of technical, professional, undergraduate, Masters or PhD courses. Programme accreditation certifies

the quality of courses and degrees, having taken account of the course objectives and national and international standards for the profession or discipline. Medicine and education are the only two areas where programmes must be accredited. If they are not, institutions lose all public funding associated with the programme. The Ministry of Health is moving towards preventing graduates from non accredited programmes working in the public sector. The Ministry of Education has proposed a legal reform that would enable it to close down programmes unable to obtain accreditation.

Institutional and undergraduate programme accreditation may be granted for as long as seven years or as little as two. Postgraduate programmes can be accredited for up to ten years. The length of accreditation is understood (rightly) as indicating the accreditors' view of relative quality. Having a high percentage of programmes accredited is also seen as the mark of a good institution.

Chile's quality assurance system does not extend to assessing the quality or cost-effectiveness of research projects.

Quality and quality assurance are considered in Chapter 6.

Governance

Within tertiary education there are three distinct governance models, one applying to state universities, another to private universities belonging to the CRUCH and the third to private universities, IPs and CFTs. Chapter 5 on Governance describes both in more detail.

Under the standard statutes used by most state universities, the highest body is the Board (*Junta Directiva*) made up of an equal number of government representatives nominated by the President of the Republic and external members nominated by the Academic Council (*Consejo Académico*). The Board, at the request of the Rector, sets the university's development policy, approves loans and the acquisition, taxation or sale of real estate, establishes the scale of academic remuneration, approves university officials and approves the grades and degrees that the university offers, as well as the study plans which lead to them. The Academic Council (called the University Council at the University of Chile), is made up of the Rector, Academic Vice-Rector, Deans and designated other directors or professors. Except in the University of Chile, where the University Council assumes the functions of the Board, in public universities the Academic Council is merely consultative.

Rectors are elected, by direct vote of university academic staff. They hold office for four years and can then be re-elected. In theory, Deans are designated by the Board at the suggestion of the Rector and directors of departments are designated by the Rector directly. In practice, Deans and Departmental Directors are elected by the academic staff, and the governing collegial bodies (Faculty Councils and the Academic Council) are made up of members elected by their peers.

Students and administrative staff play no part in institutional governance in 13 out of 16 state universities, the exceptions being the University of Chile, the Metropolitan University of Technology and the University of Los Lagos, who have brought students and staff into their collegiate bodies.

The three secular non-state CRUCH universities have followed a similar model to the state universities. Of the six Catholic universities, some find candidates for Rector through search committees rather than elections. Their arrangements also provide a role for the appropriate bishop in designating the Rector, and for the two Pontifical Universities, the final decision rests with the relevant commission at the Vatican.

The Rectors of private universities are designated by their corporate Boards which represent the owners or members of the corporation. The Rector designates the Deans, usually with the approval of the Board, but not consulting the professors. Collegiate bodies are scarce and function mainly to advise the Rector or the Dean. Deans with a track record and special prestige sometimes have an informal influence in institutional policies and decisions.

Professional Institutes and CFTs are principally managed by the senior leadership of the institutions, nominated by the proprietors or Boards. Collegiate bodies do not exist, nor are students involved in decisions about institutional development.

Internationalisation

Internationalisation has a long history in Chile. Since the 1950s, some of the oldest Chilean universities have been developing international exchange programmes, signing agreements with institutions in other countries and allowing academics to take post graduate degrees in the United States and Europe.

Reforms at the beginning of the 1980s gave a further boost to internationalisation. The market model brought strong competition among tertiary institutions that in turn led them to seek greater differentiation from one another. More recently, the global impact of information and

communication technologies has led Chilean society to value greater connectedness with the world, and Chilean higher education institutions to respond to growing demands for qualifications with international prestige. Students' enthusiasm for foreign degrees and titles has led more tertiary education institutions to establish agreements with foreign institutions and offer their students a joint or dual degree or joint courses. Some institutions offer programmes which may be taken either in Chile or abroad.

Growing internationalisation is reflected in the creation of dedicated international offices. By 2003 around 80% of the CRUCH universities had some type of formal organisation within the institution. And one of the principal activities of student affairs offices is academic interchange. In 2001, the universities received 3 477 foreign students, with over a fifth coming from the United States.[34] The government's Agency for International Co-operation has played an important role in helping Chilean students study abroad, providing relevant information and access to scholarships; while CONICYT has helped researchers to find international placements and research centres or institutes to find international partners.

A few Chilean tertiary education institutions have created campuses abroad, such as the Universidad Técnica Federico Santa María's Ecuador campus. Many foreign institutions offer and promote their programmes in Chile, either setting up as non-profit legal entities and applying for recognition as new private universities or buying existing universities. And with MECESUP support, Chilean universities participate in Project Alfa for Latin America (the Tuning project), to exchange information and improve quality, effectiveness and transparency.

Despite all this activity, some problems remain to inhibit international student and academic mobility. Chile does not yet have a clear and comprehensible credit transfer system applicable to all tertiary education institutions. Nor is it part of the international network of National Academic Recognition Information Centres, through which tertiary education institutions and employers in one country can establish how qualifications gained or studies undertaken in another country compare or equate to their own, for the purposes of entering or continuing higher education or taking up professional employment.

Internationalisation is considered further in Chapter 4.

34. Ministry of Education of Chile (2007), *OECD Thematic Review of Tertiary Education: Country Background Report for Chile*, Santiago and Ramirez, 2004.

Research and development

Of the three types of tertiary institutions in Chile, only the universities can award post-graduate degrees, so it is principally the universities that undertake research and development. The two major research and development competitive funds are the Science and Technology Development Fund (*Fondo para el Desarrollo de la Investigación Científica y Tecnológica*, FONDECYT), for basic research, and the Fund for the Promotion of Scientific and Technological Development (*Fondo de Fomento al Desarrollo Científico y Tecnológico*, FONDEF), for technological research and development. Between 2000 and 2004 universities received 100% of FONDECYT awards and 99.6% of FONDEF awards. In addition, INNOVA CHILE – CORFO supports the development of research centres within universities.

The universities form a broad spectrum, ranging from those for whom research represents an important part of their activity and budget, to those which concentrate on teaching and do little or no research. The 'big four' research universities are the University of Chile, the Catholic University of Chile, the University of Concepción and the University of Santiago. Between them, these account for two thirds of the awards given by FONDECYT and FONDEF.

Of the total funds awarded to universities by FONDECYT in 2000-2005, the University of Chile received 36.7%, the Catholic University of Chile 21.7% and the University of Concepción 10.6%. Another 27.75% went to the other CRUCH universities, making 96.75% to CRUCH universities in all, though three received less than 0.1%. Only 3.25% went to private universities, but some of these did better than some CRUCH universities. FONDEF awards in the same period were similarly concentrated on the CRUCH universities, who gained 97.8% of the funds, with six receiving 65% of the funds between them.

Competitive funds such as FONDECYT and FONDEF, while a very important source of funding for universities' basic and applied R&D, are not the only source. There are private funds, the institutions' own funds and other competitive funds available.

Extraordinarily, there is no information on how the expenditure, income or academic staff time of individual universities is split between teaching and research. There is no obligation even on state universities to provide this information to MINEDUC or to the public. However, of the base public funding paid to CRUCH universities (*Aporte Fiscal Directo*), it has been estimated that on average, the universities spend 58.6% on R&D.

Collective Chilean spending on research and development 1997-2004 is shown in Table 1.7. Growth averaged 18.6% annually, but spending on R&D failed to reach the national target of 1% of GDP.

Table 1.7 **Evolution of R&D expenditure 1997-2004**

R&D expenditure	1997	1998	1999	2000	2001	2002	2003	2004
CLP Billion	170.8	182.6	188.7	213.2	228.7	315.5	341.2	392.9
% GDP	0.49	0.50	0.51	0.53	0.53	0.68	0.67	0.68

Source: Red Iberoamericana de Indicadores de Ciencia y tecnología RICYT (www.ricyt.org) 2008

Table 1.8 **Contributions & participation by agents in financing R & D 1997-2004**

Agents		1997	1998	1999	2000	2001	2002	2003	2004
Government	CLP billions	117,9	131,8	137,5	149,9	157,5	172,4	147,6	175.0
	%	69,0	72,2	72,9	70,3	68,9	54,6	43,2	44.5
Firms	CLP billions	27.3	29.6	32.3	49.1	57.0	104.9	148.5	179.4
	%	16.0	16.2	17.1	23.0	24.9	33.2	43.5	45.7
Higher Education	CLP billions	0.0	0.0	0.0	0.0	0.0	1.4	2.8	3.1
	%	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.8
Non Profit Foundations	CLP billions	14.7	11.3	8.9	4.1	4.8	1.0	1.4	1.3
	%	8.6	6.2	4.7	1.9	2.1	0.3	0.4	0.3
Foreign	CLP billions	10.9	9.9	10.0	10.1	9.4	35.8	40.9	34.1
	%	6.4	5.4	5.3	4.7	4.1	11.4	12.0	8.7
Total	CLP billions	170.8	182.6	188.7	213.2	228.7	315.5	341.2	392.9
	%	100	100	100	100	100	100	100	100

Source: RICYT 2008

Table 1.8 shows how different parties have contributed to total Chilean spending on R&D. Chapter 7 analyses spending, and the different contributions of different sectors, in more detail.

State R&D funding went not only to the universities but also to 14 institutes and state services. The competitive public grants grew by more than 80% from 1995 to 2004. This increase reflects the government's policy of greater transparency and allocating resources for R&D competitively, with greater discretion to define the types and areas of research. Funds for human resource development increased the most (by 119%), funds for basic research grew least (53.8%). Again this was consistent with government

policy of concentrating on strengthening applied research, experimental and technological development and innovation as well as human resource capacity building.

Recent Chilean governments have also aimed to support science and technology and innovation with programmes to promote collaboration between highly skilled researchers and firms, as described in Chapter 7.

Previous OECD recommendations on tertiary education

OECD's 2004 review of Chile's National Policies for Education was mainly concerned with education below the tertiary level, but made a number of general and specific recommendations on higher education, summarised below.

- Chile should consider revising the traditional divide between CRUCH and other universities, which affects the way public subsidies and student loans are distributed. It is important to move towards a system that relates public subsidies more closely to equity and results.
- In expanding student scholarship and loan programmes, the focus should be on providing students from lower socio-economic backgrounds with more and better education opportunities.
- There could be merit in revising and evolving current course sequences into a "Bologna" pattern, with an initial degree of three or four years for all students, followed by a one or two years Master's degree, to be continued eventually by doctoral studies and specialisations. This would enable post-secondary technical education to be improved, would allow for diversified education paths, and could be more efficient, by reducing excessive academic requirements. It would also be more compatible with international trends and facilitate international academic and professional exchanges.
- Instead of restricting loans to students at traditional universities, the same loans criteria should apply regardless of where the student is enrolled, based on means testing and minimum academic achievement.
- It is undesirable to vary loans according to the tuition costs of each university; this gives institutions an incentive to raise fees. Interest rates, monthly ceilings and the maximum duration of payments should also be reconsidered, and a more efficient and co-ordinated

cost recovery mechanism should be introduced. Automatic pay deduction, as part of the income tax system, is proposed.

- Chile should develop competence-based certification systems in professional areas such as education and health care. Completing a university degree should no longer suffice.
- Chile needs a much better system of information for the public and potential students, on costs, enrolment, student characteristics, resources, institutions, course programmes, career paths open to graduates and graduate destinations.
- Chile could do more to strengthen graduate education and adapt it to the country's needs.
- University enrolment and graduation should continue to be expanded, but Chile must try to maintain quality as part of this expansion. "Soft" forms of regulation and incentives are needed to encourage autonomous institutions to participate fully in quality control. All types of tertiary institutions, if accredited, should have priority access to student loan funding.
- Reasonably qualified students from low and middle income backgrounds who could succeed at university should not have their access restricted by financial barriers. The Ministry should conduct systematic research to determine the size of this problem.
- Technical training institutes should be upgraded, to serve greater numbers of young people.
- The Ministry should move away from having an official list of "learned professions" which are the monopoly of the universities; and shorter undergraduate courses should be available for these professions, followed by Master's degree programmes.

These recommendations were well-received and action has begun in a number of areas. They remain relevant and will be built on in the remainder of this report.

References

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Chapter 2. Achievements and Issues

This chapter reviews Chile's recent significant rapid achievements in growing, developing and improving its tertiary education system. It then records a number of issues to be addressed if the Government of Chile is to reach its goal of giving fair and equal chances to its young people to benefit from a high quality, efficient and relevant high education system.

These issues are discussed from the perspective of different stakeholders and include: deficiencies in secondary education, which prepares many of the students poorly for tertiary education; a highly segmented, expensive tertiary system with excessively long university courses and high drop-out rates, and admission arrangements that perpetuate the inequalities in Chilean society; inadequate financial support for students, especially those from low-income backgrounds or entering technical education; lack of pathways and opportunities for progression between technical tertiary institutions and universities; inadequate study counselling and old-fashioned teaching with insufficient focus on economic needs and employers' expectations; and insufficient information, accountability and transparency. The review team notes the importance of improving the quality assurance system further, focussing research effort better and developing a shared vision and strategic planning at national level.

Introduction

This Chapter notes and commends the progress that Chile has made towards a modern, relevant and diverse tertiary education system competitive with those of OECD countries. The Chapter then identifies issues that remain unaddressed, or that have arisen as side-effects of the system's rapid growth and diversification. These issues, and how they might be tackled, will be discussed in more depth in later chapters.

Spectacular growth through institutional diversification and universal cost sharing

"Quality higher education", "Education with excellence", "A guaranteed professional future" and "Your future: Our work and our dream" are among the thousands of enticing advertisements that universities all over Chile put out to win students, reflecting the rapid growth of the higher education market and the high degree of competition among providers. Chile has indeed enjoyed a spectacular increase in enrolment in recent years, going from a mere 7% of the 18-24 year group in the 1970s to almost 40% today. This impressive expansion was achieved in large part through the significant development of private tertiary education and the introduction of substantive cost-sharing in the entire system.

Implementation of bold reforms

Several important reforms have accompanied and facilitated this rapid quantitative growth. Tertiary education institutions have been allowed to operate with a great degree of autonomy. In terms of recurrent funding, the Government of Chile has relied on a combination of supply and demand-side mechanisms, including a voucher-like system (*Aporte Fiscal Indirecto*) intended to promote institutional quality and a wide range of student aid mechanisms (scholarships and loans) to encourage participation of high-achieving low-income students. The government's direct budget contribution (*Aporte Fiscal Directo*) to CRUCH universities has started to include some performance-related elements. Similarly, the financing of research and some investment components has increasingly been provided on a competitive basis to stimulate academic innovation. Accreditation arrangements have had some success in fostering minimum academic and institutional management standards and protecting students from low quality programmes.

Inconsistencies, inefficiencies and distortions

Yet precisely because of these achievements and the extensive reforms that have supported them, the weight of the past has begun to show, revealing a number of inconsistencies that create serious inefficiencies and distortions in the system. If the government is to succeed in reaching its goals of equity, quality, relevance and efficient use of resources, and if Chile's tertiary education system is to enable the country to compete in the global knowledge economy, several fundamental issues need to be

addressed. The rest of this chapter presents them from the perspectives of the main stakeholders in tertiary education.

The student perspective

A key goal is to ensure equal opportunities of access and success. However, the tertiary education system is so segmented, and success in entry tests so strongly correlated with socio-economic characteristics, that students have significantly different academic and career opportunities depending on their secondary education background, family income level, gender and geographical location. The lack of articulation and pathways between technical training centres (CFTs), professional institutes (IPs) and universities compounds these issues and makes upward professional mobility extremely difficult for those entering non-university tertiary education.

Notwithstanding the large array of student aid mechanisms organised and funded by the government (scholarships and loans), there is still a sense that many low-income students, and those interested in undertaking the technical tertiary education most relevant to Chile's economic needs, are not able to study for lack of financial resources. The system of scholarships and student loans is over-complex and seeks to achieve too many objectives simultaneously, rather than focussing on ensuring equal access for all those in financial need who could benefit themselves and the country by entering tertiary education. By international standards, Chilean higher education is expensive and a very large part of the cost of student support falls on students and their families, a very small part on the state.

Students require full, clear and accessible information to make the right choices of institutions, courses and careers. Among other things they need information on the academic programmes on offer and their quality; subsequent labour market prospects and progression routes; costs and financial support available; completion prospects; and subsequent labour market outcomes and progression routes. At present in Chile some of this information is limited, biased, difficult for the average student to analyse or missing altogether. There is a particular dearth of information on graduation rates, dropout rates, the length of time academic programmes take to complete in reality as opposed to theory, past students' success in finding employment, and how all these things vary by institution, programme and student characteristics.

Having entered their tertiary institution, students hope for competent teachers who understand and meet their individual learning needs, monitor their progress and help them to complete their courses within the theoretical

course length. If studying for a profession such as teaching, nursing or engineering, students also expect that their course will give them the practical or work experience to contribute effectively to that profession on graduation. What students often get is old-fashioned teaching from staff who have not updated and adapted their methods and pedagogical skills to cope with the much more diverse student body which is a consequence of the evolution of higher education from an elite to a mass system. Such staff are ill-equipped to undertake formative assessment and progress monitoring, or to help students who find the work challenging. Students also complain about lack of practical elements and practical experience within their courses.

The tertiary education institutions

The tertiary education system is not yet a unified system where all institutions can compete on an equal footing. For public institutions, hampered by cumbersome regulations and controls in the areas of resource management, personnel policies and procurement, levelling the playing field would require increased management and operating flexibility together with a more rational distribution of budgetary resources in accordance with performance-related criteria. Allowing the private sector to compete on equal terms would involve introducing more uniform criteria for access to public funding, which not only CRUCH universities but also private universities can meet. In a fully unified system, all unnecessary differences between various types of tertiary education institutions would be eliminated, so that all types of autonomous institution operate under clear, consistent and light-touch government rules with respect to status (for-profit status should be available to universities as well as IPs and CFTs), operations, governance, teaching, research, degree-awarding, funding, personnel, contracting and other services.

There is also a need for a stronger culture of accountability and transparency in both public and private institutions. This is important in order to make institutions answerable to government and the public for their funding, rights and privileges; to encourage better quality and more relevance in academic programmes; to ensure that institutions use resources efficiently and effectively; and to give students and potential students better information. More up to date information on the labour market outcomes of graduates is needed to help institutions avoid replicating existing offerings and multiplying the number of campuses.

University courses, particularly those leading to professional degrees, tend to be old-fashioned, emphasising academic knowledge and theory rather than understanding, application of knowledge and skills and

developing the potential to innovate. Programmes are slow to evolve as national and global economic needs evolve, and are insufficiently responsive to the changing expectations of national and international employers. Few Chilean universities appreciate that it is impossible to teach undergraduates all that they will ever need to know, much better to equip them with the core knowledge and learning skills on which to build more specialised knowledge later. Programmes are very long by international standards, and because so many students have to repeat years or semesters, their actual length is even longer than their declared duration. Such long courses are unnecessary, wasteful and unfair to students, particularly the self-funded. The causes of this excessive length include Chile's *licenciatura* degree model and legislation reserving the right to award these degrees to universities.

It is not yet clearly understood in Chile that tertiary institutions may, indeed should, have a range of missions and play to their respective strengths. It is unsustainable in any system for all universities to be research universities. Instead, there is a need for more planning, co-ordination and collaboration to achieve better-focused research and research output, which will create critical mass in areas relevant to the country's development priorities and give better value for funders' money. There is also a need to give equal respect to institutions which deliver high-quality teaching and learning relevant to the needs of diverse students and their future employers; and to build ladders, bridges and pathways which allow students to progress to higher-level study with due credit given for what they have already learned, in another or the same institution.

Chile's national quality assurance system is intended to ensure sound institutional management, universal high-quality teaching and learning and good research through institutional and programme accreditation. Though the system yielded some quick wins, issues are now emerging which need attention. It is clear that institutions will do whatever is necessary to get accreditation, less clear that the pursuit of accreditation is yielding significant improvements in the quality of classroom teaching and learning as measured by outputs and experienced by students. There are complaints that present accreditation criteria are vague and subjective, leaving wide scope for personal interpretation by peer reviewers, who may favour institutions like their own and find against those with different missions.

Meeting the needs of employers

Most of Chile's professional and technical tertiary institutions (IPs and CFTs) have understood the need for their graduates to have marketable skills and be employable; have established links with employers; and take

employers' views into account in designing and developing their courses. The same cannot be said with confidence of most Chilean universities.

Through closer linkages with employers, professional associations and alumni, universities could improve their capacity to align the profile of their graduates with the needs of firms and contribute more effectively to regional development through appropriate technology transfer. This implies focusing on core strengths and characteristics, providing labour market information as a safeguard against oversupply in traditional disciplines and achieving a better distribution of qualifications between mid-level technicians and high end professionals. It also involves adjusting existing programmes so as to impart the new generic competencies that will allow young graduates to be flexible and capable of updating their skills and learning throughout life, while reducing the overall length of studies to align with international norms.

Role of the state

One of the key dilemmas that the Government faces is the tension between preserving acquired privileges and levelling the playing field for tertiary education institutions. Breaking with the weight of tradition is certainly not easy from a political viewpoint, but it is unlikely that Chile's tertiary education system can achieve the level of performance and innovation necessary to support the country's efforts to become a knowledge economy unless measures are taken to address the inconsistencies and distortions mentioned earlier. The government needs to find a better balance between supporting tertiary education institutions to meet society's needs, and allowing market forces to operate.

This will require a shared vision for the future of tertiary education in Chile, articulated through strategic plans commissioned by the State and prepared in co-operation with the institutions; an enabling financial and regulatory framework; a strengthened policy formulation and implementation capacity; simplified governance of the overall tertiary education system; a clearer definition of the missions of the different types of tertiary education institution, including a more transparent delineation between non-profit and for profit behaviour; and a comprehensive system of information on all aspects of the operation of the tertiary education sector, including inputs, processes and outcomes.

It will also require higher levels of public funding. This applies not only to student aid, as noted above, but also to direct funding to enable universities to fulfil their public good mission, including funding for research. Current mechanisms for channelling direct funding to universities

are flawed, give unfair advantage to CRUCH universities (though the degree of advantage varies between CRUCH members) and relate too much to history, not enough to performance and current needs. Research funding is too low overall and insufficiently focussed on strategic priorities; universities face serious difficulties maintaining research infrastructure and buying major scientific equipment.

Finally, the Government needs to recognise the crucial importance of improving secondary education, which is a major determinant of the academic preparedness of new students in tertiary education. While it is not impossible to compensate for poor preparation by remedial classes once students have entered tertiary education, it is more difficult and more expensive than tackling the problem earlier; also, poor school standards are a major cause of current inequities in university admissions. Improving teacher training – a key and undervalued function of tertiary education – can contribute powerfully to improving secondary education.

Chapter 3. Access and Equity

There has been strong growth in student enrolment in recent years, and the government aims to see 50% of young people aged 18-24 entering tertiary education by 2012. This chapter considers whether all groups have equal access and opportunities to enter and graduate from the system.

Part 1 discusses current admission arrangements. It considers in depth the university administration system based on the PSU national entry test, and assesses the evidence on how success rates vary according to income group, type of school, gender and region. Key findings are that students from low income groups, who attend municipal schools or who are female are significantly less likely to achieve the scores necessary to get into their preferred university, and to be eligible for student grants. Students from low income groups and municipal schools are also less likely to complete their courses at traditional (CRUCH) universities, and tend to take longer if they do. Ways of achieving greater equity in admission and retention are then considered.

Part 2 of the chapter discusses the extensive student aid system in Chile. It considers how well the system works, whether young people in different groups have equal chances of benefiting and what improvements might be possible, finding that, despite the noteworthy effort to expand student aid coverage, less than half the students from the lowest two quintiles receive a scholarship and CFT students are particularly unlikely to get student aid.

The chapter concludes with recommendations for improving access and equity in admissions, improving retention, expanding grant and loan opportunities and merging the existing loans schemes.

Introduction

As noted in Chapter 1, the numbers of students in tertiary education in Chile grew from 117 000 in 1980 to 245 000 in 1990 to over 678 000 in 2007. Between 1980 and 2006 the proportion of the 18-24 age group grew

from 7.2% to 34%, according to MINEDUC estimates, 38% according to household surveys.

The government expects coverage to be 40% by 2010 and has declared an objective of reaching 50% by 2012. The review team considers this a sound and appropriate objective, consistent with the country's economic aims.

Some other countries wishing to boost tertiary participation, especially of young people in groups currently under-represented, have found this difficult because their target groups do not aspire to go to university or college. This is not a problem in Chile, where student demand is fuelled by the country's high income differentials and the high rates of return on tertiary education, particularly university education, described in Chapter 1.

The Chilean government's stated objectives for higher education go beyond numerical expansion to achieving equity with access. The government has set itself the objective of correcting inequalities, and broadening opportunities to guarantee the right to attend higher education to all young people with talent, while also recognising (in the principal objectives of higher education policy outlined in 2003) that talent is equally distributed among all socio-economic groups.

The review team commends the Government of Chile for having set itself these laudable and ambitious equity objectives. This chapter considers how far they have been achieved, and what steps might be taken to speed up progress towards them. Assessing whether students from different groups in Chilean society have fair and equal access to tertiary education involves assessing not only whether they obtain and take up tertiary places – and graduate successfully in due course – but also which type of tertiary institution they attend and whether it is the type, and the institution, of their choice. Virtually all young people in Chile, given a free choice, would rank their preferences as follows: (1) CRUCH university (2) private university (3) IP (4) CFT. This ranking reflects institutions' relative prestige and perceived potential to boost future income, and also – a crucial factor for students from poorer families – the much better financial aid packages currently available at CRUCH universities.

Equity issues are considered as arising wherever young people who may be assumed to have equal talent or ability to benefit from tertiary education, but have different characteristics or different backgrounds, are experiencing significantly different outcomes.

Of course, 'equity gaps' are not unique to Chile. There are relatively more young people from better-off families in higher education (HE) in the vast majority of countries; but a few countries show by their example that

this is not inevitable. OECD's *Education at a Glance* 2008, in Indicator A7, illustrates this with data from up to ten OECD countries. Three findings may be especially relevant to Chile:

- Six of the eight countries for which there is data still recruit to HE proportionally more students whose fathers have white-collar occupations. In Ireland and Spain, the proportion of students with fathers in blue-collar occupations is near what would be expected from their representation in the population;
- In all ten countries, more HE students are recruited from families in which the father has higher education than is warranted by the percentage of such families in the population. But the ratio ranges widely. In Portugal it is 3.2:1, Austria 2.5:1, Germany 2.2:1, France and the UK 2:1, Italy and Finland 1.7:1, Netherlands 1.6:1 and Spain 1.5:1. Only in Ireland, with its ratio of 1.1:1, can it be said that first-generation students are not appreciably less likely to enter HE.
- If the proportion of HE students from a blue-collar background is compared to PISA figures showing each country's socio-economic variance in school performance, it can be seen that, while all inequalities in school performance carry forward to HE, there is a notably strong association between socio-economic performance variation at age 15 and socio-economic variation in HE entry, where education systems are stratified and there is a high level of performance variance between (as opposed to within) schools, Of the seven countries compared, there is least between-school variance in Finland, Ireland and Spain; these three countries also get the highest proportions of students from blue-collar backgrounds into HE.

Education at a Glance points out that countries which have expanded tertiary education in recent years will, by default, have a higher intake of students from less advantaged backgrounds. This factor helped Chile to improve access for less advantaged groups over the period 1990-2006 and should help the country to continue to improve their access as participation rises towards the planned 50%. In every other respect highlighted by OECD's analysis, Chile faces bigger challenges than most countries in achieving equity in HE entry – including a legacy of substantial social and financial inequalities and, as noted in Chapter 1's summary of Chile's PISA results, particularly high levels of between-school performance variance, of which a particularly large proportion is down to socio-economic differences between the pupils in different schools. However, as OECD observes, levelling the playing-field between affluent and less affluent students is most important, not simply as a matter of equity, but also as a way of increasing the recruiting ground for highly skilled jobs and overall labour

competitiveness. All OECD member countries are making a range of efforts and adaptations to education policy and practice to try to close equity gaps and the Government of Chile is committed to achieving this too.

Recent growth in opportunities: impact on equity

As noted in Chapter 1, tertiary opportunities for young Chileans from all backgrounds increased dramatically between 1990 and 2006.

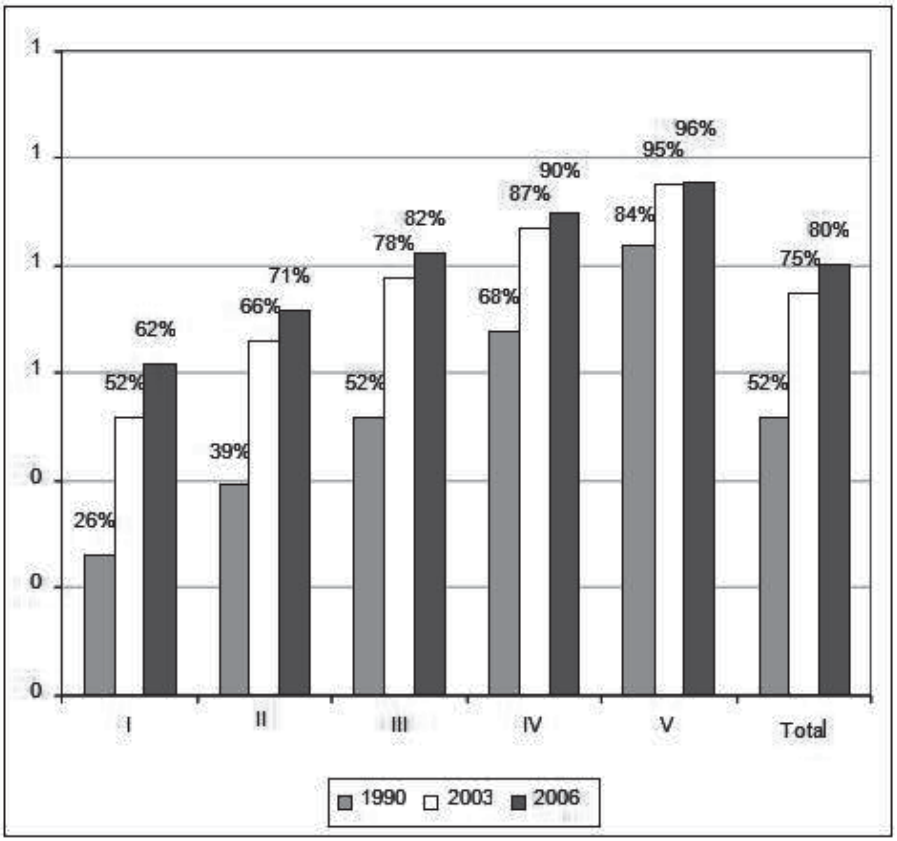
A major contributory factor was the rise in numbers successfully completing secondary education and so obtaining the leaving certificate which is the minimum qualification for tertiary education. As Figure 3.1 (also Figure 1.2 in Chapter 1) shows, the percentage of 20-24 year olds who had at least completed secondary education rose from 52% in 1990 to 80% in 2006.

Another important factor in the recent growth in participation has been the Chilean government's policy to encourage the growth of private tertiary education. Where there was demand from students willing and financially able to undertake tertiary courses, the private sector responded rapidly to meet it.

In numerical terms, therefore, access to tertiary education can be shown to have improved substantially. The number of people in tertiary institutions in 2006 was 433 000 higher than in 1990, 561 000 higher than in 1980.

How far has this numerical expansion enabled equity gaps to be bridged? The latest available figures on the student population by income group are in Figure 3.2. This Figure shows the percentage of the population in tertiary education in 1990 and 2006, by income quintile. Clearly, over this period, the chances of going into tertiary education dramatically improved for young people from poorer families. Participation from the lowest income quintile more than quadrupled between 1990 and 2006, while participation from the second lowest income quintile virtually trebled. These groups' access clearly improved the most in percentage terms. However, all quintiles improved participation very substantially; and in 2006, the participation rate of students from the highest quintile was over three times that of students from the lowest quintile.

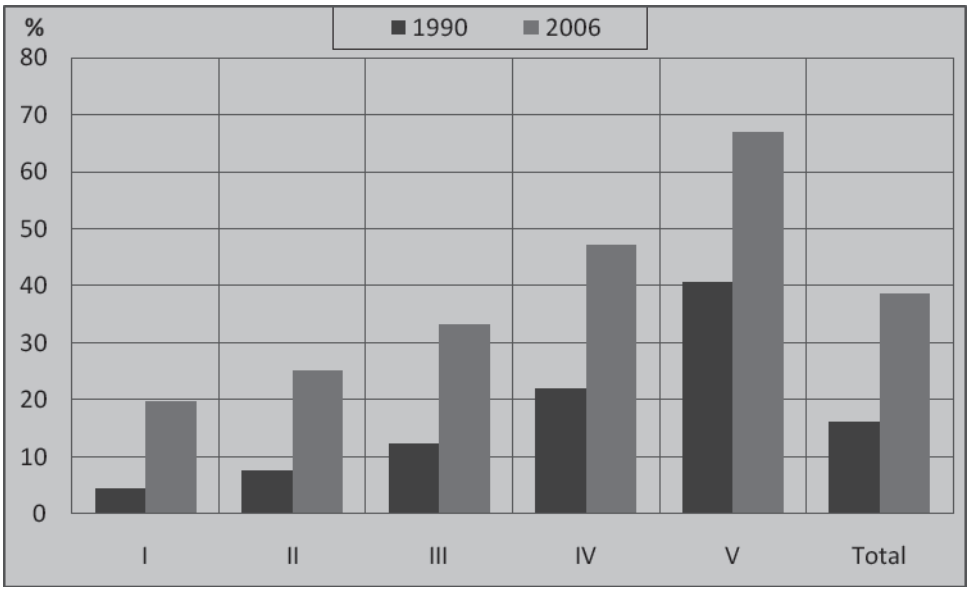
Figure 3.1 **Percent of the population 20-24 who have at least completed secondary education**



Source: MIDEPLAN (2004 and 2007)

Some differences between the participation of students from different income quintiles would of course be expected, given their different rates of graduation from secondary education. However, from Figure 3.1, we see that students from the highest quintile were just over one and a half times as likely to obtain their school-leaving certificate as students from the lowest. Yet, as just mentioned, Figure 3.2 shows that students from the highest quintile were over three times as likely as students from the lowest quintile to be in tertiary education.

Figure 3.2 **Tertiary coverage in Chile by household income quintiles, 1990-2006**



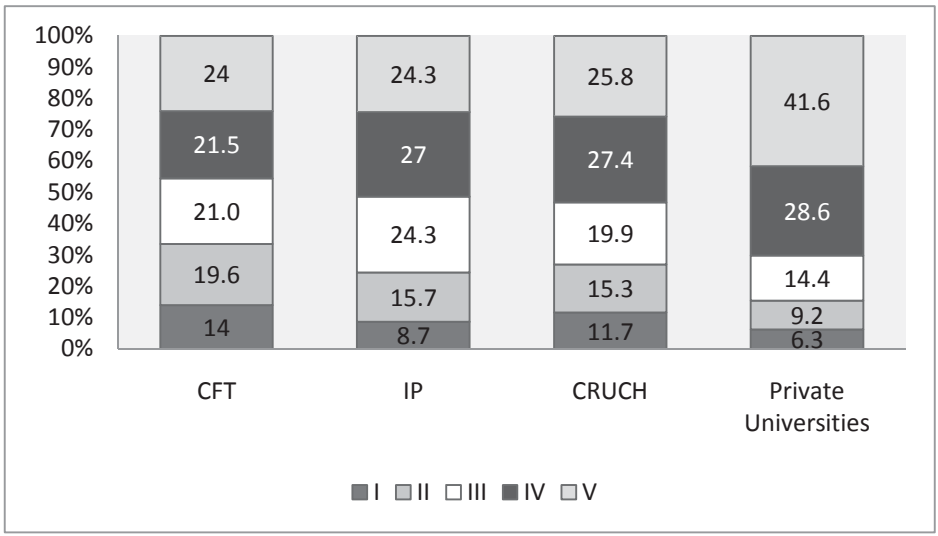
Source: CASEN Survey – respective years

This comparison suggests that additional equity issues arise in the transition from school to tertiary education, above and beyond those which are apparent by the time young people leave secondary school.

The participation differences between income groups vary, however, depending on type of tertiary institution and, in the case of universities, whether they are CRUCH or private. Figure 3.3 breaks down the student population of 2006 by household income quintile and tertiary institution attended. Students from the richest 40% of households are over-represented in all types of tertiary institution, occupying 70.2% of places in the private universities (attended by around 34% of all tertiary students), 53.2% of places in CRUCH universities (also 34% of students), 51.3% of places in IPs (20% of students) and 45.5% of places in CFTs (12% of students).[1] The poorest 20% of families are under-represented in all types of institution, though the CFTs again come nearest to parity with 14%. Private universities take only 15.5% of their students from the poorest 40% of households and 41.6% from the richest 20%.

1. Numbers and percentages of students at each type of institution were given in Table 1.1 in Chapter 1, for 2007.

Figure 3.3 **Student population by household income quintile and tertiary institution**



Source: Country Background Report authors' own calculations from the CASEN survey (2006) for persons 18-24 years old

Part 1 of this chapter will look at the equity issues around admission to and retention in tertiary education. Part 2 will look at the equity issues around current arrangements for providing financial support to tertiary students.

PART 1. Opportunities to Access and Remain in Tertiary Education

The current tertiary admission system

The basic qualification for entry to tertiary education is the school-leaving certificate. This is necessary for all types of institution, but it is sufficient only for CFTs and certain IPs.

All universities in membership of CRUCH require applicants to sit the *Prueba de Selección Universitaria* or PSU test, having agreed to confine recruitment to those school-leavers who have achieved a minimum score, currently 450. Even though it is not necessary for entry to technical and certain professional institutions, virtually all school-leavers take the PSU test, The population estimates in Chapter 1 (Figure 1.5) suggest that in 2008 there were around 240 000 18 year-olds in Chile. If this figure is correct, the number of young people leaving secondary school with their school-leaving

certificate at the end of 2007 would have been fewer than 200 000, bearing in mind the figure of 80% successful completions shown in Figure 1.2 for 2006, even if that rate rose by two percentage points by 2007. Yet as Chapter 1 also noted, nearly 217 000 people took the PSU test in December 2007 for university entry in March 2008. This suggests that significant numbers who left school in previous years also sit the PSU.

Results achieved in the PSU make a difference to access in three ways. First, a school-leaver who scores below the pass threshold defined by CRUCH, currently an average of 450 in the maths and language tests, is ineligible to enter any CRUCH university.

Secondly, students with higher PSU scores have greater chances of obtaining places at their preferred tertiary institutions. A common admissions system is operated for all CRUCH universities by a unit based at the University of Chile, called DEMRE. This system aims to allocate places in line with the ranked preferences that students have expressed, but if there are fewer places than applicants the places are allocated in order of the total score, which is built taking into account the language and maths test in the PSU, the grades in the student's school-leaving report (NEM) and, if the university so stipulates, the scores in the elective subject tests.

Thirdly, as will be explained more fully in Part 2, most current forms of student support – loans as well as scholarships – depend on achieving a PSU maths and language average score of at least 475, and some of them are confined to CRUCH universities. Though these schemes have also been designed to target support on lower socio-economic groups, students from these groups who do not meet the PSU performance requirement fall at the first hurdle.

There is no comprehensive published source of information on the admission arrangements of private universities, IPs and CFTs, reflecting the fact that all tertiary institutions outside CRUCH are owned by private organisations and operate mostly without direct government support. However, the review team understands that private universities and IPs, though not obliged to use PSU scores, are increasingly doing so. This particularly applies to private universities aiming to compete with the leading CRUCH universities for the best students, but all private universities are keen to get and keep institutional accreditation, and peer reviewers are readier to be persuaded by PSU-based entry criteria, according to institutions visited by the review team. One private, non-accredited university visited required a PSU score of just 400, plus a reasonable secondary school grade average, and used interviews and psychometric tests to check suitability and motivation for the course chosen; but achieved good retention rates through close and supportive monitoring of student progress

and financial aid from its own loan scheme. For CFT entry, the school-leaving certificate should suffice; but some CFTs, particularly those which are part of universities, seem to take PSU scores into account.

Impact of the admission system on equity and access: the evidence

Earlier in this chapter it was noted that, though the numbers and proportions of students from lower-income groups in tertiary education are much higher now than in 1990, they are lower than would be predicted from secondary school graduation rates. As this is not because fewer students from low-income aspire to tertiary education, it must be because they are less successful in gaining the places they want, or they cannot afford to take them up, or they drop out more. In the case of tertiary institutions whose admission requirements are limited to a school-leaving certificate and ability to pay, the problem would seem to lie mainly with student support arrangements, or lack of them.

In the case of universities, many IPs and the occasional CFT whose admission requirements rely wholly or partially on the student's performance in the PSU, it is likely that the admission system constitutes a barrier, if not necessarily the only barrier. A primary source of evidence on the success of various groups in the admission system is the information published by DEMRE on PSU performance and the students accepted by CRUCH universities.

Students from lower income families and from municipal schools

Figures are not available on PSU performance by income quintile, but Table 3.1 shows 2008 PSU outcomes for the four family income bands or tranches used by DEMRE.

These figures show that 60% of PSU entrants but 78% of PSU failures came from T1, the lowest income band. 42% of T1 entrants scored below the pass mark of 450 points, compared with 6.7% of T4 entrants, 32.4% of all entrants. Just 8.7% of T1 entrants scored over 600 and 0.7% scored over 700, compared with 52% and 12.7% respectively of T4 entrants. These are very significant differences, which raise a significant equity issue.

Table 3.1 **Distribution of PSU language and maths scores (averaged) by family income group**

Income Groups Points score	T1	T2	T3	T4	Not known	Total
(PSU tests for 2008 entry)	CLP 0-270 000	CLP 270 001-540 000	CLP 541 001-810 000	CLP 810 001 or more		
Under 450	54 983	11 124	2 372	1 623	84	70 186
450-600	64 704	25 227	9 077	10 018	53	109 079
601-700	10 382	7 330	4 427	9 543	2	31 684
Over 700	962	1 028	815	3 127	0	5 932
TOTAL	131 031	44 709	16 691	24 311	139	216 881

Source: Figure from DEMRE available on website www.estudie.cl

Table 3.2 shows PSU outcomes by type of school attended, in the tests taken for 2006, 2007 and 2008 entry. Over these three years, the pass rate for municipal school students was consistently below that for private subsidised and private paid, and declined from 58.43% to 57.60%; while the pass rate for students from private wholly fee-paid schools was consistently highest and improved from 91.08% to 93.70%. In the PSU for 2008 entry, the average points difference between municipal and fee-paid school pupils was 84.3 for languages and 96 for maths, up from 83.5 and 92.5 for 2007. These differences too are very significant and constitute an equity issue.

Table 3.2 **Distribution of PSU language and maths scores (averaged) by type of school attended**

School type	2006			2007			2008		
	Entrants	>=450	%>=450	Entrants	>=450	%>=450	Entrants	>=450	%>=450
Municipal	72 347	42 370	58.43%	89 ,316	51 487	57.65%	88 029	50 709	57.60%
Private subsidised	77 461	53 597	69.03%	94 754	66 474	70.15%	102 720	72 003	70.10%
Private paid	24 051	21 904	91 08%	24 768	22 942	92.63%	24 765	23 206	93.70%
Not known	2 276	969	42.57%	2 423	1 167	48.16%	1 367	777	56.84%
TOTAL	176 314	118 740	67.35%	211 261	142 070	67.25%	216,881	146 695	67.64%

Source: Figures from DEMRE, available on website www.estudie.cl

Other information available from the same source shows that there are even greater differences between school types when we consider how many entrants received PSU scores of 475 or more (the minimum needed to qualify for any form of scholarship). Currently, 47.8% of municipal school pupils achieved this, a drop of 10% from the percentage achieving 450 or more. The figure for subsidised school pupils was 60.83%, also a drop of nearly 10% from the 450+ percentage. Of the pupils from private fee-paying schools, 91% scored 475 or more, a drop of less than 3%.

These differences in PSU results may largely reflect differences in the quality of education and preparation offered by different types of schools. However, it is important to bear in mind that the differences by school type shown in Table 3.2 are not independent of the differences by income group in Table 3.1, because the poorest families send their children to the municipal schools and the richest families send theirs to the private paid schools. Also, schools are not the only educational institutions whose input may affect PSU outcomes in Chile. Higher income families who send their children to private fee-paid schools are also highly likely to pay for extra pre-PSU coaching by or at a *pre-universitario*. Every large town has one or more of these institutions and there is strong market demand for their services, which are typically delivered in the last year or two of secondary school, either during school hours by arrangement with (private) schools or in the evenings or weekends. The *pre-universitarios* cost around USD 40-50 a month, and no scholarships or subsidies are available for attending them. This means that students most in need of extra PSU preparation because their municipal or private subsidised schools have prepared them least well, are least likely to be able to afford it.

Another issue to be considered is whether students from lower socio-economic groups and municipal or subsidised schools have equal opportunities of getting a place at their preferred institution. When CRUCH universities have more applicants than places, they allocate the places to the highest PSU scorers first. Table 3.3 shows, for each of the 25 CRUCH universities for 2008 entry, their number of vacancies, number of applicants, average PSU scores of accepted applicants, and share of the top 5 000 PSU scorers nationally. The table shows that for 50 423 places there were 205 262 applicants, of whom 146 695 (see Table 3.2) reached the PSU pass threshold.

Some CRUCH universities are much more selective than others, but the lowest average PSU score in Table 3.3 is 524, for the regional University of Los Lagos. At the other end of the scale, those accepted by the two largest and most prestigious Chilean universities, the Catholic University of Chile and the University of Chile, had average PSU scores of 692 and 688 respectively. Table 3.1 and the percentage figures quoted immediately after

it give some indication of the difficulty most students from low income households will face in competing for places at the most competitive of the CRUCH universities.

Table 3.3 **CRUCH universities 2008: applicants, places, average PSU score of entrants, share of top 1 000 scorers**

University	Vacancies	Applicants	Average score	% of top 1000
University of Chile	4 404	18 398	688.26	37.10
Catholic University of Chile	3 511	11 323	692.46	46.18
University of Concepcion	4 844	23 896	601.06	6.63
Catholic Univ. of Valparaiso	2 645	14 496	614.03	0.82
Federico Santa María Univ.	2 490	11 213	592.86	3.26
Univ. Santiago de Chile	3 270	13 923	629.41	1.02
Univ. Austral de Chile	2 204	10 065	587.13	0.71
Univ. Católica del Norte	1 630	4 250	574.56	0.51
University of Valparaiso	3 577	21 079	587.80	1.33
Metrop Uni of Edn Sciences	1 063	4 209	596.31	
Tech. Met. University	1 650	7 450	581.33	
University of Tarapaca	2 033	2 900	533.25	
Arturo Prat University	1 610	1 969	524.91	
University of Antofagasta	1 362	4 616	540.94	0.41
University of La Serena	1 555	5 894	562.20	
University of Playa Ancha	1 195	7 992	554.18	
University of Atacama	740	1 269	539.00	
University of Bio-Bio	2 107	8 272	562.07	
University of La Frontera	1 658	7 931	591.76	1.63
University of Los Lagos	920	1 282	523.77	
University of Magallanes	630	812	537.12	
University of Talca	1 240	6 043	592.93	0.20
Uni Catolica del Maule	1 090	5 222	583.47	0.10
Uni Cat de la S Concepción	1 555	7 102	550.73	0.10
Uni Católica de Temuco	1 440	3 656	535.91	
TOTAL	5 0423	20 5262		

Source: Figures from DEMRE, available on website www.estudie.cl

Further evidence is in Table 3.4, which shows what percentage of each CRUCH university's accepted applicants came from each of four family income tranches. The tranches are the same as for Table 3.1. It can be seen that, by and large, the higher the university's average PSU score for accepted applicants, the lower its percentage from T1 and the higher its percentage from T4. This certainly applies to the Catholic University of Chile, which had the highest PSU average – 51.4% of its accepted applicants are from T4 and only 15.6% from T1. At the other end of the scale are

several universities whose recruitment from T1 is approaching or higher than the 60%. Students from lower income groups and municipal schools have reasonable chances of going to a CRUCH university if they live in these regions and wish to go to these particular universities; but overall, given earlier evidence that relatively few achieve the higher PSU scores, their choice of institution would appear to be much more limited than that of students from higher income groups.

Table 3.4 **CRUCH universities 2008: percentage of accepted applicants from each income band**

University	T1 CLP: 0-270 000 (%)	T2 CPL: 270 001-540 000 (%)	T3 CPL: 540 001-810 000 (%)	T4 CPL: 810 001 or more (%)
University of Chile	26.4	29.1	16.4	28.0
Catholic University of Chile	15.6	18.5	14.5	51.4
University of Concepción	51.9	27.6	11.4	9.1
Catholic Univ of Valparaiso	39.5	31.1	13.9	15.6
Federico Santa María Univ	47.4	27.2	10.9	14.5
Univ Santiago de Chile	44.4	33.8	11.8	10.0
Univ Austral de Chile	50.7	28.6	12.2	8.5
Univ Católica del Norte	40.0	31.6	15.1	13.3
University of Valparaiso	49.4	30.7	11.7	8.2
Metrop Univ of Ed Sciences	58.8	28.0	8.5	4.7
Tech Met University	54.2	33.0	8.6	4.2
University of Tarapaca	61.7	26.8	8.3	3.1
Arturo Prat University	59.6	28.9	6.6	4.9
University of Antofagasta	42.8	32.2	15.5	9.5
University of La Serena	60.2	27.0	7.9	4.9
University of Playa Ancha	64.1	25.9	6.4	3.7
University of Atacama	57.5	29.9	8.6	4.0
University of Bio-Bio	68.1	24.2	5.2	2.4
University of La Frontera	57.9	26.5	9.5	6.1
University of Los Lagos	70.2	23.5	4.6	1.7
University of Magallanes	46.4	31.4	15.4	6.8
University of Talca	59.9	27.3	7.4	5.3

University	T1 CLP: 0-270 000 (%)	T2 CPL: 270 001-540 000 (%)	T3 CPL: 540 001-810 000 (%)	T4 CPL: 810 001 or more (%)
Univ Católica del Maule	67.1	23.0	6.0	3.9
Univ Católica de Temuco	65.2	25.5	6.2	3.1

Source: Figures from DEMRE

Male and female students

Equality of access by gender seems to be regarded as less of an issue in Chile, within MINEDUC at least. The Background Report records that **"**the gender balance is notably equal, with women making up 48% of undergraduates". This figure relates to 2005, in which year women constituted 50% of students in CFTs, 39% of students at Professional Institutes, 48% of students at CRUCH universities and 53% of students at private universities.

However, one would expect to see women making up more than half of undergraduates in both the non-university and the university sectors, if their opportunities to participate in tertiary education were equal to those of equally well-qualified men. In Chile, as in most OECD and EU countries, a significantly higher percentage of women than men successfully complete secondary education (77% compared to 69% in 2005, according to Education at a Glance).[2] Thus more women than men obtain the school-leaving certificate and meet the minimum entry requirement for non-university education. Similarly, more women than men enter for the PSU; 52.7% of entrants were female in 2006, 53.5% in 2007 and 53.9% in 2008.

Table 3.5 shows PSU results for 2008 entry. Seventeen percent more females than males entered, but 6% fewer females achieved the pass mark of 450 and 7% fewer females achieved a score of 475 or more (the minimum for most scholarship schemes). Because so many more women entered, the number of women who achieved scores of 450+ and 475+ still outstripped the number of men; yet according to the latest statistics, women are in a minority at the CRUCH universities whose recruitment depends on PSU results.

2. Table A 2.1.

Table 3.5 **Percentages achieving PSU language and maths scores (averaged) of 450 and above and 475 and above by gender, 2008 entry**

Gender	Entrants	450+	% 450+	475+	% 475+
Female	116 904	75 827	64.86%	65 220	55.79%
Male	99 977	70 868	70.88%	62 531	62.55%
TOTAL	216 881	146 695	67.64%	127 751	58.90%

Source: Figures from DEMRE, available on website www.estudie.cl

The figures in Table 3.5 are strong *prima facie* evidence that current admission arrangements disadvantage female entrants.

The review team suggests that there is a problem here that Chile needs to address. The country does not do well in international studies of gender equality. The World Economic Forum publishes a Global Gender Gap Index,[3] based on separate scores for economic participation and opportunity, educational attainment, health and survival and political empowerment. In the 2007 Index Chile ranked 86, down from 78 in 2006 and 48 in 2005 (though the addition of new countries to the index accounted for some of the fall). In 2007 Chile scored equal first for health and survival and 58 for political empowerment. It was let down by women's relative lack of economic participation and opportunity (105) and educational attainment (78), which are to some extent linked. Chile's educational attainment ranking on the 2007 Gender Gap Index put it below all OECD countries except Korea, and below a number of South American countries, such as Uruguay (53), Ecuador (42), Argentina (33), Venezuela (25) and Colombia (16). All these countries also ranked better than Chile on economic participation and opportunity for women, as did Bolivia, Brazil, Peru and Paraguay.

The OECD *Economic Survey of Chile* 2007 noted that by fostering labour force participation among groups that are lagging behind, such as females, Chilean policy can contribute to raising the economy's long-term growth potential, and reducing poverty and income equality. To achieve this it is important to remove barriers to females' equal access to education at all levels, including tertiary education. It is sometimes said that forces in Chilean culture and society discourage female participation, but such forces are not visible at tertiary education level. The evidence from PSU entry shows that women are as keen as men to enter university; and *Education at a Glance 2007*[4] suggests that, if admitted, female students in Chile are at

3. www.weforum.org

4. Table A3.8 and Table C2.4.

least as likely as male students to complete their degrees. In 2005 49% of Type B first degrees and 57% of Type A first degrees were awarded to women, although in that year only 42% of Type B entrants and 52% of Type A entrants were women, and when 2005's graduates started their courses the female percentages may well have been lower.

Students by region

Equality of access by region is another aspect worth reviewing. Column 5 of Table 3.6 (also Table 1.4 in Chapter 1) shows the percentages of the population of tertiary age provided for by tertiary institutions situated in each of the 13 'old' regions. In 2006 these percentages ranged from 7% in region VI (O'Higgins) to 43% in region V (Valparaíso), around an average of 34%.

