

## Chapter 2: Programme Features

*The purpose of this chapter is to present an overview of the functioning of the Becas Chile Programme, explain its origin and main provisions, compare its main features with current international practices, and describe and assess its key statistics, design principles and application evaluation process. The chapter discusses how much human capital the country should produce in order to catch up with a peer group of countries. It is likely that the amount of scholarships provided per student – three to seven times higher than in the countries used for comparison in this chapter – will serve well the need of Chile to expand its base of qualified human resources.*

*Compared to previous programmes, BCP is a big step forward by being more responsive to the needs and choices of students, taking better account of Chile’s varying socio-economic circumstances, and being administratively transparent and innovative. Nevertheless, there is room for improvement: BCP has an age bias towards younger students and gives little weight to national priorities in the assessment of applicants for scholarships.*

### Rationale and historical background

The BCP comprises one element of a broad strategy on the part of the government to “insert the country into the knowledge society and give a definitive boost to the economic, social and cultural development of Chile.” The BCP functions as a human capital formation component alongside initiatives to increase public and private investment in R&D and strengthen the capacity for innovation across different industry sectors. The BCP is seen not only as a means of expanding expertise but also transforming attitudes, outlooks and skill sets, as part of “*Esfuerzo País*”: “a response to the need and urgency to have more academic, professional and technical experts, who are not only more productive but also more creative, innovative and enterprising.” (Becas Chile website).

More specifically, the long-term vision of the Chilean government in establishing the BCP was three-fold:

- increasing opportunities for the training and development of advanced human capital abroad;
- modernising and better co-ordinating the various government funded scholarship programmes that were previously administered by a variety of agencies and ministries; and
- fostering greater co-operation and international linkages in support of the government's agenda for human capital development (CNIC, 2009).

The creation of the BCP, however, came about as the result of a fortuitous convergence of events that provided the Chilean government with an opportunity to restructure and articulate separate programmes with related goals. In a context already characterised by internal policy changes, these events included:

- The perceived deficiencies and duplication of efforts in the offering and management of scholarships supporting Chilean study abroad by a proliferation of government agencies (OECD, 2008).
- The establishment of a National Strategy for Innovation in which major emphasis is placed on the need to prepare advanced human capital to support a more active role for Chile in the knowledge economy (CNIC, 2008).
- The availability to government of substantial international reserves, product of revenues generated by the copper industry (ECLAC/CEPAL, 2009).

The BCP is ambitious in its scope, aiming to provide opportunities for 30 000 participants by 2017. The programme envisages growth in participant numbers from around 1 000 in the first year to a steady level of 3 300 after its fourth year. At that point, it may be assumed that the BCP will represent around 20% of domestic post-graduate enrolments, thereby complementing the domestic efforts to develop Chile's human capital capacity.

Through the BCP, Chilean students can pursue higher education in internationally competitive universities all over the world. Areas of study emphasised include five cluster areas (mining, aquaculture, food industry,

tourism and global services), cross-cutting platforms (energy, environment, ICT and biotechnology) and social areas (education, health, housing, public safety and public policy).

The financing for the BCP Fund, totalling some USD 6 billion, is drawn from a fund maintained abroad and will invest around USD 250 million per year in the educational expenses of Chilean students in foreign countries. These funds have yet to be formally appropriated through legislation.

## The provisions of the Becas Chile Programme

The BCP provides an extensive range of scholarship types to accommodate the diverse dimensions of Chile's advanced human capital formation needs. Before the BCP there were only five scholarship types; the BCP has extended opportunities through eleven scholarship types that address broad professional profiles, from post doctorates to technicians. These new scholarships allow addressing different human capital needs. These types are outlined in Table 2.1. For several elements of the BCP there are multiple agencies involved, reflecting shared responsibilities for policy and administration.

Table 2.2 shows the benefits and length of support for the different types of BCP scholarships. They encompass a variety of award levels and non-award learning experiences, covering varying periods ranging from short-duration (several months) to long-duration (several years).