Table 3.6 **Evolution and annual average growth (%) of tertiary coverage per region, 1990 – 2006**

Region	Coverage Rate 1990	Coverage Rate 1995	Coverage Rate 2000	Coverage Rate 2006	Difference in % points in Coverage 1990-2006	Annual growth rate coverage 1990-2006
I	16.35	22.57	25.10	38.59	22.24	5.51
II	16.78	25.96	33.74	35.89	19.11	4.87
III	7.64	9.95	12.78	18.30	10.66	5.61
IV	10.40	18.44	23.13	30.72	20.32	7.00
V	17.87	24.75	34.17	43.07	25.20	5.65
VI	3.28	5.29	5.16	6.98	3.70	4.83
VII	5.54	9.63	13.94	19.99	14.45	8.35
VIII	14.18	18.14	24.74	35.82	21.64	5.96
IX	9.13	16.14	21.30	20.92	11.79	5.32
X	9.89	12.88	17.39	23.13	13.24	5.45
XI	1.10	0.08	3.62	8.75	7.65	13.84
XII	9.75	15.45	23.79	29.82	20.07	7.24
RM	18.57	25.77	33.26	41.28	22.71	5.12
Total	14.36	20.21	26.92	34.27	19.91	5.59

Source: Based on MINEDUC (2006) for enrolment, CELADE (2000) and INE 2006 for population 18-24 years

Table 3.7 on the next page shows, by the 15 'new' regions, the average income per head and the average score in PSU tests for 2008 entry. It will be

seen that average PSU scores are strongly associated with higher average income and higher urbanisation. The top five regions in terms of average PSU score, and the only ones to beat the national average, are Antofagasta, Santiago, Magallanes, Aisen and Valparaíso, in that order. Four of these are also in the top five for average income (Valparaíso is 6) and four of them are in the top five for urbanisation (Aisen is 7). At the other end of the scale, using 'old' regions, the five with the lowest average PSU scores are (starting from the lowest) Araucania, Atacama, Tarapaca, Maule and Los Lagos. Three of these, Araucania, Maule and Los Lagos, are also the lowest three for average income and urbanisation. Regional average PSU score does not seem to be associated with population density or distance from the capital. Regions 1, 2, 12 and 13 have some of the highest PSU scores, average incomes and urbanisation rates; though 'old' region 1 is an exception in terms of PSU score, the problem appears to lie more in the area around Iquique than in the new region around Arica.

Lower PSU scores do not indicate a less talented young population but do suggest that the schools attended are less able to prepare this young population to pass the test. The associations noted here may well be explained by the relationship between family income level and secondary school performance, and rural areas tending to have smaller schools with fewer resources. Poorer and more rural areas are also likely to have a higher proportion of municipal and private subsidised schools, because they offer limited business prospects to providers of private fee-paid education.

Tables 3.6 and 3.7 taken together appear to present a picture of varying and less than equal opportunities by region. Only those in the most highly urbanised regions of Santiago, Antofagasta and Valparaíso combine better-than-average provision (in quantity and range) within their region and better-than-average performance in the PSU. It may well be that young people from other regions have fewer opportunities to access tertiary education or lower participation rates. However this cannot be safely concluded from the available evidence, because there are no statistics showing tertiary participation rates by region of residence. Regions with good coverage may be able to give their residents reasonable access opportunities despite below-average PSU scores (Tarapaca, Bió Bió). Young people from regions with relatively few tertiary places may go in larger numbers to institutions in the big cities, particularly if they are nearby (O'Higgins) or have relatively good PSU scores and high incomes (Aisen).

Table 3.7 **Income per capita and average PSU score for 2008 entry, by region**

	Region	Density (habts/Km2)	Urban Population%	Average income per capita p.a (thousand CLP)	Average PSU score
15	Arica-Parinacota (was part of Tarapaca)	n.a.	n.a.	n.a.	452.0
1	Tarapaca	8.2	92.9	142.9	439.0
2	Antofagasta	4.4	97.6	155.9	472.5
3	Atacama	3.7	91.0	133.5	438.1
4	Coquimbo	16.9	79.8	123.4	451.7
5	Valparaíso	103.8	91.5	137.0	461.3
6	O'Higgins	52.3	70.8	123.0	453.0
7	Maule	32.5	66.9	96.2	442.0
8	Bió Bió	53.8	83.1	117.0	455.0
9	Araucania	29.7	67.9	101.4	433.3
14	Los Ríos (was part of Los Lagos)	n.a	n.a.	n.a.	443.1
10	Los Lagos	17.6	69.4	111.8	449.2
11	Aisen	0.9	83.3	167.3	462.1
12	Magallanes	1.2	92.8	172.8	462.7
13	Región Metropolitana (RM) de Santiago	433.5	96.8	184.2	467.4
	All regions	**22.0**	**86.9**	**147.3**	**457.1**

Sources: National Institute of Statistics (*Instituto Nacional de Estadísticas*), Central Bank of Chile (*Banco Central*) and DEMRE, 2008

The review team heard a great deal during fieldwork about the 'Santiago effect'. Tertiary institutions in other regions (even nearby Valparaíso) complained that the capital pulls in more than its fair share of national resources, and an undue proportion of the best and brightest university students from all round the country. From examining data on PSU applicants it is clear that a high number of those scoring highest make Santiago's prestigious universities their first choice, but it is also clear that a large proportion of the schools achieving the best PSU scores are in Santiago; and it is understandable that high-achieving and ambitious students from elsewhere may see their best chances of future success in the country's capital city.

Retention and equity: the evidence

So far this chapter has considered who gets into tertiary education, and in particular who passes and does well in the university entry test. A further question is whether different groups of entrants have equal chances of completing their programmes, or survival chances. A related issue is whether members of some groups generally take longer to complete their courses. The longer a student's course takes (because they are having to repeat years or semesters), the greater the cost to the student and the higher the chances that they will drop out, for either academic or financial reasons. Retention and successful graduation rates are important for two reasons. First, there is clearly an equity issue if some groups suffer more drop-out or failure to graduate with a degree than others. Secondly, admissions reforms designed to help greater numbers from disadvantaged groups into higher education are not helpful if the extra entrants prove unable to graduate successfully.

Information on which to judge drop-out and non-completion rates is, however, very limited. Chile does not systematically collect information at national level on completion rates or the average length of completed courses in individual universities – though the Higher Education Information System (SIES) plans to do this in the future, and institutional and programme accreditors ask these questions as a means of judging teaching quality and institutional effectiveness. MINEDUC collects some information on the percentage of students who get their degree within the theoretical length of their courses, and report[5] that success rates reach 56.8% in the CRUCH universities and 51.8% in the private universities. MINEDUC also states that first year retention rates are 82.9% in CRUCH universities and 79.1% in accredited private universities. However no more detailed data or breakdowns by student characteristics are available.

While female students appear more likely to complete their courses than male counterparts (see above) there are widespread concerns that students from poorer families or from municipal schools have higher drop-out rates and take longer to complete successfully. A 2006 UNESCO study[6] found a 28% drop-out rate between Year 1 and Year 4 among students from the top two income quintiles, while for students from the bottom two quintiles the drop-out rate was 65%. The Chilean government has made considerable MECESUP funds available to selected universities for remedial

5. Country Background Report, Chapter 9.3.

6. Quoted in Ministry of Education of Chile (2007), Country Background Report.

programmes, or 'levelling up', for students whose knowledge of maths, language or science is below the standard needed to tackle the course successfully. Universities running these remedial programmes told the review team that they are very useful, and make a very positive contribution to enabling less well-prepared students tackle higher education with some chance of success. The team understands from MINEDUC, however, that the evidence from accreditation processes has raised doubts over the effectiveness of such programmes if they are offered in parallel with the regular curriculum, resulting in very heavy workload pressures on struggling students. All universities visited saw the issue of how to compensate for poor secondary education as their greatest challenge.

One CRUCH Catholic university the team visited had analysed the academic performance of its 2007 cohort of first year students by their characteristics. Among the differences noted were that females performed significantly better than males (lending support to the thesis that the PSU tends to underestimate female performance); that students from municipal schools did much less well than those from private subsidised schools, who did slightly less well than those from private fee-paid schools; and that performance in the early stages of undergraduate courses varied strongly and directly with PSU score. Those who had scored below 525 had less than a 50% likelihood of successfully completing first semester course modules the first time, whereas the likelihood rose to 75% with scores over 600, 90% with scores over 650.[7] Consequently, this university targets remedial programmes on its lowest PSU scorers. This university does not yet know whether the remedial programmes can improve performance to the point where the lower and the higher PSU scorers have equal chances of completing their courses, within the theoretical course length.

Equity issues in admission and retention: causes and policy options

The evidence presented above shows that a number of equity issues arise around admission to CRUCH universities, and other institutions such as private universities and IPs which use PSU results in their admission criteria. It is clear that for young people who are from poorer families or municipal schools or both, the current admission system constitutes a bigger barrier to access to their institution of choice than it does for more advantaged young people. There are strong indications that the system constitutes a bigger barrier for female than for male students. The admission system, coupled with uneven distribution of places around the country, may also lead to unequal access for young people in different regions, though this

7. General presentation from *Universidad Católica del Norte*.

is less clear. Though there is much less information on the graduation rates of different groups, what there is indicates that once admitted, young people who are from poorer families or municipal schools or both are even more likely than others to drop out, even less likely than others to complete university courses and graduate with degrees within the expected time. The rest of this section considers causes of, and policy options to address, equity gaps arising from the PSU test itself; the central system for selecting students to fill places at CRUCH universities; private universities not being part of this central system; and differences in retention rates.

The university entry test and selection system was initially devised to regulate and ensure fairness in admission to CRUCH universities in 1966 – when there were only eight of them, serving a much smaller and narrower student population, and no other universities. The first such admission system, which lasted until 2003, was based on the Academic Aptitude Test or PAA. The PAA tested verbal and mathematical aptitude as well as knowledge of the history of Chile, and included elective tests in specific areas such as chemistry, biology or social sciences, depending on what the student planned to study. An individual student's total score also took account of the grades the student received in high school.[8]

The PSU replaced the PAA from 2004. The PSU is like the PAA in using multiple-choice questions to test language, maths and elective subjects, but unlike the PAA because instead of testing aptitude it tests knowledge of the national school curriculum. One motive for the change was to achieve greater equity.[9] MINEDUC officials cited a 2001 University of California study which said that for students from the lowest socio-economic levels, tests of knowledge are a better predictor than tests of aptitude for future performance in the first years at the university. It had also been suggested[10] that the PAA's testing of aptitude rather than knowledge might be to blame for women achieving lower results than indicated by their secondary school achievement. A further very important motive was to make municipal schools teach the full national curriculum.

The PSU is intended to be a 'merit' test, measuring intelligence and knowledge. However, it is now generally recognised in Chile that knowledge depends on preparation during secondary schooling and that preparation is unequal, not least because the laudable aim of ensuring that

8. *La Tercera, El Mercurio*, summarised in *Santiago Times*, 7 January 2000.

9. *La Tercera* Editorial Opinion, 5 December 2007.

10. Bravo and Manzi 2002, cited in 'Gender Parity and Equality in Chile', Beatrice Avalos, Santiago 13 June 2003.

all municipal schools teach the full national curriculum has yet to be realised. A member of the Presidential Advisory Council on Higher Education told the review team that, according to evidence the Council had received, 43% of municipal schools are still not doing so.[11]

There have even been concerns that the results gap between private and public school students has grown since the PSU replaced the PAA. A study conducted by an economist from the Center of Public Studies (CEP), Harald Beyer, reported in La Tercera,[12] analysed PAA results from private and public schools between 2000 and 2002 and compared them with results from the PSU between 2003 and 2007. According to Beyer's analysis, students from private schools averaged 37 correct answers on the PAA language test, but once it was replaced by the PSU they began to get more each year until they averaged 47 correct answers in 2007. Over the same period, public school students were getting progressively lower scores – from 25 correct answers on the language test in 2002 they dropped to 23 on the 2007 test. The change was even more pronounced on the maths test. Private school students went from 33 correct answers on the PAA in 2002 to 37 on the most recent PSU, while public school students fell from 18 correct answers to just eight. Beyer hypothesises that "in a more content-heavy test like the PSU, the students from public schools compete in worse conditions than in the case of an aptitude test. There is plenty of evidence that public school students cover a much smaller proportion of the content than students from private schools."

Beyer's results may be questioned, for example on the grounds that they do not allow for increases in the numbers (and therefore the ability range) of municipal school students taking the tests over the period up to 2007. However, DEMRE figures show that the gap between PSU scores achieved by students from Chile's three different school types widened between 2006 and 2007 and again between 2007 and 2008; so even if equity gaps associated with the test are not widening significantly, they are not narrowing either.

The Government of Chile is right to emphasise that most of the equity issues discussed here have their roots in differential preparation in secondary schools. Important national initiatives are already underway to improve secondary education for the poorer students and those attending municipal schools. Following the protests of 2006 and the recommendations of the Presidential Education Advisory Commission set up to consider secondary education issues, the Chilean government is pursuing various improvement

11. MINEDUC officials could not confirm this figure.

12. Study described in *La Tercera* Editorial Opinion, 5 December 2007.

initiatives, including the teaching quality improvement programme described in Chapter 1. It is to be hoped that these initiatives will bear fruit, and narrow the knowledge gaps between school-leavers from different backgrounds. It would be particularly helpful if government programmes succeeded in improving the standard of maths teaching in secondary schools – maths is the subject in which universities noted the most weaknesses among their incoming students – and narrowing the maths performance gap between girls and boys, which was found to be greater in Chile than in any other country participating in PISA 2006, and may partly explain women's poorer performance in the PSU.

These secondary school improvement initiatives are badly needed and should be vigorously pursued. The more that can be done to narrow school equity gaps and between-school variation, the better will be the chances of levelling the playing-field for entry to higher education. There can be no certainty, however, that they will achieve this result in the near future. In other countries which have undertaken school improvement programmes, these have not always worked. Where they have worked, they have often taken quite some time to produce results, particularly where it is necessary to improve teaching standards, teacher training and careers guidance in schools from a low base, as in Chile. Countries which had a large equity gap when they started school improvement programmes – England, for example – have tended to find it easier to raise standards generally, than to narrow achievement differences between groups. The initiatives which have been agreed within Chile do not affect the continuance of the three types of school – municipal, subsidised and fee-paid – which many commentators see as the cause of educational inequity. It therefore seems likely that even if publicly-funded schools do improve their students' performance, the fee-paid schools will make sure that their students' performance improves at least as much. Therefore, the review team sees a parallel need for reform in tertiary admission arrangements.

The Chilean government sees the following main advantages in the current PSU and selection system. First, there is a shared, common admission system that is in principle blind to anything but objective merit-based criteria: the scores obtained in a combination of PSU tests and marks from secondary education. This guards against favours to friends and potential corruption. Secondly, a PSU score of 450 represents a fair and minimum standard for university entry: MINEDUC does not believe that applicants scoring less than 450 would have enough knowledge to benefit from a course at a traditional university or have a reasonable chance of completing it. Thirdly, the fact that the PSU tests knowledge of the national curriculum brings two benefits that would not otherwise be obtained. All schools have a powerful incentive to teach the full curriculum, and because

virtually all school-leavers (at general secondary schools) sit the PSU, its results provide a valuable indication of school quality and effectiveness.

The review team's vision of a fit-for-purpose tertiary education admission system would be similar, but not identical, to the above. The system should facilitate the admission of enough students to meet the government's participation targets (in Chile's case, one million or 50% of young people by 2012), into programmes whose range, balance and level are consistent with the country's future needs. Where demand for places outstrips supply, the system should ensure that the students admitted are those most able to benefit, selected by a process that is transparent, based on objective criteria and equally fair to all potential applicants regardless of circumstances.

The Chilean higher education admission system broadly meets this specification, but with room for improvement in some aspects. The PSU passmark of 450 is particularly well-aligned with the government's participation target of 50%, because it is intended to represent average performance. DEMRE, the unit of the University of Chile which administers the test, ensures that it does so by converting the actual distribution of test scores into a normal distribution around 450.[13] One side-effect of this method is that the standard represented by the PSU passmark can vary from year to year.

It is good to have a university admission system that relies on shared objective merit-based criteria; but with some reforms (including extending the system to the private universities and their applicants) Chile could develop a system even better at achieving these aims, as well as more equitable. During fieldwork, the review team asked all institutions visited for their views on the PSU-based admission system. From their comments the team believes that there is scope for a measure of positive discrimination in favour of talented students disadvantaged by poor preparation; for making it easier for CRUCH universities with a regional mission, or other particular missions, to give preference to the type of students they were set up to serve; and for recognising that a single selection criterion based on academic achievement is not equally right for all HE institutions. Other non-academic but nonetheless objective criteria may be relevant to selection for university; and there is more to 'merit' than ability to show such knowledge in a test – even if it is a very good test, able to discriminate clearly and fairly between competing candidates for places.

There has in fact been no published independent study of the quality and reliability of the PSU test itself and of the accuracy of the marking. Any test

13. This is explained on website http://www.demre.cl/doc_tecnicos_trat_ptjes.htm

whose results are so important to so many people should be subjected to regular independent scrutiny, to check its margins of error and verify that different scores represent real differences in performance. This is especially important around key borderlines significant for admission or student aid, such as 450, 475, 500, 550 and 600 points; but because of the way the central admissions unit DEMRE allocates places at CRUCH universities, any inaccuracy or unreliability at any point on the PSU results scale could potentially cost a deserving individual a place at the institution of their choice. Northern Ireland, the only part of the UK to retain secondary school selection by ability based on a test taken at age 11, recently abandoned this policy, not because people decided selection was wrong in principle, but because independent scrutiny showed that the national test was not accurate or reliable enough to provide a fair basis for selection decisions.

An independent assessment of the PSU could resolve any doubts about its effectiveness as a test, but there is a wider question: is identifying the most knowledgeable candidates the best basis for identifying those most meriting, or suitable for, higher education? To benefit and in due course graduate from university, a student needs not only enough knowledge to provide a secure foundation for further learning, but also the ability to apply this knowledge to new problems and to master new knowledge and skills. Multiple choice knowledge tests reveal very little about these key aspects. By contrast, well-designed aptitude tests incorporating tests of verbal and non-verbal reasoning reveal a great deal more about intrinsic ability to learn and perform at higher levels and so benefit from higher education. It is worth noting that European countries with well-regarded tertiary education systems do not in general rely on multiple choice knowledge tests to establish which school-leavers can benefit from university education. The UK, France and Germany, for example, all use the results of longer school-leaving exams, in which candidates can show in more depth and detail the extent of their knowledge and their ability to apply it. So does Ireland, which does best in the OECD analysis quoted earlier of how far parents' socio-economic status effects students' participation in HE. In the US, most universities use the results of the SAT, which has both multiple choice and essay type questions, in addition to assessing other dimensions of the students' academic and non-curricular experience.

The review team met the Presidential Advisory Council on Higher Education while the Council was formulating its recommendations – one of which was to re-assess the PSU and consider other alternatives. The Council drew the team's attention to the alternative admissions arrangements being developed by the Catholic University of Chile.

The Catholic University told the team that concerns about equity in admissions prompted them to develop and pilot what they believe will be a

better and fairer system. This has been developed in the light of international experience, and is closely related to the admission system of the University of California, which has recently decided to augment the Scholastic Aptitude Test (SAT) commonly used in the US with other admissions components. The Catholic University's pilot system includes three elements: an extended essay, designed to test the applicant's ability to write, communicate and think critically; a personal statement from the student; and a psychometric test. Piloting of this system has started within the university and will continue until 2009. Piloting involves recruiting 1 500 students per annum from all types of local schools on the new system basis, and comparing their subsequent university performance with a control group of students recruited in the normal way, using the PSU. The university hopes to prove that this alternative recruitment system is both less sensitive than the PSU to differences in socio-economic background and type of school attended, and an equally good predictor of success at university. Though it is too early to be sure, results so far are understood to be very encouraging.[14] The review team was impressed by the care and research that have gone into developing and piloting this system, which could be ready for introduction for students entering the Catholic University of Chile in 2011.

Bearing all this in mind, the review team offers below a package of suggestions for addressing the equity issues identified, while improving the capacity of the tertiary admission system to achieve its purposes – starting with possibilities while pupils are still in secondary school.

Intensive academic assistance could be available in the later years of secondary school to students in municipal schools who are identified as having high academic potential. The Catholic University of Chile has been working with two municipal schools in poor districts of Santiago to identify their most talented pupils in the last year of middle school and give them special courses on Friday afternoons and Saturday mornings until they leave secondary school. The University says that the 700 children who have been through this programme so far have attained PSU scores as good as pupils from the best private schools. A similar programme has been established at University of Santiago, with a group of five *liceos prioritarios* in which most of the students are considered "at risk". Results show that early intervention helps to equalise chances of higher PSU scores. These two pilot programmes show what can be done; and provide evidence, if more were needed, that there are talented pupils capable of benefiting from higher education even in the least privileged schools. Other Chilean universities might be encouraged to mount similar programmes, as part of their public

14. Details and discussion papers are on the university's website, www.puc.cl/webpuc/piloto/p_estudiantes.html

function and, if appropriate, with public funding. As well or instead, single universities or groups of universities might consider setting up special summer schools to give gifted and talented young people from poor backgrounds the intensive preparation they need to get into the most academically demanding best universities – as has been done at England's Warwick University.

However while such schemes are very useful as exemplars, they are necessarily small scale and tend to focus on young people at the top end of the ability range. To address the equity issues affecting all young Chileans whose family and schooling circumstances disadvantage them in the competition for higher education places, it would be helpful to review and revise the PSU test. Taking account of the issues and international examples described earlier, two options are offered.

The first option would be for Chile to move away from a university entry test towards a national school leaving test or set of tests – ideally, not simple multiple choice tests but longer exams, which test both knowledge and candidates' ability to think and to apply knowledge. Such school-leaving exams or tests could also remove the need for a separate school-leaving certificate, by having two pass levels, the lower level equivalent to the NEM and the higher level setting the minimum standard for entry to an academic or professional degree course. A smooth transition from the PSU, and achievement of the government's 50% participation target, would be facilitated by making the higher pass threshold equivalent to a score of 450 in the PSU. A special school-leaving test or tests for young people in vocational secondary schools or streams, incorporating a higher pass level showing attainment of the minimum standard for professional degree courses at IPs and similar courses at universities, would be helpful.

To guard against standards drift it would be desirable for an independent agency to be tasked with developing the school-leaving tests, keeping their standards constant from year to year to allow the monitoring of national education standards over time, and arranging for tests to be marked by trained markers outside the schools concerned. Setting up such a system would have substantial costs, but the costs involved in the PSU (estimated at 17 000 million Chilean pesos annually)[15] would be saved. Introducing it would also take some time, given the need for tests and their marking and data collection systems to be developed, piloted and evaluated first. However, a school-leaving test which also set the minimum standard for university entry would have many advantages, both for school improvement and for students. Independently marked and standardised, it would yield

15. This estimate appeared in an article in *La Tercera* on 26 October 2008

better information about school quality and effectiveness. It could give pupils who pass at ordinary or higher level a qualification, useful whether they go on to higher education or into the labour market or apply for higher studies overseas. Because the tests would be taken while still at school, those who hope for but do not achieve the higher pass level could more easily contemplate staying on at school to fill their knowledge gaps and retake the tests. It would also become easier to ensure that degree course providers outside CRUCH respect the minimum standard when admitting school-leavers; though the review team is not persuaded that the same minimum standard need be required of students who have spent some time in the labour market acquiring skills and experience relevant to the programme, or who already have a lower level tertiary qualification in the same discipline.

The second option – which could also be an interim step on the way to the first – would be to reform the PSU by incorporating elements other countries consider useful and important in identifying the students most likely to benefit from HE. These elements would include extended essays and questions designed to test reasoning ability and learning potential. They could also include personal statements which could cover non-curricular experience, personal motivation and interest in the programme. Again, there should be a variant for vocational secondary school students.

Changes to the post-PSU stages of the university admission system are also suggested. It would be very helpful to applicants, and to ensuring the transparency of the admissions process, if as many as possible of Chile's private universities could be encouraged to join in a common allocation system with the CRUCH universities, including a central clearing house for applications. The central clearing house would operate much like CRUCH's central unit does now: students send in a list of the universities they would wish to attend, in order of preference; the central unit establishes which applicants best meet each university's admissions criteria; and students are then told which university has offered them a place, *i.e.* the highest-ranked on their list which would admit them.

With more, and a wider range of universities in the common allocation system it would cease to be feasible for places to be allocated, as the CRUCH central unit does for CRUCH universities now, in order of total PSU-based score. There are reservations about this system in any case. It aims to be fair to all, but many would consider it unfair for students who underperform in the PSU because of poor preparation to lose out to students with less natural ability, who have the good fortune to come from better schools or families who could afford private tuition. This may be a particularly serious problem for rural students who, if they cannot get into their local university, cannot afford to study further away. There are also

doubts about whether the PSU is a robust enough testing instrument to provide a fair basis for distinguishing between students in this way.

There is no legal impediment to CRUCH universities using different admissions and allocation criteria, if they want to. All Chilean universities are autonomous and entitled to decide their own admissions criteria. The whole PSU and DEMRE system rests simply on an agreement between the CRUCH universities, with the tacit approval of MINEDUC. There are already some differences in criteria. Each CRUCH university decides how it wishes the total PSU-based score to be made up in the case of its applicants. Some give more weight than others to the NEM score, or to scores for elective subjects. Weightings may vary between a university's different programmes. Some universities reserve small numbers of places for special groups, such as disabled students, who would not gain entry otherwise. However, in practice, most if not all CRUCH universities adhere closely, for most if not all of the students they admit, to the principle of allocation in order of PSU-based total score. A main reason is that all universities wish to maximise their chances of obtaining AFI, the special public funding given to the universities who recruit one of the 27,500 highest scorers in the PSU. Institutions may also feel peer pressure to stick to the 'rules' of CRUCH members' agreement on admissions. MINEDUC is proposing to change the allocation of AFI, to take into account not only the PSU score, but also the relative position of students in their secondary schools so as to reward those with a good study record, corrected by regional balance.

It has been suggested to the review team that if the current agreement ends and each CRUCH university operates its own different criteria, the result might be less fairness rather than more. However, the current system will need to adapt in any case, if or when the Catholic University of Chile introduces its alternative system; other CRUCH universities, particularly Catholic universities, may wish to follow suit. The review team favours a multi-dimensional rather than uni-dimensional admission system, in which universities are encouraged to adopt objective criteria appropriate to their varied missions and (if they so decide) to give priority to applicants from less advantaged or under-represented groups, who may have high potential despite poor preparation. One way of guarding against adoption of non-objective criteria or questionable practices might be for MINEDUC to discuss and develop with the universities some agreed guidelines on entry criteria. Steps might also be taken to ensure that all criteria in use are published and all published criteria adhered to.

The review team also has suggestions relating to the under-preparedness of many less advantaged young people for university. This affects their chances not only of gaining admission but also of keeping up with better-prepared peers once at university, and graduating with a degree within a

reasonable time. The measures suggested may of course become less necessary if school improvement initiatives bear fruit.

MINEDUC could explore the options for giving young people with university aspirations in less advantaged schools more help in preparing for the national university entrance test or school-leaving test. In the last two years of secondary school, regular teaching might be reinforced by extra tuition from teachers with proven skills in identifying and filling gaps in pupils' knowledge or teachers brought in from *pre-universitarios.*

Another possible approach would be to fund organisations outside the school system which could deliver pre-university tuition (or preparation to re-take the school-leaving exam) to young people after they left school. Other countries known to the review team have further education colleges, which offer young people second chances to obtain university entry qualifications, and an alternative to taking or re-taking general qualifications at school. Chile does not appear to have anything similar, except the *pre-universitarios;* and the review team was not able to find out much about their effectiveness and value for money. Another feature in certain countries is 'access' courses, run by universities or colleges, which, if completed successfully, qualify (but do not entitle) the individual to enter university. Chileans are renowned for their entrepreneurial spirit: if central or regional governments indicate the availability of contracts and funding for pre-university tuition and invite expressions of interest in providing it, a range of organisations keen to offer the service is likely to emerge, probably including existing providers of tertiary education. To serve the equity aims of such a programme, no or minimal fees should be payable by the student. However to avoid the inefficiency of paying for the pre-university tuition of young people who lack the intellectual capacity to complete a university course however well tutored, it is suggested that only those who pass a suitably calibrated aptitude test – a test of reasoning ability (verbal and non-verbal) and learning potential, not requiring the knowledge base which 'access' course candidates by definition lack – be entitled to undertake the course for no or minimal fees.

Further measures may be needed to address the equity issue that young people from lower income groups and municipal schools who are admitted to universities appear less likely to be retained until they graduate with a degree, and even less likely than students in general to complete programmes within the nominal length of the course. In general this is because they have a less secure knowledge base than other students who had better pre-university preparation. MECESUP has funded some so-called remedial programmes in the early terms of university, but these have had mixed success if delivered in parallel with the curriculum. It may be useful to try out more different ways of delivering the required post-admission

'knowledge boost', including summer school programmes or even full-year 'foundation courses' between school-leaving and starting the formal university curriculum.

In this situation there is a strong argument that students should not have to pay for filling the knowledge gaps their schools failed to fill. However there is also an onus on universities to adapt the initial academic demands of their courses, curricula and teaching to today's more diverse students. Tertiary institutions should feel a responsibility to help every student they admit to graduate; and should be more accountable than at present for poor survival rates. The institutions are not yet receiving strong signals to this effect from government: the Chilean government has an objective of getting 50% of young people into tertiary education by 2012, but has set no objectives related to completing courses and graduating with marketable qualifications. Survival rates are not measured and monitored, except by researchers. By contrast, the UK government's objective is that 40% of young adults in its target age group should have successfully completed higher education courses by 2012. The review team observed that Chilean universities appear to feel less responsibility to get students safely through their courses within the prescribed time than universities in other countries with substantial tuition fees. When a student who has paid considerable sums, often self-funded, over a period of years leaves with no qualification, this seems to be regarded as the student's fault for failing to meet the institution's standards, whereas in the UK or the US it would be seen as the institution's fault for failing to provide the necessary academic and pastoral support. It is suggested that MINEDUC agrees with the institutions a new objective or objectives relating to completion or survival rates, and sets up a system for collecting the relevant statistics.

PART 2. Opportunities to Access Student Aid

Equity and student support mechanisms

As will be shown in Chapter 8 on the financing of tertiary education, Chile has placed itself, through innovative financing reforms, among the minority of countries in the world, both developed and developing ones, which have achieved high levels of cost-sharing while offering their students many study choice opportunities. From an equity viewpoint, however, it is important to verify that the funding allocation mechanisms in place help improve the distribution of resources to students from the lower quintiles.

Since the return to democracy in 1990, successive governments have put equity high on their agenda and the present coalition government is no

exception. The principal mechanisms to ensure that low income students do not encounter any financial barriers to pursuing their studies are scholarships and student loans.

The Ministry of Education manages a large number of scholarship schemes which are described below:

- *Bicentenary Scholarships* (BB), for students attending CRUCH universities who are Chilean; show socio-economic need (*i.e*. are in the lowest two household income quintiles); and score 550 points or more in the PSU.
- *Juan Gómez Millas Scholarships* (BJGM), for students from municipal or private subsidised schools, attending CRUCH universities or any other tertiary institution with accreditation, who are Chilean or from other Latin American or Caribbean countries; are in the lowest two household income quintiles; and score 550 points or more in the PSU.
- *Scholarships for outstanding students to study pedagogy* (BdP), for students enrolling in an education or teaching degree at an institution recognised by MINEDUC, who are Chilean; score 600 points or more in the PSU; and have a Higher Secondary School grade report (NEM*: Notas de Enseñanza Media*)) which averages 6 or above (on a scale of 1-7).
- *New Millennium Scholarship (*BNM), for students from municipal or private subsidised schools, enrolling in a Higher Level Technician course in MINEDUC-approved CFTs or in professional programmes taught by licensed and accredited IPs, who are Chilean; are in the lowest two household income quintiles; and who have a NEM of 5.0 or above.
- *Scholarships for academic excellence* (BEA), for the top five percent of students graduating from each public or private subsidised secondary high school, who enrol at CRUCH universities or accredited private universities, CFTs or IPs; are in the lowest two household income quintiles; and score 475 points or more in the PSU or (if enrolling in a CFT or IP) have a NEM score of 5.0 or more.
- *The Indigenous* Scholarship, for students from defined minority ethnic groups who are in the lowest two household income quintiles and who have a NEM of 5.0 or above.
- *Support schemes* for students in the lowest two quintiles who obtain maximum scores in the PSU or are the children of school teachers.

- *Maintenance grants* are automatic for the beneficiaries of most scholarship schemes. These consist of food vouchers and cash to cover subsistence. The National Committee for Student Support and Scholarships (*Junta Nacional de Auxilio Escolar y Becas*, JUNAEB) administers the maintenance grants. There is also a maintenance programme for students from isolated regions (the extreme north or south or island territories), which consists of a money contribution and a transport quota for travel.

Table 3.8 summarises the main characteristics of these grant and scholarship schemes.

Table 3.8 **Scholarships Matrix (2007)**

Name of Programme	Institutional Eligibility	Academic Criteria	Other Criteria	Number of Beneficiaries	Amount Disbursed (Thousand USD)[1]
Bicentenary Scholarship (BB)	CRUCH universities	PSU 550	Quintiles I & II	24 737	65 532
Becas Juan Gómez Millas (BJGM)	CRUCH universities and accredited private institutions	PSU 550	Quintiles I & II	5 354	11 003
Scholarships for Outstanding Students to Study Pedagogy (BdP)	Recognised Teacher Training Programme	PSU 600 and 6 NEM	n.a.	560	1 262
Scholarships for Children of Teachers (BHP)	All institutions	PSU 500 and 5 NEM	Quintiles I, II, III , IV	5 544	5 843
New Millennium Scholarships (BNM)	Technical institutions	NEM 5	Quintiles I & II graduates of public or private-subsidised high schools	22 758	17 464
Academic Excellence Scholarships (BEA)	CRUCH universities and accredited private institutions	PSU 475 or NEM 5	Top 5% of municipal and private subsidised high schools	4 196	7 780
Becas Puntajes PSU (BP)	CRUCH universities and accredited private institutions	Best national or regional PSU score	Quintiles I to IV graduates of public or private-subsidised high schools	53	118
Isolated Zones Scholarships (BZE)	All institutions	n.a.	Isolated zones of the country	1 187	2 004
Indigenous Scholarships (BI)	All institutions	NEM 5	Indigenous population	6 399	7 194
Maintenance Grants (BM)	CRUCH and accredited private institutions	n.a.	Beneficiaries of BB, BJGM or BAE	83 011	40 396

Note: 1.USD = 466 Chilean pesos

Source: Student Aid Division, Higher Education Department, Ministry of Education

From an administrative viewpoint, the distribution of scholarships is carried out in a transparent manner, based on a set of objective criteria clearly advertised on the MINEDUC website. Students can apply online using a single form.

Funding for scholarships has increased significantly in recent years, from USD 40 million in 2000 to USD 173 million in 2007. The review team recognises that this is a noteworthy effort. But it may be still far from sufficient, considering the level of social disparities in Chile. Today, 13.8% of all students enrolled in a tertiary education institution receive a scholarship of some kind. By comparison, 51% of all undergraduates in the US receive a scholarship.

Comparing the number of student aid beneficiaries and the reference population reveals that less than half the students from the lowest two quintiles (46.4%) receive a scholarship. In addition, the amounts given are not sufficient to pay for the full tuition fees. In fact, the increase in the value of the scholarship in real terms has not followed the rise in tuition fees. For example, the per-student value of the Bicentenary Scholarship for CRUCH students has grown by 59% in real terms between 1995 and 2005 while tuition fees in CRUCH universities rose by 93% over the same period. It is estimated that the scholarships today cover between 63% and 70% of the actual cost of tuition fees. For the rest, students must take out loans. The example of medical studies can be used to illustrate the size of the potential gap between the amount of student aid and the cost of studies. The field visits revealed that the annual cost of medical studies ranges from CLP 3 to 5 million in CRUCH universities and is as high as CLP 7 million in the more exclusive private universities.

In an attempt to regulate increases in tuition fees, especially in the private sector, MINEDUC has set up an elaborate system of reference fees (*aranceles de referencia*) to calculate the minimum student aid package (scholarship and loan) that all low-income students enrolled in CRUCH universities are entitled to receive. This system, which was applied for the first time in 2007, classifies universities and professional and technical institutions on the basis of quality proxies, using the institutional accreditation results plus the same indicators as those entering into the calculation of the 5% direct budgetary transfer that is linked to performance criteria, as will be discussed in Chapter 8 on financing (proportion of faculty with a postgraduate degree, research projects awarded, publications, on time graduation rates, first year repetition rates). In the medium term, the programme accreditation results will also be taken into consideration to determine the reference fee group for which each university qualifies.

In theory, the system of reference fees has two major advantages. From an equity viewpoint, it guarantees that low income students will receive a student aid package sufficient to pay tuition fees at the level prevalent in CRUCH universities. From an efficiency viewpoint, by incorporating quality and internal efficiency proxies, it could constitute a strong incentive for quality improvement. But in practice it has proven problematic to implement, so much so that in 2008 the Ministry has applied a 6.9% increase across the board instead of using the methodology used the previous year. University leaders also criticise the fact that the grouping sanctions the existing quality configuration, thereby either preventing institutions willing to invest in quality improvement from charging higher fees, or opening up a gap between what institutions charge and the aid students can get.

In view of these complications, MINEDUC should carefully study the pros and cons of maintaining the system of reference fee system in its present form, and seriously consider revising or simplifying its approach and methodology. A first step would be to de-link the equity promotion and quality enhancement purposes of the reference fee system. Since the primary objective is to keep tertiary education accessible to low income students, the quality aspects could best be dealt with through other instruments, such as a performance-linked funding formula, performance contracts, and the accreditation system. A simpler way of setting the reference fee levels would be by benchmarking the top five public universities as assessed by the accreditation process. Complementary measures to protect students from excessive fee increases could be (i) to require tertiary education institutions whose tuition fees grow faster than the national average to justify why their costs are out of line; or (ii) to publish a list of institutions whose price outpaces the national average; or – most drastically, therefore, not recommended – (iii) to withhold student aid eligibility from institutions that consistently impose fee increases higher than the national average.

A seriously disturbing feature with respect to the distribution of scholarships is the bias in favour of students enrolled in CRUCH universities. The Bicentenary Scholarships, which went to the biggest numbers in 2007 (24 737 students), are reserved for CRUCH university students. CRUCH students can also benefit from other types of scholarships which in 2007 went to another 23 378 students. Even though detailed data are not available to make the exact calculation, there is a high probability that the proportion of CRUCH students who receive a scholarship exceeds their share of the student population coming from the poorest two quintiles (27%, according to Figure 3.3). There is no objective justification for this discrimination between students who attend CRUCH universities and students enrolled in other tertiary education institutions.

Students at private universities have very limited prospects of getting grant support. If the private university is not accredited, only children of teachers, indigenous students or those from isolated zones could qualify. If it is accredited, a few more scholarship schemes are available but it seems unlikely that very many private university students meet the conditions.

Students attending IPs and CFTs are not well catered for either. Only the New Millennium Scholarships (BNM) are reserved for students in these institutions. Students are eligible if they are in the two poorest quintiles, went to municipal or subsidised schools and have a secondary school average of 5+. However, from Figure 3.3 and Table 1.1 in Chapter 1 it can be estimated that IPs and CFTs together had nearly 59 000 students from the two poorest quintiles in 2007, whereas BNM grants went to 22 758. Therefore the majority of students from these quintiles failed to get grants. As they are unlikely to have attended private secondary schools, they must have been disqualified by the school grades condition. And there must be many more young people from disadvantaged families who remain outside tertiary education, although they could have benefited from it, because lack of finance makes further study impossible. Chile's biggest CFT confirmed this, informing the review team that many more of their students came from general secondary schools than from vocational secondary schools. Because those who had attended vocational secondary schools tended both to have lower school grades and to be poorer, they often cannot afford the fees of the better CFTs. As vocational secondary school pupils are also the least likely to pass the PSU and get into university (limited numbers of them enter the PSU, and those who took the test for 2008 entry scored an average of 429.8, well below the 450 pass-mark)[16] this indicates that only very exceptional students from these schools have any viable tertiary option open to them – a serious inequity.

Rather than continuing to operate at least 12 different grant and scholarship schemes, which favour students attending traditional universities and apply rigorous academic conditions even for non-university entry, the review team suggests that all present schemes should be integrated into a single scheme with a very small number of separate windows. Discrimination between students at CRUCH universities and those at other universities should be eliminated. Academic requirements in scheme conditions should be reviewed, to ensure that they are justified and impact fairly on different groups. In particular, the minimum academic requirements for scholarship eligibility should be lowered for students enrolling in IPs and CFTs.

16. Figures supplied by MINEDUC.

Besides the grants and scholarships, the Ministry of Education manages two student loan schemes:

- The *Fondo Solidario de Crédito Universitario* (FSCU) is available only to students enrolled in CRUCH universities. To be eligible, the students must belong to the lowest three quintiles (students from the fourth quintile can also apply but they will not receive the full amount of tuition) and obtain at least 475 points in the PSU. FSCU offers generous terms, including a subsidised annual interest rate of 2% (after accounting for inflation) and a two-year grace period after graduation. Repayments are capped at 5% of the total income earned in the previous year. The repayment period is 12 to 15 years depending on the amount owed. At the end of this period any remaining debt is cancelled. Loan recovery is the responsibility of each university.

- *The Crédito con Garantía Estatal* (CAE). Established in 2005, the new student loan programme is a partnership between the government and commercial banks. A partial default guarantee is provided by the higher education institution while the borrower studies, then by the State from graduation until repayment. Repayment begins 18 months after graduation and may last up to 20 years. To qualify the student must be studying in an accredited institution and have a minimum PSU score of 475 points or (if enrolled at a CFT or IP) a high school (NEM: *Nota de Enseñanza Media*) average of 5.3 or above. As the institutions act as guarantors while borrowers are studying, they establish the maximum number of students whom they can afford to guarantee. In principle all income quintiles can qualify; but in practice institutions focus their limited resources on those in most need.

In total, 26.4% of all undergraduate students take a loan to finance their studies. Forty nine percent of first and second quintile students enrolled in a non CRUCH tertiary education institution have a CAE loan. Table 3.9 compares the main characteristics of the two government-funded student loan programmes.

Table 3.9 **Principal characteristics of the two loan schemes**

Student loan programme Characteristics	FSCU	CAE
Academic eligibility	PSU score > 475	PSU score > 475 or NEM > 5.3
Income eligibility	Quintiles I to IV	All quintiles
Institutional eligibility	CRUCH universities	CRUCH universities and accredited tertiary education institutions
Interest rate	Inflation + 2%	Inflation + 6.1% (in 2007)
Grace period	24 months	18 months
Income-contingent	Yes	No
Number of beneficiaries (2007)	129 279	38 579
Public funds spent (2007)	CLP 74.7 million	CLP 41.7 million

Source: MINEDUC and INGRESA

The government of Chile's decision to extend loan opportunities to students outside the CRUCH universities marks significant progress towards reducing the financial barriers faced by low-income students. The new student loan programme (CAE) managed by INGRESA presents three positive features. First, it allows the government to leverage private capital in a significant way. Over the first two years of operation (2006 and 2007), almost USD 200 million worth of loans were given to students for a government contribution of only USD 28 million, representing a leverage ratio of 1 to 7.1. Secondly, by shifting the responsibility for financial guarantee against default to the universities themselves, it helps low-income students to access credit without the guarantee barrier that student loan schemes in many countries entail. In 2007, 64% of the beneficiaries were students from the poorest two quintiles. Thirdly, by linking institutional accreditation to participation in the government accreditation process, it supports quality assurance in the tertiary education system. Even with these positive features, the INGRESA managers must bear in mind the experience of countries such as the US and Canada with default. The fact that the new scheme has hardly any graduates in repayment yet does not prevent a focus on preparation for repayments and prevention of default, to avoid a sudden shock in case large numbers of graduates are not in compliance when the first cohorts are due for repayment. While this is mostly the responsibility of the participating commercial banks, INGRESA should oversee the arrangements for providing adequate information to graduating students, scaling up the government review process for paying the guarantee and designing special programmes to service defaulted loans.

In terms of possible improvements of the student loan system architecture, the first point worth underlining is that the coexistence of two loan schemes with different conditions cannot be justified either from an equity viewpoint or in terms of efficiency. First of all, the students enrolled in CRUCH universities, who represent 53% of the total student population, accounted for 64% of the public funds dedicated to student loans in 2007. Secondly, there is not enough funding to give CAE loans to all students from the first and second quintiles. Only 30% of all tertiary students not at CRUCH universities have a CAE loan, according to INGRESA statistics. Thirdly, the conditions attached to the subsidised loan scheme for CRUCH students are more favourable than those of the guaranteed loan programme in terms of the lower interest rate charged, the longer grace period, the income-contingent clause, and the possibility of loan forgiveness at the end of the official repayment period. Fourthly, from an efficiency viewpoint, the repayment record of FSCU has been less than adequate. Notwithstanding the lack of rigorous accounting and reporting procedures in some universities, the overall statistics show a deterioration between 2000 and 2005 in terms of the recovery ratio (Table 3.10).

Table 3.10 **Repayment record of the FSCU (2000-2005, in thousand of CLP)**

	2000	2001	2002	2003	2004	2005
Disbursements	38 791	41 748	46 235	49 223	50 168	55 252
Repayments	24 555	25 238	25 607	32 894	25 473	25 327
Recovery ratio	63.3%	60.5%	55.4%	66.8%	50.8%	45.8%

Source: MINEDUC statistics

The organisational arrangements of FSCU do not allow the government to take advantage of potential economies of scale in managing the student loans. This is especially true with regard to collection arrangements. Considering that, by definition, universities are not financial institutions, it would be much more efficient to use commercial banks or specialised collection agencies for this purpose. The Chilean government should therefore seriously consider merging the two existing student loans schemes, for both efficiency and equity reasons. FSCU is heavily subsidised and suffers from low levels of repayment. Having a single loan programme along the lines of the guaranteed loan system would end the segregation between CRUCH and non-CRUCH students implicit in the present dual system. The guaranteed loan programme represents a much smaller cost to

the state and has the potential for better repayment from graduates. It could be made even more efficient and equitable by introducing an income-contingent payment element or, at the very least, by following a graduated repayment schedule that would better mirror the income curve of graduates If, in the medium term, CAE were not as successful as expected in terms of loan recovery and the financial participation of commercial banks, the government of Chile could consider an income-contingent loan system along the lines of those in countries such as Australia, New Zealand or the United Kingdom.

Also, additional financial efforts should be made by the state to reach a higher proportion of needy students. Here again the position of young people wishing to enter technical training in CFTs and IPs should be considered. The CAE presently requires a NEM (secondary school grades average) of over 5.3. As demonstrated above, a lower NEM requirement of 5 excludes the majority of CFT and IP students from the two lowest income quintiles from obtaining grant support. So if loans are to be available on an equitable basis to needy students undertaking technical training, their NEM requirement should be much reduced, if kept at all.

The final aspect that needs to be examined with respect to equity is the question of affordability for students of limited means who do not benefit from a scholarship or a loan and must therefore pay tuition fees. Statistics on the number of students from Quintiles 1 and 2 who do not benefit from any financial aid are not available, but the range of tuition fees charged by the various types of institutions (Table 3.11) makes it highly likely that a significant proportion of these students are discouraged from studying in the more expensive universities.

Table 3.11 **Range of tuition fees in Chile (2005)**

	Tuition Fee Amount (USD equivalent)	Tuition Fees as % of per capita GDP
CFT	1 760	19.8%
IP	2 200	24.8%
CRUCH universities	3 700	41.7%
Private universities	4 200	47.3%

Source: MINEDUC, (2007), *OECD Thematic Review of Tertiary Education: Country Background Report for Chile*, Santiago

In fact, as will be discussed in detail in Chapter 8 on Financing, comparing the level of tuition fees with per capita income clearly reveals that the cost of studies is significantly higher in Chile than in OECD

countries that charge tuition fees. At 30% of per capita income, Chile is almost twice as high as Korea (16%) and three times as high as Japan (12%), the US and Australia (11%). Considering the high private cost of studying in Chile and the still relatively low proportion of students benefiting from student aid, the government of Chile needs to give high priority to the further expansion of student aid opportunities to ensure that no qualified student is prevented from entering and continuing tertiary education for financial reasons.

Benefits incidence analysis

An additional aspect worth investigating is whether the tertiary education funding system reduces or amplifies existing socio-economic inequalities. Notwithstanding the fact that low-income students are under-represented at the tertiary education level as a result of adverse factors in operation in primary and secondary education aggravated by the effects of the admission process, analysing the benefits incidence of public spending for tertiary education allows verification of whether low-income students receive their fair share of resources. It also serves to identify which financing instruments have a positive redistributive effect and which ones are regressive. Table 3.12 below summarises the results of the benefits incidence analysis. For each funding mechanism, the table shows the share of public resources that go directly or indirectly to each quintile group. If the share of resources is equal to or larger than the share of that group in the overall student population, the mechanism is neutral or has a positive distributive effect. A smaller share means that the mechanism is regressive. Annex 1 describes the methodology followed to construct this table.

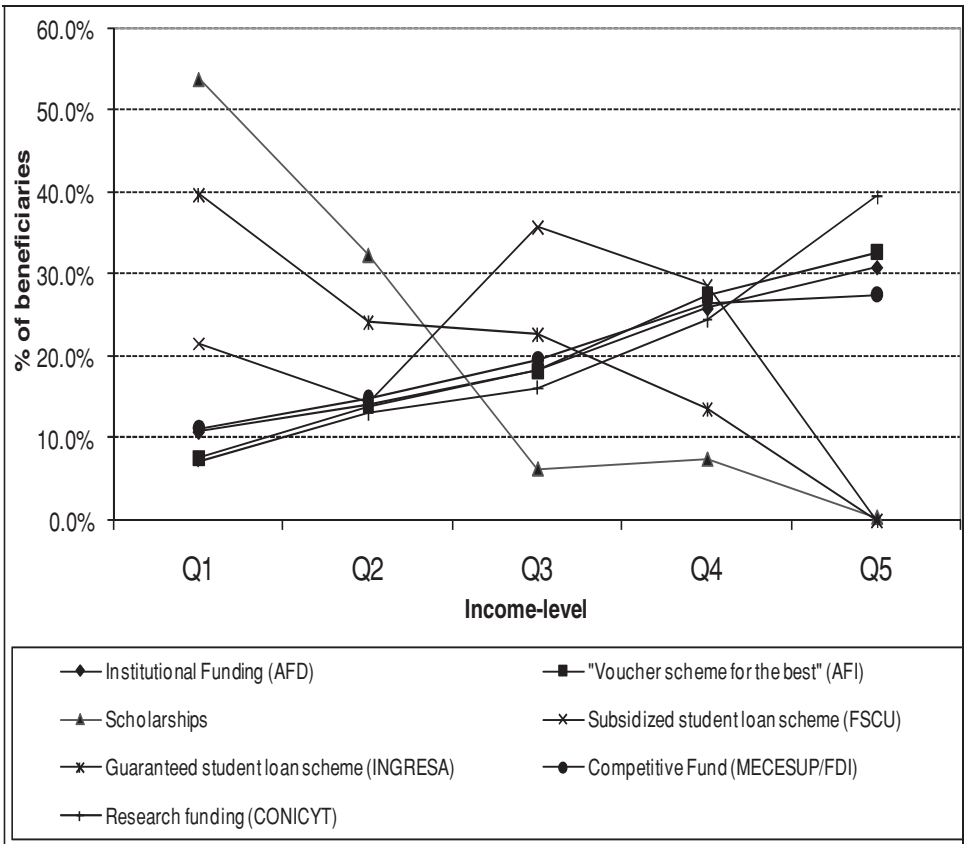
Table 3.12 **Analysis of the Benefits Incidence of Public Spending in Tertiary Education (2007)**

	Q1	Q2	Q3	Q4	Q5	Total
AFD	10.8%	14.1%	18.3%	25.9%	30.9%	100.0%
AFI	7.6%	13.9%	18.2%	27.6%	32.7%	100.0%
Scholarships	53.8%	32.3%	6.2%	7.4%	0.3%	100.0%
Fondo Solidario	21.5%	14.3%	35.7%	28.5%	0.0%	100.0%
INGRESA	39.7%	24.1%	22.7%	13.5%	0.0%	100.0%
MECESUP / FDI	11.2%	15.0%	19.6%	26.6%	27.5%	100.0%
CONICYT	7.2%	13.0%	16.1%	24.3%	39.4%	100.0%
Share of public subsidies received by each quintile	20.7%	17.3%	21.0%	22.9%	18.1%	100.0%
Share of each quintile in total enrolment	10.0%	14.1%	18.7%	26.6%	30.5%	100.0%

Source: Elaborated by the review team using the data provided by MINEDUC, the Council of Rectors (CRUCH) and the universities visited.

The main conclusion from this analysis is that, overall, the tertiary education financing system allocates a larger share of resources (38%) to students from the poorest two quintiles who represent 24% of the total student population. This is essentially due to the growing importance of the student aid mechanisms (scholarships and student loans). The scholarships and the guaranteed student loan programme are the most progressive mechanisms. The subsidised loan programme, however, is not well targeted from an equity perspective, since students from Quintiles 3 and 4 are over-represented. The quality improvement resources distributed through MECESUP are relatively neutral from an equity viewpoint because a number of regional universities, where the proportion of low income students is higher than in the Santiago universities, have been quite successful at competing for these resources. The CONICYT resources, on the other hand, have a regressive effect as the top research universities are also the ones with the highest proportion of students from rich families. The AFI is also very regressive because it is determined by the results of the PSU, in which students from lower-income families generally do less well. Figure 3.4 illustrates these distribution patterns.

Figure 3.4 **Benefits incidence analysis of public investment in tertiary education**



Source: As Table 3.12.

The findings of this analysis reinforce the conclusion stated earlier, namely that increased funding for student aid is the most effective instrument to improve equity and prevent students from being excluded from tertiary education opportunities for economic reasons.

Findings

Admission and retention

The Chilean government has declared objectives of correcting inequalities in admission arrangements and guaranteeing all young people

with talent the right to attend higher education. These laudable but ambitious objectives have yet to be fully realised.

Fewer students from lower-income groups are getting into tertiary education than would be predicted from their secondary school graduation rates. Equity gaps appear to widen during the higher education admission process, which depends heavily on performance in the PSU test.

Students who are from low income groups, from municipal schools or female are less likely to emerge from the admission process with a place at the CRUCH university of their choice than students who are from higher income groups, private (particularly unsubsidised private) schools or male. They are also less likely to be eligible for financial support if accepted. There is some – but less clear evidence – that opportunities differ for students in different regions.

Students from lower income groups are also under-represented in private universities, IPs and CFTs – most notably in private universities, least so in CFTs. This has less to do with admission systems than with the student aid available to students at these institutions.

From the limited information available, it seems that students from lower income groups and municipal schools are more likely to drop out of university. Those who graduate, tend to take longer to complete their courses.

Most of these equity gaps have their roots in differential preparation in secondary schools. Important national initiatives are underway to improve secondary education for the poorer students and those attending municipal schools. However these initiatives cannot be relied on to resolve all the equity issues in the near future.

Further action appears to be needed, to reduce the competitive disadvantages some groups face in the current admission process and to improve their chances of graduating.

Student Aid

The government of Chile has put in place an extensive system of financial aid for low income students, including scholarships, maintenance grants and student loans. Funding for scholarships has increased significantly in recent years. Despite this noteworthy effort, however, only 13.8% of all students enrolled in a tertiary education institution receive a scholarship of some kind compared to 51% in the US. In addition, the amounts given are not sufficient to pay for the full tuition fees.

Less than half the students from the lowest two income quintiles receive a scholarship. Only 30% of students from these quintiles enrolled in non-CRUCH universities, and 40% of IP students from these quintiles, have a CAE loan.

The likelihood of getting scholarship and loan support is notably low for students at CFTs, although CFTs train high numbers of the poorest students. Just 20% of CFT students from the first and second quintiles have a CAE loan.

The new student loan programme (CAE) presents several positive features, including its capacity to leverage private capital, the fact that the responsibility for financial guarantee against default is borne by the universities themselves, and the link to the accreditation process. It is the financing instrument with the most positive impact from the point of view of redistributing public resources to low-income students.

Implementation of the reference fee system has proved problematic, due to the complexity of the methodology.

Recommendations

Admission and retention

Secondary school improvement initiatives already in hand to improve education for the poorer students and those attending municipal schools should be vigorously pursued.

Review and revision of the PSU test is proposed, to address the equity issues affecting young Chileans whose family and schooling circumstances disadvantage them in the competition for higher education places and to improve identification of those most able to benefit from higher education. From international experience, two options are suggested. The first is to move towards a national school-leaving test or exam which would also set the minimum standard for university entrance. The second option is to reform the PSU by including extended essays and tests of reasoning ability and learning potential.

Some changes are proposed to the post-PSU stages of university admission system. It would be helpful to applicants and to ensuring transparency if Chile's private universities were to join in a common allocation system with the CRUCH universities, including a central clearing house for applications.

To enable the common allocation system to serve more universities with a wider range of missions, and to improve the chances of less advantaged students achieving places at their preferred institutions, it is proposed to move away from the present CRUCH practice of allocating places in order of total PSU-based score, towards a more multi-dimensional admission system than in which universities are encouraged to adopt objective criteria appropriate to their varied missions and (if they so decide) give priority to applicants from less advantaged or under-represented groups. Ways are suggested of guarding against adoption of non-objective criteria or questionable admissions practices.

It is suggested that MINEDUC explores the options for giving young people with university aspirations in less advantaged schools more help in preparing for the national university entrance test or school-leaving test.

MINEDUC could also consider funding delivery of no-fee or low-fee 'access' courses, enabling young people from under-represented groups with university potential, but who left school without passing the national university entry test, to qualify for university entry. A test of verbal and non-verbal reasoning ability, also known as an aptitude test, would assess university potential.

Further measures are proposed to help the retention of poorly-prepared young people from lower income groups and municipal schools, by delivering a post-admission 'knowledge boost' to improve completion chances before students embark on the formal university curriculum. There is also an onus on Chilean universities to adapt the initial demands of courses, curricula and teaching to today's more diverse student body, as part of their responsibility to help every student they admit to graduate. It is suggested that MINEDUC agrees with institutions a new objective or objectives relating to completion and survival rates and sets up a system for collecting the relevant statistics.

Student Aid

For both equity and efficiency reasons, it is proposed that MINEDUC would merge all the present scholarship schemes into a single programme with a small number of 'windows', and also merge the two existing student loans schemes.

It would be preferable to merge the two loan schemes on the CAE rather than the FSCU model because CAE is more promising from a financial sustainability viewpoint. The CAE could be made even more efficient and equitable by introducing an income-contingent payment element or, at the very least, by following a graduated repayment schedule that would better

mirror the income curve of graduates. Serious efforts should be made to reach a higher proportion of needy students.

If, in the medium term, CAE were not as successful as expected in terms of loan recovery and financial participation of commercial banks, the Government of Chile could consider an income-contingent loan system along the lines of those in countries such as Australia, New Zealand or the United Kingdom.

Given the high private cost of studying in Chile, the government should expand grant and loan opportunities further, and ensure that all scheme conditions are equitable and appropriate, bearing in mind the diversity of students and the diverse aims of tertiary education. The aim must be to ensure that no qualified student is prevented from entering and completing tertiary education in either the university or the non university sector for financial reasons.

MINEDUC should carefully study the pros and cons of maintaining the system of reference fees in its present complex form. A simpler way of setting the reference fee levels would be to benchmark the top five public universities as assessed by the accreditation process. Complementary measures to protect students from excessive fee increases could be (i) to require tertiary education institutions whose tuition fees grow faster than the national average to justify why their costs are out of line, or (ii) to publish a list of institutions whose price outpaces the national average.

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Annex

Methodology applied to carry out the benefits incidence analysis

An attempt was made to measure the equity impact of public funding for tertiary education in Chile (Table 3.12 in main text). For each type of funding mechanism, the table presents the distribution of resources received by each quintile group. It also computes the overall distributive effect of public funding for tertiary education, adding all the resources from different allocation instruments that are "captured" by each income group. If the share of resources is equal to or larger than the share of that group in the overall student population, the mechanism is neutral or has a positive distributive effect. A smaller share means that the mechanism is regressive from an equity viewpoint.

Data on the distribution of the students by income quintile are available from the Background Report and various other publications, using the 2006 household survey (CASEN) as the information source. The household survey contains information on family income, expenditure and tertiary education attendance. Some universities, notably the University of Chile and the Catholic University of Chile, have also shared data on the distribution of their students by income quintile.

Two methods were used to calculate the share of resources received, depending on the nature of the funding mechanism. For those mechanisms that allocate the money directly to the students, such as the scholarships and student loans, the analysis is based on official statistics from MINEDUC (for the scholarships and the subsidised student loan programme, FSCU) and INGRESA for the guaranteed loan programme (CAE), showing the distribution of resources among various income groups. Data on the distribution of the AFI by income groups and types of tertiary education institutions come from the Higher Council of Education.

In the case of the other categories of resources going to the institutions themselves (AFD, MECESUP, CONECYT), the assumption is that, for each instrument, a given quintile receives within the institution a share of resources equivalent to its proportion in the overall student population. For example, the table constructed to calculate the distribution of AFD resources takes the amount received by the University of Chile and divides its amount among the student quintiles by applying their respective share of enrolment.

The same method is followed for the Catholic University of Chile and then for all remaining CRUCH universities taken as if they were one single university, in the absence of detailed data on the distribution of students by quintile for each of the remaining 23 universities.

It is important to note that comparing the incidence of public expenditures does not tell the whole story. If detailed data on actual tuition fees paid by students from various income groups were available, the full benefits incidence analysis would look at expenditures net of cost recovery from tuition fees, at non-fee out-of-pocket expenditures and at the value of time while attending a tertiary education institution to be able to ascertain the affordability of tertiary education.

Chapter 4. Relevance

This chapter begins by discussing the market for educated labour, the views of the employers about university graduates in Chile and the availability of information for users of the education system. It then reviews the opportunities for progression through different levels and forms of learning: from schools to the work place, from further to higher education and training and across different types of tertiary education institution (CFTs, IPs and Universities). An analysis of the internationalisation of tertiary education in Chile highlights the importance of collaborative ties with foreign partners for improvement of the country's international competitiveness.

Key areas for action are discussed and the chapter closes with recommendations to improve the relevance of courses and curricula, which include: (i) strengthening the linkages between tertiary education and the labour market through better and more up-to-date information and the increased participation of employers; (ii) the creation of new pathways through the education system, which could be facilitated by the establishment of a National Qualifications Framework and of a National Recognition Information Centre; and (iii) a strategy to internationalise Chile's tertiary education system further, including through more systematic second language development and enhanced international exchange and foreign academic programmes.

Introduction

The Chilean government, mindful of the fact that labour productivity will be the key determinant of economic growth, remains determined that Chile should continue to build on the educational strengths and outcomes achieved to date in order to compete as a knowledge society in an increasingly globalised economy. In the World Economic Forum (WEF) Competitiveness Index, Chile has an overall ranking of 26 out of 131 countries and it remains as the most competitive economy in Latin America.

One pillar of this index relates to the quality of higher education and training and to the requirement for competitive economies to "nurture pools of well-educated workers who are able to adapt rapidly to their changing environment." In order to arrive at a ranking system, the WEF measures secondary and tertiary enrolment rates as well as the quality of education as assessed by the business community. Moreover, "the importance of vocational and continuous on-the-job training, neglected in many economies, cannot be overstated, as it ensures a constant upgrading of workers' skills to the changing needs of the production system".[1] Chile's WEF Higher Education and Training Ranking is 42 out of 131 countries, which places Chile ahead of its Latin American neighbours but behind all OECD countries except Luxembourg, Turkey and Mexico.

Table 4.1 **Ranking (out of 131 countries) by Higher Education and Training sub-index, selected OECD and Latin American countries, China and India: 2007-2008**

Countries	Ranking	Countries	Ranking
Finland	1	France	18
Sweden	2	Ireland	21
Denmark	3	Spain	31
Chinese Taipei	4	Chile	42
USA	5	India	55
New Zealand	12	Brazil	64
Canada	13	Uruguay	67
Australia	14	Mexico	72
United Kingdom	15	China	78

Source: World Economic Forum. The Global Competitiveness Report 2007-2008 http://www.gcr.weforum.org/

In its Investment Climate Survey, the World Bank, discussing its Knowledge Economy Index for Chile, refers to the country's "insufficient number of technical and professional workers" as a key human capital challenge[2] and refers to the "perception of employers that the insufficiency of skilled labour is one of the most severe obstacles to growth."[3]

The Chilean Council for Innovation and Competitiveness (*Consejo de Innovación para la Competividad*) informed the review team that there are serious concerns in Chile about the quality and relevance of much of the

1. World Economic Forum. The Global Competitiveness Report 2007-2008. Page 3.http://www.gcr.weforum.org/
2. World Bank, Investment Climate Survey, page 36.
3. ICS Summary page 23.

Higher Education and Training system and listed a series of issues that need to be addressed as part of the government's strategy. Among those issues are: the availability of appropriate user-friendly information systems to assist prospective students and families with career and institution choice; the rapidity and adequacy (or otherwise) of graduate absorption by the labour market; the length of time it takes to graduate in most disciplines; the quality and relevance of technical training in *Centros de Formación Técnica* (CFTs); the limited emphasis being placed on flexibility and generic competencies within academic programmes; the need for better linkages between formal and non formal training; and the need for the development of a lifelong learning framework.

While later chapters of this report focus on the governance, quality and financing of third level education in Chile, this chapter discusses the market for educated labour and the views of employers about tertiary graduates in Chile. The chapter also reviews the availability of information for users of the education system and the availability of educational opportunities for facilitating progression through different levels and forms of learning, from schools to the workplace and from further to higher education and training, and examines the barriers to individual choice at each stage. The need to re-orient existing programmes to include generic competencies and improved second language acquisition, as well as for system-wide reform to address such issues as the undue length of some studies, are discussed, as is the need to develop a strategy to improve internationalisation. The chapter concludes with policy options and recommendations to address these issues.

Provision of tertiary education in Chile

As was shown in Table 1.1, the principal providers of tertiary education in Chile are the 61 universities. The technical tertiary education system, also known as the non-university sector, is composed of the *Institutos Profesionales* (IPs), which teach 4 year professional programmes and 2–2.5 year technical programmes leading to higher technical degrees, and the *Centros de Formación Técnica* (CFTs), which normally teach programmes lasting 2-2.5 years. Some CFTs are operated by the universities to which they are affiliated. The policy of the Chilean government has been to maintain this binary system of tertiary education while developing incentives to encourage the possibility of students from the IPs and CFTs to progress to universities where appropriate.

Entry requirements to IPs and CFTs differ from those of universities. Often – usually for CFTs – a school completion certificate is sufficient and students are not required to have entered or passed the PSU. The 43 IPs are all private and self financed. Their student enrolment in 2007 was 133 000.

The 105 CFTs are also private and self financed. Their student enrolment in 2007 was nearly 79 000, making a total enrolment in professional and technical tertiary education of 212 000.

As was shown in Chapter 3 on Access and Equity, students in IPs and CFTs have less chance than university students, particularly CRUCH university students, of obtaining scholarships or loans to help fund their studies. Some needy IP and CFT students with exceptionally good school leaving reports (NEM) are eligible for New Millennium Scholarships (BNMs), or the Scholarships for Academic Excellence (BEAs) which go to the best 5% of students from any publicly-funded school. However, as shown in Table 3.8, the total numbers of students who benefited from these two schemes in 2007 was 26 954, and no doubt many of the 4 196 BEA scholarships went to students attending universities. The total number of IP and CFT students whose studies are supported from public scholarship funds is therefore estimated as 23-25 000, or around one in nine IP and CFT students. It follows that seven in eight must fund their studies themselves; though those with very good school-leaving reports who attend accredited institutions may be eligible for discretionary loans under the relatively new CAE loan scheme.

The market for educated labour

Since 2000 there have been modest improvements in rates of unemployment in Chile, which have been at levels which, although higher than many people would like to see, are not especially high by international standards (see Table 4.2). Unemployment is heavily concentrated in the younger age groups, suggesting that it takes a considerable time for those who leave the educational system to find steady jobs.

Table 4.2 **Chile: Unemployment percentage rates by age, 2000-2006.**

	2000	2001	2002	2003	2004	2005	2006[1]
all ages	8.3	7.9	7.8	7.4	7.8	6.9	6.0
15-19	25.2	25.7	29.3	26.6	20.9	23.8	20.3
20-24	18.4	17.0	17.8	17.2	17.8	15.5	13.7
25-29	11.1	11.0	11.1	11.3	11.2	11.0	9.3
30-59	5.9	5.6	5.4	5.1	5.7	4.9	4.2
60+	3.6	2.8	2.3	2.2	2.8	2.0	2.1

Note: 1. Changes in methodology in 2006 make these data not strictly comparable with earlier years.

Source: ILO database, based on surveys in last quarter of each year.

Information on levels of unemployment by educational level is available only for 2006 (Table 4.3) but this confirms the fact that the worst rates are for those with secondary or incomplete tertiary education.

Table 4.3 **Unemployment rates by level of education, 2006 (%)**

Total	**6.0**
Less than primary	3.8
Primary	4.1
Secondary	7.1
Some tertiary	7.2
First degree or equivalent	5.2
Not identifiable	1.3

Source: ILO database, based on surveys in last quarter of each year

Although consistent information about labour market trends in Chile is limited, and there is a particular shortage of data related to graduates of the tertiary education system, what information there is indicates that completing a university education is attractive in terms of labour market opportunities. MINEDUC produces an objective website, www.futurolaboral.cl, which provides information on the labour market experience of recent graduates in 100 fields, estimated to cover 75% of all technical and professional careers. In January 2008, the website contained data for the situation in 2005, based on the income data obtained from tax information for about 94% of those who graduated in 2000 and 2001. This enables the website to show an estimated "rate of return" to additional time spent in each level of education, based on the average income received by those who entered the labour market after completing that level, compared with those who completed the level immediately below. The return to completing a full university degree compared with leaving after secondary level was very high, at 19.4%. The return to an IP qualification was 13.2%, and the return to a CFT qualification was 10.4%. It should be noted that the "investment" on which this return is calculated is the private income foregone by not entering the labour market earlier. This does not include either the public expenditure costs or the private out-of-pocket costs of higher education.

The website reports not only average income (calculated at 2006 prices) obtained in each field in the second and fourth year after graduation, but also the fourth year incomes of the top and bottom 10^{th} and 25^{th} percentiles. This clearly confirms that university graduates can expect much higher incomes than those who complete courses in the IPs or, *a fortiori*, CFTs. Key

information from this part of the website is set out in Table 4.4. The highest average salaries after four years were earned by mining engineers (2.3 million CLP per month at 2006 prices). Twenty five percent of these earned over 2.85 million CLP. In general, and predictably, among university graduates earnings were higher for those trained as engineers, lawyers or in health; all of the 14 specialisations that earned over CLP 1million per month after four years were in these fields. The lowest were for those who were trained in education. Mathematics teachers (CLP 591 000) were the best paid of these. Nursery school teachers got only CLP 309 000 a month. The best paid graduates of the IPs were IT specialists (CLP 730 000 pesos); the worst paid were interior designers (CLP 309 000). Worst paid of all career streams were obstetrical assistants trained in CFTs, at CLP 238 000 a month. The 10% worst paid of these received less than CLP 147 000 a month. As would be expected, the relative differential between the best-paid and the worst-paid career streams widens with growing work experience, as shown by relative salary growth between the second and fourth years.

Table 4.4 **Fifteen best paid and fifteen worst paid career streams**

Required Courses	Career Stream	Monthly salary second year ('000 2006 pesos)	Monthly salary fourth year ('000 pesos)	% increase in income between second and fourth years	% employed second year	% employed fourth year
university	Mining Engineer	1 761	2 302	31	99	99
university	Geologist	1 558	1 814	16	95	97
university	Electrical Engineering	1 169	1 399	20	98	98
university	Medicine	1 039	1 349	30	95	98
university	Civil Engineering	1 111	1 338	20	98	98
university	Law	923	1 300	41	92	96
university	Industrial Engineering	1 035	1 294	25	96	98
university	Computer Engineering	1 093	1 254	15	98	99
university	Electronics Engineering	1 037	1 196	15	94	97
university	Mechanical and Metallurgical Engineering	909	1 177	29	95	98
university	Chemical Engineering	837	1 156	38	95	99
university	Civil Construction Engineering	864	1 075	24	96	98

Required Courses	Career Stream	Monthly salary second year ('000 2006 pesos)	Monthly salary fourth year ('000 pesos)	% increase in income between second and fourth years	% employed second year	% employed fourth year
university	Business Administration	805	1 017	26	91	96
university	Dentistry	838	1 015	21	99	100
university	Pharmaceutical Chemistry	881	982	11	99	100
CFT	Human Resources Management Technician	304	335	10	69	76
CFT	Legal Technician	298	334	12	54	67
CFT	Accounting and Computing Technician	304	330	9	63	72
CFT	Gastronomy and International Cooking Technician	302	324	7	54	63
IP	Environmental Design and Interior Architecture (IP)	247	319	29	75	80
CFT	Forestry Technician	316	319	1	57	67
CFT	Hotel Management Technician	275	318	16	49	70
University	Pre-school Teacher	276	309	12	73	85
CFT	Business Administration Technician	293	308	5	81	87
CFT	Nursing Technician	260	285	10	74	82
CFT	Bilingual Secretary	255	281	10	64	74
CFT	Tourism Technician	239	275	15	54	67
CFT	Dental Laboratory Technician	231	262	3	47	56
CFT	Computer Secretary	239	251	5	62	65
CFT	Obstetrics Technician	220	238	8	74	78

Source: www.futurolaboral.cl

The website also provides information on the percentage of 2000-1 graduates in each field that were in jobs in their second and fourth years, and the economic sectors in which these jobs were found. It confirms that a university qualification is a significant help in finding employment. Of the 18 professions where at least 98% of graduates were in employment four years after qualifying, all except librarians and mathematics teachers were in

health or engineering. Of the 53 fields where at least 90% were in employment, 46 required a university qualification. In contrast, 16 of the 22 fields where fewer than 80% were employed after four years were at CFT level.

The fact that in nearly half the career streams more than 10% of graduates were without jobs indicates a continuing worry about employment, especially among those without a full university training. It should be noted, however, that some of those without jobs may not be seeking work, or even want it. For example, some of the 20% of interior decorators without jobs may have dropped out of the labour force for family or other reasons; over 80% of the students who enrolled in courses on interior decoration were women (another interesting fact from www.futurolaboral.cl), and the participation of women in the labour force is relatively low in Chile, as discussed in the 2007 *OECD Economic Survey*. It is also possible that the surveys on which this website is based underestimate "informal" self-employment and/or work in family enterprises.

The website hints at the very high drop-out rates that afflict most university courses. It gives both initial registration and graduation data, but not for enough years to compare the two for a particular cohort. Nevertheless it is striking to find, for example, that in 2004, in the field "art and architecture", 1 736 people acquired university-level qualifications, but 6 195 registered on university courses for the first time. The Ministry of Education *Anuario Estadístico* shows that annual enrolment in these courses averaged nearly 23 784 in 2000-4. Although the enrolment figures show some growth, it is clear that the numbers starting their first courses and the numbers completing their qualifications are of quite different orders of magnitude.

As a source for analysts seeking information on the labour market, this website is very useful. The data it presents also has some potential policy importance (although presumably policy makers have information to the data underlying the website, rather than depend on the website itself.) For example, there are data on the numbers in particular professions and the proportion of these who are under 35. Fewer than 20% of the 50 000 teachers of "basic" education are under the age of 35, suggesting that policy adjustments may be required to ensure the replacement of retiring teachers. Currently only about 63% of trained teachers of basic education are working as teachers four years after graduating.

The main consumers of the website, however, are not meant to be analysts but prospective students who are about to make the most important life decision they will yet have encountered, and their advisors within their

family and school. In this respect, the website should be very helpful. Suppose you are a 16 year old who wants to become a veterinarian. You can see that salary levels seem reasonable: graduates were earning CLP 708 000 after a month, ranking 28 in the list of career streams. The top 10% got 1.2 million, which is attractive, but on the downside, the bottom 10% got only CLP 243 000. Employment prospects rank somewhat lower: with an employment rate of 90% after four years, veterinary medicine ranks 52 out of 100 career streams. More significantly, the chance of finding work as a practicing veterinarian appears much lower. In 2005 there were only 5 732 veterinarians in the country, 51% of whom were under 35. In 2004 alone, the number of students beginning to study veterinary medicine was 2 814, almost half the total stock. While the data does not permit tracking the progress of any single cohort, it can be noted that the number actually receiving degrees in 2002-4 averaged only 415, suggesting that although drop-out rates must have been very high, the number of graduates must have considerably exceeded the natural attrition of the stock of veterinarians. It is very hard for anybody, let alone an eager 16 year old, to discover how many new graduates actually find work with sick animals, or what the rest do. Only 7% enter the agricultural sector while 21% are in commerce. Presumably these include all those who actually enter veterinary private practice. In contrast, 41% are divided almost equally between non-metallic manufacturing industries and social and health services, and 31% are scattered among other sectors of the economy.

This illustrates a problem with the website. Information designed to aid the prospective career-chooser is mixed with information that can be of interest only to labour market analysts. Very little help is given to the prospective student, his/her parents, ordinary teachers or even a career counsellor, to enable them to interpret the material.

Finally, the review team heard widespread criticism that information on the website is out of date. To at least some extent this is inevitable. The data needed to show how the 2001 cohort of graduates were faring in the labour market four years after graduation could not be collected until the income data for 2005 were available, and time is obviously required to present the information in as much complexity as the website does. From the point of view of a prospective university student choosing a course for a degree, and not expecting to graduate before 2013, this information may not seem very useful, given that it reflects the composition of the labour market in the past rather than offering an analysis of likely future trends; but it must be better than casual advice given by friends and relatives. It is inherent in career choice that today's job situation may not be a good guide to the opportunities available when, after several years of training, the qualifications are finally achieved. Much more could be done, however, to

provide an assessment of what appear to be job prospects for each field, accompanied by helpful advice, perhaps drafted by an objective, respected practitioner. Employers associations and journalists are other potential sources of analysis and advice. It is important that this be done carefully – too much emphasis on potential shortages or surpluses of particular skills could lead to exaggerated swings in the preferences of school leavers. This is not, of course, to suggest a return to the discredited practice of manpower planning. In every country, the current labour market situation and even expert foresight exercises will be at best a limited guide to future demand. That is why it is important, in a globalised economy with rapidly changing technology and trading opportunities, that tertiary education guards against future uncertainties by giving all students a fundamental grounding in transferable skills. This aspect is further discussed below.

Having chosen a desired field of study, the prospective student has then to decide whether he or she will have the exam results to be accepted on the course, and the money to pay the necessary fees. It must be stressed that *Futurolaboral* is not in any way intended as a substitute for information on the tertiary education sector itself. A companion website, from the Chilean Higher Education Council (*Consejo Superior de Educación* – CSE), www.cse.cl, provides up-to-date information on courses available, their costs and characteristics, such as the marks of those currently enrolled and the number of recent entrants. It would tell an aspiring veterinarian, for example, that there are 31 institutions in the country in which veterinary medicine is available. In January 2007, five of these veterinary programmes were formally accredited and the accreditation process was still on-going for the remaining 26. Assessing the quality of non-accredited academic programmes is left to school career guidance services and university outreach and marketing services, as well the rankings in magazines such as *Qué Pasa* discussed below. The team was told that this sometimes led to abuse, as misleading information or extravagant incentives are produced by some institutions as part of their public relations campaigns, especially during periods close to the recruitment and admission process. Although there is a growing acceptance of the importance of accreditation, the meaning of labels such as autonomous institution, accredited institution (and for how many years), and accredited academic programmes has not yet been wholly understood by members of the general public. More accurate information on drop-out rates and graduation rates per academic programme, as well as on variations between institutions and the reasons that students give for dropping out, should be collected and published by the Ministry of Education or the *Consejo Superior de Educación* to supplement what is already provided.

Important public information about academic programmes and institutions is to be found in the institutional rankings which are published on an annual basis by the largest newspaper in the country, and in an education supplement published by the periodical *Qué Pasa*. Originally the rankings were at institutional level only but academic programme level surveys soon followed. The rankings are focussed on universities: *Qué Pasa* has limited interest in covering the CFTs and IPs as their target audience is those who aspire to university education. The rankings employ a complex set of indicators, including numbers of full and part time faculty, PhDs on the teaching staff and ISI publications, as well as the amount of research funding and the number of years of accreditation. Employers are also surveyed and a labour market database has evolved based on about 1 000 replies. Because the quantitative information supplied by the institutions is widely available, there is no incentive to supply false information as ultimately that leads to bad publicity.

The rankings are influential because they fill a need for parents and students: "those who pay want to know what value they are getting". Although the review team was informed that some institutions do carry out some graduate follow up – especially since recently it has been defined as an important input in the accreditation process – one outcome of these ranking publications may be that the universities have been motivated to create their own institutional analysis departments, which could eventually lead to better graduate tracking surveys. Another source of information is the weekly discussions on educational outcomes published in the newspaper *La Tercera;* these draw on the information in *Futurolaboral* for their labour market data.

Employers

The review team was informed by the Confederation of Employers that all productive sectors in Chile have vacancies for skilled labour that cannot be filled, because the education system has not been able to keep pace with the changing requirements of the labour market. Data given to the team by the Confederation suggest that 30% of young people are unemployed because their education and skills are not relevant to the labour market while a further 55% of those who are employed are not using their skills and education.[4] Besides the gaps in up to date labour market and career information discussed above, employers perceive that the absence of formal linkages between education and training and the modern labour market is a key issue, as is the absence of functional links between the Ministries of

4. SOFOFA and CPR: *Confederación de la Producción y del Comercio*.

Education and Labour.[5] At a recent international meeting, two Chilean employers' associations presented the analysis in Box 4.1 of the changes needed in the country's tertiary education system.

Box 4.1 **Views and recommendations from employers' representatives**

"Chile needs more and better technicians"

- Support the integration of vocational training in a system of lifelong learning, in order to raise the quality of academic offers.
- Increase tertiary trained technicians and foster technical training based on labour competence.
- *Chile Califica*: Promotion of business participation in co-ordination networks of vocational training.
- Entrepreneurial participation in the definition of high level technical graduate profiles, based on work competencies.

Skills for globalisation. Along with improving knowledge and base skills (language, mathematics and sciences), raise the competences in the use of a foreign language (English) and digital literacy. These are indispensable skills in the global world.

Source: Pro Growth Agenda: Presentation to OECD Dublin Meeting on Business and Education, 2004, SOFOFA and CLPC.

There is national agreement on the importance of identifying technology gaps and the skills needed to bridge them. Employers state that the labour market will require employees with broad, transferable skills, with a good grounding in mathematics and science. They suggest that more entrepreneurship and foreign language training should be included at all levels of the curriculum throughout the Chilean education system. The implication is that there will be a continuing need to revise curricula, and to keep teachers trained, up to date and capable of imparting constantly changing specific skills as the need arises.

5. Because of long established differentials in pay of different occupations, and also because average pay may be slow to adjust to emerging surpluses and shortages of particular skills, there is nothing inconsistent in having higher rates of return to a university education at the same time as apparent shortages of IP graduates.

Although much lip service is paid to the involvement of employers in tertiary education, overall, the review team concluded that linkages between employers and the tertiary education sector are relatively weak. There does not seem to be a well-developed system whereby employers can communicate their needs to higher education institutions, probably because of the history and relatively inflexible structure of higher education to date. Equally, it is not clear whether employers themselves have a system in place to anticipate their future needs. Recent changes in the accreditation process may force higher education institutions to develop formal mechanisms to gather information from employers and their representatives. Whether this information will actually be used to influence and adapt academic programmes, remains to be seen.

This limited interaction between employers and tertiary education is also reflected in the rather notional involvement of employers in the institutional governance of universities, especially the CRUCH universities. There is greater employer involvement in many IPs and CFTs, and in some private universities; although this could be mostly driven by the economic interests of the employers concerned.

System articulation: from secondary to tertiary

> *"A current threat to Chile is the loss of human and social capital if the current level of inequalities is not reduced"*[6]

It is beyond the scope of this Chapter to discuss the entire Chilean education system. However, because the roots of a successful tertiary system responsive to labour market requirements and to the needs of a competitive globalising economy lie in primary and secondary school systems that are inclusive, fair and efficient, a brief mention of some issues relating to secondary education, and especially secondary vocational education, is necessary at this point.

If Chile is to achieve its objectives of greatly increasing participation in tertiary education and improving its stock of human capital for a labour market that increasingly requires occupations with high levels of skills and qualifications, it is necessary to prepare a greater number of students in the secondary schools for progression to the tertiary system. Currently, there is disquiet that the school system is not fully responding to this need. In PISA 2006, where Chile ranked 40th of the 57 participating countries, OECD found that the gap between the performances of different schools continues to be very wide and is closely correlated to pupils' socio-economic

6. OECD *Reviews of Innovation Policy: Chile*. 2007, page 26.

background. PISA and other data suggest that poor management and teaching standards in municipal schools are partly to blame for the inequalities in access to tertiary education documented in Chapter 3 on Access and Equity.

The reform of secondary education between 1998 and 2002 postponed the onset of divergence between 'academic' and 'technical-professional' schooling from Grade 9 to Grade 11 and narrowed the gap between the two streams. In Grades 11 and 12 both streams combine general with vocational education (on which academic students spend a third of their time and technical-professional students two thirds), with specialisations designed to prepare students for work in a particular occupational sector rather than in a particular job. Thus, rather than trying to predict changes in technologies and occupations, schools aim to prepare students with flexible skills.

However, the 2004 OECD review of education policy noted that 44% of the cohort in 2001 was enrolled in the professional technical stream in secondary schools while 55% were enrolled in the scientific humanistic stream – the stream that would eventually feed the university sector. Poor students were under-represented in the academic stream and over-represented in the vocational stream.[7] In discussions with the 2008 tertiary review team, estimates for participation in the secondary (professional technical) vocational stream in 2007 ranged between 45% and 53%.

There are worries about both the high enrolment rates and the quality of this second level vocational education. A recent study by MINEDUC's Interdisciplinary Programme for Educational Research (PIIE)[8] found that in 2007 37% of school students were in the *liceos técnicos* (a total of 395 000 pupils) of which 62.8% reported that they did not have an adequate curriculum. Eighty one percent of these schools were municipal *liceos*, three quarters of which did not have the appropriate equipment to teach their own courses. Instructors had either inadequate or non-existent training as teachers.

It is estimated that 20% of vocational education instructors are themselves graduates of the *liceos* while a further 30% are working in industry and teaching at the same time. An average of 92 000 students complete their time in the *liceos técnicos* every year, only 40% of whom participate in mandatory internship practical training and obtain their

7. *National Policies for Education: Chile*. OECD, 2004, p. 179-180.

8. Quoted in *El Mercurio*, January 27, 2008.

completion certificate. In short, the issues about the vocational education track, raised in the OECD 2004 review, continue to be a cause of concern.[9]

For the large proportion of students who come from a municipal vocational school, the barriers to advancing to tertiary education are high. Many are likely to graduate without a certificate or a means of progression upwards, regardless of ability. These students are, at best, likely to stay in a vocational track.

System articulation: within the tertiary education system

> "*An effective system of vocational training provides favourable conditions for innovative activity throughout the economy, including in the SME sector.*"[10]

In conversationS with the review team, the Presidential Education Advisory Commission (*Comisión Asesora Presidencial*), an ad-hoc group of representatives from the different subsectors of the higher education system convened by the Chilean President to identify and recommend major changes, identified the lack of relevant and flexible technical education as one of Chile's key educational weaknesses. In order to improve competitiveness and to provide labour-market-relevant technical education that is attractive to young people leaving schools and to adults in need of retraining, system-wide reform and restructuring are required. A review of the regulatory framework, part of which is governed by the Constitution of Chile, will also be necessary.

The Commission considers that mission differentiation between technical institutions and traditional universities may be adequate, but that the possibilities for mobility and progression are still constrained. A similar concern is expressed by the Chilean Council for Innovation and Competitiveness. The review team concurs with this assessment. The view of the team is that the need for the tertiary education system to maintain competitiveness and to improve innovative capacity, while providing a framework to enhance the skill level of the working population, presents a substantial challenge to the entire system but especially to the tertiary vocational technical system. This issue is further discussed below.

There is wide diversity and choice of educational services throughout the country. The review team visited 30 institutions in Chile, including

9. For an in depth discussion of the relevance, quality and achievement of secondary level vocational education in Chile, see OECD 2004, pp. 188-202.

10. OECD *Reviews of Innovation Policy: Chile*. 2007. Page 25.

CRUCH and private universities, IPs and CFTs. The team saw many good third level vocational institutions where both instructors and students are engaged in solid technical training and where courses are strongly linked to the local labour market. Employer Federations are supportive of these institutions, are closely involved with them as Board Members and are happy to hire their graduates. Besides the larger and better known CFTs (such as INACAP, DUOC and CEDUC), which are often attached to universities, there are new institutions beginning to emerge with a clear vision that excellent mid level technician training is required for emerging labour market needs. The team visited one such institution in Valparaiso (see Box 4.2).

Box 4.2 **CFT UCEVALPO**
Centro de Formación Técnica de la Pontifica Universidad Católica de Valparaíso

"Formando técnicos superiors para una sociedad global"

With an enrolment that has more than doubled in the space of four years, CFT UCEVALPO is a vibrant example of a rapidly growing institution that is responding well to the needs of the local labour market in Valparaíso.

A high proportion of UCEVALPO's students, with an average age of about 25 years, are already in the workforce. In the absence of the PSU, entry to the CFT is by application and is reviewed by the Faculty on a case by case basis. Students benefit from a range of financing options including several scholarship schemes. The management of this CFT recognises the strategic importance of good technician training to the Chilean economy, hence, in addition to technical content, the curriculum emphasises the development of analytical capacity and key competencies, such as entrepreneurship, ICT and English language skills. Pedagogical methods include case studies, industry visits and internships.

Instructors and teachers come from industry. There are strong linkages with local Chambers of Commerce, the Chilean Navy and the Unions. Discounted training contracts and special arrangements are in place with 25 local industries. There are courses developed especially for the Tourist industry in Valparaíso and, especially important, for working in the Maritime Transport sector and the Port Authority.

In discussion with the review team, CFT Management emphasised the need for a system to recognise prior learning in Chile and for a qualification framework for continuous and lifelong learning.

"La estrategia es ser Técnico".

www.ucevalpo.cl

Despite the excellence of UCEVALPO and other technical institutions visited by the review team, the quality of many smaller CFTs remains a national worry. This, and the fact that overall more than 15% of CFT graduates remain unemployed after two years leads to negative perceptions about tertiary vocational and technical education and training in general.[11]

From the student's perspective, this is quite understandable, for several reasons. First, in Chile as in many other countries, attending a well-known prestigious university is regarded as more attractive than enrolling in a local technical college. Secondly, in the absence of appropriate information about the local labour market, and in a country where less reputable universities[12] make exaggerated claims about the value of their degrees, there may be ignorance of how good and relevant CFT and IP courses actually are. Thirdly, as discussed in both Chapters 3 and 8, because the present structure of student financial support in Chile is so skewed towards the university sector, young people have good financial reasons not to apply for technician training or technical degrees at an IP or a CFT.

The Chilean Council for Innovation and Competitiveness has set out a strategy for the development of a more knowledge-intensive economy in Chile, which includes a requirement for more qualifications and technical skills in the workforce. Unless more is done to make technical education and training more attractive and prestigious, it must be doubtful whether this strategy will succeed. It will be especially difficult to achieve the Council's targets for 5B technician level graduates, to meet the human capital needs for each of the Council's new industry clusters.

Some initiatives to improve the quality of technical training are in hand in Chile. Considerable progress is being made through the accreditation system to address the issue of quality in all tertiary education institutions, as explained in Chapter 6. The new accreditation system has employability as a measure of quality and as a requisite for accreditation. If well designed and implemented, this offers a timely opportunity to build up graduate information useful not only for quality/accreditation purposes but also to monitor the relevance of the programmes offered by CFTs. Furthermore, in order for a CFT to be eligible to receive public funds, it or an institution to which it is attached must be accredited. This should give increased assurance to the public and potential students of the quality of the courses on offer.

11. This is suggested by Table 4.4 and is confirmed by reviewing all 31 career streams requiring *Técnico Superior* training listed in *futurolaboral*. None reached 85% labour market absorption after 2 years.

12. So-called "*piza y pizarra*" or "chalkboard and blackboard" universities.

Students will also need to be assured that they are not in a dead end educational institution but one where they can achieve progression through the system if they want to study at higher level.

Tertiary vocational education in Chile does include some 'ladders and bridges' allowing students who have completed a lower-level technical qualification to move on and enrol in a higher-level course which accepts and credits what they have already learnt. For example, it is possible for students to progress from DUOC and INACAP CFTs to IPs and universities to which they are attached. But this is the exception in the system, rather than the rule. Overall, the system remains quite rigid.

One very important barrier to progression is the tendency in Chile to define qualifications in terms of the time taken to complete a course rather than the competencies gained. This is particularly true of university courses. Sometimes it is due to pressure from professional associations, whose views also affect career positions in government and in their professions (the review team was given examples of professional associations insisting on five year courses, when in the view of the universities the required outcomes could be achieved and competencies mastered in four). It also appears that students (in any institution) are not able to accumulate qualifications on a gradual basis, although modular programmes are now beginning to be developed in some CFTs such as DUOC where some courses are being modularised.

If Chile is to improve its capacity to deliver adult education and develop a Lifelong Learning Framework, more will have to be done to (a) recognise prior learning and (b) create incentives to attract adults to retrain and reskill. There has been progress in the participation of adult learners: according to the UNDP (2006), in 1998 22.6% of students were 25 or older, while by 2003 this figure had increased by 28.4%. It is in the non university sector that adult participation has grown most, from 22.3% to 30.3% while in universities it constituted 22.7% and 24.6% in 1998 and 2003 respectively.[13]

The overarching issue, as flagged to the review team by the Presidential Advisory Council on Higher Education and confirmed by institutional visits and discussions with employers, university management and personnel and students, is the absence of a qualifications framework whereby progression, mobility and the recognition of diplomas and degrees are assured. Although a Qualifications Framework has not proved simple to introduce in every country where it has been tried, such a framework has proved successful in some European countries, (especially in Ireland – see Box 4.3 – and also Scotland), *inter alia* in assisting in the evolution of new degree-granting

13. Country Background Report.

Institutes of Technology and new Universities, broadly similar to some Community Colleges in the USA and University Colleges in Canada. Together with a policy to recognise prior learning and move to a competency-tested basis for granting qualifications, a Qualifications Framework in Chile could also greatly facilitate the development of an Adult Learning and Life Long Learning system.

Box 4.3 **National Qualifications Framework, Ireland**

Based on the guiding principles of access, transfer, progression and quality, the Framework aims to provide a comprehensive pattern of awards whereby all certificated study and approved learning experiences are accredited in a way which maximises the opportunities for citizens to engage progressively in education and training on a life time basis. The NFQ comprises ten levels of qualifications, with each level based on nationally agreed standards, skills and competence. These standards define the learning outcomes to be achieved by learners seeking qualifications at each level. The ten levels include qualifications gained in settings from schools, to places of work, the community, training centres and to colleges and universities, from the most basic to the most advanced levels of learning. The outcomes-based nature of qualifications in the framework is a significant change from the input-based (*e.g.* time served) nature of many existing qualifications.

Source: www.nfq.ie

Besides developments in accreditation, other initiatives are under way in Chile that will greatly improve student mobility and increase system flexibility and relevance:

- *Student Credit System*: This was conceived as part of the MECESUP project in April 2003; implementation began around 2005. The credit system is limited initially to the 25 CRUCH universities, although it is hoped that eventually all tertiary education institutions will be included.[14]
- *Higher Education Information System*: The national Higher Education Information System (SIES in Spanish) is a new and ambitious undertaking whose objective is to provide timely and relevant information to all tertiary education stakeholders, the State, institutions, and students and their families. One allied objective is to support career choice for university entrants. It is planned to link the data to PSU and other institutional data systems. By early 2008, 95% of institutions had responded to requests for data.

14. http://www.sct-chile.cl/

Priority was being given to developing the webpage and the measures needed for system compatibility and implementation as soon as possible. An opportunity exists here to link all information on tertiary education in Chile: this is highlighted in the Recommendations below.

- *Chilecalifica*: The *Chilecalifica* programme was developed with the support of a World Bank loan to deal with perceived deficits in the articulation of vocational and technical education, with the participation of private sector employers and workers. The programme builds linkages between companies and educational institutions, working chiefly with Grades 11 and 12 of the technical schools (*Escuela Media Técnica Profesional*), the CFTs, and in some cases with universities. Chilecalifica also provides new opportunities for developing a lifelong learning and training system by building capacity in companies linked to educational institutions. The methodology builds on competencies gained rather than on time spent in learning and is structured along the lines of the German dual system, where formal learning and training take place for a given period of time and the rest of the time is spent training and working in companies, thus achieving the strong involvement of employers in the provision of training which ensures labour market relevance.[15] Conversations with employers established that they regard the dual system as one approach that could be a model that is useful and relevant to Chile's skills training needs. They estimate that 25 000 students are enrolled in alternance (the dual system type of training) in 10 000 companies; they would like to increase that number to 20 000 companies. *Chilecalifica* is creating the framework for a lifelong learning system. The challenge will now be to go beyond the current level of about 16 projects with another nine in the pipeline, to system level where the networks created (*e.g.* tourism, agriculture) could become permanent. This will involve the participation of all three Ministries involved: Education, Economy and Labour.

- *MECESUP:* The Programme for the Improvement of Equity and Quality of Higher Education (*Programa de Mejoramiento de la Equidad y la Calidad de la Educación Superior*, MECESUP*)*, established a competitive fund (*Fondo Competitivo*) to allocate resources for (inter alia) projects in the fields of improving

15. www.chilecalifica.cl/

undergraduate and graduate teaching and training advanced technicians.

Relevance of academic programmes and course offerings

There is general consensus among different higher education stakeholders in Chile that academic programmes and course offerings from higher education institutions need to become more relevant to the current and future needs of a competitive and globalised world in which Chile intends to become an important player. In this context, a critical impediment for the country would be the inappropriate or inadequate preparation of future professionals. However, there is limited discussion about how academic programmes could be adjusted to respond to the perceived needs of the knowledge economy and hence the desired outcomes are rather vague.

Many institutions express, in their mission statements or strategic plan, a formal intention to prepare students with the tools they need to become successful professionals in the global economy. For the most part, stakeholders perceive these statements as mere rhetoric. With some exceptions, a review of institutional documents shows little evidence of serious intent to adapt curricula to ensure that students are appropriately prepared.

Stakeholders recognise that, in general, academic programmes offered by Chilean educational institutions are not very flexible or responsive to the requirements of the world of work. There is minimal input from potential future employers of graduates when courses are originally designed and periodically reviewed. Universities tend to value good grades rather than overall preparedness and acquired competencies. Articulation and progress possibilities are limited, not only between institutions at different levels of the higher education system, but also between institutions at the same level and between programmes within the same institution. There is no serious general emphasis on acquiring a second language or work-related or intercultural competencies. Last but not least, courses are extremely long by international standards.

Generic structural deficiencies in the tertiary education curriculum in Chile include:

- Limited flexibility: A review of the curricular grid, or *"malla curricular"*, in a variety of academic programmes and institutions shows a rigid curriculum with very limited or no options (electives) once the student has chosen an area of specialisation. In some cases, flexibility is incorporated by making available a few optional

courses within the same field of study. This limited flexibility is among the principal impediments to articulation and mobility between academic programmes and levels in Chile.

- Overspecialisation of the curriculum: Most academic programmes lay strong emphasis on preparation for a specific field of study – what is known as "professionalisation" in other Latin American countries. While mission statements and academic models of institutions have as their stated goal the provision of lifelong comprehensive education, in practice excessive professionalisation of academic programmes limits mobility between academic programmes and levels. The curriculum places heavy emphasis on a variety of professionally oriented subjects but does not include general education courses. Mostly absent also are ways for students to acquire competencies in teamwork, communications, intercultural awareness, and entrepreneurship, among other skills critical for the knowledge economy. In addition, in most higher education institutions, the learning of a second language is considered optional, or the required level of competency is low.

- Excessive academic workload: This issue should be comprehensively addressed. The academic workload for undergraduate programmes in Chilean universities is much heavier than the international average. Internationally, there is a trend towards a more efficient curriculum, with less emphasis on traditional academic subjects and more on acquired competencies. This trend is leading many higher education systems to reduce academic workloads: the Bologna process in Europe is one example of this trend, which is also evident in other parts of the world. For example, the academic workload in Chile at the undergraduate level is 30% heavier than in the U.S., Canada, or Australia. However, there is resistance to the idea of changing to a lighter, more efficient academic workload. Stakeholders' arguments against change include: legal reasons (there is an unclear legal regulation for public servants which establishes a minimum academic workload if individuals are to be considered eligible for higher ranking jobs); potential opposition from students (who might fear that employers would equate a lighter academic workload with a lower quality programme); resistance from professional associations; financial pressures (lighter academic workload might mean lower revenues from tuition and fees charged by institutions); potential resistance from professors; and even the risk of the loss of accreditation. To education experts from other countries, many of these arguments seem implausible and even counter-intuitive – students and

professors insisting on more work are a rare sight on American or European campuses. A reasonable explanation advanced by Chilean educators has to do with the need to compensate for deficiencies in the entry qualifications of students, especially those who enrol in technical or vocational programmes. This represents an additional argument to ensure better articulation of tertiary education with the previous levels of the educational system in order to reduce this gap. However, the review team understands that in the competitive atmosphere of Chilean higher education, institutions could be in difficulty if they made changes while others did not. It is therefore important to address this issue system-wide.

- Teaching-learning process in the classroom: No specific information was provided to the review team on this matter. However, in discussions with academic staff and students at the institutions included in the review visit, it was mentioned that – despite national education policies aimed at moving from a traditional teaching-centred towards a student-centred curriculum, and from a subject-based to a competency-based approach – the adoption of a competency-based academic model and a student-centred learning approach is not a generalised practice, especially in traditional academic programmes. Barriers to be overcome in generalising it include the limited awareness of this new academic model and the lack of training available for academic staff wishing to adopt it; the absence or insignificance of incentives for academic staff to adopt innovative approaches; and occasional resistance from students who prefer a more traditional, passive role in the teaching-learning process.

- Adjusting the academic programmes on offer to the anticipated needs of the labour market: As mentioned earlier in this chapter, better synchronisation between academic programmes and labour market needs is critical. Employer involvement in the identification of needs, the planning of academic programmes and the monitoring of graduates is, in general, minimal and unstructured. Some institutions, spurred on by recently introduced accreditation requirements, are now conducting periodic follow up surveys of alumni. All institutions need not only to conduct comprehensive follow-up, but also to set up internal systems with input from staff, students/alumni, employers and professional associations to analyse the results, consider what employability gaps they reveal, and respond by making concrete changes in the content and curricula of the institution's academic programmes. Follow-up may also point to ending existing programmes or starting new ones.

- Retention and graduation rates: The efficiency of academic programmes – measured by graduation rates – is low in Chile. MINEDUC commissioned a study to learn about attrition in higher education, which shows that the three main reasons for dropping out are lack of vocation, economic factors and poor academic performance.[16] The high drop-out rate is related to the length of time required in order to graduate from universities. According to González *et al*. (2006) using data from the MINEDUC, the general graduation rate in Chilean universities was on average 46.3% between 1998 and 2002. In some fields the rate was higher (72.9% in education and 62.5% in health), although in others it was much lower (only 20% in the humanities and 21.5% in law). A more detailed analysis over the same period provides an even more depressing picture. Overall, according to González *et al*. (2006), between 1998 and 2002, in universities at the undergraduate level, **only 8.6% of graduates** fully finished their academic programmes and obtained their corresponding "*título*" within the five years of theoretical length of the course. Given that the official length of courses is already so long by international standards, it is almost impossible to justify making over 90% of students take even longer.

- Mobility between academic programmes: As previously described, students must choose an academic field at the inception of their studies. With a few exceptions, lateral mobility between academic programmes is not permitted, even within institutions. This factor, combined with limited career orientation in high school, greatly influences drop-out rates in tertiary education.

- Lack of significant second language competency requirements in academic programmes: With the exception of some institutions and academic programmes, the acquisition of a second language at a reasonable level of competency is not included as part of most academic programmes in Chilean tertiary education. This is an important deficiency, already recognised by government agencies, employers, institutional leaders, academic staff, and, most visibly, students. As indicated by Ramirez (2005), Chileans are less proficient in English than other Latin Americans. Reasons for this failure to establish more rigorous second language components in academic programmes include the lack of suitable teachers, inadequate language preparation at secondary school, and the

16. *Final report: Study on the Causes for University Attrition,* Centro de Microdatos, Departamento de Economía, Universidad de Chile, August 2008.

excessive academic workload which leaves little room for extra components.

Though the overall system has yet to change, important pilot schemes supported by MECESUP address the need for a more relevant academic curriculum. The MECESUP stimulus funding is aimed at piloting, at the institutional level, curricula which include a student-centred learning approach and a flexible curricular grid (*malla curricular*). Curricular re-design must also take the employability of graduates into consideration, define a more reasonable academic workload, encourage articulation between different levels of education, foster lifelong learning, and increase the quality and efficiency of academic offerings. The pilot scheme already developed by MECESUP should be extended to include more academic programmes and a greater number of institutions. Wider dissemination of success cases demonstrating greater employability of graduates should be encouraged.

Moreover, the structural deficiencies in the curriculum present an opportunity to make good use of the existing diversification opportunities in the overall tertiary education system. Quality assurance and funding mechanisms could legitimise different mission statements, including those with a clear vocational approach, and provide incentives for increased links with business and industry.

The international dimension of tertiary education

The relevance of Chilean tertiary education should also be analysed from the international perspective, in view of the national ambition to improve the country's international competitiveness further. To achieve this goal, higher education in Chile needs to become more internationally oriented. Among other things, this means expanding Chile's collaborative ties with foreign partners; doing more to equip students with the skills required by a modern, global, knowledge-based society; conducting internationally competitive research; and attracting more international students and professors.

Internationalisation of higher education in Chile has been identified in government plans as an important priority. However, there is no detailed national plan for achieving this. Most of the progress to date has been achieved by institutions in response to internal and external pressures or incentives, both academic and financial, including some government sponsored initiatives.

As in other Latin American countries, internationalisation is a relatively new focus for higher education. Only within the last decade have most

universities begun to develop their institutional capacity for internationalisation, mostly by designating a staff member to deal with international matters and also by establishing collaborative agreements with institutions from abroad (Ramirez, 2005).

However, most institutions in Chile – as in other parts of the world – pursue their internationalisation goals mainly by establishing an international office, negotiating and formalising international memoranda of understanding (MOU) which support modest levels of student and/or academic staff mobility, in some cases participating in international research initiatives with peers from abroad and offering dual or joint academic programmes in partnership with international partners. There has been far less progress in adding an international dimension to the curriculum of academic programmes and in fostering widespread student and academic staff mobility. Progress towards internationalisation is uneven, with just a few universities, and no IPs or CFTs, having an active international agenda and presence.

Table 4.5 **Chilean tertiary education students in OECD countries (2005)**

Country	Chilean students	% of Chileans studying abroad who go to this country	Total international students in this country	% of OECD international students in this country	% of Chileans among the international students
USA	3 436	47	212 627	28	1.6
Spain	1 414	19	15 004	2	9.4
Germany	619	8	108 684	14	0.6
France	531	7	45 742	6	1.2
UK	312	4	131 642	18	0.2
Italy	174	2	14 183	2	1.2
Sweden	259	4	20 195	3	1.3
Belgium	112	2	24 890	3	0.4
Australia	110	1	26 078	3	0.4
Other	404	5	152 707	20	0.3
Total in OECD	7 371	100	751 752	100	100

Source: OECD (2007). *Education at a Glance*

Though Chilean data on international mobility should be approached with great caution, there being no reliable, consistent or methodical system

in place to collect and analyse it, it is clear that student mobility has increased over the years. More Chilean students are studying abroad and more international students choose Chile as an educational destination. Progress in both areas is modest considering international benchmarks, however. As can be seen in Table 4.5, in 2005 there were 7 371 Chilean students enrolled in tertiary education in OECD countries. Almost half of them were in the US, followed by Spain (19%), Germany (8%) and France (4%). Chilean students represented 9.4% of international tertiary education students in Spain, and only 1.6% in the US. In general, Chilean students enrolled in tertiary education institutions in OECD countries represent only 1% of the 751 752 international students in the group.