Figure 2.1 displays the range of support available under the integrated BCP. The figure presents an indication of the shares of scholarship allocations by programmatic type and level of award. In practice, the allocation of scholarships is more fluid than depicted, reflecting differences in the quantity and quality of applicants in different rounds. Nevertheless, there is a substantial commitment to technical education and training (approximately 27% of scholarships) alongside a dedicated component for the professional development of school teachers in core areas (approximately 12%), alongside significant support for post-graduate study (61%).

Table 2.1 **Becas Chile scholarships, resources and benefits**

Programme	Institutions involved	Financial resources involved	Benefits being considered
- Master's - Doctoral - Professional Master's in education - Doctoral internships - Medical sub-specialties - Co-advised doctoral - Post doctoral	- CONICYT - Executive Secretariat Becas Chile	Budget Law 2009: CLP 15 667 586	- Tuition and fees: 100% - Books and student materials: USD 300 - Monthly support: USD 1 700 adjusted by cost of living - Support for spouse: 10% of support for student - Child support: 5% support for student - Medical insurance: USD 800 - Moving expenses: USD 500 - Returning expenses: USD 500 - Air travel for student, spouse and children (spouse and children only if term is over 12 months) - Language Course (if term is over 12 months), thereafter free for the first 2 quarters and co-funded depending on SES - Pre- and post-natal support for new born children
- Semester abroad - Internship for professional development certificate abroad for university professors (TESOL)	- PIAP - Executive Secretariat Becas Chile	Budget PIAP : CLP 1 584 000  Budget TESOL: CLP 309 600	- Books and supplies: USD 300 - Monthly cost of living: USD 1 700 adjusted by cost of living  - Health Insurance: USD 600 - Air travel for student - Visa fees
- Mathematics and sciences internships	- CPEIP - Executive Secretariat Becas Chile	Budget 2009 CLP 1 117 014	- Tuition and fees: 100% - Books and supplies: USD 300 - Monthly cost of living: Housing and food + USD 400 for personal expenses - Health insurance: USD 800 - Air travel for student - Visa fees
- Vocational and Technical internships	- DIVESUP - Executive Secretariat Becas Chile	Budget 2009 CLP 5 102 105	- Tuition and fees: 100% - Books and supplies: USD 300 - Monthly cost of living: USD 1 700 adjusted by cost of living - (distributed in housing + food + personal expenses) - Support for spouse: 10% of support for student - Child support: 5% support for student - Medical insurance: USD 800 - Moving expenses: USD 500 - Returning expenses: USD 500 - Air travel for student, spouse and children (spouse and children only if term is over 12 months) - Language Course (if term is over 12 months), thereafter free for the first 2 quarters and co-funded depending on SES - Pre- and post-natal support for new born children

*Note:* Benefits change based on duration and type of programme. In some cases, also includes cost of processing visa.

*Source:* Decree 664, which established *Sistema Bicentenario Becas Chile*.

**Table 2.2 Duration of sponsorship provided by Becas Chile  
(maximum time financed)**

<b>Name of scholarship</b>	<b>Duration of sponsorship</b>
Master's	Max. of 2 years
Doctoral	Max. of 4 years
Post doctoral	Min. 6 months - Max. 24 months
Doctoral internship	Min. 3 months - Max. 10 months
Doctoral co-advising	Min. 10 months - Max. 24 months
Professional Master's in Education	Max. 2 years
Internships in Mathematics and Sciences	4 months
Semester abroad	6 months
Internship for a Professional Development Certificate abroad	Max. 4 months
Medical sub-specialties	Min. 1 academic year - Max. 36 months
Technical Internships	Max. 1 year

*Note:* This length of time does not include time required to study a second language which may be awarded to sponsored students additionally.