The available information does not differentiate between degree-seeking students and exchange students, or between undergraduate and graduate students. An estimate of scholarships provided by the main public funding agencies shows that in 2006 there were 848 Chilean students pursuing advanced degrees abroad with support from the public sector (see Table 4.6). In 2008, the BECAS Chile scholarship was launched by which about 6000 people (2,500 technicians) will be sent on graduate programmes overseas to obtain graduate degrees or technical diplomas by 2010.

Table 4.6 **Degree seeking Chilean students abroad 2006**

Source	Masters	Doctorate	Other	Total
CONICYT	n	215	0	215
MIDEPLAN	73	116	285[1]	189
MECESUP	13	116	0	129
AGCI	16	0	0	16
CNCA	10	4	0	14
Total	112	451	285	848

Note: 1. This includes 264 non classified existing scholarships for Master's or Doctoral programmes

Source: CONICYT (2007). Capital Humano Avanzado

On the other hand, the number of international students enrolled in Chilean tertiary institutions has been increasing in recent years. In 2005 there were 1 966 foreign students in Chile, of which 881 came from OECD countries (0.1% of citizens from OECD countries studying abroad). As shown in Table 4.7, the US sends the largest share (25%), followed by Peru (19%), Argentina (8%) and Bolivia (7%).

Table 4.7 **International tertiary education students in Chile (2005)**

Country	Students	Percentage
USA	498	25%
Peru	365	19%
Argentina	150	8%
Ecuador	103	5%
Bolivia	132	7%
Germany	84	4%
France	73	4%
Mexico	53	3%
Spain	46	2%
UK	5	0%
Italy	12	1%
Sweden	17	1%
Belgium	5	0%
Australia	13	1%
Other	410	21%
TOTAL	**1966**	**100%**
Students from OECD in Chile	881	0.1%

Source: OECD (2007) *Education at a Glance*. Calculation based on data available at http://dx.doi.org/10.1787/068417017111

Foreign students constitute an important impetus for the internationalisation of tertiary education. They also represent a significant source of revenue for institutions thanks to higher academic fees, and the host country's economy benefits from their presence. Tertiary education institutions from Chile, with the support of PROCHILE (the official Chilean export promotion bureau), have been promoting Chile as an international destination for foreign students, but the institutions and the government still seem unsure about how aggressively Chile wishes to compete in the international market for students. The shared language in Latin America (excluding Brazil) offers unique opportunities for creating a common market for higher education services and promoting student mobility. As one of the countries offering the highest quality tertiary education, Chile could benefit significantly from such a market. However, the Chilean higher education institutions and government need to define a clear policy on this matter. Does the country consider the export of educational services a key international trade priority, as do New Zealand and Australia? How widely does the country want to open its doors for international students? Currently, as Table 4.8 shows, Chile has a lower proportion of foreign students enrolled in its tertiary education system than any OECD country. At 0.3%,

international students have a very small share of national enrolment, compared to the OECD average of 7.6%.

Table 4.8 **Foreign students as percentage of total national enrolment in tertiary education in selected countries (2005)**

Country	Percentage
New Zealand	28.9
Australia	20.6
UK	17.3
OECD	7.6
Portugal	4.5
USA	3.4
Japan	3.1
Spain	2.5
Korea	0.5
Poland	0.5
Chile	0.3
OECD Average	7.6

Source: OECD (2007). *Education at a Glance*

Recommendations

As discussed, there already exist in Chile a range of policy interventions such as the continuous improvement of public information systems, the development of strong technical institutions such as DUOC and INACAP and the provision of scholarships and other instruments developed using MECESUP. The following policy options which build on existing programmes might also prove helpful:

Labour market linkages

- Chile should build on the existing strengths of *Futurolaboral*, by: (a) the provision of fuller interpretation of the labour market data contained on the website, aimed at students and their families as well as at trained career counsellors; (b) the regular updating of that information; (c) the provision of more forward-looking analysis to help institutions avoid replicating course offerings that are available elsewhere or developing new courses for which there is no labour market demand; (d) the development of linkages to other useful online resources such as the *Consejo*.

- The country should build up a unified information system on the quality of academic programmes, the extent of student dropout and its causes. In time, this information base should also be expanded to include systematic Graduate Tracking Surveys, and surveys of employer satisfaction with graduates.
- There should be stronger linkages between employers' needs and higher education institutions' academic programmes, involving participation and commitment from both sides. Employers should have greater involvement in: (a) institutional governance; (b) identification of relevant new courses and development and renewal of the curricula; (c) internships as part of course requirements (where appropriate).

System articulation and pathways

- Institutional and legal barriers to progress through the tertiary education system should be eliminated, and new pathways through the system created. A National Qualifications Framework could be developed, embracing all qualifications, academic and vocational, from secondary level up to PhD**.** It would seem sensible to build this up from the foundations laid by the training qualifications framework adopted by C*hilecalifica*. This Framework could be designed to make access to tertiary institutions easier for students from all backgrounds, including vocational secondary schooling, work and previous tertiary study, and to facilitate transfer between institutions and progression from lower to higher level degrees within the tertiary system, by including arrangements for credit accumulation and transfer. To support this, credits from all tertiary education institutions should be made compatible. The Framework could also provide for recognition of equivalent qualifications nationally and internationally, and for accreditation of previous learning. Qualifications should be based on outcomes and competencies achieved, not on time/hours of study put in. In all these ways, a National Qualifications Framework could help and encourage lifelong learning.
- A National Recognition Information Centre (NARIC) should be established, to agree and certify equivalences between Chilean and foreign qualifications, thus opening up opportunities for Chileans to have their education and skills qualifications recognised abroad when applying for undergraduate or post-graduate places or jobs.

Relevance of courses and curricula

- A comprehensive review of the curriculum taught in tertiary level institutions should be undertaken, to: (i) identify areas where curricula are unduly inflexible and overspecialised and develop an action plan to tackle these problems without sacrificing the overall quality of the programmes; (ii) introduce additional curricular elements such as teamwork, communication skills, intercultural awareness, entrepreneurship, and the learning of a second language to a high level of competency.
- Taking into account both national needs and international standards, the academic workload in tertiary education programmes in Chilean HEIs should be reviewed, in order to develop leaner and more effective academic programmes, as well as to establish further articulation with the previous levels of education in order to reduce the gap in relevant knowledge required at the entry level in tertiary education.
- To make better use of the existing diverse range of opportunities in the overall tertiary education system, quality assurance and funding mechanisms could legitimise different mission statements, including those with a clear vocational approach, and provide incentives for increased links with business and industry.

Internationalisation

- There should be greater national commitment to incorporating second language development and proficiency in undergraduate programmes. This will require alignment of third level second language objectives with those for secondary schools, and a coordinated commitment to the development of language teachers at all levels.
- Participation of Chilean tertiary students and academic staff in international exchanges should be increased, and financial support should be made available for gifted students who could not otherwise afford to take part in these exchanges.
- A consistent and internationally comparable information system should be established to gather reliable information about students and staff participating in foreign academic programmes, and about foreign students and staff conducting academic work in Chile.
- A strategy and implementation plan to position Chile as a destination for international education should be developed.

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Chapter 5. Vision, Governance and Management

This chapter considers the nature and functions of Chilean tertiary institutions in the light of their history and evolution. It considers a range of issues, including which tertiary institutions should have the authority to award degrees; how the system as a whole is governed; and institutional governance and management, including the different governance models of public and private institutions.

The review team concludes that, while the existing distinctions between universities, professional institutes and technical training centres should remain, the boundaries between them should be made more flexible, eliminating the rigid stratification between licenciatura *and non-*licenciatura *degree programmes and CRUCH and non-CRUCH institutions; that the existence of for-profit universities should be acknowledged; and that state-owned universities should become administratively and financially more autonomous, and managed according to the procedures of private legislation. The chapter ends with a number of recommendations designed to improve tertiary governance and management.*

The nature and functions of higher education institutions

The first Chilean universities date from the 19th century, and have evolved since then into a large system of tertiary education, with well over 650 000 students in some 200 institutions of different kinds. These institutions perform a variety of missions. The functions of tertiary education in the 21st century have been summarised by the Chilean government as follows:[1]

- *Develop society's advanced human capital,* made up of its directors, managers, professionals and technicians, teachers, scientists and engineers who undertake research and development work and, in

1. Country Background Report.

general, those that use advanced knowledge and information networks productively.

- *Supply opportunities for continuous learning* at the post secondary level for everyone who needs or wants to improve, renew or expand their skills and capacities.
- *Supply information and advanced knowledge* for a country's government and economic growth, by analysis, research and experimentation in different disciplines and collaboration with firms, public organisations, and the community.
- *Serve as a vital support for a reflective culture and public debate*, two pillars on which democracy rests and the civil liberties of the people are constructed.
- *Stimulate regional development*, *cities and opening windows* on the world of science, technology and contemporary ideas.

Therefore, higher education institutions are powerful instruments charged with realising several important and different goals in society. They are also institutions which have been defined as "relatively enduring collections of rules and organised practices, embedded in structures of meaning and resources that are relatively invariant in the face of turnover of individuals and relatively resilient to the idiosyncratic preferences and expectations of individuals and changing external circumstances".[2] The two dimensions, instrumental and institutional, are interdependent, but also subject to tensions. As an instrument of economic development and social change, higher education institutions have to respond efficiently to external demands and the aspirations of those that support and need them. As institutions, they need to be autonomous and to develop their own values, organisational culture and traditions, which impact on the motivation and capacity of those working in them to respond to external expectations. An important dimension of governance, therefore, is to manage effectively this tension between accountability demands and the institutional desire to remain autonomous.

Higher education institutions depend on external resources to exist, and these resources can either be supplied by governments and private donors in acknowledgement of their contribution to social goals, or obtained in a competitive market from students and firms in exchange for the educational and technical services they provide. Most higher education institutions today combine these sources of support in different degrees, depending on their

2. Olsen 2005, p.5.

institutional history, the availability of public and private resources of different kinds, and the national legislation of their countries. In Chile, as in most countries, there is a wide array of higher education institutions with widely differing institutional cultures and sources of support, from large, traditional, collegial, multi-function universities to new, entrepreneurial and market-oriented teaching institutions. This institutional diversification is a positive feature of Chile's higher education system, which allows it to respond with speed and flexibility to the country's growing demand for social mobility, professional education, culture and scientific and technological research.

The current framework for governance in higher education in Chile developed in response to changing political circumstances in the past, and needs adjustment so that it can respond better to the current situation and the country's future needs. Its main institutional features are the division of higher education institutions into three categories – Universities, Professional Institutes (IPs) and Technical Training Centres (CFTs) – and the division of universities into two groups, those that do and those that do not belong to the National Council of Rectors (CRUCH).

Chilean higher education institutions can be private or state-owned. All private and state-owned universities created before 1980 belong to the Council of Rectors. Apart from the special case of three Catholic universities (del Maule, de Temuco and de la Santísma Concepción), those created afterwards, all private, do not. IPs and CFTs can be for profit or not, but private universities cannot be for profit. Only universities belonging to the Council of Rectors, whether state-owned or private, receive subsidies from the government. Other institutions can receive support from public, competitive funds of different kinds, as well as different kinds of public support to their students.

There are several reasons why Chile's higher education system must shed some of the shackles of rigidity that reflect its history as well as the history of Chile's society. One is to nurture the multiple talents of Chile's population. Another reason, closely linked, is to fortify a pluralist, outward-looking society in which institutions such as those in higher education not only serve to preserve important elements from the past, but also help imbue a spirit of reflection and change.

The authority to confer higher education degrees

The main legal function of Chile's higher education institutions has traditionally been to provide degrees and certification for the learned professions. The different rights that universities, IPs and CFTs have in this

regard shape the way the Chilean higher education system is organised today.

Table 5.1 **Chile, number of institutions and students enrolled, 2006**

INSTITUTIONS		ENROLMENT					
		Technical degrees (5B)	Other professional degrees (5A)	University first degrees (with *licenciatura)* (5A)	Master and Diploma Degrees (5A)	Doctoral Degrees (6)	Total (including special community programmes, not shown in previous columns)
State-owned, CRUCH	16	3 049		124 234	6 037	1 144	146 557
Private, CRUCH	9	3 267		89 923	4 423	1 341	101 113
Private, non CRUCH	36	8 625		198 404	5 300	132	218 284
Professional Institutes (IPs)	43	43 368	76 276				121 042
Technical Training Centres (CFTs)	105	68 275					68 805
Total	209	126 584	76 276	488 837	15 760	2 617	655 801

Note: These figures are rather different from the MINEDUC figures for 2006 in the updated Background Report, but are comparable with the 2007 figures from INDICES 2008 used in Table 1.1 (not used here because they do not distinguish between State and private CRUCH universities).

Source: data from *Consejo Superior de Educación*, INDICES 2007, cited by Profesor J.J. Brunner in 'Chile's Higher Education System: a comparative political economy focus'.

Only universities can grant academic degrees, which include those of *licenciado*, (defined as "the degree granted for a student who has concluded a study programme which includes all the essential aspects of a given knowledge area or discipline",[3]) master and doctor. Legislation also defines a group of 18 legally recognised professions that require a *licenciatura* as a

3. "*Es el que se otorga al alumno de una universidad que ha aprobado un programa de estudios que comprenda todos los aspectos esenciales de un área del conocimiento o de una disciplina determinada"* (extract from the Constitutional Law on Education, referred to as LOCE).

pre-condition for obtaining a professional degree, which in practice restricts the award of these degrees to universities.

A professional degree linked to a *licenciatura* requires at least four years of formal education; some university professional degrees may take five or six years. IPs can provide other, non-regulated professional degrees, for instance in specialised engineering fields (but not civil engineering), lasting about four years, and also short-term technical degrees of about two years. There is a clear hierarchy of prestige among these different degrees, and most students go for university degrees if they can.

Table 5.1 shows student enrolment in the various types of institutions in 2006 and the types of degree programmes they were enrolled for.

Table 5.2 shows the professions requiring a *licenciatura*. The monopoly given to universities for the provision of these degrees is based on unwarranted assumptions, and has important negative consequences for Chile's higher education. One assumption is that each of these 18 professions, and not others, are endowed with a peculiar set of "essential aspects of a given knowledge area"; another is that only institutions with university status could teach this "essential" content. To international education experts this list seems arbitrary, suggesting that its creation owes more to the strength of the different professional associations than to the intrinsic scientific nature of the degrees. For instance, only four engineering degrees are considered as professions, including "commercial engineer", which in most countries would be either an economist or a business administrator – but the list excludes newer fields such as chemical or electronic engineering, as well as traditional ones such as accountancy and nursing.

Table 5.2 **Professional degrees requiring *licenciatura***

Abogado: Licenciado en Ciencias Jurídicas (Lawyer)
Arquitecto: Licenciado en Arquitectura (Architect)
Bioquímico: Licenciado en Bioquímica (Biochemist)
Cirujano Dentista: Licenciado en Odontología (Dentist)
Ingeniero Agrónomo: Licenciado en Agronomía (Agricultural Engineer)
Ingeniero Civil: Licenciado en Ciencias de la Ingeniería (Civil Engineer)
Ingeniero Comercial: Licenciado en Ciencias Económicas o Licenciado en la Administración de Empresas (Commercial Engineer)
Ingeniero Forestal: Licenciado en Ingeniería Forestal (Forestry Engineer)
Médico Cirujano: Licenciado en Medicina (Medical Doctor)
Médico Veterinario: Licenciado en Medicina Veterinaria (Veterinarian)
Psicólogo: Licenciado en Psicología (Psychologist)
Químico Farmacéutico: Licenciado en Farmacia (Pharmacist)
Profesor de Educación Básica: Licenciado en Educación (Primary School Teacher)
Profesor de Educación Media en las asignaturas científico-humanistas: Licenciado en Educación (Secondary School Teacher)
Profesor de Educación Diferencial: Licenciado en Educación (Special Education Teacher)
Educador de Párvulos: Licenciado en Educación (Nursery School Teacher)
Periodista: Licenciado en Comunicación Social (Journalist)
Trabajador Social o Asistente Social: Licenciado en Trabajo Social o en Servicio Social (Social Worker)

Source: Law 18.962, Article 56, Ministry of Education, Chile.

The review team believes that the Chilean concept of *licenciatura* – which limits knowledge of the essential aspects of a discipline to those having a *licenciatura* and moreover makes this a prerequisite to the entrance of 18 professions – should be revisited. It assumes the division of knowledge into a limited and predefined number of disciplines, each associated with a specific curriculum provided in a university. Today, however, most traditional disciplines are being superseded by new specialised and interdisciplinary subject areas and new professional activities that do not fall within the usual mould of the traditional professions. In most countries that have kept the term, *licenciatura* either means a teaching degree or is a generic term referring to the duration of post-secondary education, rather than to a special kind of content.

The first negative consequence of the way Chile conceives the *licenciatura* and the professions is that it creates an artificial stratification, or dividing line, between similar professional degrees. This stratification affects both the social prestige and the legal rights of the degree holder. This artificial classification leads to a mismatch between diplomas and new jobs in the labour market and limits the creation of new diplomas by cross-

fertilisation. There is no *a priori* reason to assume that all universities are able to provide students with "essential knowledge", while no professional institutes can. As Chile develops a reliable system of institutional and programme accreditation, it is the accreditation, rather than the legal status of the institutions, which should define the value and prestige of the degree obtained by the student.

A second negative consequence is that it takes too long for students to complete their first degrees, and large numbers drop out without ever obtaining any formal recognition of their efforts. At the Catholic University in Valparaiso, for instance, degrees in architecture and civil engineering take six years; other professional and non-professional degrees take four to five years. In practice, few students complete their courses and graduate within the prescribed time (fewer than 9%, according to the study by Gonzalez *et al*. quoted in Chapter 4).

The third negative consequence is that this division creates a barrier to the mobility of students between technical, professional and university degree courses. If students with technical or professional degrees from a CFT or IP want to get higher qualifications, they must start their studies again, perhaps with credits for some previous courses, but having to learn from scratch all the disciplines that are part of the curriculum of the related *licenciatura*. In a more flexible arrangement, these students could continue to study at Professional Institutes to strengthen their previous education, and could get higher degrees that would be fully equivalent to those provided through university undergraduate courses, or could transfer to universities without having to start their studies all over again.

The transition from a rigid, stratified curriculum to an open, more flexible arrangement is not easy, but could be started with a few simple measures. Chile should stop having a closed list of university-level professional degrees. Universities and professional institutes should have the freedom to provide the degrees they want, according to their accredited qualifications, within a broad framework similar to the three cycle framework being adopted in European and other countries through the Bologna process: a first three year degree for general or vocational education; a second, one to three year professional or masters degree; and an advanced, doctoral level degree in sciences, technology, the humanities and medicine. There should be a clear separation between education degrees and professional certification or licensing. government agencies, in partnership with professional associations, could develop certification or licensing procedures based on knowledge and practical requirements in areas involving personal or material risk, such as medicine, engineering and law; and professional associations could establish their own procedures for the certification of professionals in their fields seeking their seal of approval.

The licensing or certification bodies should have also the authority to revoke the certification of professionals that fail the ethical or competence requirements of their fields, according to well-established procedures.

Public governance

Public governance of higher education in Chile is shared by MINEDUC, the Council of Rectors (CRUCH), the Higher Council of Education, the National Council for Scientific and Technological Research and the National Accreditation Commission. Their responsibilities and functions are established in several legal instruments, but all are framed by the Constitutional Education Law of 1990 (LOCE),[4] issued as a decree just before the end of the military regime, and currently under revision. Because it is a constitutional law, a four sevenths majority is required in the Congress to change it. Public authority over higher education institutions is limited by the autonomy of the universities, which freely determine the programmes they offer, their governance structure and their administrative organisation. Public universities and others in membership of CRUCH enjoy a special status in terms of funding and other opportunities.

MINEDUC is the main governmental agency for regulation and co-ordination of tertiary education. It is the Ministry's responsibility to propose and evaluate policies; assign resources; evaluate educational development as an integral process; report on results to the community; study and propose general standards suitable for the sector and oversee their compliance; and grant official recognition to the institutions. Within MINEDUC the main unit responsible for the sector is the Division of Higher Education. Other relevant units are responsible for, and known by the names of, *Chilecalifica*, a programme devoted to strengthening technical education jointly co-ordinated by the Ministries of Education, Labour and Economy; and MECESUP, a programme devoted to improve the quality and performance of higher education institutions through competitive funds.

Established in 1954, the Council of Rectors (CRUCH) includes 25 universities. 16 are state universities, 6 are Catholic universities and 3 are private lay universities set up before 1981 (Austral, Concepción and the Federico Santa María Technical University). CRUCH excludes the other 36 private universities created since 1981, as well as all IPs and CFTs.

CRUCH is an autonomous, self-governing institution, but it is supported by public money and performs several important roles in Chile's higher education system, including the administration of the university entrance

4. The LOCE (Ley 18.982).

test, the PSU. CRUCH participates in policy discussions with the government, and makes co-operation agreements, on behalf of Chile's universities. The review team received the impression that MINEDUC is inclined to defer to CRUCH in matters of higher education policy. When the team raised the question of reforming the PSU with the then Head of the Higher Education Division, the response was that the Division would not object to proposals to that effect, if they came from CRUCH.

According to the Background Report, "the first *Concertación* governments gave the greatest resources to the universities in the Council of Rectors, whether as increases in direct contributions or through the creation of investment funding mechanisms, such as the Institutional Development Fund (*Fondo de Desarrollo Institucional, FDI*)". When student scholarships were first introduced for economically disadvantaged students, and when a state-guaranteed loan system was added, these were confined to students at CRUCH universities. The CRUCH universities are still the only ones receiving direct subsidies, and as explained in Chapter 3, their students are still the only ones eligible for the Bicentenary Scholarships and the more favourable and state-guaranteed loans.

The Higher Council of Education (*Consejo Superior de Educación*, or CSE) was established in 1990 by LOCE as the organisation responsible for licensing new universities and IPs and for ensuring that the conditions laid down for their creation have been met. The Council's principal tasks are to evaluate and approve or reject institutional projects of private institutions that aspire to official recognition and licensing. It has also important functions regarding basic education, but has no direct influence over CRUCH universities or other autonomous tertiary institutions.

The functions of CSE regarding higher education were changed by Law 20.129, of November 2006, which created a National System of Quality Assurance in Higher Education for Chile. Now CSE has a seat in a co-ordinating committee for quality assurance, together with the President of the National Accreditation Commission (*Comisión Nacional de Acreditación, CNA*) and the Head of the Higher Education Division of the Ministry of Education; it receives appeals regarding some of the accreditation decisions of CNA. The Higher Council of Education (CSE) also participates in the cancelling of official recognition of higher education institutions. Finally, the Council retains its role in the licensing of new higher education institutions, a role recently extended to include licensing of CFTs.

The National Commission of Accreditation (CNA) is an autonomous agency. The President of the Republic designates its President. The Commission has 13 other members including the head of MINEDUC's

Higher Education Division; 3 nominated by CRUCH; 2 (including the Vice-President) nominated by the private universities; 2 by the National Council for Scientific and Technological Research; one nominated by the IPs and one by the CFTs; two nominated by the Commission's other members to represent the interests of the productive sector and the professional associations respectively; and an Executive Secretary. Law 20.129 also envisaged two student members, but those seats are not presently filled because students have refused to appoint their representatives. The review team regards this as a deficiency in current arrangements, which should be remedied.

The CNA's role is to evaluate and improve the quality of tertiary institutions' management and operations, and to evaluate and improve the quality of the programmes they provide. Among the CNA's functions are accreditation of tertiary institutions and their teaching programmes at the graduate and undergraduate levels, and maintaining a public information system for publication of its decisions. It is also the role of the Commission to authorise the establishment and supervise the activities of independent accreditation agencies; five agencies are now approved and in operation. The independent status given to the new accreditation agency, as well as its decentralised approach through the accreditation of accreditors, are steps in the right direction.

The National Commission for Scientific and Technological Research (*Comisión Nacional de Investigación Científica y Tecnológica*, or CONYCIT) is Chile's co-ordination agency for science and technology, and does not deal directly with higher education. However, it plays a role by providing fellowships to graduate students and financial support to graduate and research projects in universities through competitive mechanisms.

The Ministry of Economy's agency for supporting enterprises, CORFO, has combined its programmes to stimulate innovation and R&D to increase the country's economic competitiveness in INNOVACHILE. An important component of this activity is to support co-operation links between higher education and public and private institutions. In 2005 the Chilean government created a six-member National Council for Innovation and Competitiveness, to propose a national strategy for innovation for the country. One of the activities of the Council was to identify eight main clusters of economic activity in which Chile should concentrate its innovation efforts, and it has proposed the creation of an inter-ministerial agency for the co-ordination of all the innovation efforts in Chile. The Council also advises on which CONICYT and INNOVA Chile programmes are to be funded by the important Fund for Innovation and Competitiveness (established in 2006).

The greatest problem in the current governance of tertiary education in Chile is its segmentation; and the most important manifestation of this segmentation is the historical division between CRUCH and non-CRUCH institutions. This stratifies universities in a way not warranted by their actual activities and performance, and has two main consequences. First, CRUCH institutions and their students enjoy a number of legal privileges and financial and social benefits not available to others. The equity of this situation has been questioned in recent years, and some changes have been made, for example the extension of certain scholarships and loans to non-CRUCH students; but there is a long way to go. Secondly, the public governance role of CRUCH enables CRUCH universities to represent their institutions' interests to government and influence government policy in a way not given to other universities, to IPs or to CFTs. There are other representative associations, for example the Association of Private Universities; but they do not enjoy the same standing and influence. If a unified tertiary education system and a coherent tertiary education policy are to be achieved, it is important to end unwarranted historical divisions between different types of tertiary institutions and their students, and to give all parts of the tertiary sector fair and equal influence in public policy and decision-making. Whether to achieve this through one association representing all tertiary institutions, or separate but equal associations for universities, IPs and CFTs, is for Chilean stakeholders to decide.

The review team has considered whether the existence of multiple agencies dealing with higher education within and outside the Ministry of Education should be a concern; but has concluded that it should not. These agencies perform different functions, such as policy setting, institutional representation, accreditation, basic and applied research funding, support for innovation, the management of student loans, and others. Some of these are rightly public functions, others are best entrusted to specialised independent organisations. In an open, competitive society it is to be expected that different sectors of society will want to make their cases and pursue their own agendas. It is central government's role to deal with the ensuing tensions and conflicts of priorities. However, in such a diversified and pluralistic tertiary education system with a large number of autonomous and privately owned institutions, it is especially important for central government to commission periodic strategic planning exercises, to assess whether the tertiary institutions collectively are producing the technical and professional competencies the country needs; paying proper attention to access and equity; conducting enough high quality research, relevant to the needs of society and the economy; and giving value for the public resources devoted to tertiary education. The institutions should of course be fully involved in these planning exercises.

Institutional governance and management

Chilean universities established before 1990, whether state-owned or private, enjoy academic, economic and administrative autonomy, according to LOCE. Private institutions created after that can obtain their autonomy after a period of supervision by the Higher Council of Education.

The ways Chilean higher education institutions are governed and managed depends on whether they are state-owned or private, on their academic status, and also on their institutional culture. State universities are under the authority of a Board made up of an equal number of government representatives nominated by the President of the Republic and external members nominated by the Academic Council (*Consejo Académico*). The Academic Council (called the University Council at the University of Chile) is made up of the Rector, Academic Vice-Rector, Deans and other directors or professors designated to the Council. With the exception of the University of Chile, where the University Council assumes the functions of the Board, in most state-owned universities the Academic Council is merely consultative and at the convenience of the Rector. The Rector, nominated by the President of the Republic, is responsible for the management of the University, and governs with the support of the Deans, Department Directors and other authorities.

This hierarchical authority system was established in 1981. Reinforcing it in 1990, LOCE established that no students or administrative personnel could participate in university collegial bodies with voting rights. Since 1990, however, this system has been changing, and in 1994 legislation was introduced establishing that the rectors of state owned universities would be elected by the vote of the university academic staff, and then sanctioned by the President of the Republic. Collegial bodies exist also at the Departments and Faculties within the universities, which usually elect the Department directors. More recently several state-owned universities have included student representatives in their Academic Senate or similar body.

Catholic Universities have different modes of selection for their rectors. In some, the Rector is elected by his peers; in others, there are search committees, and the rector can come from outside the institution. In all cases short lists are submitted to the bishop in the diocese, either for the direct appointment of the Rector, or to be sent to the Vatican, which makes the final decision in the case of pontifical universities.

State universities are subject to general state regulations about all their labour contracts, expenditures and accountability. The private universities that are part of CRUCH receive public subsidies and are accountable to MINEDUC for the use of the resources they receive. State-owned

universities are free to establish the salaries and career patterns of their academic and administrative staff, but the civil service rules make it extremely difficult for academics to be dismissed or to transfer to other institutions, and non-Chileans cannot become full faculty members of state universities. Chile is working to improve the rules and mechanisms for the use and accountability of public money, and one example is *Chilecompra,* an Internet-based system for all kinds of state purchases. Still, the rules of public service are more much rigid and cumbersome than those of the private sector.

The great merit of the current arrangements for state institutions is that they provide high levels of legitimacy to the university authorities, leading to an institutional climate of participation and ownership that is the opposite of the traumatic experience of the years of the military regime, when military officers imposed by the government ruled universities. However, these arrangements also have some drawbacks. The universities do not have the possibility of recruiting a rector or other academic staff from outside, who could bring wider experience and fresh perspectives to the institution. As someone elected by his/her peers, the rector is unlikely to propose changes that could affect the interests or views of his/her supporters. State-owned universities are highly differentiated internally, not only among academic disciplines, but also among professors of different generations and levels of academic qualifications, political ideologies and conceptions about the way higher education institutions should be. Thus, decision-making tends to be very slow, since it depends on the deliberation of collective bodies at different levels of authority and responsibility. To reduce this problem, a distinction should be made between representation on collective bodies and participation in decision-making, so that all academic staff are represented but not all participate directly in the decision-making process. Also, seats on governing boards should be given to other stakeholders representing civil society or employers.

Private universities are also ruled by a Board and a designated rector. The Board usually represents the owners or the corporation that own the institution, and selects the rector from within or outside the university ranks. Some private universities have collegiate bodies that participate in the selection of departmental directors or deans; in others, these collective bodies are limited to advisory tasks. In other institutions, particularly in IPs and CFTs, all decisions are centralised, with no participation of collegiate bodies or students in decisions.

In the review team's view, the requirement on state universities that they function as part of the civil service places them at a clear disadvantage in relation to the private sector. The answer could be to transform them into foundations or similar institutions that act according to the rules of the

private sector, under the necessary rules of financial accountability. Their public nature should be established by their goals, not their administrative rules and regulations; and the government, as the main owner and supporter, should use its authority in nominating rectors and members of universities' boards to make sure that they fulfil the public missions that are assigned to them. Another way for the government to guide the higher education institutions, state-owned or private, is by replacing the current direct subsidies with performance-based financial support and to require the institutions to engage in strategic planning in line with national objectives.

Box 5.1 Private Universities Worldwide

Around the world: one in three higher education students is enrolled in a private institution. Nearly all world regions now have Private Higher Education (PHE). It has been established longest in the USA, in Latin America where it now accounts for half of overall provision, and in Asia. In the last two decades new private provision has emerged in the Middle East, in Africa (predominantly Anglophone rather than Francophone countries) and in eastern and central Europe. Public HE institutions are least challenged by the private sector in Western Europe. But with the possible exception of Portugal, no country in the world has seen a decline in its PHE share in the last two decades; and in countries where PHE is well-established, its recent growth has been striking.

Typically, PHE has grown up to provide:

- "something more – to meet student demand the public sector cannot expand to absorb, or cater for students poorly served by that sector *e.g.* older learners in work;
- "something better" – for those unhappy with the standards of mass public education;
- "something less rigorous" – for those unable to meet the academic standards set by selective public institutions;
- "something different" – specialised provision, religious affiliation (*e.g.* Catholic in Latin America and Europe, Muslim, Pentecostal in Africa), ethnic or nationalist context.

PHE is encouraged by governments who believe it will help meet rising demand for higher-level qualifications and/or challenge the public institutions to improve their market responsiveness and overall efficiency and effectiveness. In some countries, private growth occurred unexpectedly to governments, who then had to adjust their policies, regulatory regime and funding arrangements to accommodate it; for example, the People's Republic of China, Malaysia and South Africa changed their laws to recognise previously disallowed PHE.

In the **USA**, private institutions include some of the longest-established and most prestigious universities, such as Harvard, Stanford and Yale. These old-established private universities have large research and endowment funds so do not rely heavily on tuition fees. They are structured as "**non-profit**" institutions akin to charities and obtain tax advantages accordingly, even if business-like in their operations. The USA also has the largest and most developed "**for-profit**" (FP) sector in the world: of around 9 000 post-secondary institutions, nearly half are FP. The vast majority of US FPs provide for non-university students, although since the early 1990s, universities have taken the largest share of FP expansion and degree-granting places are increasing quickly. Several large US-based companies (*e.g.* Apollo, Laureate, Kaplan) have a worldwide presence, establishing campuses in other countries, purchasing existing foreign institutions, or marketing distance education curricula for international delivery. Corporate FPs are well-accepted in the US system, including by the non-profit universities who invest sizeable parts of their endowments in the larger FPs through stock purchases. However, some concerns have arisen over inappropriate student recruitment and retention practices; loss of local leadership, governance and collegiality when key decisions are taken in faraway corporate headquarters; loss of accountability when corporate FPs are bought out by private equity groups; and rising costs as expanded federal student aid allows FPs to raise their tuition fees and increase private profits at public expense.

The People's Republic of China decided to expand its HE provision radically in 1999. Private universities now account for about 6.6% of student enrolments, or about 1.34 million of the 20.2 million students enrolled in formal higher education in 2006. The major public universities in China have also set up second-tier colleges as income-generating extensions benefiting from the university's self-accrediting status. These are effectively private institutions and have enrolments of 1.47 million students, around 7.3% of the total. China's 1998 higher education law stipulates that private universities are legal persons (and able to possess private property) and its 2003 law allows 'a reasonable return on private school investment'. An earlier (2002) law requires that a board of trustees oversee university governance.

Malaysia also has a sizeable private sector, while several older private institutions make up the majority of overall provision in **Japan, Indonesia, the Philippines, South Korea and Taiwan**.

Japan, Belgium and the Netherlands all have religiously-founded private universities. These have received public grants in return for administrative, quality assurance and other controls and have become indistinguishable from the public universities.

In **Australia and New Zealand**, the role of the PHE sector to date is based largely on niche markets, in highly specialised areas of study, rather than mass provision. Mostly it is confined to management, commerce and IT and occurs more at the diploma and certificate level than at the degree and post-graduate degree level.

Middle Eastern countries which have seen new private provision introduced in recent years include **Egypt, Israel, Jordan, Oman, Saudi Arabia and Syria**.

Source: Roger King 'Private Universities: Models and Business Plans', strategy paper for Universities UK *(in press).*

The private tertiary sector contains both non-profit and for-profit institutions, though universities are forbidden by law from being for-profit. The review team suggests that this ban should be lifted. In principle, there is no reason why a non-profit institution would always provide better education than a for-profit one. There seems to be no logic in requiring universities, uniquely among educational institutions, to be non-profit. Some private universities are truly non-profit. Others are obviously commercial undertakings barely disguised as non-profit institutions. Legislation allowing private universities to be for profit, if properly designed, could bring these questionable practices into the open, and allow the profits to be properly taxed. Even if private universities do not get direct subsidies, they benefit from subsidies indirectly, via student aid and research funding or scholarships. Therefore all their financial transactions need to be transparent, demonstrating that resources, both public and private, are being properly used. Box 5.1 describes private higher education (non-profit and for-profit) around the world, and shows how certain countries have accommodated for-profit universities. The review team believes that it would be appropriate for Chile to do so too. Whether or under what conditions for-profit institutions should benefit from public funding is considered in Chapter 8 on Financing.

Recommendations

- Chile should move towards a higher education system that is more flexible and better articulated among the three existing types of institutions. The link between professional degrees and academic degrees (exemplified in the legal requirement of a *licenciatura* before obtaining certain professional degrees) should be eliminated. Chile should cease to have a closed list of 18, legally defined university level professional degrees, which have a *licenciatura* as a requisite and can only be granted by universities; and IPs should have the freedom to provide the degrees they are capable of offering, within a broad three-cycle framework similar to that of the Bologna process**.**
- There should be a clear separation between education degrees and professional licensing with the development of certification systems in fields related to health, technology and law.
- The current division between CRUCH and other universities is anachronistic, and should be allocated on the basis of the social functions they perform, under clear rules for eligibility: it should not

depend on whether or not they belong to the Council of Rectors, but on whether they perform social functions that deserve to be publicly supported. All Chile's universities and other tertiary institutions should be effectively represented and involved in discussions with government and in international co-operation.

- Central government should commission periodic strategic planning exercises, with the close involvement of the tertiary institutions, to assess whether the institutions collectively are producing the technical and professional competencies the country needs; paying proper attention to access and equity; conducting enough high quality research, relevant to the needs of society and the economy; and giving value for the public resources devoted to tertiary education.

- To enable tertiary institutions to combine in the best possible way the double requirements of institutional autonomy and public accountability, while preserving their diversity, changes in legislation and public policies should be introduced to achieve the following objectives:

  - The public nature of autonomous, state-owned universities should be based in the public-oriented or public-spirited nature of their work and their strategic goals, not in their formal adherence to the peculiar accounting and personnel administration regulations of the civil service.

  - Public universities should be encouraged to introduce modern management practices into their strategic planning and operations. They should also be allowed to recruit rectors and other academics from outside the ranks of university staff.

  - The corporate decision-making process in public universities should be streamlined: it should cease to be assumed that all academic staff represented on collective bodies participate directly in decision-making. Institutional governance and public accountability should be strengthened by giving seats on governing boards to other stakeholders representing civil society or employers. At the same time, accountability should be encouraged.

  - The law that prevents private universities operating on a for-profit basis should be replaced by new legislation allowing for the existence of for-profit institutions, side-by-side with non-profit and state-owned institutions, subject to clear rules of accountability.

– All tertiary institutions receiving any form of public support or subsidy, whether public or private, should be subject to the same accounting and transparency rules governing their use of these resources.

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Chapter 6. Quality

In this chapter, recent quality reforms including the introduction of institutional and programme accreditation are described. Their impact on institutions, public perception and the quality of teaching and learning is reviewed. Other aspects discussed are the quality of research, the quality of tertiary institutions' contribution to their communities, the quality of provision on outlying campuses, the uses and misuses of quality information and the quality of teacher training. The chapter concludes with a number of recommendations, covering both the accreditation system and teacher training.

The review team suggests that the accreditation system can become more effective if all tertiary education institutions participate, if the different missions and structural characteristics of different institutions are recognised, if core principles are more clearly set out and if upward pressure on quality is continued by establishing stricter benchmarks once most institutions gain accreditation. The chapter also considers how to improve the quality of teacher training and the quality and availability of sufficient numbers of teachers, especially in mathematics, physics and other sciences and languages. Recommendations are made on improving all aspects of quality.

Introduction

This chapter will consider Chile's quality assurance framework; the available evidence on the quality of Chilean tertiary education; and one specific aspect, the quality of teacher training undertaken by Chilean tertiary institutions.

Significant progress has been achieved in recent years in the development of a sound quality assurance framework for Chilean tertiary education. Chile has progressed from a regulatory and bureaucratic process based on a traditional concept of quality control of institutions and their

academic offerings, to a decentralised and semi-independent peer-review-based process of institutional and programme accreditation consistent with those existing in the most developed countries, although it still has peculiarities unique to Chile. There is now greater public awareness of the existence of a mechanism for differentiating the quality of institutions and their academic offerings. Tertiary education institutions – even those that resisted initially – have fully accepted the principle of external periodic peer review. Chile is to be congratulated for achieving these changes in two decades; in many other countries it has taken substantially longer to embed a similar approach to quality.

However, establishing and gaining acceptance for the principles of quality assurance is only a first step. The next step is to ensure that the quality assurance framework is effective in improving the real quality of institutions and their academic offerings, and that it will stimulate continuous innovation and improvement in the quality of the teaching and learning, academic research and outreach.

This chapter analyses recent quality-related developments in the Chilean tertiary education system, reflects on strengths and weaknesses, and makes some recommendations for further improvement.

From quality control to quality assurance and beyond

Analysing tertiary education anywhere in the world involves addressing three aspects: access, quality and relevance. Sometimes it is argued that improving one of these risks diminishing the others. For instance, it may be thought that the quality of the overall system will decline, at least in the short term, if a country decides to increase access to higher education; or that the quality of the system can only be increased by making it more selective; or that academic quality will suffer if courses and programmes are made more relevant to employers' needs, or if students are accepted because they have relevant skills and work experience rather than on strictly academic criteria.

The review team, however, sees access, quality and relevance as three sides of the same triangle. It is important to 'grow' the triangle while ensuring that each side is of equal length. The Background Report comments that one of the biggest current tensions within Chile's tertiary education system is "between coverage and guarantee of quality". Underlying this, the team suggests, is a now outdated current of opinion which assesses 'quality' in higher education by whether graduates continue to reach the same standards as their predecessors, having been through identical courses, identically taught. By definition, if more students from

more diverse backgrounds and constituting a wider slice of the academic ability range go to university, they will almost certainly not achieve the same average standards as before, particularly if their predecessors were selected for their ability to do well in the existing courses. But in a fast-developing world, where Chile's economic success requires half the young population to be taught to tertiary level and achieve tertiary qualifications, university programmes and university teaching cannot stay the same. Rather, they should evolve to cater for the different needs of today's more diverse students and to be relevant to today's labour market needs. High quality programmes, like high quality teaching, are both relevant and accessible.

The review team believes that tensions between quality, access and relevance can be resolved if the term 'quality' is properly understood, and if Chile benefits from international experience of the most effective ways to ensure and improve it.

At the international level, as shown in Table 6.1, many leading countries have been moving away from traditional quality control approaches (Type I) towards others more linked to quality assurance of their higher education systems (Type II, labelled "transitional"). In other cases, in addition to controlling and assuring quality, the approach adopted places a greater emphasis instead on fostering improved quality (Type III, labelled "hybrid"). Chile is unique in being positioned between Types II and III, so has been labelled Type IV. Chile, as indicated, can claim the important achievement of having established a quality system which has moved effectively from the traditional controlling approach towards a quality assurance-based approach. In this still relatively new system, as in other countries in a similar situation, this approach is expected to translate into an effective fostering of quality in the overall activities of institutions involved in the process, and, consequently, in the overall tertiary education system. It is too early however to claim that this ultimate goal has been fulfilled; responses from institutions and external stakeholders are still mixed, as might be expected.

Table 6.1 **Typology of tertiary education quality frameworks**

Variable / Type	Type I: Traditional	Type II: Transitional	Type III: Hybrid	Type IV: Chile
Emphasis on Quality	Quality Control (QC)	Quality Assurance (QA)	Quality Fostering (QF)	High on QC and QA. Low on QF
Level of intervention	Institutional	Academic offerings	Institutional and academic offerings	Institutional and academic offerings
Timing of intervention	*Ex ante facto*	*Ex post facto*	Both	Both
Major evaluation approach	Educational outcomes	Educational processes	Both	Both
Participatory approach	Mandatory	Voluntary	Both	Both
Applicability by institutional type	Either private OR public educational institutions	Private AND public educational institutions	Educational institutions and specialised accrediting agencies	Educational institutions and specialised accrediting agencies
Applicability by institutional level	Universities	Universities and some non-university institutions	All levels of the tertiary education system	Heavy on universities and still limited on CFTs and IPs
Level of government participation	Central government Agency	Independent. Non-governmental entity	Semi-autonomous	Semi-autonomous

Source: Adapted from Marmolejo (2005)

The Chilean tertiary education quality framework aims to cover the three main elements of a typical quality system: quality control (licensing or authorisation of institutions and/or academic programmes, based on a set of minimum criteria), quality assurance (assurance that a programme or institution is satisfactorily fulfilling its mission and objectives), and quality promotion (fostering a culture of self-evaluation and improvement in the day to day activities of an institution and in the offering of its academic programmes, as well as educating the society about the characteristics, limitations and benefits of quality and accreditation). This comprehensive approach contrasts with those adopted in other OECD countries, as shown in Table 6.2.

Table 6.2 **Tertiary education quality frameworks in selected OECD countries**

Country	Quality goal	Emphasis	Evaluation criteria
Chile	Control (QC)	Higher Education Institutions (HEI)	Institutional mission
	Assurance (QA)	Academic programmes (AP)	Profile of graduates
	Fostering (QF)	HEI	Self-regulatory mechanisms
Mexico	QF	HEI and AP	Peer evaluation system
	QF	Specialised Accrediting Agencies (SAA)	Certification of SAA
	QF	AP	SAA
Spain	QC	HEI and AP	Criteria and mechanisms established by central government and regional authorities
France	QC	HEI and AP	Institutional mission complemented by quality standards defined by the academic community
UK	QC	AP	Criteria agreed between QA Agency and government. Benchmarks of AP defined by specialists. Evaluation of minimum standards.
USA	QC	HEI	Institutional mission vs. criteria defined by accrediting agencies
	QC	AP	Criteria defined by specialised accrediting agencies and professional associations
	QA	Individuals in specific professions	Professional examination by government agencies

Source: Adapted from CNAP (2007)

Officially known as the National System of Quality Assurance (SNAC by its acronym in Spanish), the Chilean tertiary education quality assurance framework is composed of the National Higher Education Commission (CNES), which grants institutional licensing or authorisation, and the National Commission of Accreditation (CNA) which grants institutional accreditation; evaluates and grants authorisation to accrediting bodies specialised in specific academic fields; and grants accreditation of academic programmes in the absence of a specialised accrediting body. The system has existed in this form only since the beginning of 2007, when a new Quality Assurance Higher Education Law was promulgated. Under the new law, CNA was created. It largely assumed the functions conducted since 1999 by the National Commission for Accreditation of Undergraduate Programmes (CNAP) and the National Commission for Accreditation of Graduate Programmes (CONAP).

The accreditation process has three stages: (i) self assessment consisting of written reports; (ii) a peer review visit comprising meetings at different levels of the institution to check the reality of the self assessment, at the end of which the evaluation team issues an initial verbal report; and (iii) a written report which announces the decision.

By the time the new law was adopted, the results achieved by CNAP in terms of institutional accreditation and accreditation of academic programmes were impressive. CNAP designed the overall quality framework, including the development of evaluation criteria, desired academic profile of graduates, and training of peer evaluators. More importantly, and especially noteworthy considering that the accreditation process was voluntary, when CNAP ended its functions, a total of 55 institutions and 338 academic programmes had been accredited. At that time, 73.4% of the tertiary education students in Chile were enrolled in accredited institutions, and 6% were enrolled in institutions in the process of seeking accreditation.[1]

Since CNAP was merged into CNA, there has been additional movement in the system as institutions gained, renewed or lost accreditation. By April 2008, a total of 62 institutions were accredited, of which 44 were universities, 10 were IPs, seven were CFTs and one was a military academy. Nine universities, one IP and two CFTs had applied for and been denied accreditation (six of the universities have appealed against the CNA's decision). Decisions on a further two institutions (one university, one CFT and an IP) were pending.[2] In January 2008, over 80% of students were at

1. CNAP, 2007.

2. All figures in this paragraph are from CNA's Web site consulted on 1 April 2008.

accredited institutions[3] and 20.7% of undergraduate students were enrolled in accredited programmes.

One important outcome of the quality framework is that it has filtered out some low quality tertiary providers. Since its inception, a substantial number of tertiary education institutions have closed their doors, and some public institutions have been forced to make substantial changes.

The review team also found that the great majority of institutions had found the external scrutiny involved in accreditation peer review processes valuable, or at least salutary. Many felt that accreditation's core requirements (such as self-assessment and the need to collect information on graduate destinations) were a useful discipline and that their institutional management and teaching had benefited from going through the process. This was particularly true of the accredited CRUCH universities.

It is also now generally accepted that a sound quality system is critical to the future progress of Chile's tertiary education system; will be a key factor in positioning higher education to contribute importantly to national competitiveness; should translate into more effective and relevant research; and should force institutions to prepare graduates more appropriately to meet labour market needs.

Despite these advances, there is still a need to develop Chile's quality assurance and quality improvement framework further, making it stronger, more decentralised and more trustworthy.

The contribution of the MECESUP programme to quality improvement

An important contribution to improving the quality of Chilean tertiary education has been and is being made by the Programme to Improve Quality and Equity in Higher Education (MECESUP in its Spanish acronym), created by the Chilean government in 1997. The MECESUP programme supported the Government's policies for higher education reform initiated in the 1990's. In its first phase the programme supported reforms to the budget allocation process, through a competitive fund to promote quality and relevance; the development of the system for programme and institutional accreditation discussed above; the revitalisation of graduate education; investment in learning infrastructure; and reform of curricula and teaching and learning practices. Supported in part by a World Bank loan, the programme invested over USD 200 million in Chile's tertiary education system from 1997-2005.

3. Country Background Report.

A second phase of the programme, known as "MECESUP 2", has continued and expanded on the success of phase one. MECESUP 2 plans investments of over 90 million US$ from 2006-2009 in an improved regulatory framework for tertiary education (including the creation of a Higher Education Information System), the continued competitive allocation of funding for academic innovation, and the piloting of performance-based budgeting for tertiary institutions.

The Academic Innovation Fund has made hundreds of grants to support: (i) advanced human capital training, including the development of national PhD programmes and the strengthening of local and international networks for graduate education; (ii) renewal of the undergraduate curriculum, through investments in teaching staff, curriculum re-design, remediation of basic skills for students, and enhancement of the relevance of degree programmes; and (iii) academic innovation, to keep the teaching and learning process up to date through the incorporation of new technologies and pedagogical practices.

The pilot performance agreements foster institutional restructuring and modernisation and encourage the development of action plans to bring institutional practice in line with national needs and priorities. Marginal funding is provided as agreed targets are reached, rather than inputs being financed in advance. Four CRUCH universities, competitively selected, have and are implementing performance agreements.

The MECESUP programme is widely credited with having catalysed significant experimentation and change in Chilean tertiary education. Where there are new curricula, improved teaching and learning practices, budget and management innovations, enhanced faculty qualifications and institutional improvement plans, it is often thanks in some measure to innovations promoted and funded by MECESUP. The challenge for MECESUP now is to ensure the insertion and institutionalisation of its successful mechanisms into the Ministry of Education's comprehensive approach to the governance and management of tertiary education.

Quality of teaching, learning and taught courses

Probably the weakest element in Chile's quality framework for tertiary education continues to be the assurance and promotion of quality in undergraduate teaching. Chile is not unusual in this respect; other countries also find it difficult to show, with concrete evidence, how accreditation translates into the quality of undergraduate level teaching and learning. At the institutional level, it is clear that institutional leaders and administrators attach importance to quality in order to secure and maintain accreditation.

Although significant efforts have also been made to achieve programme accreditation, there is still limited concrete evidence that these efforts have involved or resulted in improvement of the teaching and learning process. This might be assumed, but the review team has not seen supporting evidence. However, it is encouraging to known that after accreditation, or because of it, most HEIs have developed 'graduate profiles' or expected learning outcomes; they have also started collecting data on graduation rates, actual length of programmes, and other output-oriented issues, largely ignored before accreditation. At the same time, many HEIs developed information systems and started moving from 'intuitive' decision-making towards evidence-based decisions.

A UNESCO report on higher education in Latin America[4] recognises that there is no consistent research demonstrating the positive benefits of accreditation processes at the institutional level. The report highlights the need to move from a "culture of evaluation" towards a "culture of a responsible, autonomous and efficient management of institutions", in which the evaluation, accreditation and quality assurance processes become permanent and embedded in the strategic and operational work of the institutions.

The Chilean quality assurance system intends to achieve this ultimate goal. However, during fieldwork visits to institutions, members of the review team often heard from academics and students that the pedagogical methodologies used in the classroom still tend to be very traditional, emphasising the memorisation of content, fostering individual rather than collaborative learning, relying on traditional tests of competencies. Only limited use is being made of student input: while it is not uncommon for students to be asked to provide feedback on teacher performance, it is rare for their views to be sought on the design and improvement of programme structures and course content. Institutions appear resistant to using ICT and distance education methodologies in support of the educational process, for example to make it easier to transfer credits from other levels of education and academic programmes, or to foster more learning activities outside the classroom, such as internships.[5]

Interestingly, institutional leaders, while recognising the need to develop more relevant and accessible curricula for academic programmes, suggest

4. Fernandez, 2006.

5. A report published by UNESCO shows that although almost a half of the universities belonging to CRUCH have developed some type of e-learning programmes, only one university in the country, UNIACC, provides an online qualification that is comparable with a professional degree. (UNESCO, 2007).

that the accreditation system itself impedes radical change. "We cannot innovate or be very creative, or we risk losing our accreditation" one rector argued. This perception appears to have some foundation in reality.

One institution visited by the team, which failed accreditation twice, was also dissatisfied with the process and the interpretation of the criteria. For this institution, accreditation has become very damaging both to the reputation of the institution and to the morale of the staff. At the start, they regarded the accreditation process as a useful means of installing a culture of self-evaluation, and embraced it enthusiastically. Having failed in the first round, management and faculty worked hard to remedy the weaknesses identified by the first round reviewers. In the second round, despite a favourable verbal report, the written was again negative. This institution felt that their peer evaluators were too focused on their own notion of quality; paid too little attention to objective quantitative indicators and were not wholly impartial. While the final result in this case may be justifiable, the institution's doubts about the transparency of the process and the objectivity of the criteria could be relatively easily addressed, thereby strengthening the entire quality system in future.

Accordingly, the review team believes that CNA needs to develop and tighten up its criteria, reducing the scope for subjective interpretation by peer reviewers. Although, understandably, the Chilean accreditation model aims to foster a comprehensive approach more oriented towards processes than to specific metrics of performance, vague definitions and criteria are nevertheless unhelpful, allowing reviewers to place excessive reliance on their own vision of a quality institution. It is particularly unfortunate if this occurs when CFTs and IPs are being reviewed by peers from universities. Although institutional leaders can object to the appointment of any reviewer, it may be more useful for CNA to do further work to ensure that criteria are appropriate to the different missions of IPs, CFTs, and indeed some universities who cater for less academic and more diverse student intakes, and to recruit reviewers knowledgeable about these institutions. Otherwise, there will continue to be doubts about the fairness of some accreditation verdicts, these doubts will not be unwarranted, and the credibility and integrity of the accreditation system will be put at risk.

As described in the Chapter 4 on Relevance, most Chilean university curricula have limited flexibility, which makes it difficult for them to adapt to meet new and foreseeable labour market needs. The curricula are also not readily adaptable to modern pedagogical practices such as defining and imparting skills and competencies. However there are some encouraging exceptions, where institutions and academic programmes have risen to this challenge; it would be helpful to disseminate their successful methods to other institutions. And in general, there is still only limited outside input into

the design and updating of academic programmes (particularly the updating). Institutions still lack reliable systems which would enable them to discover what knowledge and skills their students acquired in the time they spent at the institution, and which acquired competencies their graduates use subsequently.

It is right that the CNA's general evaluation criteria place emphasis on evaluating the effectiveness of the teaching-learning process, and introducing systematic follow-up of graduate destinations and outcomes. It is important for accreditors to look rigorously and critically at institutions' practice in these areas; peer reviewers should also be asking what institutions do with and learn from the follow-up information. In particular, they should ask how it is used to design and improve future programmes. It would be helpful for the CNA to lead the definition and implementation of common methodologies among institutions.

Other useful developments include the pioneering work done by the now defunct CNAP in defining benchmarks for *perfiles de egresados* (graduation standard profile) for a variety of academic programmes, as well as the work conducted under the "Tuning" project carried on in Chile and other Latin American countries. This follows similar projects in the European Union to define desirable competencies for graduates of various academic programmes. However, the major challenge will be to disseminate these models and to ensure that they are effectively used and evaluated in the classroom.

As indicated earlier, a variety of pilot projects to promote competency-based curricula have been implemented at the institutional level with the support of MECESUP. However, there is still a need for more evidence of real improvement of quality in classroom teaching, student learning and students' labour market outcomes. This will only come when academics understand the purpose of competency-based curricula and have the training and commitment to deliver it effectively. One professor told the review team: *"Now we have a novel fashion which is the competency-based curriculum, which is being highly publicised by the institution, but for which we were not properly trained, and which also assumes that students are eager and prepared to learn. At the end, nothing has changed since we keep teaching the same way and the students keep learning the same way. It is like a new suit being worn by the same old man."*

The need to have better assurance of quality at the level of teaching, learning and course design is critical. This is especially important considering that in the very competitive Chilean tertiary education sector some institutions make marketing-driven claims about the quality of their

educational offerings with no supporting evidence, which risks misleading prospective students.

Quality of research

Research is another element of institutional activity defined as an indicator of overall institutional quality by CNA. Not all higher education institutions conduct research, but in various institutional strategic plans and in government plans, research has been identified as a key pillar for the development of the country. The recent OECD review of Chilean innovation policy recognises the critical importance of higher education institutions in the research agenda of the country. The report stresses the need to provide greater support for research, but also recommends that university research should be more collaborative, more transparent and more open to evaluation of its effectiveness.[6]

While Bernasconi (2007) suggests that by international standards, no university in Chile can properly be called a research university, the quality framework for graduate programmes defined by CNA and its predecessor in graduate programmes, CONAP, has encouraged increasing awareness of and interest in research in some higher education institutions. In the accreditation system in Chile – as in other countries – it is assumed that a good graduate programme has academic staff with the highest credentials in the field, good students and, more importantly, good research. At the same time, government policies implemented by MINEDUC and CONICYT have been supporting the improvement of graduate credentials for faculty members, the establishment of national graduate programmes and increased funding for research.

As indicated in Chapter 7 on Research and Development, it is important to increase funding for research under a more clearly defined national (and corresponding regional) long term strategy. This requires clearer and more transparent procedures for the award of competitive funding support, and for the conduct and evaluation of the research itself. It is known that research supported by CONICYT follows strict peer review-based criteria to award financial support to proposals submitted by academic staff from institutions. However, it is not clear what process is followed by other funding agencies. Nor is it clear what requirements – if any – attach to the quality assurance and subsequent evaluation of funded research.

There is a clear need to establish a more transparent and accountable system, so that funders, the government and the public can see the quality

6. OECD, 2007.

and value for money they are getting from the research supported by them or on their behalf. There is no reason to fear that this would restrict the autonomy of scientific researchers or of the higher education institutions.

Quality of contribution to the community

The quality framework for tertiary education in Chile includes review of institutional involvement in public service activities beneficial to the surrounding communities. Tertiary institutions, especially the public universities, conduct a variety of activities in this area, but the review team could find little information about the mechanisms institutions use to assess and continuously improve the quality of their community service, cultural dissemination and outreach.

Though the effectiveness of such activity is always hard to measure, it is right to focus attention on it. In all areas of the world, tertiary education institutions are increasingly being expected to fulfil expanded roles and responsibilities, including greater regional engagement. They are also increasingly subject to scrutiny and calls for transparency, accountability and dialogue from internal and external stakeholders. Therefore their involvement in community service and outreach, like their teaching and research, should be conducted within a quality framework. It is encouraging that CNA has included some of the aforementioned components (linkages with the surrounding community, and continuing education) as part of the elective areas for institutional accreditation, in addition to the regular standards guiding the assessment of "extension", or community service. It would be helpful to develop further specific quality guidelines at the institutional level to help Chilean tertiary institutions in this work.

Quality at outlying campuses

In recent years many Chilean universities, both public and private, have responded to growing competition by opening new branches in one or more locations. This enables them to offer their services to increasing numbers of students in their own home towns or regions, and boost their fee revenue.

In principle it benefits students to have a broader range of educational options available locally. However, the proliferation of branch campuses, and the difficulties of supervising distant locations effectively for managers and administrators at the main campus, have raised quality concerns. The review team was told that there are often significant differences between the quality of the academic offerings at flagship central campuses and outlying campuses, which is sometimes an issue in accreditation.

The fact that the criteria for institutional accreditation explicitly require that self regulatory policies and mechanisms are in place at all levels, locations and modes of operation of the institution, confirms the need for institutions to have sound systems in place to ensure that they offer the same quality of academic programmes and institutional support at branch campuses as at central campuses. Nevertheless, although internal self-regulation is the ultimate goal, in the meantime, it may be necessary to have stricter licensing and accreditation measures to verify this. Public institutions could conduct a serious review of current operations in outlying campuses, to decline their long-term academic and financial sustainability; there may be advantages in merging with other local institutions. These measures could extend to Chilean institutions which have established operations in other countries, and also to foreign institutions which offer total or partial academic programmes in Chile, run in partnership with Chilean institutions or independently.

Chilean tertiary institutions rely overwhelmingly on publicity to position themselves in a very competitive tertiary education market and to attract local students. Publicity promotions naturally aim to stress the institution's strengths. The review team observed that accreditation status was used as a key marketing tool, often speciously. As one student said: *"We are really confused, since we live in a city in which suddenly we are inundated with a plethora of institutions, all of them claiming to be the best in the world, and all of them advertising in a vague way that they are accredited. In this scenario, it looks like being accredited doesn't make any difference anymore."*

One current problem is that the difference between institutional and programme accreditation is not always made clear. The public and potential students also seem uncertain what to make of the fact that some institutions get accreditation for more years than others. Although it was understandable that this distinction was used in the early days of accreditation, as a way of recognising different levels of institutional development, it might now or soon be desirable for CNA to consider dispensing with it. At the end of the day, what matters to students is if an institution is accredited or not, and if its academic programmes are accredited or not.

An additional source of confusion is that some institutions have explored or embarked on seeking accreditation from foreign accreditation agencies, mostly based in U.S regions. Although it is legitimate to seek validation of institutional quality from agencies abroad, it is less legitimate to present such accreditation as "international" accreditation – as institutional leaders sometimes do for marketing purposes – when in reality it is only foreign accreditation, with many elements not necessarily applicable or relevant to Chile.

Quality of teacher training

Teachers for primary and secondary schools are trained in tertiary education institutions. As much of the success and failure of students in higher education depend on the quality of primary and secondary education, training teachers in sufficient numbers and of good quality is crucial for the performance of higher education.

The 2004 OECD review of Chile's national education policy paid considerable attention to the status and the quality of primary and secondary teachers. The government has taken that review's recommendations seriously and is acting upon them. Yet serious questions are still being raised about the quality of large parts of the secondary (as well as the primary) school system in Chile. Many of the present review team's interlocutors identified similar problems to those noted in the 2004 review, relating to the way teachers are being trained and the conditions under which they are functioning in schools. Though several promising steps have been taken, some new developments seem to have exacerbated the problems. Many universities, for example, have closed their Faculties of Education, or restricted the course offerings to a limited number of subject teacher curricula. Though the present review team did not visit secondary schools and derives its information mainly from discussions with rectors, deans, academics and MINEDUC officials, the consensus is strong enough and the issue important enough for this review also to identify areas for consideration and action.

Though pre-school and primary school teachers are also educated at universities, this report concentrates on teachers for (upper) secondary school, who are also responsible for teaching subjects like mathematics and science in the last two years of primary school. The team's focus is also on the training of teachers who will work in the humanistic-scientific schools and streams: the large majority of teachers in the *Licéos Técnicos* do not have a university degree. They are often technicians who are offered some pedagogical training as part of MINEDUC's response to the recommendations of the 2004 review.

There are basically two ways to acquire the title of *profesor en educación media* in a certain subject at schools for humanistic-scientific education. One is through completing a programme in education with a certain specialisation *e.g.* in chemistry or English. These programmes are normally found in Faculties of Education of general universities or in the two specialised Pedagogical Universities (Universidad Metropolitana de Ciencias de la Educacion in Santiago and Universidad de Playa Ancha in Valparaiso – which also provides a few other professional programmes). These courses nominally last five years on average and have a heavy

emphasis on pedagogy and subject knowledge. They result in the student getting an academic degree (*licenciatura*) in education and a professional title of, for example, *profesor en educación média con química* (chemistry). The second way is to first obtain an academic subject degree, say in mathematics, and then enrol in a nominally 1 to 2-year programme, usually in the Faculty of Education but at the University of Chile in the Faculty of Philosophy and Humanities. By far the largest number of teachers has chosen the first path. To give just one illustration: the Catholic University of Chile, which only provides the second route, trains at most three physics teachers per year.

The 2004 review recommended increasing teacher training capacity in subjects such as language, mathematics, sciences and social studies, and encouraging faculties or schools of education to interact and collaborate more closely with other faculties in the universities. More practice work was suggested, with good mentor teachers in schools. Rigorous evaluation of the theoretical and practical work of students was deemed necessary, in particular of their content knowledge and ability to teach the required curriculum.

The review also recommended putting quality assurance mechanisms in place. One of these should be mandatory accreditation for teacher education programmes. There should also be quality controls on initial teacher training programmes offered through distance learning, which had been found to be often of poor quality. Another issue to which attention was drawn concerned the need for teachers to be able to teach a diverse range of students with different social backgrounds and learning abilities, in such a way that achievement gaps between groups were narrowed rather than perpetuated. More special education teachers and remedial teachers were proposed. As regards continuing professional development, the recommendation was to move away from general pedagogical training towards helping teachers to develop the skills to teach specific subject matter.

MINEDUC has acted on these recommendations. Programmes offered through distance training have been discouraged. The mandatory accreditation has been introduced: to be able to teach in publicly-funded schools, graduates must have been through accredited teacher training programmes. A qualification test, to be taken by students before graduation, was introduced at the end of 2008: the test was devised in collaboration with the universities and the *Colegio de Profesores* (the largest teacher union). The possibility of developing standards for competence in working with diverse and mixed ability classes is being investigated. Teaching practice in schools is now being introduced more widely, and tutors and mentors for new teachers are being discussed and sometimes introduced. Remedial programmes to upgrade the skills of existing teachers are under

development. As an example, MINEDUC is working on a specialisation for primary school teachers in Grades 7 and 8 in four areas – mathematics, sciences, languages and social studies – through postgraduate programmes. Mandatory evaluation of active teachers has been introduced in a well thought-through way and with clear but fair sanctions focusing on improving performance; but only at public schools.

It has been only four years since the 2004 review and changes in teacher training practice and teaching quality do not happen overnight. Yet a number of the 2004 concerns remain, and are sufficiently serious for this review team to recommend that MINEDUC and the universities accelerate and intensify their efforts to improve teacher training. Points strongly made to the team during fieldwork visits included: the need for more attention to subject matter content during training; the lack of effective control of teacher training programme quality; shortages in teachers for the science subjects and for languages; and the general need to boost the status of teachers and teacher training. The diminishing number of students taking the educational route after their subject degree is an issue of considerable concern. Better preparation of teachers to work with pupils from very different backgrounds and with mixed abilities is crucial, if students' educational futures are to cease being determined by their socio-economic backgrounds.

Findings and recommendations

Chile's current system of quality assurance in tertiary education has brought important benefits, but still has some limitations and faces some challenges. The review team makes the following recommendations.

Accreditation

- Though institutional accreditation is currently voluntary, all tertiary institutions should be strongly encouraged to prepare for and seek it. This is recommended to ensure that all tertiary institutions are seen to be well-managed organisations offering quality and value to their students; that as many students as possible are eligible for financial support, where accreditation is a condition of that support; and that all public funds spent on subsidising students are well spent. Most universities have already sought accreditation, but only about 50% of all autonomous IPs and CFTs have.

- Institutional accreditation criteria, and the way they are interpreted by peer reviewers, should be appropriate to the nature of the institutions seeking accreditation, and flexible enough to accommodate their different missions, while sticking to certain core principles. There are a range of different missions even among universities. Those universities which focus on undergraduate teaching should not be expected to have the same proportion of teachers with higher degrees as those which focus on research. Those tertiary institutions of any kind which cater for lifelong learners or specialise in upgrading skills previously acquired should not be penalised for admitting students with lower academic attainment.

- The core accreditation requirements for all tertiary institutions should include effective management, high teaching and learning standards, competence-based teaching methods appropriate to course objectives and the needs of the institution's students, employer involvement in programme decisions and course design, and good survival rates and graduate outcomes, ensured *inter alia* by following up and acting on information from former students.

- The CNA should give priority to further development of the quality assurance framework, building in criteria appropriate to every type of tertiary institution; greater participation of the employers' sector in both institutional and programme accreditation; greater buy-in from students; fuller public information to ensure greater awareness of what 'accredited' means; and international comparability. To ensure that all tertiary institutions have confidence in the accreditation system, the CNA also needs to reduce the risk of inappropriate or biased peer review reports, by more careful selection and more intensive training of peer reviewers and introducing regular appraisal of their work.

- Once most institutions in the system obtain accreditation, it will be important to "raise the bar" by establishing stricter benchmarks. Otherwise, the accreditation system may become a less relevant and less effective means of improving quality.

- For programme accreditation, it will be important to identify and introduce a wider range of independent accrediting agencies. Professional associations could have an important role.

Teacher training

Useful steps have been taken in the right direction since the 2004 OECD review commented on the need to improve teacher training, but efforts must be intensified. The review team's recommendations are as follows:

- Although teacher training already benefits from increased budgets, the scale and pace of change needs to be stepped up, which will require larger, more comprehensive improvement programmes and substantially higher spending.

- The quality and the availability of sufficient numbers of teachers should be as important for MINEDUC as the quality and quantity of medical doctors and nurses is for the Ministry of Health: they are in a way the Ministry's own workforce. Therefore MINEDUC should not hesitate to take a much higher profile on these issues. It should develop coherent policies and devise a concrete medium- and long-term action plan, to meet attainable but ambitious targets. The numbers of high-calibre subject teachers, especially in mathematics, physics and other sciences and languages, need to be greatly increased. This will involve promoting greater collaboration between faculties of education and subject faculties in universities.

- Communications between the various stakeholders (Ministry, universities, the teacher unions, etc…) are increasing, based on a shared feeling that teacher training must be improved. This presents an opportunity for MINEDUC to get other stakeholders' input and build consensus with them on the action plan recommended above. The review team understands that a Committee of rectors, deans and teachers from the public and the private educational sectors, chaired by the rector of one of the pedagogical universities, agreed in 2005 on the diagnosis. Such a committee, which apparently still exists, could be an important change agent, if sufficiently empowered by the Ministry.

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Chapter 7. Research and Development

This chapter discusses the importance of research and innovation in Chile. It analyses the growth of research in recent years, and the relative contributions of government and the private sector to research spending and research performance. It considers research in higher education: which institutions carry it out, its impact, strengths and weaknesses, and how university research might be developed. The chapter also looks at research funding and funding trends; at the research policy framework; at ensuring longer-term support for centres of excellence or regional centres; and at international research co-operation.

The chapter concludes with a number of recommendations for improvement, including on: using expected increases in funding for research to find a good balance between funding a broad science base and supporting strategic priority areas, both for economic and public sector development; moving towards fewer, larger and more targeted funding instruments; tilting the balance of funding more towards centres of excellence, regional centres and infrastructure, away from projects; promoting more differentiation so that different higher education institutions may pursue different missions, not always including research; and clarifying responsibilities for defining, co-ordinating and implementing policy within Chile's science, technology and innovation system.

Introduction: the need for research and development, and their relation to innovation

Innovation (developing and exploiting for commercial or society's use new products, processes, services, infrastructures, etc) is vital for the success of companies and economies, as well as for increasing the quality of life and social well-being. Innovation is the result of technological change, which is a major driver of economic growth, in combination with many other changes, *e.g.* in organisational design, management methods, marketing concepts, financial techniques and policy approaches. Technological change

and many of the other developments mentioned rest increasingly on scientific research in the natural, engineering and medical sciences, and today to a greater extent than ever in the social sciences and humanities.

Research and development therefore fulfil several functions. Through them new technologies are developed, and knowledge is acquired about how to use and adapt existing technologies worldwide to improve the economic performance of companies. Research also addresses key needs of society: health and the environment are just two obvious examples. A third crucial role for research is to help train high level professionals not only to be the next generation researchers, but also to apply research and to manage knowledge and contribute to informed debate more generally throughout society.

Chile currently spends approximately 0.7% of its GDP on R&D, of which 0.25% is spent in companies.[1] Most of the non-company research is carried out in universities. A number of research institutes dependent on ministries exist, but carry out little research. They are doing tests or are involved in other technology services, lacking the tradition and resources to engage in research proper. The international astronomical observatories also account for quite a bit of research.

There is an increasing recognition in the Chilean government that further investment in research, development and innovation is necessary if Chile is to maintain its economic and social progress. This will require substantial public and private investment. In advanced economies government shares of total R&D expenditure vary from as low as 25% to 50%. It is a widespread view that 35 or 40% would represent a reasonable figure. All over the world private companies have insufficient incentives to provide the level of spending on research that modern economies need: the benefits are uncertain, can take a long time to accrue and are often difficult to appropriate. Social benefits outweigh private ones for large parts of research. This is true for Chile as well. In Chile today, however, the problem is not so much the balance between public and enterprise investment – data suggest that enterprise recently surpassed public expenditure on R&D. The problem rather is that the absolute level of investment of both sectors is too low for a country of Chile's GDP and aspirations. So in Chile the enterprise sector will have to step up its efforts. However, the government cannot escape the need to increase its research spending either.

1. *Consejo Nacional de Innovación para la Competitividad (2008), Hacia una estrategia nacional de Innovación para la Competitividad, Volumen II*. It should be noted that the latest available figure (2004) for how much enterprises spent was rather larger, at 0.32%, but data may not be completely accurate.

Research and development in Chile

R&D expenditure in Chile has been going up since the late nineties, and rapidly since 2002. Total expenditure on R&D in Chile has developed as shown in Table 7.1

Table 7.1 **R&D Expenditure, Chile**

	1997	1998	1999	2000	2001	2002	2003	2004
GERD in million USD	407.5	396.5	370.5	394.9	360.1	457.8	494.1	633.7
GERD in billion CLP	170.9	182.5	188.6	213.1	228.8	315.6	341.2	392.9
% of GDP	0.49	0.50	0.51	0.53	0.53	0.68	0.67	0.68

Source: RICYT

A few comments are in order here. The first is about currencies. For reasons of international comparison one is often inclined to refer to amounts expressed in USD. As Table 7.1 shows, that may distort reality. The exchange rate has been fluctuating dramatically: from about CLP 450 to the USD in early 1998, up to 750 at the beginning of 2003, down to 430 at present. Secondly, part of the apparent rise may have to do with measurement problems. It is for example not unlikely that business expenditure on R&D has been underestimated considerably in the past, and that only since 2002 and 2003 have more comprehensive data become available. The sudden increases in 2002 and 2003, especially in R&D personnel, are hard to explain otherwise.

Tables 7.2 and 7.3 show how R&D financing and performance[2] are distributed by sector.

2. 'Financing' (sometimes the rather confusing term 'spending' is used) and 'performing' are standard terms used in R&D statistics. 'Financing' indicates how much money a sector itself invests in R&D, irrespective of whether the research is carried out by the sector itself; 'performing' indicates how much R&D it carries out, irrespective of the source of funding. In most countries the higher education sector spends relatively little of its own resources on R&D, but carries out substantial amounts, usually financed largely by the government.

Table 7.2 **R&D Expenditure: by financing sector in billion CLP and shares of total (%)**

	1997	1998	1999	2000	2001	2002	2003	2004
Government	117.9	131.8	137.5	149.9	157.5	172.4	147.6	175.0
	(69)	*(72.2)*	*(72.9)*	*(70.3)*	*(68.9)*	*(54.6)*	*(43.2)*	*(44.5)*
Enterprises	27.3	29.6	32.3	49.1	57.0	104.9	148.5	179.4
	(16)	*(16.2)*	*(17.1)*	*(23.0)*	*(24.9)*	*(33.2)*	*(43.5)*	*(45.7)*
Higher Education						1.4	2.8	3.1
						(0.4)	*(0.8)*	*(0.8)*
Non-profit Organisations	14.7	11.3	8.9	4.1	4.8	1.0	1.4	1.3
	(8.6)	*(6.2)*	*(4.7)*	*(1.9)*	*(2.1)*	*(0.3)*	*(0.4)*	*(0.3)*
Foreign	10.9	9.9	10.0	10.1	9.4	35.8	40.9	34.1
	(6.4)	*(5.4)*	*(5.3)*	*(4.7)*	*(4.1)*	*(11.4)*	*(12.0)*	*(8.7)*

Source: RICYT

Table 7.3 **R&D Expenditure: by performing sector in billion CLP and shares of total (%)**

	1997	1998	1999	2000	2001	2002	2003	2004
Government	67.3	72.1	71.1	86.1	92.4	34.7	38.6	40.1
	(39.4)	*(39.5)*	*(37.7)*	*(40.4)*	*(40.4)*	*(11)*	*(11.3)*	*(10.2)*
Enterprises	18.5	19.3	20.6	31.8	34.1	113.0	150.5	181.1
	(10.8)	*(10.6)*	*(10.9)*	*(14.9)*	*(14.9)*	*(35.8)*	*(44.1)*	*(46.1)*
Higher Education	83.4	89.4	95.2	93.3	100.2	122.5	100.7	125.7
	(48.8)	*(49)*	*(50.5)*	*(43.8)*	*(43.8)*	*(38.8)*	*(29.5)*	*(32)*
Non-profit Organisations	1.5	1.5	1.7	1.9	2.1	45.1	51.9	46.0
	(0.9)	*(0.8)*	*(0.9)*	*(0.9)*	*(0.9)*	*(14.3)*	*(15.2)*	*(11.7)*
Foreign	0	0	0	0	0	0	0	0
	(0)	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*	*(0)*

Source: RICYT

From these sector figures it seems clear that in several sectors, data before and after 2002 are difficult to compare: the enterprise sector's steep increase beginning in 2002 being one example, the sharp decline in the share of the government's institutes performing R&D another. The remarkable one-year only decline in the government's expenditure in 2003 also raises questions of data reliability. The sudden increase in foreign investments in R&D in Chile, together with a corresponding rise in non-profit organisations performing R&D, may very well reflect that since 2003, foreign investments in and research carried out by the international astronomical facilities in Chile have been properly taken into account.[3] No official data are yet available for 2005 and later years, so official figures do not yet show the substantial increase in government expenditure in the last three years, notably through the Innovation Fund.

The apparent problems with the data clearly underline the importance of establishing an observatory to gather and analyse statistical data on R&D that is supported by and serves all stakeholders.

However, one fact that seems to stand out is that enterprises, which include some public enterprises, now spend as much, and probably more, on R&D than the government does. That does not square with the generally held view that public resources still account for most of Chilean R&D, and that universities carry out most of the research in Chile.[4] From data on where R&D money is actually spent, it is clear that there is very little public money going directly into the enterprise sector: enterprises themselves largely pay for the research and development they carry out. Chile's situation is somewhat exceptional in this regard, but this review of tertiary education is not the place to go into more detail on how governments nowadays are willing to boost enterprise investment in R&D, increasingly through tax relief (*e.g.* for wages for R&D personnel), strategic programmes or mechanisms such as the US Small Business Innovation Research programme.

As already noted, the real problem is that both public and enterprise investments in R&D are way below what one should expect for a country with Chile's GDP growth rate and ambition. Table 7.4 illustrates some key

3. RICYT's State of the Science report (2007) notes that information on enterprise R&D is based on surveys answered on a voluntary basis.

4. The March 2008 report of the Presidential Advisory Council on Higher Education still mentions that universities carry out 80% of all research in Chile, and the remainder in the astronomical facilities, some government laboratories and enterprises. The total number of researchers quoted in this report is at 3 500, however, much smaller than the 2004 figure of 18 365 CONICYT gives.

international comparisons. With a very few exceptions not shown here (Luxembourg and some oil-rich Arab states), countries with Gross National Income per capita above USD 10 000 spend at least 1% of their GDP on R&D. Many countries with much lower GNI per capita, such as China, spend more than this because they are convinced that, together with education, R&D is one of the basic conditions for long-term growth.

Table 7.4 **Gross expenditure on R&D as % of GDP**

Countries	R&D as % of GDP, (2005 or latest available year)	GNI per capita[1]
Finland	3.5	37 530
Japan	3.3	38 950
Korea	3.0	15 840
US	2.6	43 560
OECD Average	2.3	
EU27	1.7	
Czech Republic	1,3	11 220
People's Republic of China	1.3	1 740
Spain	1.1	25 250
Russia	1.1	4 460
Estonia	1.0	9 060
Brazil (2004)	0.9	3 550 (2005)
India (2004)	0.7	730
Chile (2004)	**0.6**	**5 870**
Mexico	0.5	7 310
Argentina	0.5	4 470
Colombia	0.5	2 290

Note: 1. World Bank data: Gross National Income calculated using the ATLAS method

Source: World Bank, 2005.

RICYT also has data on the R&D expenditure on socio-economic objectives, but these are sparse and unreliable. The latest are from 2001, and show that 14.5% is spent on exploration of the earth, 23.1% on agricultural technology and 46.2% on non-oriented research. That 0% goes to health research probably reflects the poor data rather than reality.

According to RICYT, Chilean expenditure on R&D amounted to 5.9% of the overall expenditure on R&D in Latin America in 2005,[5] up from 4.2%

5. Chile's figure may be 2004 rather than 2005.

in 1996. This compares with 2005 figures of 53.8% for Brazil and 26.1% for Mexico. Argentina had fallen back to 6.2% as a consequence of the economic crisis in the late nineties, and the other countries represented 7.9%. In terms of manpower the situation is somewhat different, but statistical differences (*e.g.* counting heads or FTEs) as well as differences in purchasing power may explain why Chile accounts for 8.1% of the manpower, Brazil for 48.2%, Argentina for 15.1% and Mexico for 20.8%.

RICYT data on human resources in R&D are shown in Table 7.5, but like the data on expenditure, they raise questions. The sudden rise of the R&D manpower from 2002 to 2003, in particular, probably indicates that more comprehensive data became available from 2003 onwards. But it is clear that the enterprise sector has become the major player.

Table 7.5 **R&D personnel: total numbers and sector shares of researchers in FTE (%)**

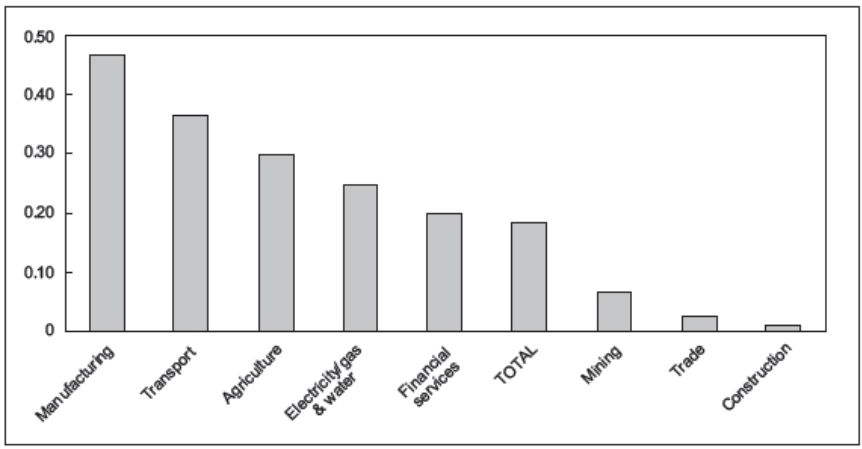
	1997	1998	1999	2000	2001	2002	2003	2004
Researchers, headcount	5 959	6 008	5 970	6 105	6 382	8 507	17 212	18 365
Technicians, headcount	5 072	5 325	5 919	6 083	6 060		11 008	12 218
Researchers, FTE	5 278	5 439	5 549	5 629	5 712	6 942	12 322	13 427
Technicians, FTE	3 956	4 154	4 617	4 745	4 727		7 783	8 262
Researchers, FTE, in:								
Government						514	419	550
						(7.4)	*(3.4)*	*(4.1)*
Enterprises						986	6 802	7 532
						(14.2)	*(55.2)*	*(56.1)*
Higher Education						5019	4 621	4 552
						(72.3)	*(37.5)*	*(33.9)*
Non-profit Organisations						423	493	779
						(6.1)	*(4.0)*	*(5.8)*

Source: RICYT; the numbers per sector are calculated on the basis of percentages available at RICYT

Companies are, as mentioned before, now responsible for performing much of Chilean research and development. Of course, development dominates, and the overall amount of R&D is still small. The 2007 OECD *Review of Innovation Policy* has dealt extensively with whatever data are available on enterprise R&D, so there is no need to go into detail here. But, as linking universities and government institutes to the enterprise sector is increasingly an issue, it is worth giving an insight into the R&D efforts in

various economic sectors. Figure 7.1 is a copy of a figure from OECD's Innovation Policy review with information on the R&D intensity (R&D expenditure as percentage of net sales) in Chile's main economic sectors.

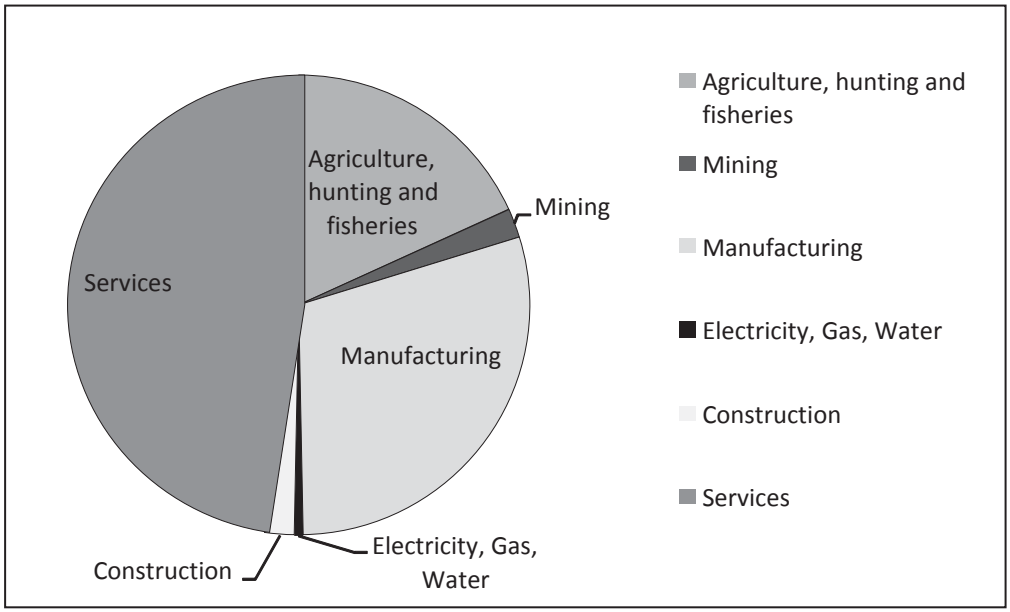
Figure 7.1 **R&D in Chile's main economic sectors**



Source: Ministry of Economy

Figure 7.2 shows how the 2004 expenditure on R&D by enterprise, some CLP 180 billion, is distributed over the various business sectors. It demonstrates that R&D spending is heavily concentrated in three sectors: agriculture, hunting and fisheries, manufacturing and services. (Services include transport, financial services and trade – shown separately in Figure 7.1).

Figure 7.2 **R&D expenditure of various sectors (2004)**



Source: CONICYT

Chile's share of services in overall enterprise R&D is remarkable. The OECD average is 28%. It is true that upcoming economies tend to have a larger share of enterprise R&D in the service sector than the traditional industrialised countries, but almost 50% is very high. As much of the R&D in the service sector is likely to relate to ICT, could it be that the recent more inclusive accounting of enterprise R&D is accompanied by some problems in drawing the line between ICT investments in which are research and development, and investments which are not? This is just one of the questions which need to be answered before the information in these tables can be used as a spur to future action. Other questions relate to seemingly low R&D intensity in all sectors listed, but particularly manufacturing and utilities, compared to OECD averages; and the very low figure for the mining sector, which may suggest over-reliance on foreign companies for technology inputs.

Research in Chilean universities is heavily concentrated in a small number of them. Andrés Bernasconi[6] compared the five biggest (in terms of ISI publications over the years 2001-2003), as in Table 7.6.

Table 7.6 **Profile of the five biggest research-oriented universities in Chile, 2004**

Indicator	University of Chile	Catholic University of Chile	University of Concepción	University of Santiago	University of Austral	Average
Students						
Numbers[1]	26 470	19 829	18 411	17 555	9 295	18 312
High scorers[2] (%)	94	94	51	75	41	71
Graduates[3] (%)	11.7	10.0	5.1	3.2	3.9	6.8
PhDs conferred[10]	50	37	34	8	5	27
Faculty (2003)						
Numbers[4]	3 392	2 349	1 430	2 425	784	2 076
Fulltime[5](%)	35.9	43.4	57.1	25.0	67.2	45.7
PhDs[6] (%)	20.7	48.9[11]	25.5	13.9	22.6	26.3
Fulltime PhDs[7] (%)	34.3	71.6[11]	40.8	38.8	31.7	43.4
Research						
Projects[8]	569	393	222	157	95	287
Publications[9]	2 322	1 432	928	546	376	1 121

Notes:

1. total enrolment, undergraduates and graduates
2. % of freshmen among the 27 500 students with the best scores in the PSU
3. proportion of graduate students in total enrolments
4. total headcount
5. the proportion of faculty who are full-time
6. the proportion of faculty with a PhD degree
7. the proportion of full-time faculty who are PhD holders
8. "Projects" are externally funded and competitively assigned research grants
9. the sum of all the ISI-indexed articles published in the previous three years
10. number of PhD degrees conferred in 2003

6. A. Bernasconi, *Are there Research Universities in Chile?* In: Philip G. Altbach & Jorge Balán. 2007. 'World Class Worldwide. Transforming Research Universities in Asia and Latin America'. Baltimore: Johns Hopkins University Press, pp. 234-259.

11. includes faculty with a medical specialization degree – if those are excluded, the proportion of Catholic University of Chile faculty with doctorates reported by *Qué Pasa* (2004) is 29.7%, and full-time faculty with PhDs is 47%.

Sources: (1) and (3) *Consejo Superior de Educación* (2004); (2) *Departamento de Medición, Registro y Evaluación* (DEMRE), Universidad de Chile (2005), for the class of 2004; (4), (5), (6), (7), and (10) (data for 2003) from CRUCH (2003); (8) and (9) *El Mercurio* (2004).

Many universities, however, have now started to engage in research, and though the first three in Table 7.5 still dominate the scene, some others are beginning to catch up with the fourth and fifth. In 2007 the University of Chile counts about 900 publications annually, the Catholic University some 600 and the University of Concepción around 500, whereas the University Federico Santa Maria and the University Católica del Norte produce between 120 and 140.

Many available statistics do not yet show this more recent engagement in research, as for 2005 and later on, very few comparative data are available. Table 7.7 shows for example the publications numbers of the 15 universities that are most active in research for a period of four years, ending in 2004.

Table 7.7 **Publications 2001-2004, by the most research-active universities**

University of Chile	3123
Catholic University of Chile	1975
University of Concepción	1237
University of Santiago	725
Austral University I	527
Federico Santa María University	293
Catholic University of Valparaíso	247
Católica del Norte University	226
University of La Frontera	216
University of Valparaíso	131
University of Antofagasta	139
University of Talca	99
University Andrés Bello	82
University of Los Lagos	66
University of La Serena	70

Source: Chilean Academy of Science, *Análisis y Proyecciones de la Ciencia Chilena 2005*

Table 7.8, giving data on the number of PhD programmes and degrees conferred in 2004, also shows great differences; though again it should be borne in mind that later figures might tell another story.

Table 7.8 **Total numbers of PhD programmes (of which in science) and of PhDs conferred, 2004**

	Programmes	Degrees
University of Chile	33 (23)	89
Catholic University of Chile	25 (16)	60
University of Concepción	17 (14)	40
Catholic University of Concepción	7 (4)	8
Federico Santa María University	4 (4)	0
University of Santiago	10 (9)	17
Austral University	6 (5)	17
University of La Frontera	3 (3)	0
Católica del Norte University	4 (2)	0
University of Valparaiso	2 (1)	0
Technological Metropolitan University	8 (4)	0
University of Talca	2 (2)	0
Andrés Bello University	4 (4)	1
University of La Serena	1 (0)	6

Source: Chilean Academy of Science, *Análisis y Proyecciones de la Ciencia Chilena 2005*

In the same publication as provided the figures for Table 7.8, the Academy of Science also gave some useful comparisons to estimate the quality of research in various disciplines. The review team compiled Table 7.9 on the basis of data from Tables 4.1 – 4.9 of this Academy Report,[7] which are derived from the standard databases for doing scientometrics, most of which are part of Thomson Scientific (formerly the ISI). Impact is defined as the number of citations received by all the papers with at least one author working in a Chilean institution, published during the specified period in a given discipline. The Chilean impact is in the first place

7. The team has not used the impact measured by what the Academy calls the Index of Attraction. It is not clear how this Index is calculated, and its results contradict the impact as indicated in Tables 4.1 – 4. 9. For example astronomy fares quite well in Chile with an impact slightly above world average. But the Index of Attraction leads to an impact 16.6 times as large as the global average.

compared to the impact data for the US and the EU. Taking their average gives quite a good approximation of the world average, as they account for 80% or more of all the world's publications. A comparison is also given with Latin America as a whole.

Table 7.9 **Impact of Chile in various disciplines, compared to US, EU and Latin America**

Discipline	Impact Chile	Impact US	Impact EU	Impact LA
Mathematics	2.7	4.1	3.1	2.4
Physics	6.1	11.9	7.8	4.8
Chemistry	4.1	13.1	9.7	4.8
Astronomy	14.8	14.9	12.9	11.0
Ecology, environmental and aquatic sciences	4.4	9.0	7.6	4.8
Biomedical sciences	9.0	19.7	17.9	5.5
Earth sciences	6.0	12.0	8.4	5.4
Agricultural, animal husbandry sciences	2.1	6.4	5.1	2.5
Engineering sciences	2.8	4.9	3.6	2.5

Source: Review team on the basis of Academy of Science data 2004

On this evidence, the quality of Chilean research is rather good. In most areas it is better than the Latin American average, and in a few areas it is on a par with the world's best.

The third category of organisations performing research is government institutes. There are 13 of these, including the *Fundación Chile* (CLP 1.9 billion per annum) which promotes innovation and the training of manpower, rather than carrying out research itself. The largest ones in terms of R&D efforts are the Institute for Agricultural Research INIA (CLP 7.2 billion per annum), the National Geological and Mining Survey SERNAGEOMÍN (CLP 4.1 billion per annum) and the Chilean Nuclear Energy Commission CCHEN (CLP 4.0 billion per annum). The amounts in brackets are their R&D budgets for 2004. Overall, the annual budget for all the institutes together was rather stable in the years up to 2004 at about CLP 24 billion per annum. Most of them provide technology services rather than carrying out research, so there may be statistical inaccuracies here.

For astronomical research in universities the presence of several of the world's most powerful telescopes in the Andes is of course a major opportunity. The following list of them illustrates how attractive Chile's conditions are for world-class astronomy:

- VLT at Cerro Paranal (Europe's ESO);

- The telescopes at La Silla (ESO);
- GEMINI-South at Cerro Pachón (US, UK, Canada, Australia, Argentina, Brazil, Chile);
- Cerro Tololo Inter-American Observatory, consisting of several telescopes at Cerro Tololo (operated by the US Association of Universities for Research in Astronomy AURA);
- Southern Observatory for Astronomical Research at Cerro Pachón (AURA);
- ALMA (US, Canada, ESO, East Asia, Spain);
- APEX (German Max Planck Gesellschaft, Sweden, ESO).

Funding science and technological development, especially in higher education

Funding for research and development in the higher education sector in Chile comes largely through CONICYT. CONICYT's total 2007 budget amounted to CLP 90 billion, up from 48 billion in 2004. The recently created Innovation Fund, active since 2006, has been funding, among others, several CONICYT programmes such as the *Programa de Financiamente Basal* for Centres of Excellence. In total CLP 24.6 billion out of CONICYT's overall 2007 budget of some CLP 91 billion comes from the Innovation Fund. The Second Volume of the Innovation Strategy,[8] released in March 2008 by the National Innovation and Competitiveness Commission, may give an indication of how it will be used in the future.

CONICYT has developed a large number of funding instruments. Currently there are 11, most of them with a number of sub-programmes. The two major research and development competitive funds are the Science and Technology Development Fund (*Fondo para el Desarrollo de la Investigación Científica y Tecnológica*, FONDECYT), for basic research, and the Fund for the Promotion of Scientific and Technological Development (*Fondo de Fomento al Desarrollo Científico y Tecnológico*, FONDEF), for technological research and development. The budget for FONDECYT was rather stable in real terms (Chilean pesos of 2004) between 1999 and 2005 at between CLP 19 and 21 billion per annum, and has since risen to CLP 33 billion (running currency) for 2008.

8. See ref 1.

Universities are virtually the sole beneficiaries of FONDECYT and FONDEF; they received 100% and 99.6% of the awards from these two funds during 2000-2004. Of the total funds awarded to universities by FONDECYT in 2000-2005, the University of Chile received 36.7%, the Catholic University of Chile 21.7% and the University of Concepción 10.6%. Of this 27.75% went to the other CRUCH universities, making 96.75% to CRUCH universities in all, though three received less than 0.1%. Only 3.25% went to private universities, but some of these did better than some CRUCH universities. FONDEF awards in the same period were similarly concentrated on the CRUCH universities, who gained 97.8% of the funds, with six receiving 65% of the funds between them.

Table 7.10 provides an overview of all 11 CONICYT programmes with their 2007 and 2008 budgets. Together with CONICYT's own operational costs of some CLP 5 billion these add up to an overall budget of around CLP 91 billion in 2007.

Table 7.10 **CONICYT programmes**

		Budget 2007 (CLP billion)	Budget 2008 (CLP billion)
FONDECYT	Core programme funding individual research projects	26.0	33.1
FONDEF	Applied research, pre-competitive development, technology transfer; university-industry co-operation	12.2	12.4
FONDAP	Centres of Excellence in priority areas, including units for valorisation	4.9	4.5
EXPLORA	Presenting science to society at large throughout the country	3.3	1.9
Financiamenta Basal	Basic infrastructure funding for Centres of Excellence	9.1	6.4
Programa Bicentenario	Improving the Science, Technology and Innovation system; strengthening science base; industry-university linkages	18.8	9.3
Programa Astronomía	Research in astronomy	0.6	0.6
Programa Regional	Regional research centres jointly with regional governments	2.4	2.6
Becas for postgraduates (note: there are many other *Becas* schemes)	Grants to follow PhD and Masters education in Chile and abroad or mixed; as well as complementary funding for *e.g.* printing thesis, conference visits	8.4	13.6
Relaciones Internacionales	International co-operation	0.3	0.6
Información CyT	Access to scientific information	0.1	0.2

Source: CONICYT

To underline both the domination of a few universities and the rising power of others, the distribution of the 2007 CONICYT's FONDECYT and FONDEF funds in Table 7.11 is illuminating.

Table 7.11 shows that the first three universities are still dominant, but that a second category of universities is forming. It also shows that, so far, outside the CRUCH universities Andrés Bello is the only serious candidate to join the club of Chilean research universities.

Table 7.11 **2007 FONDECYT and FONDEF awards (CLP billions)**

Institution	FONDECYT	FONDEF	Total
CRUCH universities (first twelve)			
University of Chile	7.2	1.9	9.1
Catholic University of Chile	4.8	1.4	6.2
University of Concepción	2.5	1.8	4.3
University of Austral	1.5	0.7	2.2
University of Santiago	1.6	0.4	2.0
Catholic University of Valparaíso	0.9	0.3	1.2
Católica del Norte University	0.6	0.5	1.1
Federico Santa Maria University	0.6	0.4	1.0
University of Los Lagos	0.1	0.8	1.0
Arturo Prat University	0.1	0.9	1.0
University of La Frontera	0.4	0.3	0.7
University of Antofagasta	0.3	0.4	0.7
Non-CRUCH universities (first two)			
Andrés Bello University	0.4	0.1	0.5
Universidad del Desarollo	0.1	0.0	0.2
Not-for-profit or government institutes (first two)			
Instituto de Investigaciones Agropecuarias (INIA)	0.1	0.3	0.4
Centro de Estudios Científicos	0.3	-	0.3

Source: CONICYT

A second source of funding for research at universities comes from whatever universities are able to set aside from their AFD and AFI allowances (where universities receive this support) or tuition fees. Outside these there is no direct government funding of the basic infrastructure for research; though salaries of professors are probably largely covered through these mechanisms. There is a CONICYT estimate of how much of the AFD

is spent on average on R&D. The Academy of Science report cited earlier quotes a figure of 58.6%. This would mean that in 2004, out of a total of CLP 107.3 billion, about CLP 62.9 billion was spent on R&D, which was at the time of the same order as CONICYT's budget. Of this, according to the same Academy report, 41% represents basic research, 47% applied research and 12% experimental development.

There is, however, no information on how the expenditure, income or academic staff time of individual universities is split between teaching and research. Even state universities are not obliged to provide this information to MINEDUC or to the public.

The third, much smaller, source is CORFO, the agency for supporting enterprises in a variety of ways, including promoting innovation, technology transfer and entrepreneurship, under the Ministry of the Economy. CORFO has combined all its instruments to promote innovation in the INNOVAChile programme.[9] Most programmes of INNOVAChile are targeted at companies. However one programme, Innovation Projects of Public Interest, targets universities and government institutes and agencies; and another one, Pre-competitive Innovation Projects, is focused exclusively on universities. This last programme spends some CLP 13 billion per annum for pre-competitive research in universities. INNOVAChile announced in early April 2008 the results of its last competition for both Public Interest and the Precompetitive Innovation Projects. Of the total amount of CLP 20.8 billion, 13.6 billion will go to 38 university projects. INNOVAChile's total 2007 budget amounted to CLP 37 billion.

A recent law introduced a 35% tax deduction for company research done by universities or research institutes. They account for only a small proportion of expenditure on research and development (about CLP 3 billion) and these tax measures will not be discussed further in this report as they have been dealt with in OECD's 2007 review of Chile's Innovation Policy.

In addition to funding through CONICYT, the AFD/AFI contributions and CORFO, two major additional programmes (co-funded by the World Bank) have contributed to funding R&D. The first is MECESUP, though its focus is on higher education generally rather than research specifically. The second is the Millennium Science Initiative, which is exclusively for research. More recently the Bicentennial Science and Technology Programme (PBCT), operated by CONICYT and also co-funded by the World Bank, has become operational.

9. CORFO (2008), Logros 2007 y Prioridades 2008.

Universities can benefit as well from some other, much smaller programmes. One example is the Foundation for Innovation in Agriculture which funded projects (not all of them research) worth a total of CLP 22.4 billion between 1996 and 2006.[10] Another is the Fund for Fisheries Research, whose 2007 budget amounted to some CLP 4 billion.[11]

The Ministry of Development and Planning runs two grant programmes dedicated to support for PhDs and Masters training. One is for studying in Chile, the other, the *Becas Presidente*, for studying abroad. Table 7.12 shows the total number of grants awarded over the past three years.

Table 7.12 **MIDEPLAN Postgraduate Scholarships (*Becas Presidente*)**

	2005	2006	2007
National grants	108	113	130
International grants	130	191	300

Source: MIDEPLAN

A major change has been the establishment of the Innovation Fund in 2006. It accounts to a great extent for the increases in CONICIYT's budget in 2007 and 2008. The Innovation Fund is sourced by a new tax on copper exports. The Fund is not operated by a separate organisation. The Innovation Council advises on the key programmes, existing ones or new ones, on which the budget should be spent. Conditions are specified. As an example, CONICYT's *Financiamente Basal* programme, which is funded completely from the Innovation Fund, requires CONICYT to sign agreements with three ministries: the Ministry of Finance, of the Economy, and of Education. A significant part of the Innovation Fund's 2007 budget of CLP 52 billion went to CONICYT, *i.e.* some CLP 25 billion. Other beneficiaries include CORFO, and especially its INNOVAChile program. The Innovation Fund's budget is increasing rapidly: the 2008 budget is CLP 80.9 billion.

It is worth noting that in Chile, as in many countries, the word 'innovation' is very freely used; a somewhat confusing array of initiatives is the result. In Chile there is INNOVAChile, a programme operated by CORFO. From 2001 till 2005 there was a programme of the Ministry of the Economy called *Chile Innova*, managed by CORFO, CONICYT, FIA (the Foundation for Innovation in Agriculture), the National Normalisation Institute and Intec (the Corporation for Technological Research in Chile).

10. http://mauriciolorca.blogspot.com/2006/12/fundacin-para-la-innovacin-agraria.html

11. www.fip.cl

The most recent additions are the Innovation Fund, which acts basically as a source of funds for a variety of existing or new programmes of other organisations such as CORFO or CONICYT, and the Innovation Council.

Trends in research funding

Two trends stand out. One is concerned with funding research centres and groups, the other with promoting industry-university co-operation. This report has described several interesting initiatives, but the review team wonders whether these are sufficiently driven by a long-term vision on what a funding system should provide. Many programmes or sub-programmes are rather small, and some funding does not seem to be sustainable, for example for the *Bicentenario* programme.

Within basic research, the recent focus has been on developing critical mass and research excellence by focusing on research centres or groups. The Advanced Priority Areas Research Fund Centres of Excellence Programme (FONDAP) concentrates on priority areas. A total of seven centres received funding until 2006. The Millennium Scientific Initiative (ICM), managed by the Ministry of Planning with the objective of strengthening human science and technology research capacity, aims at training up teams to international levels of academic and scientific excellence. There have been six competitions to create Scientific Institutes and Units in which these teams will work, resulting in five Institutes (two of which are funded through the Innovation Fund) and 15 nuclei in the natural and exact sciences, plus seven nuclei in the social sciences created in late 2007 which now receive public funds on the basis of the projects presented. Of the fifteen nuclei in the natural and exact sciences, five are funded by MIDEPLAN, eight through the *Programa Bicentenario* and two through the Innovation Fund, illustrating that the ICM Programme has succeeded in activating Chilean funding sources to provide for expansion and sustainability. The emphasis is on young scientists developing activities and innovation projects linked to strategic development areas, which is a very sensible and forward-looking way to go.

The recent *Programa Finaciamente Basal*, funded through the Innovation Fund, is meant to finance centres of excellence for longer periods, five years renewable for another five years. Seven centres were announced in early 2008. Though different in purpose, it was explicitly designed to build on the experience obtained in the ICM Programme.

Recent Chilean governments have also aimed to support science and technology and innovation with programmes to promote collaboration between highly skilled researchers and firms. Relevant programmes include

the Bicentennial Science and Technology Programme (PBCT), started in 2003. Managed by CONICYT with partial funding from a World Bank loan, it aims to help guide the country toward a knowledge economy and society, through investment in science, innovation, integration with the enterprise sector and scientific and technological networks. One component is a Programme for Enterprises Technological Research Consortia, which subsidises large or medium-sized research teams involving universities, research institutes and enterprises. Another is the Researchers in Industry Programme, which aims to increase the stock of highly qualified research personnel in Chilean industry by financing doctoral scholarships for students doing industry-based theses or research; some 42 firms have been assisted in this way to develop innovative solutions to improve business competitiveness. A third component is the International Co-operative Research Programme, a competitive fund to promote international collaboration with the best national and industrial researchers. The various components seem to address useful targets, but though it is too early for a comprehensive assessment of results, the review team again suspects that efforts and funding are being spread too thinly. The overall amount for the whole Bicentennial programme is now only 10% of CONICYT's budget and declining rapidly (by 50% between 2007 and 2008).

Another example, also aimed at creating critical mass, is the CONICYT-managed Programme for Regional Centres of Scientific and Technological Development, of which the Mining Science and Technology Research Centre in Antofagasta is an example. There are now 13 Regional Centres operational, but the review team found the CONICYT amounts available for this programme rather small for it to have a real impact.

CONICYT's *Programa de Consorcios Tecnologícos Empresariales de Investigación* is part of a broader effort to stimulate technological consortia involving enterprises. CORFO's INNOVAChile Programme and the Foundation for Innovation in Agriculture (FIA) of the Ministry of Agriculture also promote the establishment of such consortia, which can, but do not need to, involve universities. CONICYT currently supports five Enterprise Technological Consortia, but many more exist.

As already mentioned, the Corporation for the Promotion of Production (CORFO) has combined all its instruments to promote innovation in the INNOVAChile programme, which is focused on providing special funding to encourage business innovation. One particular programme, the pre-competitive research programme, is targeted at universities. Another one, the programme for Innovations of Public Interest, is open to universities and government institutes and agencies.