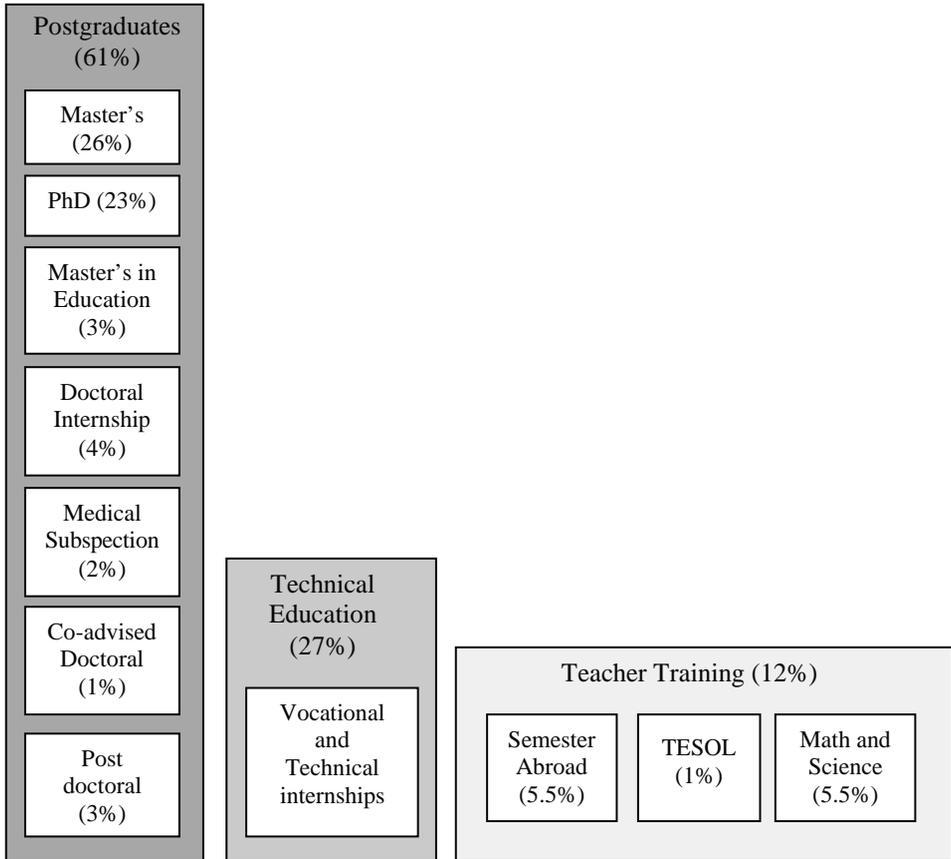
*Source:* Calls for Applications 2009.

The different scholarship components of the BCP provide different kinds and levels of support for students and involve different criteria for selection among applicants. One of the government's longer-term intentions is to reduce the legacy of complexity and incongruity of the different components, thereby simplifying information for applicants and increasing the administrative efficiency of the overall scholarships system through common processing technologies.

The average benefits available to participants under the BCP are larger than under previous schemes and take account Chile's varying socio-economic circumstances. In fact, previous scholarships such as MIDEPLAN's, did not include language courses and gave an average monthly allowance of USD 820. The latter led a large number of students to work during their studies to cover their living expenses.

With regards to scholarship conditionality, BCP scholarships require recipients to commit to return to Chile. Recipients may stay abroad after graduation for half the number of years for which they were given a scholarship, but must repay the scholarship if they choose to stay beyond that. Upon their return, recipients must stay in Chile for twice the number of years for which they were given a scholarship. The number of years decreases for work outside the capital.

Figure 2.1 Indicative participant shares within the BCP scholarship programmes



Note: The figures are calculated in terms of the number of new scholarships to be assigned yearly at steady state.

Source: Becas Chile.

### International comparison of BCP provisions and arrangements

The BCP is a large programme both relative to Chile’s population and economy and in absolute terms by any measure. As shown in Table 2.3, Chile will be providing three to seven times more scholarships per enrolled tertiary student than a group of comparator countries. The programme’s size is not disproportionate relative to Chile’s need to expand its advanced human capital base, as is discussed in Box 2.1.

Table 2.3 Cross-country comparison of programme size

	Programme or institution	Students sponsored	As a % of total student enrolment at the tertiary level
<b>Chile before Becas Programme</b>	MIDEPLAN, MECESUP, CONICYT, ACGI, CNCA	Year 2007 200	0.03
<b>Chile after Becas Programme</b>	Becas Chile	Year 2010 3 300	0.36
<b>Mexico</b>	CONACYT	Year 2005 2 645	0.11
<b>Brazil</b>	CAPES	Year 2007 4 043	0.08
<b>China</b>	SSSAP	Year 2007 12 402	0.05

Source: Review team compilation, via the website of each programme.

Compared against the programmes of a different set of countries, the BCP is more comprehensive with regards to the range of scholarship options offered and more generous with regards to the benefits per scholarship granted. In terms of degree level, countries tend to focus primarily on the highest end of the education spectrum – senior researchers, doctoral and post-doctoral studies – and few provide scholarships for technical degrees. In terms of benefits, countries frequently have cost-sharing models which can include the student, an NGO, and the home and host countries and institutions. Table 2.4 illustrates these differences.

The government-sponsored scholarship programmes in other countries also actively target “priority areas”. For PhDs, these tend to be broad in scope but heavily biased towards the sciences. For technical degrees, existing evidence indicates the focus is narrow and varies by partnership. Table 2.5 details these both for Chile and a sample set of countries.

Finally, government-sponsored scholarship programmes in other countries have significant strings attached to them. While they all require sponsored students to return to their home country, it is unclear what consequences students face when they choose not to return.

Table 2.6 describes the conditionality of scholarship programmes both for Chile and for a sample set of countries. The issues of graduate return and reinsertion relating to the BCP are discussed in detail in Chapter 3 of this report.

Table 2.4 Cross-country comparison of scholarships and benefits offered

	Programme or Institution	Types of study abroad scholarships offered	Extent of benefits offered
<b>China</b>	State Sponsored Study Abroad Programmes (SSSAP)	<p><b>185 study abroad programmes, 5 major categories:</b></p> <ul style="list-style-type: none"> <li>- State Sponsored Senior Researchers Programme</li> <li>- State Sponsored Visiting Scholar (including Post-Doctoral Research) Programme</li> <li>- State Sponsored Post-graduate Programme</li> <li>- Exchange Scholarship with other countries</li> <li>- State Sponsored Special Programme</li> </ul>	For PhD / sandwich PhD degrees: Return international airfare and a living stipend, while the tuition and research fees are paid by the host universities
<b>Colombia</b>	COLCIENCIAS	New and continuing PhD studies, specifically for candidates working with accredited research groups and institutions	For PhD degrees: Tuition, monthly stipend (up to USD 1 600 per month), medical insurance (up to USD 1 500 per year), thesis expenses (up to USD 1 000), and tuition for language courses in which studies are to be conducted (up to 6 months)
<b>Mexico</b>	Mexico's National Council for Science and Technology (CONACYT) scholarship programme	<p>PhDs mostly, and on a case by case basis, Master's and Diploma Certificates</p> <hr/> <p>Technical degrees (work programme must be designed and approved by the receiving institution prior to application)</p>	<p>Living stipend (partial or total, USD 1 000 per month, more if living in the United Kingdom or in the European Union), medical insurance, and in some cases, tuition</p> <hr/> <p>All costs covered for scholarship recipient (some costs borne by CONACYT, others by the receiving institution)</p>

Source: Review team compilation, via the website of each programme.