Towards a better research funding system

The review team's analysis points to three major issues. First, national policy does not attempt to strike a balance between funding a broad science base and supporting strategic priority areas: this is not even the subject of informed discussion in Chile. Secondly, it would be more efficient and effective to have fewer, larger, more targeted funding instruments. And thirdly, there is a need for more funding of basic infrastructure (buildings, equipment, consumables, critical mass of staff); infrastructure funding, as opposed to funding of projects or programmes, is relatively neglected in Chile.

CONICYT has not so far introduced priority areas for its research projects (such as CODECYT), or for PhD or Masters training grants, or for the grants for centres of excellence or research groups. FONDAP centres are meant to be for priority areas, but the identification of these areas does not seem to be based on a genuine strategic discussion. CORFO has adopted a limited form of priority setting. Of course, the absence of formal priorities does not mean that all research performed is just blue sky research, nor that all PhDs trained will find themselves jobless on the labour market. But Chile would undoubtedly benefit from a more strategic approach. Economic sector priorities, public sector priorities, areas of national academic strength such as astronomy, and the development of a strong and broad science base, should all be supported by a mixture of funding opportunities for free academic research and funding for strategic priority areas. This support should come not only through projects but increasingly through programmes.

With the establishment of Chile's National Innovation Council the debate on strategic economic priorities has accelerated considerably. The Innovation Council has proposed eight clusters, on the basis of worldwide market opportunities over the next 10 to 15 years and the capabilities in Chile. These clusters are: mining, aquaculture, niche tourism, food processing, fruit culture, offshoring (not in the sense of offshore marine technologies, but offering global services), pig and poultry husbandry and financial services.[12] If there is a consensus in Chile that much of the

12. A discussion is ongoing in Chile about the appropriateness of building policy on clusters. Much of that discussion is based on a narrow interpretation of clusters, namely as geographically very concentrated groups of companies, assisted by other organisations in that same region. Sometimes that is the case; on other occasions clusters may represent a national strength where companies benefit from co-ordination or collaboration or both. The review team understands that the Innovation Council uses this broader and more flexible interpretation of clusters.

economic development over the next ten years will be found in these sectors, they would seem to be a natural focal point for more strategic research, development and innovation policies. Of course there are other natural focal points: first, public sector priorities such as health or energy or water; secondly, those generic, enabling areas of science and technology that serve not only other priority areas but also economy and society at large – ICT, life sciences and material sciences are all examples; and thirdly, opportunity areas such as astronomy, for which Chile just happens to have ideal conditions. Every country must find its own best mix of economic and public sector priorities, facilitating basic science, creating special opportunities, and supporting both exceptional established scientists and promising young researchers. It is one of the essential goals of science policy to make sure that at any time human resource development and funding opportunities fit this mix. If this is done well, the focal points suggested above offer Chile a stable but flexible set of drivers for developing its research, development and innovation capacities.

The review team is clear that there are currently too many instruments for funding research and development in Chile. They can overlap considerably, even within one organisation (for example programmes aimed at university-industry co-operation or at centres of excellence), and many of them are quite small. In short, there seems to be too much readiness to 'innovate' in creating new ones. Science funding needs to be planned taking a medium- and long-term view, therefore funding instruments should be reasonably stable. Clear and transparent procedures are needed, as well as clear criteria showing who, or which organisations, are eligible to submit proposals. To ensure sound scientific research, the criteria should also stipulate what environment a researcher or a team should be working in. The review team was informed that a consultant is currently considering the relations between the funding instruments of CONICYT and CORFO. This should be a thorough exercise and be followed up by government action after an extensive dialogue with stakeholders. It should also be done in close co-operation with the Innovation Council, so as to fit into medium- and longer-term plans for the Innovation Fund.

If the science base is to be built up, and sustainable support for strategic priorities created, institutions must be able to maintain an infrastructure for science. Funds must be available for building and maintaining laboratories, for buying and maintaining and updating equipment including computers, and for key scientific and technical personnel. Until recently the funding system in Chile did not provide for these sorts of investments. Universities had to finance them in whatever way they could. Only very few have managed to do so, and even they have problems getting funds for equipment.

MECESUP has been the major investor in scientific infrastructure in the country over the past decade or so. CONICYT has been funding research centres or groups for some seven years. The regional centres are based on joint funding by CONICYT and a regional government, for exploiting regional strengths and specialisations. This is an excellent idea, and it is good that CONICYT recognises the need for more investment in these centres, for the review team heard concerns that these centres are as yet fairly virtual and their activities sometimes concentrated on co-ordination. Seven FONDAP-funded centres have come into operation since 2000. The ICM centres and nuclei have already been mentioned. Very recently eight Centres of Excellence have been announced under a new programme, the *Financiamento Basal*. There does seem to be considerable overlap between all these instruments for funding centres and groups. CONICYT should perhaps look again at the need for all the present mechanisms, and seek agreement with the Innovation Council and the government on a longer-term funding perspective for funding centres of excellence, including small and medium-sized equipment. The criteria could incorporate priority areas.

Restructuring of the funding mechanisms could not only remove duplication but also fill gaps – for example, it would be useful to introduce a funding mechanism to enable universities to buy the more expensive scientific equipment, provided they make it accessible to researchers from other universities, on a regional basis or more widely. As funding for research would then expand, it could be worthwhile to request CONICYT to set up a Task Force to consider which very expensive pieces of equipment warranting a national approach, would be priority items for the next five to ten years. The Task Force could also consider which organisational structure(s) would be best suited to making sure that all qualified researchers in the country can use this equipment. An example is the new research vessel bought and operated by the Chilean Navy, which will be accessible to all researchers in the fields of oceanography and fisheries.

The review team's recommendations on funding for higher education institutions are in Chapter 8, but whether or not these can be fully implemented, the team believes that it is important in future to focus funding for scientific infrastructure on a limited number of research-active universities. This requires modifications to the existing funding model, as well a mechanism to determine which universities have good claims to be doing worthwhile, quality research. In the meantime, CONICYT is the appropriate body to ensure a good balance between longer-term investment in research centres of excellence, and shorter-term investments in projects and PhD training. Including a certain percentage for overhead costs in project grants could also assist universities to maintain an infrastructure for research.

Research policy framework and responsibilities

Policy responsibility for science is formally vested in CONICYT. It is not yet a formal responsibility of one Minister, though CONICYT of course reports to the Minister of Education. Other ministries, for the economy or for agriculture for example, are responsible for technology development for their sectors. The establishment of the National Innovation Council marks an important change, and its recent recommendations[13] go a long way towards a more differentiated but at the same time more co-ordinated governance system for science, technology and innovation.

Responsibility for key areas within science, technology and innovation needs to be allocated to specific ministers or state secretaries. International experience shows that this can be done in different ways. A combination of higher education and science and technology is frequently found, with innovation normally explicitly or implicitly added. One example is England, where for some time responsibility for science and innovation was vested in the Department of Trade and Industry, whereas responsibility for all education, including higher education and university research, lay with the Department of Education. However, very recently, a new Department of Innovation, Universities and Skills was created, combining responsibilities for science and innovation, higher education and adult skills training.

Following the recommendation of the Innovation Council, the review team thinks it very important to reach a clear conclusion on the allocation of these responsibilities in Chile. The debate on where these responsibilities should lie must extend beyond government, to take into account the views of all stakeholders, such as universities and other tertiary sector institutions, CONICYT, CORFO and the private sector. Whatever the allocation chosen, a co-ordination mechanism must be put in place, consisting at least of the ministers most directly concerned with science, technology and innovation.

Identifying the policy responsibilities should go hand in hand with a clearer separation between policy and implementation responsibility. CONICYT and CORFO should be positioned firmly in the implementation domain, and should operate within broad policy guidelines established at government level; though of course they should have input when the policy guidelines are being developed.

The three major challenges a new governance system will face have already been identified. One is to establish a policy framework, based on establishing key economic and public sector priority areas and deciding how

13. Consejo Nacional de Innovación para la Competetividad (2008), *Hacia una estrategia nacional de Innovación para la Competetividad,* Volumen II.

these will be supported by a strong, broad science base. The second task is to review current funding instruments and move towards an efficient, transparent and diverse set of instruments with minimal overlap. This exercise should include all the current instruments in science, technology and innovation operated by CONICYT and CORFO, as well as the smaller funds, notably in agriculture and fisheries. The Innovation Fund should not be used to consider every year whether new instruments need to be added, but rather to provide a longer-term funding perspective for a stable set of funding instruments. That leads to the third and overarching task. There should be agreement on a medium- to long-term budgetary plan for investing in research and innovation, in order to sustain the growth that the system has witnessed over the past years by enabling institutions to build their own planning on this foundation.

Policies must be evidence-based. Initially the evidence available may have to be confined to the inputs to research, development and innovation, but international efforts are under way to extend the evidence base to throughputs and outputs. The Chilean system needs to develop such output-based data as well. CONICYT has made a start in the context of the *Bicentenario* Programme with establishing an observatory, KAWAX, to gather information on science, technology and innovation. This is an important initiative but CONICYT should ensure that it will really be a national endeavour, supported by and working for the benefit of all stakeholders in science, technology and innovation.

Developing university research

Many Chilean universities have begun to develop research activities. For most of them, however, as shown earlier in this chapter, research is not only new, but a small part of their overall efforts.

It is important to keep in mind international comparisons, which add realism and identify the magnitude of the challenge Chilean universities as well as the government face. There is no doubt that high quality is found in several places. But even the four universities dominating the scene in Chile are at a distance from research universities in advanced economies, for reasons which include lack of funding and the still rather low number of PhD holders among staff. This is reflected in their output, for example publications in ISI journals. In 2007, the Chilean university with the highest number of such publications achieved 900; and the highest number of PhDs awarded by any university was 70. At the lower end, one university reports around 50 publications and the granting of four PhD degrees. By contrast, also in 2007, the University of Leiden, a well-known European research university in the Netherlands with student numbers similar to major Chilean

universities, counts 5 500 scientific publications and awarded some 300 PhD degrees.

Overall, Chilean universities awarded some 500 PhD degrees in 2007.[14] In addition quite a few Chileans pursue a PhD degree abroad. An indication of the numbers is given by the relative share of CONICYT PhD grants for study in Chile and for study abroad.[15] In 2007 CONICYT-supported students accounted for 420 PhD degrees granted in Chile, compared to 170 abroad. The comparable figures for 2006 were 320 and 190, suggesting that more PhD degrees were granted within the country in 2007. CONICYT estimates that its grants account for about 80% of all PhD students from Chile, the remainder having come from MECESUP. However, there is a small number of grants for following a PhD training in Chile awarded by MIDEPLAN (14 in the 2006/2007 round) as well as grants for doing a PhD abroad, also awarded by MIDEPLAN. The latter are the *Becas Presidente de la República* of which in 2005/2006 some 70% concerned PhDs. As the number of *Becas Presidente de la República* has risen rapidly recently (from 130 in 2005 to 300 in 2007) one may expect that within a few years the number of foreign PhD degrees conferred on Chilean students will rise considerably as well. Assuming that the current number is about 70, one arrives at an estimate of 550 PhDs trained in Chile and some 250 abroad. To put that figure in perspective: universities in the Netherlands, a country with the same population as Chile (16.5 million), awarded 3 000 PhD degrees in 2005. So on the one hand Chile is still at a much lower level, but on the other hand the number of PhDs awarded is rising rapidly. Though the balance between PhDs trained in the country and those trained abroad is shifting towards training in the country, it is worth repeating Chapter 4's warning that Chile's use of limited resources to send students abroad is not very efficient (many agencies providing support, no clear link between fields of study and institutional/national priorities for development, etc.). In addition, there are no clear policies to attract these students back to the country afterwards: other countries have developed 'repatriation schemes'. In late 2008, after the review team finished their fieldwork, an ambitious new programme was launched by the Ministry of Education, called *Becas Chile*. If this scheme achieves its aims of supporting 30 000 graduate students abroad over ten years, this will reverse the proportion of PhDs in Chile and abroad. While such a scheme can be useful as a way of co-ordinating many smaller programmes, it should not detract from

14. Note, however, that in a presentation of December 4 2008 for the Brazilian Academy of Science Jorge E. Allende provides a detailed overview of how many PhDs each of the Chilean universities conferred. The total adds up to only 287.

15. Personal communication CONICYT.

strengthening and multiplying PhD programmes within Chile. Without such programmes Chilean universities will not be able to retain the best PhDs, whether trained in Chile or abroad.

Another indicator of research output is the number of patents granted to staff of various universities. Table 7.13 shows this for the five universities with the most patents: at the head of the table is a university not in the top five for research publications, indicating that different institutions emphasise different aspects.

Table 7.13 **Number of patents granted to selected universities**

University	2006	2003-2006
Federico Santa Maria University	7	30
University of Concepción	2	28
University of Chile	6	15
Catholic University of Chile	0	15
University of Santiago	1	9

Source: Universidad Técnica Federico Santa Maria

Differences in universities' research activity and focus may also arise as a result of regional activity or opportunities. Some, for example, are near major mining centres and able to undertake research in collaboration with major mining industry employers. Others are near major horticulture areas, or valleys where the wine industry is prominent, or in desert areas with potential for research on water problems or agriculture in arid conditions. Often regional and local governments are keen to work with universities on special subjects of economic or cultural importance to the region. Dedicated training opportunities, assistance from industry experts in providing state-of-the art inputs into training, internships, joint research or private sector involvement in creating science parks are among the many benefits such specialisation generates. Universities, companies and the national and regional governments are strongly advised to continue moving in this direction wherever such opportunities exist.

The pattern that arises is one of a very large number of universities with very considerable differences in research activity. Still many have an ambition to increase their efforts, some of them stimulated by a desire to play a regional role. Against this background, a key issue for the future development of Chilean tertiary education institutions is the need for each institution to establish what position or niche it aspires to occupy. There are several roles to choose between. Some universities may have the ambition to become research universities, but it is not sustainable for all universities to do this. Of all the 4 392 institutions of higher education in the US, only 282

qualify as research universities, and of these the top 200 account for 95% of all the research carried out in the higher education sector.

Some universities may want to limit their research efforts to a few areas of regional relevance. Others may want to provide high quality undergraduate education, with or without also providing graduate education. Cross-cutting through these categories, one may find universities focusing on technology, and others aiming to be broad-based.

Finding their niche will be a difficult process for Chilean universities, and they will need guidance from the government. The Chilean government has a tradition of arms-length governance of higher education, but clearly needs to become involved if research and quality research-based PhD training are to acquire the necessary critical mass. This process could be stimulated if CONICYT provided significant and long-term competitive funds to finance university research centres; but consensus needs to be established first, on the principle of having a range of universities with a range of missions. Helping institutions to find and develop their respective niches may also aid decentralisation and regional development.

Those universities who want to become research universities will need to raise the numbers of PhDs among their key staff quite significantly. Some universities already have clear policies in place. A reasonable if stretching aim would be for at least 80-90% of full-time and part-time staff to have a PhD in ten years time. CONICYT might build into its PhD support programme a sub-component to address this issue.

International co-operation

International co-operation is vital to every modern university. As already described in Chapters 4 and 6, this is recognised widely in Chile. The following observations concentrate on international co-operation for the purposes of research.

The international astronomical observatories, which in the past operated rather separately, nowadays have meaningful collaborations with several universities in Chile. These help them to drive up quality and make connections with the international scientific community. They also provide experience with the most advanced instruments, computers and electronics to be found anywhere in the world. Also, Chile has now a partnership agreement with the EU which enables Chilean scientists to participate with European counterparts in the EU's Seventh Framework Programme.

CONICYT has quite a few agreements with foreign organisations engaging in student exchange or offering PhD opportunities in their

countries. Examples are the Fulbright programme, the German DAAD (*Deutsche Akademische Austauschdienst*) and the French Foreign Ministry. CONICYT also has a special funding scheme to promote internationalisation.

On the policy side Chile is already involved in the OECD programmes in higher education and science, technology and industry, providing exposure to experiences in science, technology and higher education policies worldwide. The newly established observatory for information on science, technology and innovation is part of a network of several well-known observatories of a similar nature.

One can only welcome these and other initiatives and encourage universities, organisations such as CONICYT and the government to continue investing in international relations at all levels, and to develop a well thought-through strategy in pursuing them. There should be a clear purpose. For example, one university identified one foreign research institute or university for each of its own faculties or institutes. Effective collaborations were subsequently established with each of them, for staff development, joint research projects and other activities.

The dialogue between the government, universities and CONICYT might fruitfully discuss additional initiatives in specific areas, such as increasing the number of PhD holders among full-time and part-time staff at universities. This might be done by sending staff abroad for at least part of their PhD training. It is also worth investigating the possibility of creating a Latin American equivalent of the European Erasmus programme. This programme, supported by the European Union, provides financial support for students wishing to spend a semester at a university elsewhere in the EU. A third possibility might be for CONICYT, in assessing proposals for supporting research centres, to incorporate international linkages as one of the decisive criteria.

Recommendations

- A better balance must be found between funding a broad science base and supporting strategic priority areas. To help this to happen, strategic priorities should be defined. Natural focal points are the clusters proposed by the Innovation Council; public sector priorities; generic, enabling areas of science and technology (ICT, life sciences, material sciences, key areas in social sciences and humanities); and areas where the country is already strong, such as astronomy.

- It would be more efficient and effective to have fewer, larger, more targeted funding instruments. There are too many funding instruments, with a considerable degree of overlap, to promote industry-university linkages, PhD training grants and support for research centres; and some of them are too small. It is necessary to review, restructure, simplify and concentrate the funding mechanisms of CONICYT, CORFO, MIDEPLAN and others. The aim should also be to achieve a better balance between longer-term investment in centres of excellence, and investments in projects and PhD training. This review of the funding instruments should involve an extensive dialogue with stakeholders, and close co-operation with the Innovation Council so as to fit with the medium- and longer-term plans for the Innovation Fund.

- To fill present gaps, a mechanism should be introduced for funding universities' more expensive scientific equipment, on condition that they allow other universities to use it too. It would also be helpful to include overhead costs in project grants, to help universities to maintain an infrastructure for research.

- The balance between funding basic infrastructure, and funding projects or programmes, needs to be tilted more in favour of infrastructure funding. To help achieve more stable funding for research infrastructure, a limited number of potential research universities should be identified, some of which may well focus on regional priorities, and changes should be made in existing funding models. Individual institutions should decide what position and mission they aspire to, with guidance from the government. Those not aiming for research university status may want to provide high quality undergraduate education, or limit research efforts to a few areas of regional relevance, or focus on particular subject areas such as technology.

- Policy and implementation responsibilities for key areas within the science and technology domain should be clearly allocated to specific ministers**,** having taken the views of all stakeholders into account. A co-ordination mechanism allowing a fair representation of all interests and responsibilities must be put in place. Better evidence on research, development and innovation outputs should be developed, to help guide policy-making.

Chapter 8. Financing

This chapter examines the availability of financial resources for tertiary education and the impact of the innovative financing reforms that Chile has implemented in recent years. Financing is discussed from aspects such as resource mobilisation, utilisation and allocation. The equity of the financing system, particularly as regards funding for disadvantaged students, has already been considered in Chapter 3.

The chapter closes with a series of findings and recommendations, including recommendations addressing the need to (i) design a long-term vision outlining the role of the government in tertiary education funding, (ii) increase public funding for tertiary education on both equity and quality grounds, and (iii) harmonise existing allocation mechanisms to eliminate the present funding discrimination between CRUCH and non-CRUCH institutions.

Introduction

The continuous expansion and modernisation of the Chilean tertiary education system is dependent on the availability of financial resources and the existence of allocation methods that encourage innovative behaviour among tertiary education institutions. In this context, it is worth observing that Chile has implemented several first generation reforms that no other Latin American country – not even many Western European countries – have managed to put in place. Indeed, the introduction of substantial tuition fees in public universities, the rapid growth of private tertiary education, the use of innovative allocation mechanisms such as the voucher-like AFI (*Aporte Finscal Indirecto* – Indirect Public Grant), the competitive fund for quality improvement and the performance contracts, and the establishment of the guaranteed student loan programme in partnership with private banks are path-breaking reforms that put Chile among the small group of nations with a sophisticated financing architecture. To assess the impact and

coherence of these financing reforms, this chapter examines the following dimensions:

- Resource mobilisation: is Chile investing sufficiently at the tertiary education level?
- Resource allocation: are public resources distributed in a manner that encourages innovation and rewards performance?
- Resource utilisation: are available resources used in an effective manner?

Bearing in mind that Chile is about to become a member of the OECD, this chapter relies as much, for benchmarking purposes, on comparisons with industrial countries as with Latin American nations.

Resource mobilisation

Public funding

Chile opted many years ago for a mixed funding approach to education, whereby budgetary resources would be complemented by significant contributions from students and their families. Thus, even though public spending on education as a proportion of GDP has increased from 2.4% to 3.4% between 1990 and 2006, it is still well below the OECD average of 5.4%. Official statistics indicate that education accounts for less than 20% of total government expenditure. At 14% in 2006, the share of tertiary education within the education budget is also on the low side, compared to the OECD and EU averages of 23% and 24% respectively.

Table 8.1 **Government expenditure on education**

Year	Public Expenditure on Education as % of GDP	Education as % of Government Budget	Higher Education as % of Education Budget
1990	2.4	11.1	17.5
1995	2.7	13.5	17.3
2000	3.9	16.2	14.2
2001	4.1	16.7	13.9
2002	4.2	17.3	13.7
2003	4.1	17.8	12.9
2004	3.9	17.9	12.9
2005	3.7	17.4	16.0
2006	3.4	16.7	14.2

Source: *Indicadores de la Educación en Chile* 2006, Chilean Ministry of Education Portal

As a result, public spending for tertiary education is markedly low, as can be clearly seen from benchmarking Chile against other OECD countries. As Table 8.2 shows, at about 0.3% of GDP, Chile has the lowest level of all comparator countries, well below the OECD and EU averages of 1.3% and 1.1% respectively.

Table 8.2 **Expenditure on tertiary education as proportion of GDP (2004)**

Countries	Total Expenditure for all Levels of Education	Public Expenditure on Tertiary Education	Total Expenditure on Tertiary Education
Denmark	7.2	1.8	1.8
Finland	6.1	1.7	1.8
Sweden	6.7	1.6	1.8
OECD average	**5.7**	**1.3**	**1.4**
France	6.1	1.2	1.3
EU19 average	**5.4**	**1.1**	**1.2**
Israel	8.3	1.1	1.9
Austria	5.4	1.1	1.2
Ireland	4.6	1.0	1.2
United States	7.4	1.0	2.9
Germany	5.2	1.0	1.1
Netherlands	5.1	1.0	1.3
New Zealand	6.9	0.9	1.5
Mexico	6.4	0.9	1.3
Portugal	5.4	0.9	1.0
Spain	4.7	0.9	1.2
United Kingdom	5.9	0.8	1.1
Brazil	3.9	0.8	1.0
Australia	5.9	0.8	1.6
Italy	4.9	0.7	0.9
Korea	7.2	0.5	2.3
Japan	4.8	0.5	1.3
Chile[1]	**6.4**	**0.3**	**2.0**

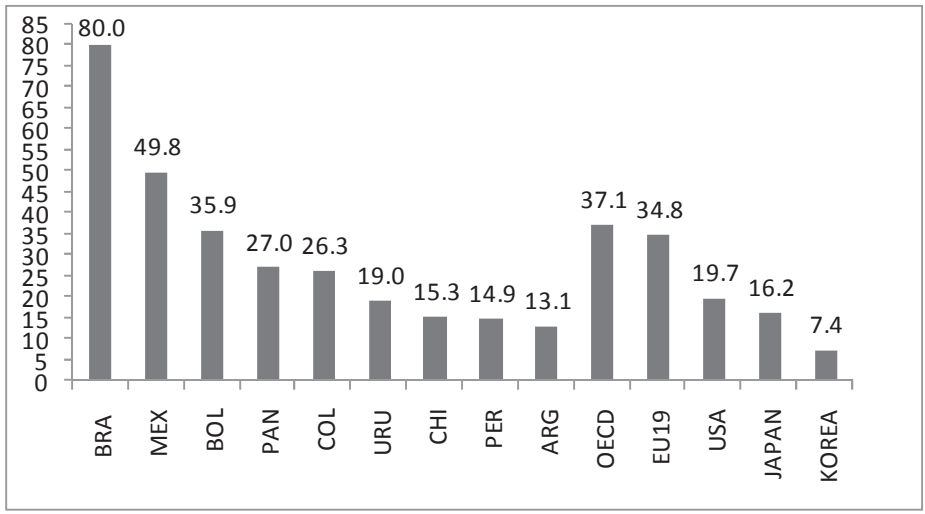
Note: 1. 2005 data

Source: OECD *Education at a Glance,* 2007

Another way of benchmarking Chile's spending performance consists of looking at per student expenditure (Figure 8.1). At 15%, Chile is among the bottom countries in the Latin American region. Even dismissing the extreme case of Brazil which is known for its high unit costs and relative lack of efficiency in resource utilisation (Salmi, 2008), Chile's per student expenditure represents less than a third of Mexico's, and less than half that

of its much poorer neighbour, Bolivia. Similarly, it is less than half the level of per student public expenditure devoted by OECD and EU economies.

Figure 8.1 **Public Spending Per Student as Proportion of Per Capita GDP (2005)**



Sources: 1) CINDA (2007) *Educación Superior en Iberoamérica*; 2) OECD (2007) *Education at a Glance*

The low level of public funding is not a new phenomenon. In the past ten years, Chile's expenditure has evolved in sync with the rest of the world. Per student expenditure rose by 7% in real terms between 1995 and 2004, compared to 9% for OECD countries on average. This happened despite a significant growth in enrolment, reflecting the fact that, to compensate for the low level of public funding, the government of Chile adopted in the early 1980s a resource mobilisation strategy based on the following two pillars:

- Universal cost sharing in public universities and technical institutions.
- Rapid growth of private tertiary education, including non-university institutions.

Cost-sharing

Chile was the first country in Latin America to introduce tuition fees in public tertiary education institutions in the early 1980s. It is still today the only country in the region with significant fees at the undergraduate level, as

illustrated by Table 8.3. In the other countries, any attempt to introduce or increase tuition fees has been met with strong political opposition, as vividly illustrated by the ten-month strike at the UNAM, Mexico's flagship university, in 1999.

Table 8.3 **Tuition fees in public universities in Latin American countries (2006)**

No Fees	Argentina, Brazil, Cuba, Guatemala, Honduras, Nicaragua, Venezuela
Less than USD 500	Bolivia, El Salvador, Mexico[1], Peru
Between USD 500 - 1 000	Colombia, Costa Rica
More than USD 3 000	Chile

Note: 1. Only in a few universities in the Northern states (Aguascalientes, Baja California, Nuevo Leon, Sonora)

Source: OECD *Education at a Glance 2007* for Chile; for the other countries, field visits by Jamil Salmi

As the benefits incidence analysis carried out in Chapter 3 has shown, it appears that, from an equity viewpoint, the imposition of tuition fees in Chile has had a slightly progressive character because of the availability of scholarships and subsidised loans for low income students.[1] By contrast, the Latin American tertiary education systems that continue to offer "free" education, such as in Brazil or Peru, are more likely to be more regressive because of the high proportion of students from the wealthiest families who gain access to the top public universities without contributing to cover the cost of tuition.

Beyond the Latin American region, Chile stands out today among the few nations in the world where students and their families pay more than USD 1 000 a year to study at public universities, as illustrated by Table 8.4.

1. This does not mean, however, that sufficient resources are available for scholarships, grants and student loans. As will be seen later in the chapter, there is a strong need for additional public funding to ensure that no academically qualified student from a low income family finds it difficult to enter or stay in tertiary education for economic reasons.

Table 8.4 **Average fees in public universities in OECD countries and Chile**
(USD converted using PPPs – academic year 2004-2005)

> USD 5 000	USA (5 027)
USD 3 000-4 000	Australia (3 855), Canada (3 464), **Chile (3 140),** Japan (3 920), Korea (3 883)
USD 2 000-3 000	Israel (2 658), United Kingdom (1 859)
USD 1 000-2 000	Italy (1 017), New Zealand (1 764), Netherlands (1 646)
USD 500-1 000	Austria (837), Belgium (574), Spain (795)
< USD 500	France (160), Turkey (276)
No significant fees	Czech Republic, Denmark, Finland, Ireland, Iceland, Norway, Poland, Sweden

Source: OECD *Education at a Glance 2007*; Chilean Ministry of Education; Background Report

Chile's level of tuition is even higher in relative terms, as shown by Table 8.5 which compares the level of fees in Chile with those OECD countries that have significant levels of cost-sharing (annual fees higher than USD 1 000). It clearly shows that Chile's 28% represents the highest level of fees in the world relative to the country's wealth, compared to only 11% in the United States, 12% in Japan and 16% in Korea. Even in private universities, the effort of Chilean families to pay for tuition is the highest of all countries after the United States.

Table 8.5 **Tuition fees as percentage of per capita Gross National Income**

Country	Public Universities	Private Universities
Australia	11.3%	21.9%
Canada	10.0%	n/a
Japan	11.8%	18.5%
Korea	16.3%	31.1%
New Zealand	6.5%	n/a
United Kingdom	5.2%	4.9%
United States	11.4%	42.0%
Italy	3.3%	11.5%
Netherlands	4.4%	4.4%
Israel	12.0%	29.2%
Chile	**27.9%**	**32.0%**

Sources: OECD *Education at a Glance 2007*; Background Report; World Bank World Economic Indicators.

Resource diversification in public universities

To compensate for the low level of public resources, the public universities have to rely on other income sources besides tuition fee payments. They have therefore been forced to seek additional resources through donations, contract research, consultancies, continuing education and other miscellaneous activities. Table 8.6, which shows the distribution of income by funding source in all CRUCH universities, documents this exceptionally high level of resource diversification. On average, the universities receive only 17% of their income from government sources. Paradoxically, some private universities receive a much higher share of public funding than many public ones. The University of Concepción, for example, receives more than twice as many public resources as the University of Chile.

Table 8.6 **Distribution of income of CRUCH universities by funding source (2006)**

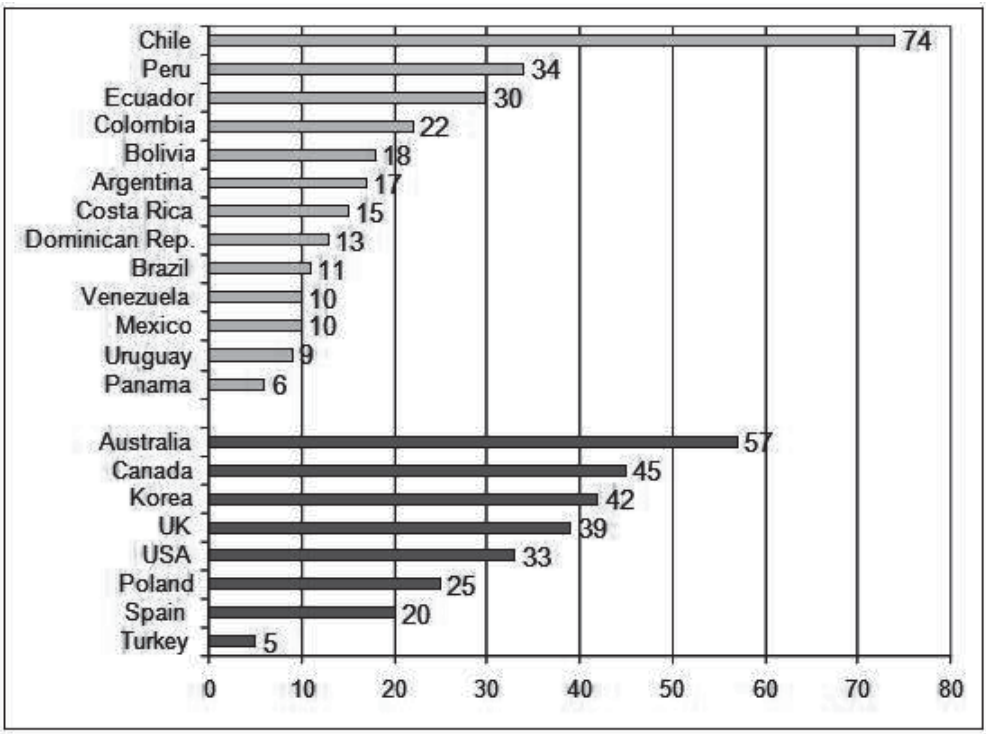
University	Government support[1]	Tuition fees	Self generated resources
U. Austral de Chile	47.1%	23.2%	29.7%
U. Tec. F. Sta. María	33.5%	25.3%	41.2%
P. U. Católica de Valparaiso	33.3%	43.6%	23.2%
U. Metropolitana de Cs. de la Ed.	33.1%	37.8%	29.0%
U. de Tarapaca	30.3%	36.3%	33.5%
U. de Antofagasta	30.1%	40.3%	29.6%
U. de Talca	29.8%	40.5%	29.7%
U. de Concepción	26.9%	23.4%	49.7%
U. Católica del Norte	24.7%	29.4%	45.9%
U. de La Serena	24.3%	27.9%	47.8%
U. Católica de S. Concepción	24.3%	54.3%	21.4%
U. de Atacama	19.7%	17.3%	63.0%
U. de Santiago de Chile	19.0%	44.1%	36.9%
U. de Magallanes	14.3%	31.9%	53.8%
U. del Bio-Bio	13.7%	42.7%	43.6%
U. de Chile	11.7%	21.7%	66.6%
P. U. Católica de Chile	11.6%	29.3%	59.0%
U. Arturo Prat	11.5%	72.5%	16.0%
U. Católica de Maule	10.6%	46.6%	42.8%
U. Playa Ancha de Cs. de la Ed.	8.2%	40.4%	51.4%
U. Católica de Temuco	7.7%	52.6%	39.7%
U. de Valparaiso	7.5%	52.0%	40.6%
U. de La Frontera	7.1%	36.6%	56.3%
U. de Los Logos	6.1%	52.8%	41.1%
U. Tec. Metropolitana	5.6%	39.0%	55.4%
Total	**17.3%**	**33.7%**	**49.0%**

Note: 1. Direct (AFD) funding + indirect funding (AFI) + FCSU repayments

Source: CRUCH statistics

Chile is again unique in this regard. As Figure 8.2 indicates, the Chilean public universities are the best performing institutions of their kind when it comes to income generation. The proportion of self-generated resources (including tuition fees and research contracts) is by far higher than in any other Latin American country. Peru, which comes in second place with 34%, is way behind Chile's 74%. Chile is also doing much better in this respect than any of the OECD countries for which data are available.

Figure 8.2 **Self-generated income in public tertiary education institutions as a proportion of total resources (2005)**



Note: Self-generated income represents principally tuition fees and income from consultancies and research contracts.

Sources: CINDA. For Poland and Turkey, database of the International Comparative Higher Education Finance and Accessibility Project, downloaded on 2/21/2008 from http://www.gse.buffalo.edu/org/IntHigherEdFinance/. For US, National Center for Education Statistics database, downloaded on 2/20/2008 at http://nces.ed.gov/programs/digest/d06/tables/dt06_338.asp.

Private tertiary education

Up until the early 1980s, Chile had only 6 private universities. But since 1981, the government has actively encouraged the emergence of a large private sector. As Table 8.7 indicates, today, 47 private universities (including the six Catholic universities, which are technically private, and three others which, like the Catholic universities, are in CRUCH) operate alongside the 16 public universities, enrolling 63% of all university students. In addition, it should be noted that the non-university sector (CFTs and IPs), which enrols 29% of all tertiary education students, is entirely private. Altogether, the private sector represents today 73% of all students compared to 64% in 1994.

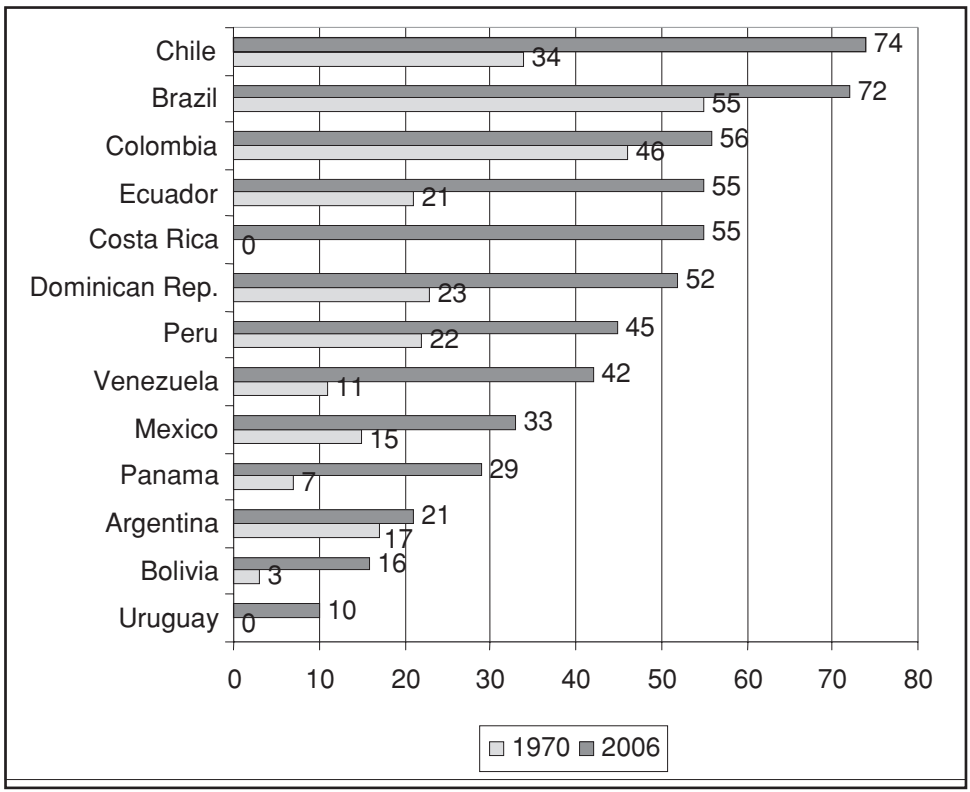
Table 8.7 **Growth of private sector institutions and enrolment**

	Private universities	
Academic year	% institutions	% students
1980		
1994	64.2	28.4
2000	75.0	
2005	73.8	62.6

Source: Background Report, IESALC report

Thus, the larger proportion of the increase in tertiary education coverage since 1981 has been made possible by the rapid growth of new private tertiary education institutions funded for the most part by the students and their families. While the growth of the private sector has been a feature of many Latin American countries, the increase enjoyed by Chile has been among the fastest in the region, as illustrated by Figure 8.3.

Figure 8.3 **Evolution of share of private tertiary education enrolment (1970-2006)**



Source: CINDA 2008 and Guadillo García 1998.

Research funding

Notwithstanding increasing government interest in science and technology, as exemplified by the 2007 OECD *Review of Innovation Policies in Chile* and the government's own reports prepared by the Innovation Council, public R&D spending is small, both as a percentage of GDP and in absolute terms. Chapter 7 discusses the issue of low research funding, illustrated by Table 8.8, which has already appeared as part of Table 7.4. Chile's R&D investment, at 0.6% of GDP, is one third lower than Brazil's, although Brazil's per capita GDP is one third less than Chile's. Chile's R& D spending represents only 25% of the OECD average. It is also low relative to other countries with much smaller GDP per capita, such as

India which generates 17% more R&D spending with one third of Chile's per capita GDP.

Table 8.8 **Gross expenditure on R&D as % of GDP**

Countries	R&D as % of GDP, (2005 or latest available year)
Finland	3.5
Japan	3.3
Korea	3.0
US	2.6
OECD Average	2.3
EU27	1.7
China	1.3
Spain	1.1
Russia	1.1
Brazil (2004)	0.9
India (2004)	0.7
Chile (2004)	**0.6**
Mexico	0.5
Argentina	0.5
Colombia	0.5

Source: OECD *Science, Technology and Industry Scoreboard* 2007, OECD

Though recent statistics show that enterprises appear to carry out much more research and development than previously thought, the 2007 OECD *Review of Innovation Policy* noted correctly that the universities still play an important role in the Chilean research. A small group of universities receive almost 40% of total R&D expenditure. Within the university sector, the lion's share of research funding (FONDECYT and FONDEF grants) goes to three institutions: the University of Chile, the Catholic University of Chile and the University of Concepción account for 59% of all research funds among CRUCH universities. Almost all the other significant players in terms of university research are traditional CRUCH universities, including the Catholic University of Valparaíso, the Federico Santa María Technical University, the Catholic University of the North and Austral University. The newer private universities capture only 3.6% of the research funding going to universities. Most of it is captured by five institutions (Andrés Bello, U. del Desarrollo, U. de los Andes, Adolfo Ibanez, and Diego Portales), which are striving to develop high quality graduate programmes.

When it comes to research productivity, however, those universities which receive most funding are not necessarily the most efficient, considering their human capital stock. Table 8.9 measures the effectiveness of universities in competing for research funding by calculating the amount of research funds received per full time PhD faculty. Interestingly, the top

two universities (Arturo Prat and Los Lagos) are not among the traditional research leaders. In addition, a number of smaller regional universities are more successful than some of the more prestigious research universities in Santiago and Concepción. The University of Chile seems to be almost three times as effective as the other two heavyweights in the area of research, the Catholic University of Chile and the University of Concepción.

Table 8.9 **Effectiveness in competing for research funding (2006 – CLP thousands)**

Universities	Total Research Funding	Number of full-time PhD faculty	Research funding per faculty member
U. Arturo Prat	870 780	28	31 099
U. de los Lagos	1 108 950	38	29 183
U. de Chile	8 029 622	433	18 544
U. Católica de Temuco	1 081 700	29	14 818
U. de Magallanes	333 980	23	11 517
U. Austral de Chile	1 125 101	207	11 481
U. Técnica Federico Santa María	2 046 418	98	9 886
U. de la Frontera	199 715	73	8 683
U. de Concepción	1 009 671	426	7 950
U. de Santiago de Chile	1 593 005	206	7 733
U. de Valparaiso	3 107 655	58	7 295
U. de Antofagasta	402 385	80	6 938
U. Católica del Norte	506 413	127	6 330
U. Pontificía Católica de Chile	5 381 658	863	6 236
U. Pontificia Católica de Valparaiso	1 078 440	175	6 163
U. de Talca	502 312	102	4 925
U. del Bio-Bio	338 463	76	4 453
U. Católica de la Santísima Concepción	220 803	38	3 807
U. de la Serena	135 701	58	3 571
U. de Tarapaca	123 ,548	59	2 094
U. Metropolitana de Ciencias de la Educación	48 782	36	1 220
U. de Atacama	36 088	20	1 002
U. de Playa Ancha de Ciencias de la Educación	27 925	35	798
U. Tecnológica Metropolitana	8 509	40	425
U. Católica del Maule	3 078	40	77

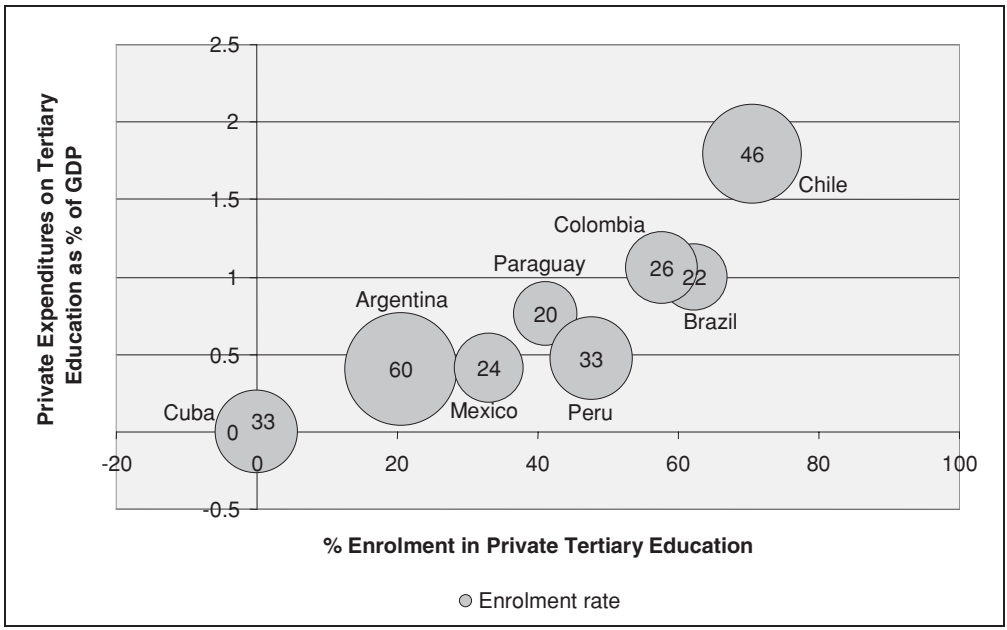
*Source*s: CRUCH and CONICYT statistics 2008.

Leveraging private Funding

In summary, the rapid growth of tertiary education enrolment in the past two decades has been the result of an expansion strategy principally based on the mobilisation of private resources. Figure 8.4 captures the intensity of privatisation along two dimensions, the proportion of students enrolled in private institutions and the level of private expenditure. It shows unequivocally how Chile, more than any other Latin American country, has

successfully channelled private sector investment to establish tertiary education institutions and relied on a combination of tuition fees from students, research grants and contributions from companies to finance the operation of the tertiary education system. The size of each circle in the graph is proportional to the tertiary enrolment rate of the respective country.

Figure 8.4 **Tertiary enrolment rates and degree of privatisation in selected Latin American countries**



Source: UNESCO Institute of Statistics 2005.

In recent years, the country has even managed to attract foreign investment in the private tertiary education sector. It is estimated that at least 4 private universities have been purchased in recent years by international groups such as Apollo and Laureate.

From an international perspective, Chile is today the country that has achieved the highest leverage ratio in terms of complementing its public investment for tertiary education with private resources. Figure 8.5 shows that no other economy, including OECD countries such as Korea and Japan that have also used private investment as their main source of funding for tertiary education development, has a private / public funding ratio as high as Chile.

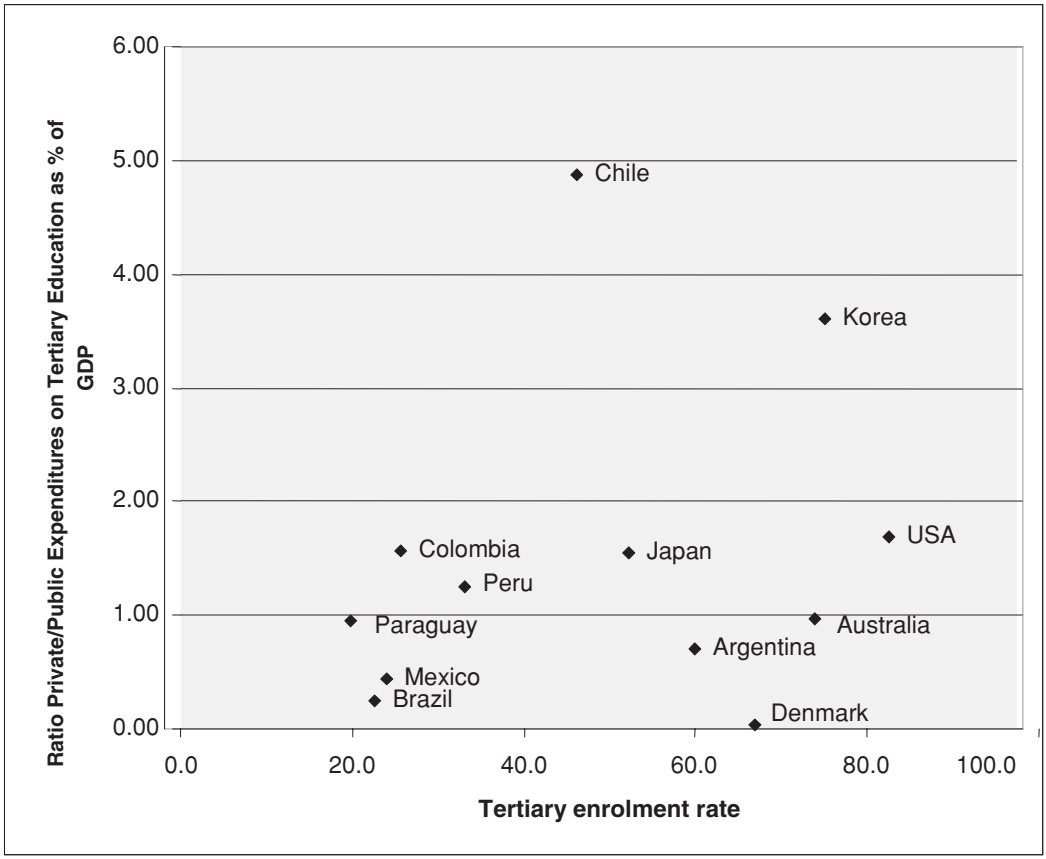
However, Chile's success in mobilising private resources does not eliminate the need to consider the implications of the relatively low level of public funding. In itself, it would not be a serious issue if the Chile tertiary education system could be considered to perform well on important dimensions such as equity and quality. But the acute social inequities analysed in Chapters 1 and 3, and the cost of tertiary studies to students in both the university and non-university sectors, are ample justification for substantial additional public funding for tertiary education. Furthermore, the government's plans to improve the competitiveness of the Chilean economy as it transitions into a knowledge-based economy call for expanding research activities in the Chilean universities, as emphasised in the report of the Innovation Task Force. This implies the development of first rate graduate programmes which, in turn, cannot be built up unless undergraduate education has the capacity to produce high quality graduates. There is therefore a strong rationale for raising the level of public funding on both equity and quality grounds.

The next steps are then to estimate the desirable level of public funding, decide what categories of institutions and students should be the beneficiaries of the increased funding, and assess what would be the most appropriate allocation mechanism(s) to achieve this purpose.

Whereas there is no iron rule to decide what would be the right level of public funding, one way to go about it could be for Chile to benchmark itself against the few countries, such as Korea and Japan, which have followed the same path of high private funding and high private enrolment to expand tertiary education in a sustainable way. This means that over the next few years Chile should plan to double its public investment in tertiary education in order to reach a level of public effort comparable to that of Japan.

There are two main options for choosing the beneficiaries of increased public funding. The government may want either to favour the public universities or to assign these resources against objective criteria linked to the equity and quality objectives pursued. Since this issue is directly linked to the types of allocation mechanisms that the government of Chile is relying on to distribute public resources for tertiary education, the pros and cons of each approach are examined in the next section.

Figure 8.5 **Mobilisation of private resources as expansion strategy**



Source: OECD and UNESCO statistics 2008.

Resource allocation

"Everybody is equal. But some are more equal than others."

George Orwell

Variety of public funding mechanisms

While many if not most governments still rely on historical/negotiated budgets to transfer resources to their public tertiary education institutions, a small number of nations have introduced innovative approaches linking

resource allocation to some objective criteria that are increasingly performance-based. Some countries apply a funding formula, others allocate investment funds on a competitive basis, others employ performance contracts, and very few have pioneered a voucher-based allocation system (Salmi and Hauptman, 2006). But Chile is unique in that the whole range of possible allocation mechanisms, from the most traditional to the most innovative, can be found among the instruments used by the government to finance the tertiary education system.

Chile's allocation system is complex not only because of the number of instruments used but also because of the variety of eligibility criteria regarding the institutions and students who benefit from public resources in one way or another. To present the full range and diversity of existing public funding mechanisms, Table 8.10 outlines the main characteristics of each modality, including the eligibility criteria and amounts involved. In 2006, 56% of all public funding was transferred directly to both public and private tertiary education institutions, and 44% through the students in one form or another. Direct budget support represented only 37% of total public funding.

Strengths and weaknesses of existing allocation mechanisms

To analyse their strengths and limitations, Figure 8.6 organises these various mechanisms along the key dimensions of performance and competitiveness. Performance refers to whether or not the allocation mechanism is directly linked to some measure of results. The second dimension reflects the degree to which resources are allocated on a competitive basis. Following that logic, Quadrant 1 represents the most traditional allocation approach which is the budget entitlement (*Aporte Fiscal Directo* – AFD) going to the 25 CRUCH universities on a historical basis. The small portion of the *AFD* allocated on some objective criteria (5%) appears in Quadrant 2. Quadrant 3 regroups the direct and indirect allocation mechanisms that embody a combination of performance and competitiveness, such as the various competitive funds to which tertiary education institutions can apply and the range of grants, scholarships and loans that the better academically qualified students can receive. Finally, Quadrant 4 shows the other grants / scholarships that are linked essentially to particular social characteristics of the students. It also includes the donations that private contributors can make to tertiary education institutions with the incentives of a 50% tax break.

Table 8.10 **Public funding mechanisms (2007)**

Funding Mechanism	Beneficiary Institutions and Students	Amount (CLP million)	Proportion of Total Funding
Direct Public Funding of Institutions			
Entitlement (*Aporte Fiscal Directo - AFD*)	CRUCH universities	122 714	34.0%
Competitive Funds I (*MECESUP*)	CRUCH universities, technical institutions and accredited private universities in specific areas	26 352	7.3%
Competitive Funds II (*Fondo de Desarrollo Institucional*)	CRUCH universities	1 631	0.5%
Performance Contracts[1] (*Convenios de Desempeño*)	4 public universities	0	0.0%
Research Funds I (*FONDECYT*)	All universities	23 236	6.4%
Research Funds II (*FONDEF*)	All universities	11 371	3.2%
Indirect Funding of Institutions			
Vouchers (*Aporte Fiscal Indirecto – AFI*)	Institutions attended by 27,500 top students according to PSU results (15% of new entrants) All institutions eligible	18 864	5.2%
Student Support			
Scholarships	62 800 students enrolled in CRUCH universities (12% of students)	40 000	11.1%
Subsidised Student Loan (*Fondo Solidario*)	38 579 students enrolled in CRUCH universities	74 700	20.7%
Guaranteed Student Loan (*Crédito con Aval del Estado – CAE*)	21 327 students enrolled in accredited institutions (20 CRUCH universities, 15 new private universities and 14 technical institutions)	41 720	11.6%
Total		360 589	100%

Note: 1. Actual disbursements on the performance contracts started only in 2008

Source: Country Background Report 2008, CINDA Chile report 2008, INGRESA 2008.

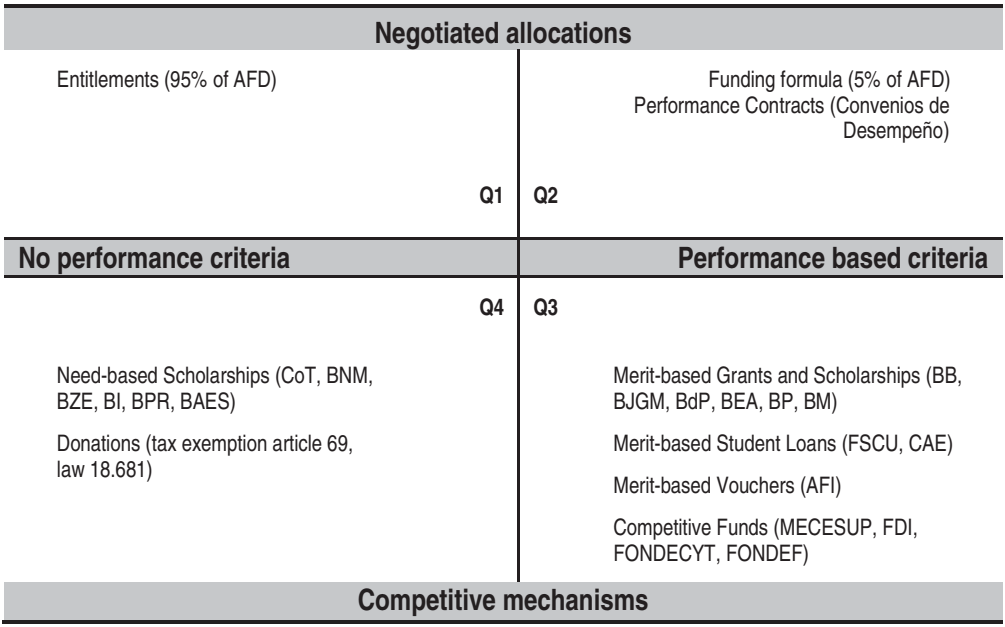
By using a great variety of allocation mechanisms, the government of Chile is able to pursue several important policy objectives at the same time: expansion of access through private sector growth (AFI, CAE), quality improvement (AFI, MECESUP, PC), and increased equity (Scholarships, FSCU, CAE). These funding mechanisms make some positive contributions:

- AFI provides, in theory, a strong incentive for tertiary education institutions to raise their quality, as they can receive additional resources and claim additional prestige by attracting the higher performing secondary school graduates. Chile is, with Kazakhstan, Georgia and Hungary, one of the very few countries in the world relying on this form of demand-side mechanism linked to the academic performance of incoming tertiary education students. A 2002 study of the impact of AFI (Bernasconi and Rojas) found a positive correlation between the reputation of universities as measured by the *Qué Pasa* ranking and the proportion of AFI students opting to study at these universities. The existence of the AFI mechanism has also pushed more non-CRUCH universities to adopt the PSU results as their principal selection criterion.

- Over the past ten years, MECESUP has evolved into a highly effective competitive fund to promote quality improvement and pedagogical innovations. By using objective criteria and procedures, overseen by an independent monitoring committee with international representation, the programme has successfully developed a culture of efficiency and transparency in investment allocation. It stands out as one of the most successful competitive funds the World Bank has been associated with.

- To complement the MECESUP projects which finance targeted innovations within university faculties and departments, the newly-introduced performance contracts aim to achieve the transformation of universities as whole institutions. While it is too early to assess whether the performance contracts will attain their goals, it is worth underlining that Chile has approached their use in an original way compared to the experience of other countries (France, Denmark, Austria, Spain, etc.) by starting with four pilots selected on a competitive basis. The lessons of the pilot phase will be evaluated before the performance contracts can be extended to the entire tertiary education system, not as a competitive mechanism like MECESUP, but as an instrument of the Ministry of Education to promote improvements in institutional performance measured against negotiated objectives and benchmarks.

Figure 8.6 **Matrix of funding mechanisms: dimensions of performance and competitiveness**



Source: Adapted from José Joaquín Brunner (2007) Mercados Universitarios: Los Nuevos Escenarios de la Educación Superior. Informe Final de Proyecto FONDECYT N° 1050138. Santiago de Chile.

- Competitive grants are the main source of university research funding and are largely channelled through four programmes: FONDECYT, which provides project-based support, FONDAP, which supports group of researchers, FONDEF, which supports research collaboration with industry and CORFOINNOVA, which provides support to research centres. This competitive approach to research funding encourages a culture of excellence through objectivity and transparency in resource allocation.
- Finally, as described in Chapter 3, Chile has a whole range of student aid programmes to increase equity (two grants programmes, ten scholarship programmes and two separate student loan schemes). The new student loan programme (CAE) presents three positive features. First, it allows the government to leverage private capital in a significant way. Over the first two years of operation (2006 and 2007), almost USD 200 million worth of loans were given to students for a government contribution of only 28 million dollars, representing a leverage ratio of 1

to 7.1. Secondly, by shifting the responsibility for financial guarantee against default to the universities themselves, it helps low-income students to access credit without the guarantee barrier that student loan schemes in many countries entail. Thirdly, by linking institutional accreditation to participation in the government accreditation process, it indirectly supports quality assurance in the tertiary education system.

At a systemic level, the financing architecture of the Chilean tertiary education system can be described as a three-pillar montage. The CRUCH universities' entitlements represent about a third of all public funding (32.3%); a fifth (19.0%) is allocated through performance-based mechanisms such as the funding formula (5% of AFD), the competitive investment funds (principally MECESUP) and the competitive research funds (CONICYT); finally, almost half of the resources (48.7%) are allocated through or in relation to the students themselves (AFI, scholarships and loans) who, in turn, pay tuition fees to the institutions where they elect to study.

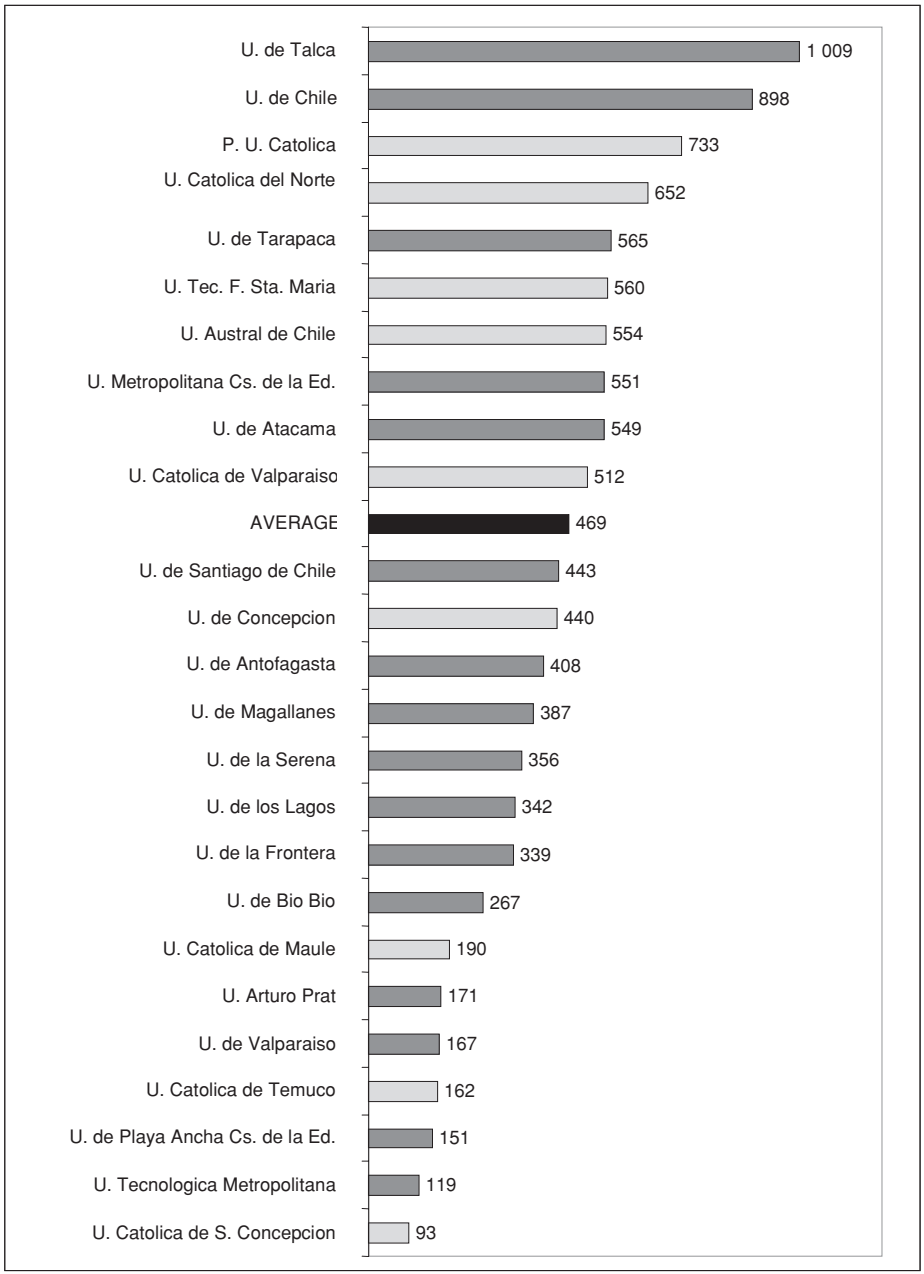
There are, however, several negative features attached to the various funding mechanisms. The first major issue is linked to AFD, the direct budget contribution to the 25 CRUCH universities. The lion's share of AFD (95%) is distributed without any objective criteria; only a small share (5%) is allocated following a formula that principally recognises the research performance of universities, focusing on the number of faculty with advanced degrees and scientific production measured by the number of publications by researcher. Figure 8.7, which shows the per-student allocation for each university, clearly illustrates the striking disparities among beneficiary institutions. The annual per student allocation ranges from USD 233 to 2 500. The University of Talca, the top recipient, receives more than twice the national average, and ten times more than the poorest university in the system. Eight universities get less than half the national average. Chile is unique in the world in having such variations among its public universities, and in having some private universities receiving significantly more public resources than many public universities, in both relative and absolute terms. These are serious distortions.

To illustrate the dysfunctional dimension of this dual distribution approach, Figure 8.8 presents a comparison of the distribution of resources between the first category (95%), which essentially reflects historical tradition, and the second portion (5%), which uses objective criteria through the funding formula described in the previous paragraph. The significant difference between the respective shares received by several universities under the two distinct mechanisms confirms that the overall distribution follows a flawed logic. For example, in the case of the University of Chile, the -4.91 figure indicates that if the university were to receive its entire

budget based on the funding formula criteria, its proportion of the total national budget would be lower by almost 5 percentage points. In other words, instead of receiving almost 21% of the entire government direct allocation, it would be entitled to only 16%. Because the share of the funding formula is so small, it does not serve its purpose of redressing the historical inequities of the system. The AFD therefore undermines the efficiency goals pursued with the other financing instruments (AFI, performance contracts, MECESUP).

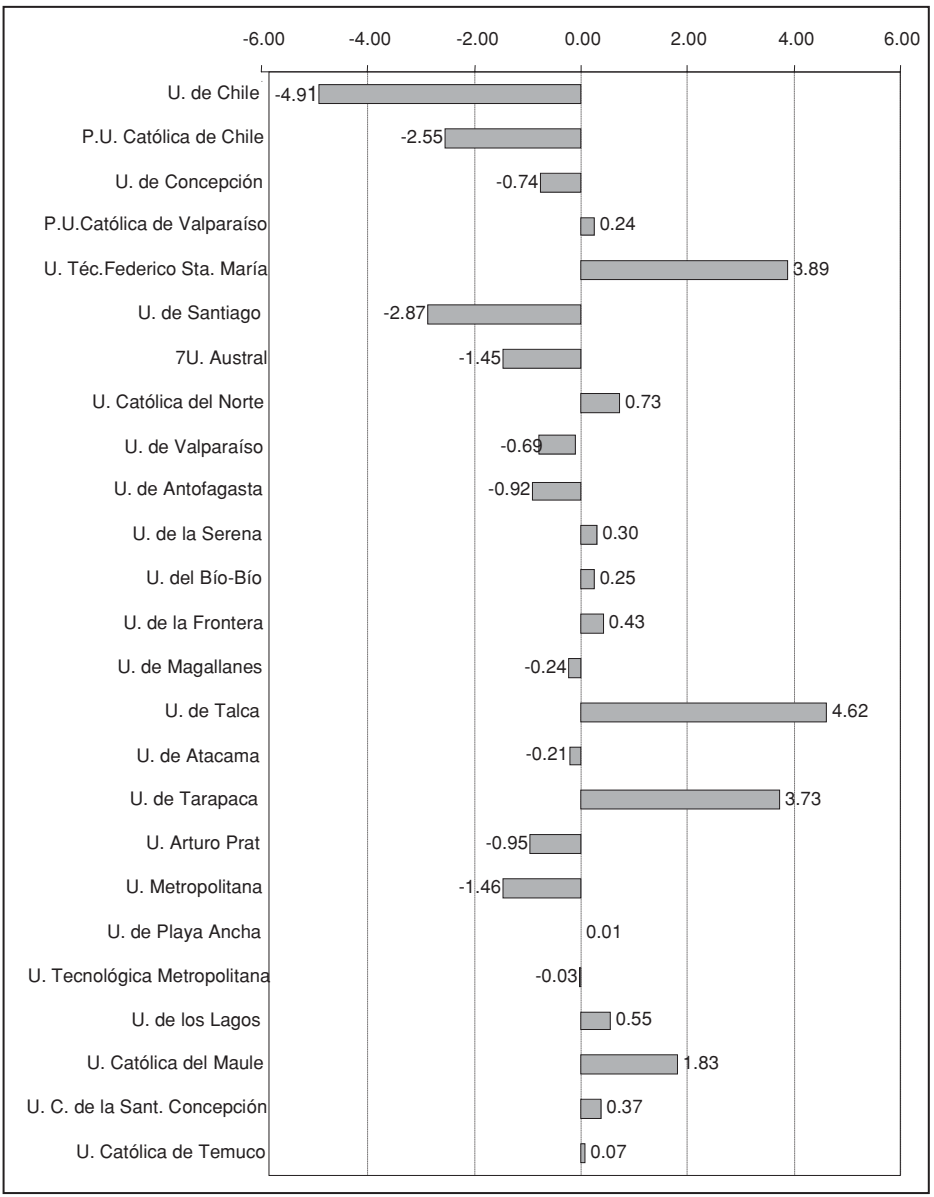
In addition to the flaws that are inherent to the AFD mechanisms, the dichotomy between CRUCH and non CRUCH institutions results in a situation of *de facto* discrimination at two levels: first between private universities that receive public subsidies (AFD, MECESUP) because they are part of CRUCH and those that are not eligible, and secondly between the CRUCH students who benefit from more scholarship opportunities and have access to a highly subsidised loan scheme and the other students who can borrow money only through the guaranteed loan programme. A stark illustration of this unequal division of resources is the fact that close to three-quarters of the public subsidies going to private universities are captured by the private CRUCH universities (73.8%) even though these universities enrol only 19% of all students attending a private tertiary education institution.

Figure 8.7 **AFD resources distribution among CRUCH universities (CLP 1 000)**



Source: MINEDUC -- Public universities are shown in dark grey and private universities in light grey.

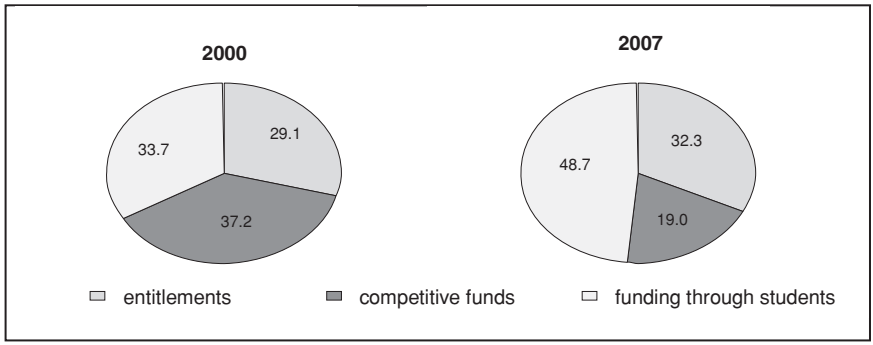
Figure 8.8 **Comparison of 95% and 5% allocation for CRUCH universities (difference in percentage within overall distribution)**



Source: Rector of University of Bió Bió presentation, 2008.

Viewed in the context of the overall tertiary education system, the CRUCH monopoly is inconsistent with the diverse and competitive nature of the system. It serves neither efficiency nor equity purposes. In that respect, it is worrying to observe that the relative share of the AFD entitlement has increased between 2000 and 2007 from 29% to 32% of total public funding (Figure 8.9).

Figure 8.9 **Evolution of the distribution of public funding (2000-2007)**



Source: Ministry of Education Statistics 2008.

The AFI has been criticised on several fronts. Even though there are indications that it may have helped indirectly to improve the quality of tertiary education by introducing some degree of competition among institutions in its earlier days of operation (Bernasconi and Rojas, 2002), there is a sense that today the universities and institutes that manage to attract AFI students are motivated more by publicity considerations than a genuine concern for higher quality. From an efficiency viewpoint, the fact that the AFI allocation has been frozen for the past twelve years, whereas the AFD increased by about 30% in real terms between 1995 and 2007, runs against the principle of allocating public resources on the basis of some measure of performance. In the early 1990s, about 30% of incoming students qualified for the AFI, but today that proportion has been halved.

From an equity viewpoint, PSU scores are highly correlated with socio-economic origin (Chapter 3). AFI operates therefore as a disincentive to take on students from underprivileged backgrounds, especially penalising tertiary education institutions in the regions. The fact that choosing to study at a CRUCH university gives students access to better student aid opportunities (scholarships and subsidised FSCU loans) also makes it more difficult for non-CRUCH private universities to attract top students.

Towards a more consistent allocation system

The Chilean government's approach to funding tertiary education has evolved over the past two decades into a sophisticated system with a variety of mechanisms, including innovative ones. Viewed in the international context, the level of public funding is however quite low and there are inconsistencies among the various allocation mechanisms. As the government considers options to reform the financing system, using inputs from its own Presidential Advisory Council on Higher Education and the present OECD review, this may be an appropriate moment for Chile to define a long-term vision outlining the role of the government in tertiary education funding. This would guide decisions about the desirable level of public funding and the most efficient and equitable manner to distribute these resources among institutions and students.

With regard to the level of funding, the government of Chile could base the allocation of additional resources on the principles of strengthening the 'public good' mission of tertiary education and compensating for market failures. In the first instance, additional funding would focus on improving postgraduate education and research, in recognition of the long term external benefits accruing from a stronger science and technology base and a more cohesive society with a deep sense of shared values, which transcend the private benefits captured by individuals. In the second instance, sufficient resources would be mobilised to expand the student aid package needed to facilitate the participation of all academically qualified students from low income families. This would help overcome the capital market imperfections and information asymmetries that constrain the ability of individuals to borrow adequately to finance their studies.

The following specific measures could be envisaged in order to rationalise the overall funding system for tertiary education in line with the principles outlined above, and the directions established by the government of Chile in recent years with respect to linking funding with performance and stimulating healthy competition among all tertiary education institutions.

AFD

Given that AFD is not linked to performance criteria and indirectly discriminates against the majority of students enrolled at the tertiary level, the government of Chile should consider transforming AFD so as to address both these issues.

The least disruptive way to address the fact that AFD is not linked to performance would be to expand the formula-based part of AFD gradually

while at the same time reducing the research bias of the formula. A possible approach would be to follow the Dutch model which links resources to the number of graduates as a way of encouraging tertiary education institutions to be more efficient. This first scenario would address the fact that AFD is not linked to performance at present.

It would also be desirable to move towards eliminating the discrimination arising from AFD's payment only to CRUCH members and establishing a level-playing field. The new system would reflect the following two principles: (i) all Chilean students whose tertiary institutions meet essential quality and accountability requirements would be entitled to public subsidies through student aid, if personally eligible; and (ii) the arrangements for direct public funding to institutions would be consistent with the institutional diversity and competitive nature of the Chilean tertiary education system.

Once these principles are accepted, the government should weigh the pros and cons of various possible funding models to implement them, in the light of Chile's specific historical, political, economic and social circumstances. Three alternatives could be envisaged in the medium term.

- A differently configured dual system where only public tertiary institutions, *i.e.* the 16 existing public universities, would receive direct funding in return for fulfilling public good functions such as doctoral education and basic research in disciplines requiring expensive infrastructure investment. No private institution, including the nine other members of CRUCH, would receive direct funding. There would however be an expanded scholarship/student loan scheme for students enrolled in eligible private institutions. The eligibility criteria would be defined in terms of meeting quality assurance (positive evaluation by improved accreditation system) and financing accountability (independently-audited financial statements) requirements. The government would have the option of setting tuition fee ceilings in the public universities.

- A more extensive direct funding system where all accredited public and non-profit private institutions would receive core resources linked to their student numbers and some simple performance criteria such as the number of degrees conferred. Institutions willing to participate in the scheme could be required to implement a uniform fee structure or accept limitations on the fees they could charge, as well as meeting quality assurance and financial accountability requirements as above, and perhaps other conditions.

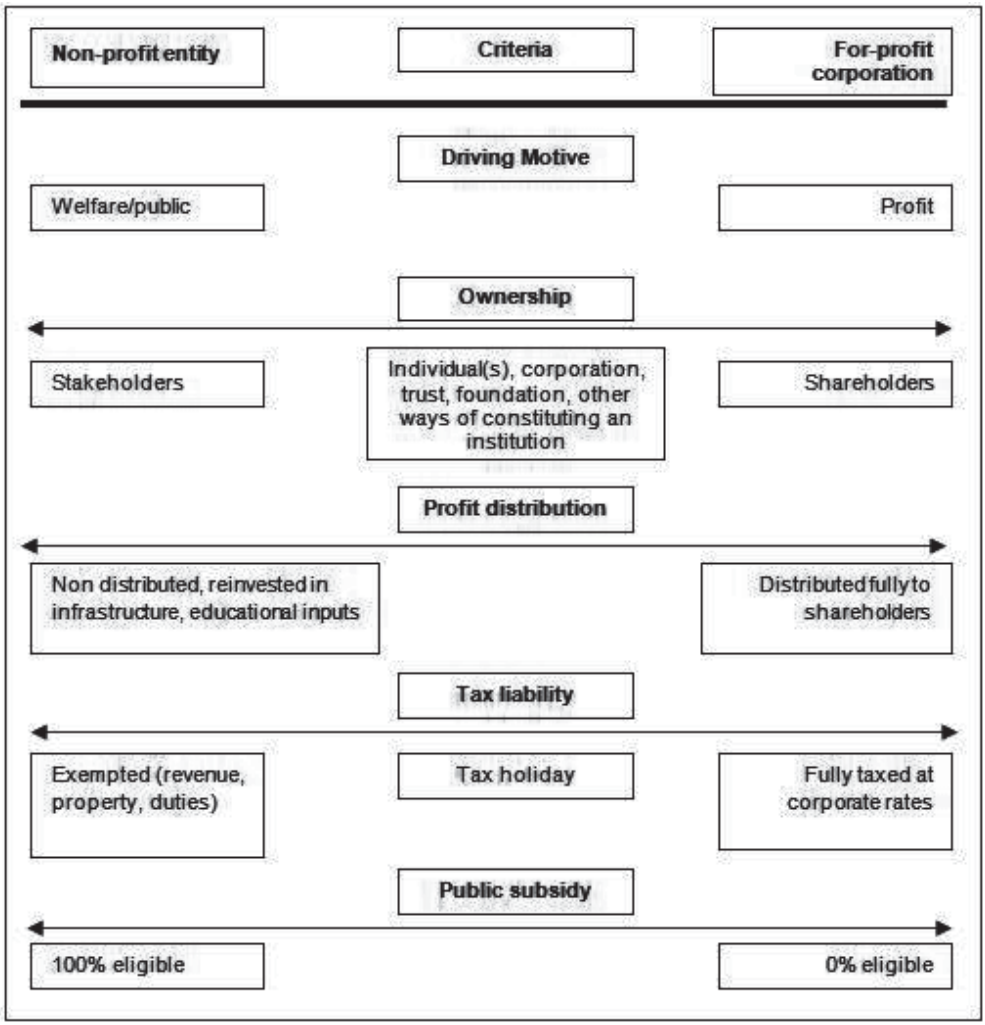
- A voucher-like per-student payment system whereby an amount equivalent to the reference cost of studies would be transferred to all eligible tertiary education institutions on the basis of the number of students choosing to study in and graduating from each institution.

The choice between these options depends on the view taken by the Chilean government, stakeholders and the public on two issues. First, would it be right to withdraw direct public funding from private, non-profit institutions which as CRUCH members have always enjoyed it, and to confine this funding to a small group of publicly-funded institutions, presently consisting solely of universities? If not, option one falls. Secondly, if it is appropriate to extend public subsidies in the form of direct funding to private tertiary institutions, should this direct funding be in principle available not only to non-profit private but also to for-profit private institutions? It will be recalled that in Chapter 5 the review team recommended a change in the law to allow some private universities, as well as IPs and CFTs, to have for-profit status.

To inform debate on this second issue, Figure 8.10 sets out the key areas of difference between non-profit and for-profit private tertiary education institutions. It shows the main dimensions that need to be taken into account when considering the legal status of private universities. It makes the point that the distinction between non-profit and for-profit universities is not always binary, but that there is a continuum depending on the legislative framework and the characteristics of the tertiary education institutions concerned. The most important factors, in terms of eligibility for AFD funding, would be the tax status of the institution and the extent to which it reinvests its profit for educational purposes or distributes them to shareholders. In the review team's opinion, the principle of achieving a level playing-field does not require the Chilean government to give the same financial treatment to institutions which distribute profit to shareholders as to those which re-invest their profits in education. The former can always set up non-profit arms or subsidiaries if they wish to benefit from direct (non-competitive) funding for teaching or research. There may however be a case for making vouchers available to for-profit institutions who take low-income students on reduced fees, thus also reducing public student aid liability.

Whichever option is favoured, the government would need to design and implement a carefully formulated transition plan that would include injecting additional resources for the combined core funding and student aid package. This would address the particular situation of the CRUCH universities whose core public funding would be affected by the change in allocation mechanisms.

Figure 8.10 **Key areas of differentiation between non-profit and for-profit private tertiary education institutions**



Source: Elaborated by Jamil Salmi, Richard Hopper and Svava Bjarnson

AFI

Considering the socially discriminating nature of the PSU selection to which the AFI is closely linked, and the fact that AFI applies only to a small proportion of students entering tertiary education for the first time, it is recommended to eliminate this mechanism in the form it is operating in at

present. To be used in a meaningful way as a performance incentive, the AFI would have to rely on criteria that are socially more inclusive and would need to be significantly larger in terms of number of students and resources affected.

Competitive funds

After almost ten years of operation, MECESUP has proved its strengths. It would be desirable to confirm this form of competitive, objective and transparent mechanism as the main approach for allocating public investment funds to tertiary education institutions. FDI funding should be fully and finally subsumed within such a mechanism to avoid duplication. Finally, if the government decides to break the CRUCH monopoly as recommended in this report, the competition for public investment funds should be open to all accredited tertiary education institutions.

Performance contracts

After the ongoing pilots are implemented, an independent evaluation should be undertaken to assess the degree of success of the performance contracts and identify areas for improvement. The government could then consider using the performance contracts as a general instrument to promote institution-wide reforms and innovations in tertiary education, with all accredited public and non-profit private institutions being eligible to participate.

Grants and scholarships

Rather than continuing to operate at least 12 different grants and scholarships schemes, the Ministry of Education may want to review the various programmes with a view to integrating them into a single scheme with a small number of separate windows. All discrimination between the students who are enrolled in CRUCH universities and the other students should also be eliminated.

Student loans

MINEDUC should seriously consider merging the two existing student loans schemes into a unified system, for both efficiency and equity reasons. FSCU is heavily subsidised and suffers from low levels of repayment, whereas the guaranteed loan programme represents a much smaller cost to the State and has the potential for better repayment from graduates. Having

a single loan programme would suppress the segregationist features of the present dual system between CRUCH and non-CRUCH students.

Increases in public funding

These would be allocated as follows. For resources meant to cover recurrent costs, the government would rely on the reformed AFD as discussed above; the scholarships and student loan programmes; and the performance contracts. Public resources to expand research activities would be distributed through a simplified scheme of research funds, putting more emphasis on research groups and centres and on infrastructure for those universities qualifying as research universities, as elaborated in Chapter 7. In addition, to increase but streamline opportunities for doctoral students, it would be important to create, for example within FONDICYT, post-doctoral scholarships to help promising young scientists to establish themselves. Many such schemes exist, for example as part of the Research Excellence Initiatives in Ireland – see Box 8.1. Finally, additional funding for investment purposes would continue to be channelled through an efficient and transparent competitive mechanism such as MECESUP.

As the government of Chile proceeds to formulate a consolidated financing policy for tertiary education, it will be important to pay close attention to the political economy of the reforms under consideration. Any measure which challenges the CRUCH monopoly is likely to encounter resistance from CRUCH institutions, and from any stakeholder groups whose entitlements and privileges would be negatively affected. To build the consensus and awareness needed to move ahead successfully, the government will need to communicate extensively and in the most transparent manner the reasons for the proposed changes. These include the present disparities and inconsistencies; the government's aim that 50% of young people should participate in tertiary education, which calls for a scale of expansion in the system that can only come from the newer non-CRUCH institutions; and the country's economic need to boost numbers undertaking high-quality technical training. The additional public funding could be used to offer financial incentives that would make the new funding architecture more attractive to all parties. Finally, transitional measures should apply to the changes in terms of scholarships and student loans, with grand-fathering clauses to protect students who are already in the system.

Box 8.1 **Research Excellence Initiative in Ireland**

The Irish Research Council for Science, Engineering and Technology (IRCEST), established in 2001, manages the ***Embark Initiative***. The purpose of this new programme, funded as part of the National Development Plan, is to promote excellence in research through innovation. An important component of Embark consists of doctoral and post-doctoral scholarships and grants to encourage students to engage in a full-time career in their chosen field of research; to support their research interests through guaranteed funding with the aid of expert reviews; and to empower the Irish economy through knowledge creation, development, and national competitiveness.

The Embark Initiative spent EUR 12 million (2002-2004) in order to fund "innovative and exciting research" at Irish Third Level Institutions, for a total of 88 projects. The funding was allocated to "Ireland's most talented researchers engaging in a wide range of projects in the sciences, engineering and technology under the Basic Research Grants Scheme, jointly funded by Enterprise Ireland and the Irish Research Council's Embark Initiative".

The Embark Initiative operates the Postdoctoral Fellowship Scheme, the Basic Research Grants Scheme, the Post Graduate Research Scholarships Scheme, and the Graduate Research Education Programme; and plans to offer new schemes in the future. The Post Doctoral Fellowship Scheme, in its sixth year, will award up to 55 students an amount of approximately EUR 4.8 million. These students will be assessed by an international peer review panel.

In 2007, the Minister for Education and Science, the Irish Research Council for Science, Engineering and Technology (IRCSET) and the Irish Research Council for Humanities and Social Sciences (IRCHSS) allocated funding of up to EUR 8 million to create five Graduate Research Education Programmes in the humanities, sciences, social sciences, technology and engineering. This scheme benefited up to 50 new PhD scholars within the successful programmes.

The Post Graduate Research Scholarship Scheme has just been introduced in 2008. This is a EUR 11.8 million scheme to fund "early career formation of up to 165 doctoral and masters researchers in the sciences, engineering and technology". The aims of this scheme are knowledge creation and benefit to society by targeting students who are talented in science, engineering and technology.

*Source***:** http://www.ircset.ie/about_embark/index.html

Resource utilisation

Several structural and functional features constrain the ability of tertiary education institutions to operate as efficiently as they could. As raised in Chapter 5, the long duration of first degree studies and the civil service

regulations that public universities are legally bound to follow are among the most important limitations in that regard.

The fact that the theoretical duration of first degrees in Chilean universities is generally one year and often two years longer than similar degrees in North America or Europe represents a social cost of great magnitude for the country. Aligning the duration of first degrees with international practice, as recommended in Chapter 5, would permit the redeployment of a significant proportion of resources currently used in tertiary education, with resulting savings for students and their families.

A related consequence of the long duration of studies is the low level of internal efficiency which characterises some parts of the tertiary education system. Table 8.11 measures the apparent graduation rate by principal areas of studies. Health sciences obtain by far the best results (87%). Compared to the average apparent graduation rate of 58%, internal efficiency is a concern in several key disciplines, including law (40%), natural sciences and mathematics (42%), as well as art and architecture (45%). The apparent graduation rate is calculated by comparing the number of graduates in 2006 to the number of first year students in 2002 (five years earlier).

Table 8.11 **Apparent graduation rates by discipline for 2002 cohort**

Disciplines	First year students in 2002 (A)	Graduates in 2006 (B)	Graduation rate (B/A)
Agriculture, fish farming and oceanography	3 001	1 440	48%
Art and architecture	2 879	1 307	45%
Natural sciences and mathematics	3 246	1 351	42%
Social sciences	9 208	6 035	66%
Law	2 268	902	40%
Humanities	1 233	729	59%
Education	7 997	6 193	77%
Technology	16 674	7 969	48%
Health	4 227	3 693	87%
Total	50 733	**29 619**	**58%**

Source: CRUCH statistical yearbook (2006).

The situation has improved a little over the past few years, since the apparent graduation rate for the 1997 cohort was only 53%. There has been a clear improvement, in particular, among CRUCH private universities which have seen their apparent graduation rate increase from 26.7% in 1998 to 42.3% in 2002. But it is important to underline that internal efficiency is likely to be worse in reality because the data used in Table 8.11 for first year

students do not distinguish new entrants from students who are repeating their first year. Given the finding by Gonzalez *et al*, quoted in Chapter 4, that only 8.6% of graduates fully completed their programmes and obtained their degrees within the five year theoretical length of their courses, it is likely that many, even most, of the 2006 graduates started their programmes earlier than 2002.

As the Ministry's Higher Education Information System builds up its data base and analytical capacity, internal efficiency is one of the priority issues it should focus on. This could be done by undertaking detailed studies of student cohorts across a representative cross-section of universities to obtain a clearer picture of the actual determinants of repetition and abandon and identify appropriate remedial approaches.

One of the major constraints in ensuring efficient resource utilisation comes from the tight government regulations that the public universities are subjected to. Civil service regulations, especially with regard to human resources policies, financial management and the procurement of goods and services, do not provide the needed flexibility to use available resources in the most efficient and effective manner. For example, public universities cannot hire any new faculty member by direct negotiations; they must go through a public competition. Once recruited, faculty and administrative staff become public servants, which means that the evolution of their career and remuneration is only loosely connected to their actual performance. There is no compulsory retirement age. As a result many universities report difficulties in managing the transition from older to younger academics in a strategic way.

The obligation to undertake all procurement activities through the public portal *ChileCompra* makes the process unnecessarily cumbersome for the purchase of goods and services directly related to the academic nature of universities, such as specialised scientific equipment ordered in small quantity. *Ex-ante* financial controls for all transactions cause delays throughout the process.

Table 8.12 outlines areas where public universities face regulatory limitations compared to the situation of CRUCH and non-CRUCH private universities.

Table 8.12 **Key areas of regulation**

Regulations and Incentives	Public universities	CRUCH private universities	Non-CRUCH private universities
Receive part of their regular budget from the State	Y	Y	N
Eligible for MECESUP funding	Y	Y	Y[1]
Can receive donations	Y	Y	Y
Flexibility to hire and dismiss faculty	Limited	Y	Y
Flexibility to establish salaries	Limited	Y	Y
Subjected to government financial control rules (*ex ante* controls and audits)	Y	N	N
Subjected to government procurement rules	Y	N	N
Can take a long term commercial loan	N	Y	Y

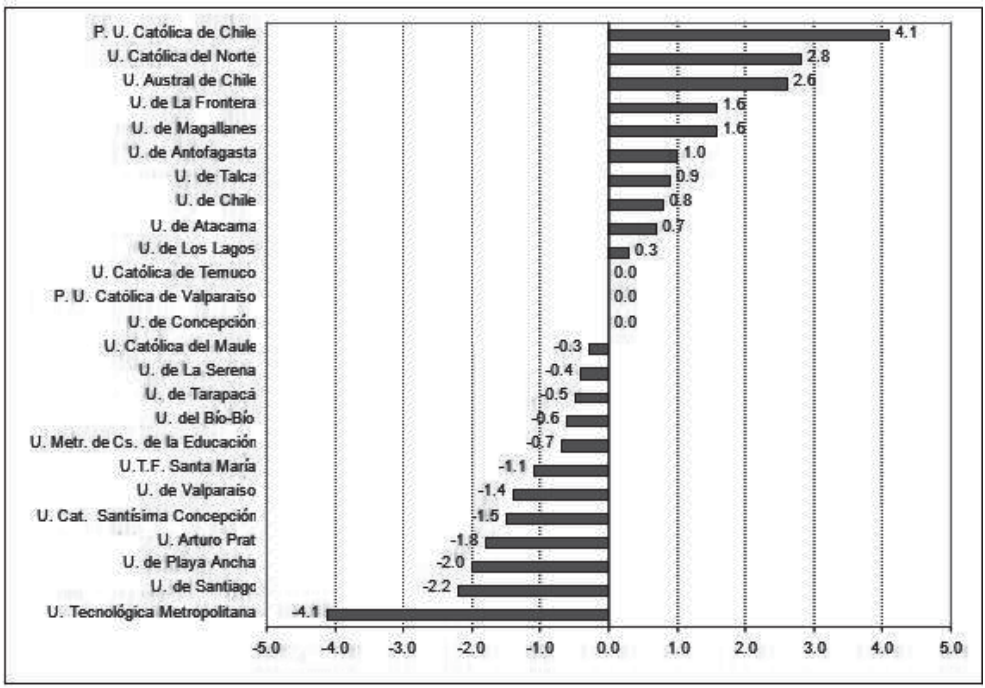
Note: 1.Only for accredited universities and in specific areas.

Source: Field visits, January 2008.

As a result, public and private universities do not compete on a level playing field. This problem, which is common in most countries with a dominant public tertiary education sector, carries an element of paradox in the case of Chile, where private sector enrolment accounts for more than two-thirds of the total student population and the government actively encourages competition among public and private institutions through the AFI voucher system, the competitive research funds and the guaranteed student loan system. The paradox is that, although public universities receive the majority share of their funding from private sources, they must follow civil service regulations while the CRUCH private universities, which receive a significant part of their income from public sources, are not constrained by the same regulations, even in terms of financial control for the public portion of their resources. Chapter 5 has already recommended changes in these areas.

One way of obtaining an idea of the relative efficiency of universities is to look at their efficiency in competing for investment funds allocated through the MECESUP programme. Figure 8.11 measures the difference between the share of competitive funds received by each CRUCH university and its student population size (share of its student population over the total student population in CRUCH universities). A positive number indicates that the university concerned is doing better than its size would imply; a negative number is a sign of under-performance against this criteria.

Figure 8.11 **Efficiency in capturing MECESUP funding**



Source: MINEDUC and MECESUP

The analysis presented here underlines two relevant findings. First, within CRUCH, the private universities tend to display better performance than the public ones. There are three private universities among the top five in terms of efficiency in capturing MECESUP resources, and 7 among the 14 which obtain a larger or equal share compared to their enrolment size. This would tend to validate the earlier discussion about the weight of civil service regulations on public universities. Second, the variation among public universities is also quite significant, which indicates that, faced with

the same administrative constraints, some university leadership teams are much more successful than others in defining strategic priorities and designing winning projects.

To create a level playing-field, the Chilean authorities should allow the public universities to operate under administrative arrangements and financial management rules equivalent to those enjoyed by private institutions. Several countries, notably the UK, Germany, Japan, Singapore and Thailand, have moved in recent years to transform the status of their public universities in order to give them more managerial autonomy. These governance reforms have ranged from making constraining regulations more flexible to giving public universities the status of private law corporations.

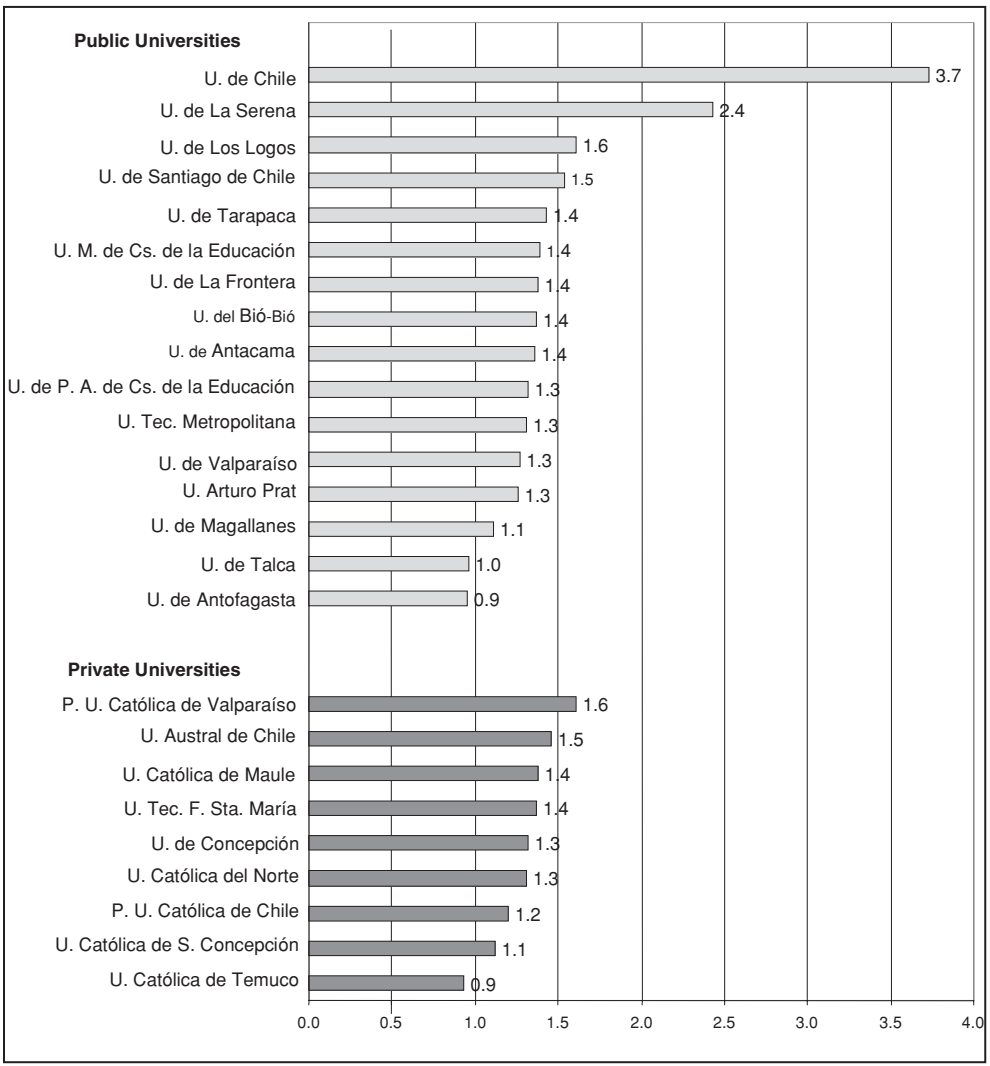
The Chilean government should consider transforming the status of public universities to give them the degree of management autonomy which would be aligned with the competitive nature of the tertiary education system. This should cover, in particular, the following three dimensions:

- All public universities should be able to manage their human resources in such a way as to attract, remunerate and reward qualified faculty and administrators strictly on the basis of performance criteria.
- Financial controls would apply after transactions are carried out; they should not operate as impediments to flexible management practices.
- *ChileCompra* regulations should be carefully analysed in relation to the procurement needs and specificities of universities to distinguish between the categories of goods and services that can be more efficiently purchased using *ChileCompra* and those where exclusive reliance on the common system can be counterproductive. Similarly, in terms of financial controls and audits, public resources should be treated in the same way regardless of which type of university spends the money; conversely, the use of private resources should be regulated by similar rules in both public and private universities regardless of their affiliation to CRUCH.

Another dimension of potential inefficiency, linked to the civil service status of the public universities, is that they may tend to employ a higher proportion of administrative staff than private universities. Statistics are not available for non-CRUCH universities, but the comparison between public and private CRUCH universities (Figure 8.12) shows that, contrary to the situation in other countries in the region, there is a high degree of efficiency in the deployment of human resources, as measured by the number of administrative staff divided by the number of academics. The only outliers

are the University of Chile and the University of Serena. The 3 to 1 gap between the University of Chile and the Catholic University of Chile is of concern.

Figure 8.12 **Proportion of administrative staff in public and private universities**



Source: CRUCH statistics

It is suggested that the two universities which are out of sync undertake a benchmarking exercise to understand why they have relatively more administrative staff than the other CRUCH institutions and assess their staffing needs with a view to improving the balance between academic and non-academic staff.

The highly competitive nature of the Chilean market for tertiary education also has unintended consequences in terms of the effective use of available resources among public universities. Many universities tend to open branches in cities other than their main campus, notably in Santiago in the case of the regional universities. The specialties offered in these satellite branches are not always linked to the main areas of strength or focus of these universities, leading to a dispersion of efforts and resources not warranted by strategic considerations other than the desire to increase the visibility of the university from a branding viewpoint. It is suggested that accreditation teams pay more attention to this phenomenon and make appropriate recommendations. Institutions should implement their expansion plans in a strategic manner consistent with their academic comparative advantages. This issue could be addressed as well through the future performance contracts.

Findings

Overall observation

- Chile offers a unique combination of financing characteristics and approaches which are hard to find anywhere else in the world. Compared to other countries in the Latin American region and even most industrial and developing nations, Chile's tertiary education system stands out for the low level of public funding. At the same time it has implemented bold financing reforms in the areas of resource mobilisation, resource allocation and student aid.

Resource mobilisation

- Chile opted many years ago for a mixed funding approach, whereby budgetary resources are complemented by significant contributions from students and their families. As a result, public spending for tertiary education is markedly low, including funding for university research.

- At the same time, however, Chile is among the countries in the world that have achieved the highest level of cost-sharing in public tertiary institutions on a universal basis.
- In addition, a significant proportion of the increase in tertiary education coverage since the democratic transition has been managed through a rapidly growing private sector funded essentially by the students and their families and enrolling almost 70% of the total student population.

Resource allocation

- Notwithstanding the low level of public funding, the government relies on a wide range of allocation instruments to distribute public resources.
- Many of the allocation instruments, AFI, MECESUP, performance contracts for example, are quite sophisticated in their purpose and design. But there is a need for greater harmonisation among the various financing instruments used at present in order to eliminate inherent inconsistencies, inefficiencies and distortions.
- The financing system displays two distinct positive features compared to common practices in most countries in the world. First, Chile provides core budget funding to a number of private universities which receive 48% of all public subsidies for tertiary education. Second, in order to transfer resources to tertiary education institutions, the country relies more on indirect funding – linked to some measure of student or institutional performance – than on direct payments.

One of the major weaknesses of the financing system is that most of the public funds are reserved to the traditional CRUCH universities entrenched in their historical privileges. Another serious shortcoming is that 95% of the direct budget allocation does not correspond to any performance criterion. As a result, Chile is perhaps the only country in the world with such variations in budget allocation among its public universities, with the top recipient enjoying a per student contribution ten times as high as the lowest recipient. Interestingly, a few private universities receive significantly more public resources than the majority of public universities. Among private institutions, the 9 CRUCH universities capture three-quarters of the public subsidies going to the private sector even though they enrol only 19% of the corresponding student population.

Resource utilisation

- Government regulations provide insufficient incentives and flexibility for public universities to use available resources in the most efficient and effective manner. They are therefore unable to compete with private tertiary education institutions on a level playing field.
- There seems to be insufficient financial oversight over private tertiary education institutions.
- The fact that the theoretical duration of first degrees in Chilean universities is generally one year and often two years longer than similar degrees in North America or Europe represents a social cost of great magnitude for the country.
- Low internal efficiency is a concern in several important disciplines, including law, natural sciences and mathematics, and architecture.
- With two notable exceptions, CRUCH universities are quite efficient in the deployment of administrative employees relative to academic staff.

Recommendations

Overall recommendation

- Chile needs to design a long-term vision outlining the role of the government in tertiary education funding**.** This would guide decisions about the desirable level of public funding and the most efficient and equitable manner to distribute these resources among institutions and students.

Resource mobilisation

- There is a strong rationale for raising the level of public funding for tertiary education on both equity and quality grounds**.**
- Chile could benchmark itself against the few countries, such as Korea and Japan, which have followed the same path of high private funding and high private enrolment, and plan progressively to double its public investment in tertiary education over the next few years.

- The government of Chile should base the allocation of additional resources on the principles of strengthening the 'public good' mission of tertiary education and compensating for market failures. In that context, funding for research would also need to increase**.**

Resource allocation

The following specific measures are suggested to rationalise the overall funding system, in line with the principles outlined above and the policy directions established by the government of Chile in recent years with respect to linking funding with performance and stimulating healthy competition among all tertiary education institutions.

- *AFD*. The AFD should be transformed to make it more performance-based. The government could gradually expand the formula-based part of AFD and make it more output-focused**.**

- It would be desirable also to eliminate the present funding discrimination between CRUCH and non-CRUCH institutions, adopting the following two principles: (i) all Chilean students whose tertiary institutions meet essential quality and accountability requirements would be entitled to public subsidies through student aid, if personally eligible; and (ii) the arrangements for direct public funding to institutions would be consistent with the institutional diversity and competitive nature of the Chilean tertiary education system. Three alternative ways of doing this are suggested:

  - A differently configured dual system where only the 16 existing public universities would receive direct funding in return for fulfilling public good functions such as doctoral education and basic research in disciplines requiring expensive infrastructure investment. This, like all the alternatives, would be accompanied by an expanded scholarship / student loan for students enrolled in eligible private institutions.

  - A more extensive direct funding system where all accredited public and non-profit private institutions would receive core resources linked to their student numbers, subject to meeting conditions relating to quality, financial transparency and fees charged to students.

  - A voucher-like per-student payment system whereby an amount equivalent to the reference cost of studies would be transferred to all eligible tertiary education institutions on the basis of the

number of students choosing to study in and graduating from each institution.

- *AFI*. Elimination of the AFI in its present form is suggested, in the light of the proposed transformation of the AFD and expansion of the student aid programmes. To be used in a meaningful way as a performance incentive, the AFI would have to rely on criteria that are socially more inclusive and would need to be significantly larger in terms of number of students and resources affected.

- *Competitive Funds*. A competitive, objective and transparent mechanism such as MECESUP would be the main approach for allocating public investment funds to all accredited tertiary education institutions.

- *Performance contracts*. If the performance contracts are successful during the pilot phase, the government could use them as a general instrument to promote institution-wide reforms and innovations among all accredited public and non-profit private institutions.

- *Grants and scholarships*. MINEDUC should consider the feasibility of integrating all existing grants and scholarships programmes into a single scheme, with a small number of separate windows, which would not discriminate against non-CRUCH students.

- *Student* loans. The two existing student loans schemes should be merged, for both efficiency and equity reasons.

- Increases in public funding would be allocated as follows: to cover recurrent costs, the government would rely on the reformed AFD, the scholarships and student loan programmes; and the performance contracts. Public resources to expand research activities would be distributed through a simplified scheme of research funds, putting more emphasis on research groups and centres and on infrastructure. Additional funding for investment purposes would be channelled through an efficient and transparent allocation system such as MECESUP.

Resource utilisation

- To create a level playing-field, the Chilean authorities would allow the public universities to operate under administrative arrangements and financial management rules equivalent to those enjoyed by private institutions.

- All private tertiary education institutions would manage their resources according to standard and transparent accounting practices, and prepare annual financial reports that would be audited independently.
- Chile should gradually move towards shorter first degrees in conformity with the worldwide trend.
- To improve internal efficiency, the Higher Education Information System would undertake detailed studies of student cohorts to obtain a clearer picture of the incidence and causes of repeated years and drop-out and identify appropriate remedies.

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Chapter 9. Information, Transparency and Accountability

This chapter considers the amount and quality of information available to Chilean users of tertiary education as well as to policy makers. It begins by considering the extent to which the sources of information available to potential students support informed choices. It looks at the existing state of official sources of information that are inputs into both individual student choices and tertiary education policy decisions. The chapter discusses current government plans for expanding and consolidating information in higher education through the construction of a Higher Education Observatory. It considers the legal requirements for institutions to report detailed financial and other information, the state of compliance with these requirements, and the implications for transparency and accountability. The chapter concludes with recommendations for improvements to information and accountability requirements and practices, focusing particularly on the role of the Higher Education Observatory and the need for robust and comprehensive financial information from tertiary institutions.

Introduction

In Chile, over 6 000 programmes of study are offered by over 200 institutions in the tertiary education system. Individuals require information in order to decide whether to pursue tertiary-level education, and if so, which programmes are most suitable for their needs. They wish to understand the value of the skills, qualifications and credentials they might obtain. Some seek to estimate the private economic and financial return on their potential investment, the amount of time it will take to complete a chosen degree programme and the amount of income they will have to forego while studying. Some would like to understand other potential benefits, such as increased personal and job satisfaction, and how getting one type of degree now may open doors to still further education in the future. Many are interested in the quality, experience and pedagogical practices of instructors, plus the amount and quality of infrastructure and

library resources to which they will have access. Some want to know how well the "brand value" of a particular degree will hold up over time. Some focus exclusively on the affordability of a programme in the short-term, their and their family's ability to pay for it, and the availability of financial assistance. Others may approach their decisions more idiosyncratically, basing them on advice of friends, family, peer groups or other influential individuals. It is quite common, for example, to choose the institution parents, teachers or advisors believe most suitable in relation to the student's academic performance at school. Whatever the decision process, good decisions require access to timely and accurate information on a range of issues.

Governments also require information on the character, relevance and performance of national tertiary education systems. They need to judge their effectiveness in forming the skills needed by the national economy, and whether they provide equitable access to learning opportunities. Governments also want to know how capable tertiary institutions are at accessing, producing, and disseminating research and knowledge; how efficiently they use public funds; and whether the product they provide to students is of adequate quality. They seek to determine whether institutions should be allowed to make financial profits from their activities, and/or whether they deserve preferential tax treatment.

The two groups (individuals and governments) differ in the amount and quality of information required. Individuals generally care more about the cost and value of the degree than about the efficiency with which inputs are used to produce it. Governments care about how the allocation of inputs leads to results and whether these results are optimal. This chapter will consider the extent and quality of the information available to both consumers of tertiary education and to government policymakers.

Information for potential students

Chileans who are considering tertiary education have access to several sources of information to aid their decision processes. The casual observer in Santiago and other major cities is struck by the amount of billboard space devoted to advertisements for universities or other tertiary institutions or programmes. Television viewers also find numerous advertisements. As one might expect, these tend to provide information that is generally true, if partial and selective about the institutions in question. One hopes that they serve as a starting point for a more methodical search by potential students.

Advertisements for accredited institutions now almost invariably highlight the institution's "accredited" status. This testifies to the important

role the accreditation system has come to play in Chilean higher education. Most advertisements do not divulge what type of accreditation the institution has received (Institutional Management, Research, Staff Qualifications, Linkages). However, the essential information prospective students need is conveyed by the 'accredited' label, which centres on institutional management and undergraduate teaching. Other areas may be highlighted by individual institutions, but are less directly important to prospective students selecting a study option. Nevertheless, it may be worthwhile for the National Accreditation Commission (CNA) to be more active in educating consumers on the types of accreditation and their meaning in practice. Overall, the vigorous advertising market attests to a dynamic higher education sector where institutions vie to attract potential students.

Students seeking additional information have many options. Most of those interviewed by the review team were aware of "*Futurolaboral*" as the prime source of information on earning potential of graduates. Chapter 4 on Relevance discusses the content and use of *Futurolaboral* with respect to whether or not, from the perspective of labour market success, students should pursue tertiary education. The site provides a commendable amount of useful information, both in aggregate and broken down by courses of study: on overall enrolments in tertiary education by level, graduates, average income and rate of return. The site divulges earnings, employability data, and sectors of the economy where graduates of particular occupations are employed. It also highlights special national and international studies on labour market trends and demand for skilled labour.

Futurolaboral is an impressive instrument overall – comparable to some of the most advanced labour information portals in OECD countries – and an important resource for future students. But potential students must decide not only whether to study, but what and where to study. Here *Futurolaboral* also serves as a gateway to five important information resources on the specific study options available.

Factual information on study options comes from two types of sources. Government agencies, such as the MINEDUC, the *Consejo Superior de Educación* (CSE) and the CNA are responsible for collecting and publishing a wide variety of information. The *Directorio de Educación Superior* is maintained by the Higher Education Division (DIVESUP) of MINEDUC. It is a factual guide to available degree programmes. It is searchable by institution type (public or private university, IP or CFT), by degree type, and by region. Where available the database indicates whether the course is offered by the main campus or a satellite campus, whether it is a day or evening course, the duration of the programme, its costs, and recent

enrolment. In early 2008, the contents of the database related to the study offerings from academic year 2004. It is not clear how often the data is updated. Students whom the review team interviewed did not indicate this site as a main source of information.

More well known is the *INDICES* database maintained by the CSE. Here one finds information on the historic evolution of Chilean tertiary education, the tripartite classification of institutions, the different classes of degree, and the authority of the different institutions to grant these. The site explains the process through which the different institutions are granted initial permission to operate, are examined, supervised, and granted autonomy. It also explains the roles of the various regulatory and quality assurance bodies. The minimum legal requirements for university entry are explained, and sound general advice is offered to prospective students on what to consider when selecting a programme of study.

The *INDICES* website also explains the consumer protection laws that apply to higher education: first-year students have a 10-day grace period during which they may withdraw from an institution and be reimbursed 99% of any tuition fee paid. They may also register complaints that are contractual in nature with the *Servicio Nacional de Consumidor* (SERNAC), or with the CSE (as regards universities) or MINEDUC (as regards CFTs and IPs) if the complaint pertains to the quality of education. The CSE receives a wide range of complaints, which may range from minor administrative disputes to false advertising to provision of seriously deficient educational services. The CSE determines the appropriate course of action in each case, and informs the plaintiff of the actions taken.

A major service in consumer protection provided by the CSE is its list of closed tertiary education institutions. As part of the explanation of how permission to operate is granted, the CSE explains its authority to have the Ministry close institutions that have failed to receive their license to operate. The website provides the names of 36 institutions which failed to complete the licensing process satisfactorily in the period from 1996 to the present. The CSE recommended that MINEDUC revoke official recognition from these institutions, and they were obliged to cease operations. For institutions that are in the licensing process, *INDICES* makes available the date of their inscription and the expected date of the decision granting them autonomy. The institutions which have been granted autonomy are also listed along with the date autonomy was conferred.

Table 9.1 **Selected sources of information on tertiary education**

Institution	Information source	Main types of data available
Ministry of Education	Higher Education Directory DIVESUP	Searchable compendium of programmes of study database of student aid and scholarship opportunities
		Statistical compendium
Ministries of Education, Economy and Labour	Futurolaboral	Occupations database with information on numbers and salaries of graduates for over 100 occupations
CSE	INDICES	General information for prospective students
		Searchable database of programmes of study, numbers and distribution of tertiary education undergraduate students (total and first year), postgraduate students, teachers, institutions, accredited institutions, student origins etc
		Searchable database of tertiary education institutions
		Information on student aid and scholarships
		Comparison programme
Council of Rectors (CRUCH)	Council of Rectors Website	Information on the PSU
		Annual statistical compendium with enrolment data by type of degree programme
		Student aid information
National Accreditation Commission	CNA Website	Accreditation status of universities, IPs and CFTs.
		Institutional accreditation reports with detailed commentary
Unversia.cl	Dedicated Unversia.cl Website for Chile	Comprehensive information of interest to current and future students
Qué Pasa Magazine	Annual Survey of Universities	Rankings of most prestigious institutions, highest rated programmes of study
El Mercurio Newspaper	Academic Alternatives Website	Articles for prospective tertiary education students
		Database on programmes of study
El Mercurio Newspaper	Academic Alternatives Television Programme	Journalistic information on programmes of study and issues in tertiary education

Source: Review team

Most prospective students visit *INDICES*, however, for specific information on available programmes of study. Similar in scope to the *Directorio de Educación Superior* provided by the Ministry, the *INDICES* database of programmes of study provides more features and, perhaps most importantly, more current data. The database tool allows students to find information on a single programme or to compare a listing of all programmes in a given area of study, type of institution, type of degree programme or region. For each programme, the database includes information on entry requirements, tuition, enrolment, PSU score averages, how long the programme has been in existence, and, when available, the percentage of full-time faculty, and whether any specific financial assistance is available for the programme. The review team was informed that institutions are scrupulous about updating their data in INDICES, not least because this is a principal source of information on which the magazine *Qué Pasa* bases its annual rankings. Students interviewed by the review team seemed to be familiar with and satisfied by the INDICES database. However, the CSE itself acknowledges that it is not in a position to verify the accuracy of the data provided by the institutions. While INDICES is probably the most comprehensive source of data on specific programmes, its information cannot be considered completely authoritative.

The National Accreditation Commission (CNA) makes its decisions public and maintains a website providing comprehensive information on results of accreditation decisions. In addition to lists of which institutions and programmes have been accredited, the site makes available the *acuerdos,* or reports to the institutions, that summarise the accreditation decision and its supporting rationale. These reports contain frank synopses of the assessments of the strengths and weaknesses of the institution or programme as reported by peer evaluators. The assessment information they contain is clear and specific; any prospective student taking the time to consult these reports could hardly fail to come away with a clear picture of the attributes and relative value of the programme or institution. The Chilean quality assurance system deserves commendation for this level of transparency.

Nonetheless, a system with over 600 000 students and 6 000 programmes will increasingly rely on diverse, decentralised and, in many instances, commercial channels for providing information to prospective students. Apart from the advertising that institutions themselves undertake, a growing set of private information providers are taking an increasingly active role in satisfying the demand for information about tertiary education. Websites devoted to tertiary education, including advice for prospective students, are multiplying. One such site, *Universia*, provides comprehensive information on tertiary education-related themes from an Ibero-American

perspective, and has dedicated sites for most Latin American countries, including Chile. The information provided rivals Indices in its comprehensiveness, and the site has caught the attention of university leaders and administrators. Other sites run by major daily newspapers offer similar services, and there are even television programmes specifically aimed at the growing number of prospective tertiary students.

Clearly the most influential of the commercial information sources is the annual rankings published by *Qué Pasa* magazine. Since 2000, the magazine has published an annual survey of university quality. It ranks institutions in terms of overall prestige, student selectivity, top public and private universities; it also ranks their individual study programmes. A distinctive feature of the *Qué Pasa* rankings is that they do not rely only on published statistics such as PSU score and proportion of students receiving merit scholarships. Instead they seek the opinions of employers, and specifically seek out those involved in hiring decisions at a sample of top businesses. As a result, the *Qué Pasa* rankings tend to be an influential measure of the market value of degrees, and provide a counterbalance to more academically-focused measures of institutional performance.

The supply and demand for information is a product of the persistent and growing demand for tertiary education, and the competition among institutions to attract students. Ample information exists for the potential consumer who seeks to make an informed decision in a methodical way. Nevertheless, given that the tertiary age group generally consists of 18-24 year olds, a non-negligible percentage will be swayed by subjective factors. The review team was made aware of a particular case where a tertiary institution had enrolled significant numbers of students in programmes of study for a career whose employment prospects in Chile were almost non-existent. Complaints to MINEDUC and the CSE were accompanied by calls for government regulation to ensure that tertiary institutions demonstrate a reasonable labour market demand for graduates of their programmes. While labour market analysis is indeed important when decisions to open study programmes are taken, the government should respect the institutions' right to take these decisions internally, and then account for them through the accreditation system. It is not advisable to shift the risks of future labour market failure from prospective students to institutions. The dynamism of Chile's tertiary sector is, on the whole, a distinct virtue; its responsiveness should serve the national economy well over the long run. Legal regulation of the study programmes autonomous institutions can offer would be a much less effective means of encouraging the development of courses with good career prospects than continuing efforts to improve the quality of information available to prospective students, along with efforts to improve the quality and relevance of instruction.

Information for policy-making and evaluation

The information needs of policymakers differ significantly from those of prospective students. Policymakers need information on the system's resources and resource utilisation, as well as its efficiency, outcome and impact. A national information system for higher education should permit continuous judgments on the effectiveness of institutions, their discharge of their responsibilities, the appropriateness of their privileges and the value they are giving for their funding.

The data on tertiary education traditionally collected by MINEDUC provides a reasonable basis for analysis of general trends in the system. There are standard descriptive statistics encompassing figures such as enrolment and graduates. Data on government transfers to CRUCH institutions and on allocations and use of funds in government-supported student aid programmes has similarly been routinely published. Macroeconomic-related figures on the percentage of GDP spent on tertiary education are tracked, along with data on equity gathered from the three-yearly CASEN household surveys. CONICYT publishes data on the destination of competitively-awarded funds for its research programme. In addition, Chile has actively co-operated with international organisations such as the OECD, UNESCO, UNDP and the World Bank to carry out studies of education. The OECD's principal education statistics publication, *Education at a Glance*, reports several tertiary-level indicators for Chile.

However, as the system has expanded, matured, and diversified, the amount and quality of information available for policymaking has failed to keep pace. Descriptive statistics often do not reach the levels of precision needed to make more discriminating distinctions in institutional and system performance. Several examples of sub-optimal availability or precision of data became apparent to the review team:

- Figures on net enrolment of the tertiary age group are not readily available; institutions do not disaggregate their reported enrolment figures by student age. This is an important omission considering that a significant proportion of tertiary students are adults who are entering or returning to tertiary education after spending years in the labour force.
- The proportion of students studying fulltime versus part-time or day versus evening courses is not readily available. The most detailed figures on day versus evening studies come from a 2006 UNDP report on equity rather than from routine MINEDUC statistics.

- Drop out and survival rates, plus time taken to complete degrees, are measured by proxies or estimates.
- No information is available on the amount of non-sudsidised credit provided by private banks to tertiary students.
- No reliable information exists about international students in Chile, and Chilean students studying abroad.
- Information on academic faculty and staff characteristics is scarce. Institutions have not been obliged to report on faculty age, salaries, employment conditions (fulltime versus part-time), nor on faculty activities such as time dedicated to research versus teaching.

Public institutions are only required to report in detail on the use of public funds, not on their overall use of funds. Public institutions are also required to have their financial statements audited. The vast majority of institutions – public or private – claim to make their audit results public annually, but no standard financial classification, recording and reporting format exists.

Institutionally-reported enrolment figures consistently differ from figures gleaned from household surveys.

The last item points to a serious deficiency within the information system. Institutions face different incentives and consequences for reporting information to different sources. It is widely acknowledged in Chile that different figures will be reported, "depending on who is asking and why". A major instance of this is thought to occur with respect to the location of enrolment within an institution with more than one campus. Institutions have an interest in showing a greater proportion of enrolment at central or flagship campuses rather than in branch campuses.

Similarly, private universities report on academic staff in terms of fulltime equivalents (FTEs) rather than on a head count basis. Statistics are kept on FTEs by level of academic qualification, but these do not permit an accurate assessment of the true percentage of part-time versus fulltime staff in a given institution or programme.

However, other inconsistencies seem to arise mainly because there are no arrangements to chase up institutions which fail to report and capture their data, meaning that what may appear to be comprehensive national figures turn out, on closer inspection, to be incomplete. This is true, for example, of the CSE's otherwise very valuable *INDICES* database. The 2008 analysis of institutions makes clear that, while statistical reports were received from all but one of the universities, 11 of the 44 IPs and 16 of the 87 CFTs did not send in their reports. This lacuna is not routinely mentioned

in the other *INDICES* analyses. The review team found out from the CSE via MINEDUC that if institutions do not report voluntarily, the CSE neither requests their figures nor attempts to estimate and include the missing numbers. This suggests that household surveys are more likely to be right about the level of participation in tertiary education than the institutionally-reported figures relied on by MINEDUC, and that enrolment in IPs and CFTs is particularly likely to have been under-reported.

In addition, the government has little information about the use of funds within institutions. Private institutions are required to report on their activities to Chilean tax authorities. For-profit CFTs and IPs fall under the same tax regime as any other private business, except that they receive an exemption from property taxes on buildings used for educational purposes. Private universities, which by law cannot be for-profit, enjoy this advantage and do not pay tax on their revenues from educational activities (student fees). They are required to report income and activity to tax authorities, but have significant latitude on permissible investments and expenditures. It is readily acknowledged in Chile that this latitude allows private universities to conduct activities that are tantamount to profit-taking while still complying with the legal requirement to be non-profit institutions.

To the extent that Chile is allowing *de facto* for-profit higher education under a not-for-profit legal and regulatory structure, it is missing an important opportunity to leverage public policy to improve tertiary education quality. Many other OECD countries, especially those with large percentages of private financing of higher education, have tax systems that mandate different treatment of expenditure devoted to core educational activities versus other "business activities." The net result creates a significant tax and financial advantage for institutions whose spending supports their educational mission.

The accreditation system has made progress in halting the abuses of *de facto* profit-making in non-profit private institutions. Most institutions cannot exist without access to government-guaranteed loans for students. To access these, the institutions must have accreditation, and therefore must subject their finances to scrutiny. In cases where there is a serious divergence between educational mission and financial priorities, the institutions risk not being accredited. However, the accreditation system is not the most efficient way to oblige institutions to comply with the spirit of laws that seek to ensure the tertiary education resources are reinvested in improving the quality of education. More adequate legislation and regulation is needed to prevent non-profit institutions from making *de facto* profits, or to allow institutions to make profits but under appropriate tax regimes. Coupled with careful enforcement, these measures could eliminate the

ability of institutions to dedicate themselves to a hidden agenda of profit making at the expense of their educational missions.

This point is particularly important because, over the past decade, aggregate demand for tertiary education and individuals' willingness to pay for specific courses of study has consistently been higher than the cost of enrolling the marginal student and granting additional degrees. As a consequence, a major concern of public policy for tertiary education in Chile revolves around managing the resulting quality tensions. Tertiary education policy seeks to oblige providers to offer a quality product that satisfies individual users as well as the legitimate interests of the State in the creation of a qualified labour force. Within such a dynamic tertiary education landscape, room exists for more attention to how tax policy can leverage greater targeted investment in activities that lead directly to improved education quality, and how it can prevent tax-exempt institutions from extracting *de facto* profits.

Finally, the review team detected a deleterious tendency among tertiary education institutions towards a culture of "selective use" of information that discourages the release of accurate information. Competition for students creates incentives for any given institution to publicise data that may be methodologically weak but nevertheless paints the institution in the best possible light. If one institution releases such data, other institutions will put themselves at a disadvantage if they publish more methodologically rigorous and accurate data that shows them faring worse. In the absence of agreed data collection methodologies, "indicator inflation" and selective use of statistics have become unfortunately commonplace. In fact, the review team learned that some institutions maintain a set of accurate indicators – for internal use only – by which they judge institutional performance. These same institutions may maintain a second set of indicators that conform to the loose methodological standards in general use, which are made available to the public.

The Higher Education Information System (SIES)

Steps are being taken to address the information gaps identified above. Foremost among these is the creation of a Higher Education Information System within MINEDUC.

Law 20.129 of 2006, which creates the National System of Quality Assurance for Higher Education, addresses the need for comprehensive, high quality information. Articles 49-52 of the law mandate the Ministry to create and maintain a national Higher Education Information System,

mandate institutions to compile and provide the necessary contents, and provide the Ministry with the authority to sanction non-compliance.

The Higher Education Information System has set out to eliminate the information gaps with respect to universities by obliging institutions to report using a single methodology and standard definitions. The information system seeks to produce comparable data for the following indicators, disaggregated by programme of study, area of knowledge and institution:

- Student intake and enrolment;
- Drop out and survival rates for first year students and all matriculated students;
- Graduates.

The system also seeks to collect comprehensive and comparable data on academic staff, and on the financial and organisational aspects of institutions. To date it has developed and distributed standardised submission forms for reporting on all of the above areas, except the financial and organisational aspects of institutions.

Standardised methodology would also allow for comparative analysis of student characteristics such as gender, age, PSU performance, socio-economic background, prior educational achievement, family income and earnings.

Perhaps the most important feature of the Information System is the plan for the data to be validated by MINEDUC. It is being designed to permit cross-checking of data with other reliable sources of government information while maintaining appropriate privacy and confidentiality.

The progress to date on the Information System represents an important step towards eliminating the unreliability of key aspects of data on the Chilean tertiary education system. MINEDUC should continue efforts to assure compliance by institutions with this system. It should also promote dissemination and analysis so that policymakers can quickly take advantage of the improved, comparable data.

With respect to research and STI capacity building, in some key areas data is difficult to obtain or not up-to-date. The latest CONICYT and RICYT official statistics on R&D are mostly on 2004. A significant portion of data related to research is input focused, and data is dispersed among different sources. Over the past few years, an attempt has been made to create a STI Observatory based at CONICYT. This initiative received World Bank support under a science and innovation funding project. The observatory, known as KAWAX, has not yet fulfilled its potential. The

National Commission on Innovation for Competitiveness has managed to compile an impressive amount of data from a variety of sources, but these do not appear to be regularly collected, updated, and made easily available to the public.

Findings

Numerous sources of information exist to meet the needs of prospective students of tertiary education. While no source is comprehensive and complete, taken together they provide a reasonable degree of access to the information needed to make informed consumer decisions.

The significant weaknesses in the Information System are due in large part to the absence of standardised classification, recording and reporting formats and the lack of completeness, checking and verification of institutionally-reported data. They also stem from a failure to address the conflicting incentives that institutions face when reporting data. As a result, Chile lacks the high quality and precise data it requires for accurate assessment of the tertiary education system's performance in key areas.

Closing these information gaps is of critical importance to the overall health of the system. The report of the Presidential Advisory Council on Higher Education endorses the greater use of performance criteria for the allocation of public resources; the review team concurs with this recommendation. Increased use of performance-based funding intensifies the need for reliable and comparable information throughout the system. As Chile accedes to OECD membership, it should redouble efforts to produce, disseminate and use full, reliable and comparable data and information for policy-making and the protection of students' interests.

Recommendations

- MINEDUC should continue and expand efforts to collect, verify and disseminate reliable and comparable information through the Higher Education Information System.
- Particular attention should be paid to obtaining robust financial information and other data on the use of institutional resources – not only those that are publicly provided. The government should use tax policy to promote investment of institutional resources in activities that improve education quality and eliminate a concealed drive for profits that is at odds with institutions' educational mission.

- Efforts by tertiary education authorities to standardise data classification, recording and reporting requirements and enforce high reporting standards are likely to be more beneficial than efforts to require institutions to make detailed *ex-ante* demonstrations of labour market demand for graduates of their programmes of study.

Chapter 10. Conclusions and Recommendations

This chapter begins with a brief summary of the findings and recommendations of the Presidential Advisory Council on Higher Education, noting a wide measure of agreement between the Council's report and that of the review team. Then the chapter sets out the review team's own conclusions and recommendations on each aspect of tertiary education.

Introduction

This Chapter will recap on the review team's conclusions and recommendations. Before doing so, it will give a very brief summary of the conclusions of the Presidential Advisory Council on Higher Education, which published its report in March 2008. The review team met members of the Council to hear about their work in January 2008, but the team and the Council prepared their recommendations quite separately. There is, nonetheless, a high degree of consensus between the analysis and the recommendations of the two groups. The review team believes that this report may be seen as complementary to the Council's report: developing the analysis, highlighting many of the same concerns, and presenting practical strategies for implementing solutions to the issues recognised by all.

Conclusions and recommendations of the Presidential Advisory Council on Higher Education

The description here of the Council's conclusions will concentrate on those which the Council included in their general report, though interesting reports have also been published of the discussions in the Council's four subcommittees.

The system and its governance

The Council's report says that system governance needs to distinguish between four functions:

- Definition and financing of public policies, to be under the responsibility of the present Department of Higher Education, possibly transformed into a Vice-Ministry or a separate Ministry of Higher Education, Science and Technology that could replace it.
- Quality assurance, shared between the Accreditation Commission and the Higher Council of Education (licensing).
- Protection of the rights of students as education users – the Council unanimously recommends the establishment of an independent agency to protect the rights of students.
- Representation of the interests of the institutions that make up the system – there is a need for a body where the interests of all tertiary education institutions would be represented and could be expressed.

The tertiary education institutions

The Council recognises the positive nature of the institutional diversity which characterises the Chilean system. It concludes however that there are still good reasons to give special funding to the public universities, such as: the need to have institutions that are not linked to any ideology and maintain a pluralist intellectual approach, the need to reduce regional disparities through the regional public institutions, and the need to support disciplines where private returns are very low but social returns high (humanities, for example). The Council recommends that the state define the conditions for special financial support to these institutions.

The Council:

- Notes the need to distinguish clearly between non-profit and for-profit universities and technical institutions – though there was disagreement among Council members on whether or not to allow for-profit universities to operate legally.
- Unanimously recommends removal of the regulatory and administrative constraints that prevent public universities from competing flexibly with the other tertiary education institutions.
- Is open to making all non-profit institutions eligible for public funding through performance contracts and competitive funds, but

believes that private universities benefiting from public funding need to be more accountable for this funding.

- Recommends better articulation between the non-university sector (IPs and CFTs) and the university sector; and
- Recommends that the State establish and finance public IPs and CFTs.

Access, equity and student aid

The Council makes a general recommendation about the need to re-assess the PSU and consider other alternatives, but stops short of specific recommendations.

The Council favours a unified student loan scheme for all tertiary students, recommending that the eligibility criteria and amounts for scholarships and student loans be the same for all students regardless of the institution attended, and whether it is public or private. However Council members did not all agree on the details. Some members wanted to continue with eligibility criteria combining need and merit; others thought that eligibility should be based solely on financial need. The majority favoured bringing all student loans into the state-subsidised loan scheme (FSCU), with more money for maintenance grants for students in the lowest three income quintiles and reference tuition fees closer to actual prices. A minority group of members proposed abolishing tuition fees for students in the lowest three quintiles during the first two years of study in universities and the first year in technical institutions, and financing their studies through a unified student loan scheme thereafter.

Financing

The Council outlines the following basic principles:

- The desirability of continuing to combine two complementary forms of funding, direct funding of institutions and demand-based funding.
- There should be no discrimination between public and private universities.
- All institutions that receive public money must satisfy strict eligibility criteria.
- As regards direct funding of institutions, some members of the Council proposed to modify the AFD by linking it more closely to performance, others proposed to make it available to all institutions

that satisfy eligibility criteria; but there was no consensus and no precise definition of the proposed changes.

As regards indirect funding, some members suggested linking or confining the AFI to the low-income quintiles, others wanted to keep it as is.

The Council also recommends that:

- all accredited institutions should be eligible for competitive funds.
- there is a need to verify that all donations, particularly to private institutions, are used for genuine educational improvement purposes, and there should be some form of incentive scheme to help institutions that have been unsuccessful in attracting donations.

Quality assurance and accountability

The Council recommends:

- Stricter rules and controls for licensing and a more objective and transparent accreditation system with better safeguards against conflicts of interest by peer reviewers.
- Making resources available to help those institutions that fail accreditation.
- Making accreditation criteria better adapted to the non-university institutions.
- Enhancing institutional accountability, and
- Establishing a more dynamic and reliable Information System.

Science, technology and research

The Council calls on both the government and the productive sector to contribute more to tertiary education. Specific recommendations are to increase funding for doctoral students in both public and accredited private institutions, and to create a direct funding mechanism for the institutions that receive them. The Council warns against over-concentration of funding in the clusters identified by the Innovation Council, and invites the government to support fundamental research in science and mathematics. The Council also recommends incentives to encourage university-industry linkages, and more funding for research overall.

Conclusions and recommendations of the review team

The review team's report begins with an overview of the Chilean system in Chapter 1. Chapter 2 summarises what Chile has already achieved in relation to tertiary education, and the issues still to be addressed. These issues are discussed in more detail in Chapters 3 to 9, which contain the review team's conclusions and recommendations on various aspects of tertiary education, as described below.

Chapter 3: Access and equity – admission and retention

The review team notes the Chilean government's declared objectives of correcting inequalities in admission arrangements and guaranteeing all young people with talent the right to attend higher education; but also that these laudable but ambitious objectives have yet to be fully realised.

Fewer students from lower-income groups are getting into tertiary education than would be predicted from their secondary school graduation rates. Equity gaps appear to widen during the higher education admission process, which depends heavily on performance in the PSU test. Students who are from low income groups, from municipal schools or female are less likely to emerge from the admission process with a place at the CRUCH university of their choice than students who are from higher income groups, private (particularly unsubsidised private) schools or male. They are also less likely to be eligible for financial support if accepted. There is some – but less clear - evidence that opportunities differ for students in different regions.

Students from lower income groups are also under-represented in private universities, IPs and CFTs – most notably in private universities, least so in CFTs. This has less to do with admission systems than with the student aid available to students at these institutions. And from the limited information available, it seems that students from lower income groups and municipal schools are more likely to drop out of university. Those who graduate, tend to take longer to complete their courses.

Most of these equity gaps have their roots in differential preparation in secondary schools. Important national initiatives are underway to improve secondary education for the poorer students and those attending municipal schools. However these initiatives cannot be relied on to resolve all the equity issues in the near future. Further action appears to be needed, to reduce the competitive disadvantages some groups face in the current admission process and to improve their chances of graduating.

The review team makes the following recommendations:

- Secondary school improvement initiatives already in hand to improve education for the poorer students and those attending municipal schools should be vigorously pursued.

- Review and revision of the PSU test is proposed, to address the equity issues affecting young Chileans whose family and schooling circumstances disadvantage them in the competition for higher education places and to improve identification of those most able to benefit from higher education. From international experience, two options are suggested. The first is to move towards a national school-leaving test or exam which would also set the minimum standard for university entrance. The second option is to reform the PSU by including extended essays and tests of reasoning ability and learning potential.

- Some changes are proposed to the post-PSU stages of university admission system. It would be helpful to applicants and to ensuring transparency if Chile's private universities were to join in a common allocation system with the CRUCH universities, including a central clearing house for applications.

- To enable the common allocation system to serve more universities with a wider range of missions, and to improve the chances of less advantaged students achieving places at their preferred institutions, it is proposed to move away from the present CRUCH practice of allocating places in order of total PSU-based score, towards a more multi-dimensional admission system in which universities are encouraged to adopt objective criteria appropriate to their varied missions and (if they so decide) give priority to applicants from less advantaged or under-represented groups. Ways are suggested of guarding against adoption of non-objective criteria or questionable admissions practices.

- It is suggested that MINEDUC explore the options for giving young people with university aspirations in less advantaged schools more help in preparing for the national university entrance test or school-leaving test.

- MINEDUC could also consider funding delivery of no-fee or low-fee 'access' courses, enabling young people from under-represented groups with university potential, but who left school without passing the national university entry test, to qualify for university entry. A test of verbal and non-verbal reasoning ability, also known as an aptitude test, would assess university potential.

- Further measures are proposed to help the retention of poorly-prepared young people from lower income groups and municipal schools, by delivering a post-admission 'knowledge boost' to improve completion chances before students embark on the formal university curriculum. There is also an onus on Chilean universities to adapt the initial demands of courses, curricula and teaching to today's more diverse student body, as part of their responsibility to help every student they admit to graduate. It is suggested that MINEDUC agree with institutions a new objective or objectives relating to completion and survival rates and sets up a system for collecting the relevant statistics.

Chapter 3: Access and equity – student aid

The review team notes that by international standards, the cost of tertiary study in Chile is very high. The government of Chile has put in place an extensive system of financial aid for low income students, including scholarships, maintenance grants and student loans. Funding for scholarships has increased significantly in recent years. Despite this, only 13.8% of all students enrolled in a tertiary education institution receive a scholarship of some kind compared to 51% in the US. In addition, the amounts given are not sufficient to pay for the full tuition fees. Only 30% of all tertiary students at non-CRUCH universities from the first and second quintiles, and only 40% of IP students from these quintiles, have a CAE loan. The likelihood of getting scholarship and loan support is notably low for students at CFTs, although CFTs train high numbers of the poorest students.

The review team considers that the new student loan programme (CAE) presents several positive features, including its capacity to leverage private capital, the fact that the responsibility for financial guarantee against default is borne by the universities themselves, and the link to the accreditation process. It is the financing instrument with the most positive impact from the point of view of redistributing public resources to low-income students.

Implementation of the reference fee system has proved problematic, due to the complexity of the methodology.

The review team's recommendations are as follows:

- For both equity and efficiency reasons, it is proposed that MINEDUC would merge all the present scholarship schemes into a single programme with a small number of 'windows', and also merge the two existing student loans schemes.

- It would be preferable to merge the two loan schemes on the CAE rather than the FSCU model because CAE is more promising from a financial sustainability viewpoint. The CAE could be made even more efficient and equitable by introducing an income-contingent payment element or, at the very least, by following a graduated repayment schedule that would better mirror the income curve of graduates. Serious efforts should be made to reach a higher proportion of needy students.
- If, in the medium term, CAE were not as successful as expected in terms of loan recovery and financial participation of commercial banks, the Government of Chile could consider an income-contingent loan system along the lines of those in countries such as Australia, New Zealand or the United Kingdom.
- Given the high private cost of studying in Chile, the government should expand grant and loan opportunities further, and ensure that all scheme conditions are equitable and appropriate, bearing in mind the diversity of students and the diverse aims of tertiary education. The aim must be to ensure that no qualified student is prevented from entering and completing tertiary education in either the university or the non university sector for financial reasons.
- MINEDUC should carefully study the pros and cons of maintaining the system of reference fees in its present complex form. A simpler way of setting the reference fee levels would be to benchmark the top five public universities as assessed by the accreditation process. Complementary measures to protect students from excessive fee increases could be (i) to require tertiary education institutions whose tuition fees grow faster than the national average to justify why their costs are out of line, or (ii) to publish a list of institutions whose price outpaces the national average.

Chapter 4: Relevance – labour market linkages

The review team notes serious concerns in Chile about the relevance to labour market needs of much of the output of the tertiary education system, particularly the university sector. There is a lack of user-friendly information systems to assist prospective students and families with career and institution choice. Links between higher education institutions and the world of work are weak.

The review team recommends that:

- Chile should build on the existing strengths of *Futurolaboral*, by: i) the provision of fuller interpretation of the labour market data contained on the website, aimed at students and their families as well as at trained career counsellors; ii) the regular updating of that information; iii) the provision of more forward-looking analysis to help institutions avoid replicating course offerings that are available elsewhere or developing new courses for which there is no labour market demand; iv) the development of linkages to other useful online resources such as the *Consejo Superior*.

- The country should build up a unified information system on the quality of academic programmes, the extent of student dropout and its causes. In time, this information base should also be expanded to include systematic Graduate Tracking Surveys, and surveys of employer satisfaction with graduates.

- There should be stronger linkages between employers' needs and higher education institutions' academic programmes, involving participation and commitment from both sides. Employers should have greater involvement in: i) institutional governance; ii) identification of relevant new courses and development and renewal of the curricula; iii) internships as part of course requirements (where appropriate).

Chapter 4: Relevance – system articulation and pathways

The review team finds that there are unnecessary barriers preventing students in Chile from progressing from secondary (particularly vocational secondary) to tertiary education; and very few "ladders and bridges" to facilitate progression within the tertiary system. It is difficult to move from lower tertiary technical training to university study in the same discipline without starting again from scratch.

The review team recommends that:

- Institutional and legal barriers to progress and pathways through the tertiary education system should be eliminated. and new pathways through the system created. A National Qualifications Framework could be developed, embracing all qualifications, academic and vocational, from secondary level up to PhD. It would seem sensible to build this up from the foundations laid by the training qualifications framework adopted by C*hilecalifica*. This Framework could be designed to make access to tertiary institutions easier for students from all backgrounds, including vocational secondary schooling, work and previous tertiary study, and to facilitate transfer

between institutions and progression from lower to higher level degrees within the tertiary system, by including arrangements for credit accumulation and transfer. To support this, credits from all tertiary education institutions should be made compatible. The Framework could also provide for recognition of equivalent qualifications nationally and internationally, and for accreditation of previous learning. Qualifications should be based on outcomes and competencies achieved, not on time/hours of study put in. In all these ways a National Qualifications Framework could help and encourage lifelong learning.

- A National Recognition Information Centre (NARIC) should be established, to agree and certify equivalences between Chilean and foreign qualifications, thus opening up opportunities for Chileans to have their education and skills qualifications recognised abroad when applying for undergraduate or post-graduate places or jobs.

Chapter 4: Relevance – courses and curricula

The review team finds that academic programmes need to become more relevant to the current and future needs of a competitive and globalised world in which Chile intends to become an important player. University programmes tend to be unresponsive to the requirements of the world of work. Curricula are often inflexible and overspecialised. By international standards, courses are extremely long and the workload of students and staff very heavy. These factors lead to high drop-out and low survival rates.

The review team recommends that:

- A comprehensive review of the curriculum taught in tertiary level institutions should be undertaken, to: i) identify areas where curricula are unduly inflexible and overspecialised and develop an action plan to tackle these problems without sacrificing the overall quality of the programmes; ii) introduce additional curricular elements such as teamwork, communication skills, intercultural awareness, entrepreneurship, and the learning of a second language to a high level of competency.

- Taking into account both national needs and international standards, the academic workload in tertiary education programmes in Chilean HEIs should be reviewed, in order to develop leaner and more effective academic programmes, as well as to establish further articulation with the previous levels of education in order to reduce the gap in relevant knowledge required at the entry level in tertiary education..

- To make better use of the existing diverse range of opportunities in the overall tertiary education system, quality assurance and funding mechanisms could legitimise different mission statements, including those with a clear vocational approach, and provide incentives for increased links with business and industry.

Chapter 4: Relevance – internationalisation

Internationalisation of higher education in Chile has been identified by the Chilean government as an important priority. However, the review team finds that there is no clear national plan for achieving this, and that progress to date has been patchy.

The review team recommends that:

- There should be greater national commitment to incorporating second language development and proficiency in undergraduate programmes. This will require alignment of third level second language objectives with those for secondary schools, and a co-ordinated commitment to the development of language teachers at all levels.
- Participation of Chilean tertiary students and academic staff in international exchanges should be increased, and financial support should be made available for gifted students who could not otherwise afford to take part in these exchanges.
- A consistent and internationally comparable information system should be established to gather reliable information about students and staff participating in foreign academic programmes, and about foreign students and staff conducting academic work in Chile.
- A strategy and implementation plan to position Chile as a destination for international education should be developed.

Chapter 5: Vision, governance and management

The review team acknowledges the history that has shaped higher education governance in Chile, but suggests some adjustments to meet today's needs. Features of the system which are thought to have outlived their usefulness include the concept of the *licenciatura* and universities' exclusive right to award these professional degrees; the divide between CRUCH and non-CRUCH universities; the requirement on state universities to function as part of the civil service; and legal restrictions preventing universities having for-profit status.

The review team recommends that:

- Chile should move towards a higher education system that is more flexible and better articulated among the three existing types of institutions. The link between professional degrees and academic degrees (exemplified in the legal requirement of a *licenciatura* before obtaining certain professional degrees) should be eliminated; Chile should cease to have a closed list of 18, legally defined university level professional degrees, which have a *licenciatura* as a requisite and can only be granted by universities; and universities and IPs should have the freedom to provide the degrees they are capable of offering, within a broad three-cycle framework similar to that of the Bologna process.

- There should be a clear separation between education degrees and professional licensing, with the development of certification systems in fields related to health, technology and law.

- The current division between CRUCH and other universities is anachronistic, and should be abolished. Public support to higher education institutions should be allocated on the basis of the social functions they perform, under clear rules for eligibility: it should not depend on whether or not they belong to the Council of Rectors, but on whether they perform social functions that deserve to be publicly supported. All Chile's universities and other tertiary institutions should be effectively represented and involved in discussions with government and in international co-operation.

- Central government should commission periodic strategic planning exercises, with the close involvement of the tertiary institutions, to assess whether the institutions collectively are producing the technical and professional competencies the country needs; paying proper attention to access and equity; conducting enough high quality research, relevant to the needs of society and the economy; and giving value for the public resources devoted to tertiary education.

- To enable tertiary education institutions to combine in the best possible way the double requirements of institutional autonomy and public accountability, while preserving their diversity, changes in legislation and public policies should be introduced to achieve the following objectives:

  – The public nature of autonomous, state-owned universities should be based in the public-oriented or public-spirited nature of their work and their strategic goals, not in their formal

adherence to the accounting and personnel administration regulations of the civil service**.**

- Public universities should be encouraged to introduce modern management practices into their strategic planning and operations. They should also be allowed to recruit rectors and other academics from outside the ranks of university staff.
- The corporate decision-making process in public universities should be streamlined: it should cease to be assumed that all academic staff represented on collective bodies participate directly in decision-making. Institutional governance and public accountability should be strengthened by giving seats on governing boards to other stakeholders representing civil society or employers. At the same time, accountability should be encouraged.
- The law that prevents private universities operating on a for-profit basis should be replaced by new legislation allowing for the existence of for-profit institutions, side-by-side with non-profit and state-owned institutions, subject to clear rules of accountability.
- All tertiary institutions receiving any form of public support or subsidy, whether public or private, should be subject to the same accounting and transparency rules governing their use of these resources.

Chapter 6: Quality – accreditation

The review team finds that significant progress has been achieved in recent years in the development of a sound quality assurance framework for Chilean tertiary education. Chile now has a decentralised and semi-independent peer-review-based process of institutional and programme accreditation consistent with those existing in the most developed countries, although it still has peculiarities unique to Chile. There is now greater public awareness of accreditation as a means of differentiating between the quality of institutions, and the institutions themselves have fully accepted the principle of external periodic peer review. Chile is to be congratulated for the degree of change achieved in a relatively short time.

However, establishing and gaining acceptance for the principles of quality assurance is only a first step. The next step is to ensure that the quality assurance framework is effective in improving real quality, and that it will stimulate continuous innovation and improvement in the quality of

the teaching and learning, academic research and outreach. Present accreditation criteria have been criticised as too vague, leaving too much scope for subjective interpretation by peer reviewers, and insufficiently adapted to the range of tertiary institutions and their missions.

Probably the weakest element in Chile's quality framework continues to be the assurance and promotion of quality in undergraduate teaching. There is no consistent research evidence that accreditation processes have brought positive benefits at the institutional level. There is a need to move from a culture of evaluation towards a culture of a responsible, autonomous and efficient management of institutions, in which the evaluation, accreditation and quality assurance processes become permanent and embedded in the strategic and operational work of the institutions.

The review team makes the following recommendations.

- Though institutional accreditation is currently voluntary, all tertiary institutions should be strongly encouraged to prepare for and seek it. This is recommended to ensure that all tertiary institutions are and are seen to be well-managed organisations offering quality and value to their students; that as many students as possible are eligible for financial support, where accreditation is a condition of that support; and that all public funds spent on subsidising students are well spent.

- Institutional accreditation criteria, and the way they are interpreted by peer reviewers, should be appropriate to the nature of the institutions seeking accreditation, and flexible enough to accommodate their different missions, while sticking to certain core principles**.**

- The core accreditation requirements for all tertiary institutions should include effective management, high teaching and learning standards, competence-based teaching methods appropriate to course objectives and the needs of the institution's students, employer involvement in programme decisions and course design, and good survival rates and graduate outcomes, ensured *inter alia* by following up and acting on information from former students.

- The CNA should give priority to the further development of the quality assurance framework, building in criteria appropriate to every type of tertiary institution; greater participation of the employers' sector in both institutional and programme accreditation; greater buy-in from students; fuller public information to ensure greater awareness of what 'accredited' means; and international

comparability. To ensure that all tertiary institutions have confidence in the accreditation system, the CNA also needs to reduce the risk of inappropriate or biased peer review reports, by more careful selection and more intensive training of peer reviewers and introducing regular appraisal of their work.

- Once most institutions in the system obtain accreditation, it will be important to "raise the bar" by establishing stricter benchmarks. Otherwise, the accreditation system may become a less relevant and less effective means of improving quality.
- For programme accreditation, it will be important to identify and introduce a wider range of independent accrediting agencies. In this context, professional associations could have an important role.

Chapter 6: Quality – teacher training

The review team notes that, as much of the success and failure of students in higher education depends on the quality of primary and secondary education, training teachers in sufficient numbers and of good quality is crucial for the performance of higher education. The team finds that useful steps have been taken in the right direction since the 2004 OECD review commented on the need to improve teacher training, but efforts must be intensified.

Recommendations are as follows:

- Although teacher training already benefits from increased budgets, the scale and pace of change needs to be stepped up, which will require larger, more comprehensive improvement programmes and substantially higher spending.
- The quality and the availability of sufficient numbers of teachers should be as important for MINEDUC as the quality and quantity of medical doctors and nurses is for the Ministry of Health. MINEDUC should devise a concrete medium- and long-term Action Plan, to meet attainable but ambitious targets. The numbers of high-calibre subject teachers, especially in mathematics, physics and other sciences and languages, need to be greatly increased. This will involve promoting greater collaboration between faculties of education and subject faculties in universities.
- MINEDUC should get other stakeholders' input and build consensus with them on the Action Plan just recommended.

Chapter 7: Research and development

The review team finds that further investment in research, development and innovation is necessary if Chile is to maintain its economic and social progress. The current levels of investment by both the government and the private sector are considerably below what would be expected of a country with Chile's GDP.

Changes are also suggested in current arrangements for supporting and funding research. First, a better balance must be found between funding a broad science base and supporting strategic priority areas. Second, it would be more efficient and effective to have fewer, larger, more targeted funding instruments. There are too many funding instruments, with a considerable degree of overlap, to promote industry-university linkages, PhD training grants and support for research centres; and some of them are too small. Third, the balance between funding of the basic infrastructure (buildings, equipment, consumables, critical mass of staff) and funding projects or programmes needs to be weighted more in favour of infrastructure funding, which is relatively neglected in Chile. Fourth, there is a need for government help and planning to develop university research, in those universities with the mission and the capacity to conduct worthwhile national, regional or sectoral research.

The review team makes the following recommendations:

- A better balance should be found between funding a broad science base and supporting strategic priority areas, which need to be defined. Natural focal points are the clusters proposed by the Innovation Council; public sector priorities; generic, enabling areas of science and technology (ICT, life sciences, material sciences, key areas in social sciences and humanities); and areas where the country is already strong, such as astronomy.

- It would be more efficient and effective to have fewer, larger, more targeted funding instruments. There are too many funding instruments, with a considerable degree of overlap, to promote industry-university linkages, PhD training grants and support for research centres; and some of them are too small. It is necessary to review, restructure, simplify and concentrate the funding mechanisms of CONICYT, CORFO, MIDEPLAN and others. The aim should also be to achieve a better balance between longer-term investment in centres of excellence, and investments in projects and PhD training. This review of the funding instruments should involve an extensive dialogue with stakeholders, and close co-operation with

the Innovation Council so as to fit with the medium- and longer-term plans for the Innovation Fund.

- To fill present gaps, a mechanism should be introduced for funding universities' more expensive scientific equipment, on condition that they allow other universities to use it too. It would also be helpful to include overhead costs in project grants, to help universities to maintain an infrastructure for research.

- The balance between funding basic infrastructure, and funding projects or programmes, needs to be tilted more in favour of infrastructure funding. To help achieve more stable funding for research infrastructure, a limited number of potential research universities should be identified, some of which may well focus on regional priorities, and changes should be made in existing funding models. Individual institutions should decide what position and mission they aspire to, with guidance from the government. Those not aiming for research university status may want to provide high quality undergraduate education, or limit research efforts to a few areas of regional relevance, or focus on particular subject areas such as technology.

- Policy and implementation responsibilities for key areas within the science and technology domain should be clearly allocated to specific ministers, having taken the views of all stakeholders into account. A co-ordination mechanism allowing a fair representation of all interests and responsibilities must be put in place. Better evidence on research, development and innovation outputs should be developed, to help guide policy-making.

Chapter 8: Financing – general

The review team recognises that Chile offers a unique combination of tertiary education financing characteristics and approaches which are hard to find anywhere else in the world. Compared to other countries in the Latin American region and even most industrial and developing nations, Chile's tertiary education system stands out for the low level of public funding. At the same time it has implemented bold financing reforms in the areas of resource mobilisation, resource allocation and student aid.

However, it is recommended that:

- Chile needs to design a long-term vision outlining the role of the government in tertiary education funding. This would guide decisions about the desirable level of public funding and the most

efficient and equitable manner to distribute these resources among institutions and students.

Chapter 8: Financing – resource mobilisation

Chile opted many years ago for a mixed funding approach, whereby budgetary resources are complemented by significant contributions from students and their families. As a result, public spending for tertiary education is markedly low, including funding for university research. At the same time, however, Chile is among the countries in the world that have achieved the highest level of cost-sharing in public tertiary institutions on a universal basis. A significant proportion of the increase in tertiary education coverage since the democratic transition has been managed through a rapidly growing private sector funded essentially by the students and their families and enrolling almost 70% of the total student population.

The review team makes the following recommendations:

- There is a strong rationale for raising the level of public funding for tertiary education on both equity and quality grounds.
- Chile could benchmark itself against the few countries, such as Korea and Japan, which have followed the same path of high private funding and high private enrolment, and plan progressively to double its public investment in tertiary education over the coming years.
- The government of Chile should base the allocation of additional resources on the principles of strengthening the public good mission of tertiary education and compensating for market failures. In that context, funding for research would also need to increase.

Chapter 8: Financing – resource allocation

The review team notes that, notwithstanding the low level of public funding, the government relies on a wide range of allocation instruments to distribute public resources. Many of the allocation instruments, AFI, MECESUP, performance contracts for example, are quite sophisticated in their purpose and design. But there is a need for greater harmonisation among the various financing instruments used at present in order to eliminate inherent inconsistencies, inefficiencies and distortions.

The financing system displays two distinct positive features compared to common practice in most countries in the world. First, Chile provides core budget funding to a number of private universities which receive 48% of all

public subsidies for tertiary education. Secondly, in order to transfer resources to tertiary education institutions, the country relies more on indirect funding – linked to some measure of student or institutional performance – than on direct payments. However, a major weakness of the financing system is that most of the public funds are reserved to the traditional CRUCH universities entrenched in their historical privileges. Another serious shortcoming is that 95% of the direct budget allocation does not correspond to any performance criterion. As a result, Chile is perhaps the only country in the world with such variations in budget allocation among its public universities, with the top recipient enjoying a per student contribution ten times as high as the lowest recipient. A few private universities receive significantly more public resources than the majority of public universities. Among private institutions, the 9 CRUCH universities capture three-quarters of the public subsidies going to the private sector even though they enrol only 19% of the corresponding student population.

The review team recommends the following specific measures to rationalise the overall funding system, in line with the principles outlined above and the policies of the government of Chile in recent years with respect to linking funding with performance and stimulating healthy competition among all tertiary education institutions.

- The AFD should be transformed to make it more performance-based. The government could gradually expand the formula-based part of AFD and make it more output-focused.
- It would be desirable also to eliminate the present funding discrimination between CRUCH and non-CRUCH institutions, adopting the following two principles: i) all Chilean students whose tertiary institutions meet essential quality and accountability requirements would be entitled to public subsidies through student aid, if personally eligible; and ii) the arrangements for direct public funding to institutions would be consistent with the institutional diversity and competitive nature of the Chilean tertiary education system. Three alternative ways of doing this are suggested:
  - A differently configured dual system where only the 16 existing public universities would receive direct funding in return for fulfilling public good functions such as doctoral education and basic research in disciplines requiring expensive infrastructure investment. This, like all the alternatives, would be accompanied by an expanded scholarship / student loan for students enrolled in eligible private institutions.

  - A more extensive direct funding system where all accredited public and non-profit private institutions would receive core resources linked to their student numbers, subject to meeting conditions relating to quality, financial transparency and fees charged to students.
  - A voucher-like per-student payment system whereby an amount equivalent to the reference cost of studies would be transferred to all eligible tertiary education institutions on the basis of the number of students choosing to study in each institution.

- Elimination of the AFI in its present form is suggested, in the light of the proposed transformation of the AFD and expansion of the student aid programmes. To be used in a meaningful way as a performance incentive, the AFI would have to rely on criteria that are socially more inclusive and would need to be significantly larger in terms of number of students and resources affected.

- As regards competitive funds, a competitive, objective and transparent mechanism such as MECESUP would be the main approach for allocating public investment funds to all accredited tertiary education institutions.

- If the performance contracts are successful during the pilot phase, the government could use them as a general instrument to promote institution-wide reforms and innovations among all accredited public and non-profit private institutions.

- *Grants and scholarships*: MINEDUC should consider the feasibility of integrating all existing grants and scholarships programmes into a single scheme, with a small number of separate windows, which would not discriminate against non-CRUCH students.

- *Student loans:* The two existing student loans schemes should be merged, for both efficiency and equity reasons.

- Increases in public funding would be allocated as follows: to cover recurrent costs, the government would rely on the reformed AFD, the scholarships and student loan programmes; and the performance contracts. Public resources to expand research activities would be distributed through a simplified scheme of research funds, putting more emphasis on research groups and centres and on infrastructure. Additional funding for investment purposes would be channelled through an efficient and transparent allocation system such as MECESUP.

Chapter 8: Financing – resource utilisation

The review team finds that government regulations provide insufficient incentives and flexibility for public universities to use available resources in the most efficient and effective manner. They are therefore unable to compete with private tertiary education institutions on a level playing field. There seems to be insufficient financial oversight over private tertiary education institutions. The fact that the theoretical duration of first degrees in Chilean universities is generally one year and often two years longer than similar degrees in North America or Europe represents a social cost of great magnitude for the country. Low internal efficiency is a concern in several important disciplines, including law, natural sciences and mathematics, and architecture. With two notable exceptions, CRUCH universities are quite efficient in the deployment of administrative employees relative to academic staff.

The review team recommends that:

- To create a level playing-field, the Chilean authorities would allow the public universities to operate under administrative arrangements and financial management rules equivalent to those enjoyed by private institutions.
- All private tertiary education institutions would manage their resources according to standard and transparent accounting practices, and prepare annual financial reports that would be audited independently.
- Chile should gradually move towards shorter first degrees in conformity with the worldwide trend.
- To improve internal efficiency, the Higher Education Information System should undertake detailed studies of student cohorts to obtain a clearer picture of the incidence and causes of repeated years and drop-out and identify appropriate remedies.

Chapter 9: Information, transparency and accountability

The review team notes that many sources of information exist to meet the needs of prospective students of tertiary education. While no one source is comprehensive and complete, taken together they provide a reasonable degree of access to the information students need to make informed decisions.

The significant weaknesses in the information system are due largely to the absence of standardised classification, recording and reporting formats

and lack of completeness, checking and verification of institutionally reported data. They also stem from a failure to address the conflicting incentives that institutions face when reporting data.

As a result, Chile lacks the high quality and precise data it requires for accurate assessment of the tertiary education system's performance in key areas. Closing these information gaps is of critical importance to the overall health of the system. The report of the Presidential Advisory Council on Higher Education endorses the greater use of performance criteria for the allocation of public resources; the review team concurs. Increased use of performance-based funding intensifies the need for reliable and comparable information throughout the system. As Chile accedes to OECD membership, it should redouble efforts to produce, disseminate and use complete, reliable and comparable data and information for policy-making and the protection of students' interests.

The review team makes the following recommendations:

- The Ministry of Education should continue and expand efforts to collect, verify and disseminate reliable and comparable information through the Higher Education Information System.
- Particular attention should be paid to obtaining robust financial information and other data on the use of institutional resources – not only those that are publicly provided. The government should use tax policy to promote investment of institutional resources in activities that improve education quality and eliminate a concealed drive for profits that is at odds with institutions' educational mission.
- Efforts by tertiary education authorities to standardise data classification, recording and reporting requirements and enforce high reporting standards are likely to be more beneficial than efforts to require institutions to make detailed *ex-ante* demonstrations of labour market demand for graduates of their programmes of study.

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Reviews of National Policies for Education

Tertiary Education in Chile

Education has been a central priority of Chile since the return of a democratic government in 1990 and remains a priority as Chile prepares itself for OECD membership. A firm commitment to access and equity has led to ever-increasing numbers of young people entering tertiary education, which poses challenges for financing and quality. The government has successfully responded to these challenges, but, as enrolment continues to grow, new policies will need to be implemented to achieve the goal of a world-class tertiary education system responsive to the requirements of a global economy.

This joint OECD and World Bank review gives a brief overview of post-secondary education in Chile and describes its development over the past twenty years. It presents an analysis of the system and identifies key directions for policy reform in light of the challenges encountered by officials, communities, enterprises, educators, parents and students. It concludes with a set of key recommendations concerning the structure of the system and its labour market relevance; access and equity, governance and management; research, development and innovation; internationalisation; and financing. This report will be very useful for both Chilean professionals and their international counterparts.

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