Table 2.5 Cross-country comparison of prioritised areas

	Areas prioritised
<b>Chile</b>	Five cluster areas (mining, aquaculture, food industry, tourism and global services), transversal platforms (energy, environment, ICT, biotechnology) and social areas (education, health, housing, public safety and public policy).
<b>China (PhD)</b>	Energy, resources, environment, agriculture, manufacture, information technology, life sciences, space study, maritime study, nanotechnology, new materials, humanities and applied social sciences.
<b>Colombia (PhD)</b>	Identification and sustainable use of biodiversity, preservation and sustainable development of water resources, development of electronics and materials, research in health sciences, Colombian social studies.
<b>Mexico</b>	<p>For PhD / Master's and some Diploma Certificates:            Computer science and telecommunications, biotechnology, materials technology, construction, petrochemicals and manufacturing processes. Applied social sciences, epidemiology for the country's most common diseases, study of technologies that contribute to meeting the basic needs of the population and to the economic development of the country's marginalised regions.            Master's and Diploma Certificates in languages, arts, sports or similar areas are not sponsored.</p> <hr/> <p>For technical degrees:            - The <i>Internationale Weiterbildung und Entwicklung gGmbH</i> (inWent) in Germany offers 20 spots for high quality technical degrees to engineers and/or specialists in the areas of quality control, environmental protection and worker safety.            - The Japan International Co-operation Agency (JICA) offers 50 spots for highly specialised technical work-study in Japan.</p>
<b>Egypt (PhD)</b>	Agriculture and irrigation, industry, oil and natural gas, electricity and energy, transportation, communication and information, technology, and tourism.

Source: Review team compilation, via the website of each country.

Table 2.6 **Cross-country comparison of scholarship conditionality**

<b>Conditionality of scholarship programmes</b>	
<b>Chile</b>	<p>Scholarship is conditional upon the recipients' commitment to return to the country. Recipients must:</p> <ul style="list-style-type: none"> <li>- Demonstrate academic excellence and full-time dedication during their studies abroad;</li> <li>- Submit semester grades and/or a letter from their thesis advisor about their progress;</li> <li>- Obtain the degree for which their scholarship was provided;</li> <li>- Repay the scholarship awarded if they choose to stay abroad after graduation for more than half the number of years for which they were given a scholarship;</li> <li>- Stay in Chile twice the number of years for which they were given a scholarship. The number of years decreases for work outside the capital.</li> </ul>
<b>Fulbright Chile</b>	<p>Master's degree scholarship recipients must:</p> <ul style="list-style-type: none"> <li>- Demonstrate academic excellence and full-time dedication during their studies abroad;</li> <li>- Submit semester grades and/or a letter from their thesis advisor about their progress;</li> <li>- Commit to returning to Chile and staying there for a minimum of two years after graduation.</li> </ul>
<b>China</b>	Scholarship recipient must graduate from the intended programme and return to China.
<b>Colombia</b>	Scholarship is conditional upon the recipients' return to the country.
<b>Mexico</b>	<p>For PhD / Master's and some Diploma Certificates, scholarship recipient must:</p> <ul style="list-style-type: none"> <li>- Maintain a grade point average above 80%;</li> <li>- Provide CONACYT with a performance review for every semester under scholarship;</li> <li>- Graduate from the intended programme;</li> <li>- Return to the country. Those who do not return must reimburse CONACYT the full amount of the scholarship plus interest and their names will be publicly published on a list of "contract breakers".</li> </ul> <p>For technical degrees, scholarship recipient must:</p> <ul style="list-style-type: none"> <li>- Finish the intended programme;</li> <li>- Provide CONACYT with a full write-up regarding the experience 6 months after it is over;</li> <li>- Return to the country. Those who do not return must reimburse CONACYT the full amount of the scholarship plus interest and their names will be publicly published on a list of "contract breakers".</li> </ul>

Source: Review team compilation, via the website of each programme.

### ***The Chinese experience with study abroad programmes***

China is an interesting case study for Chile because it highlights how government resources committed for study abroad can best be used to strengthen local domestic capacity, and how study abroad can be an effective incentive without huge outflows of public resources.

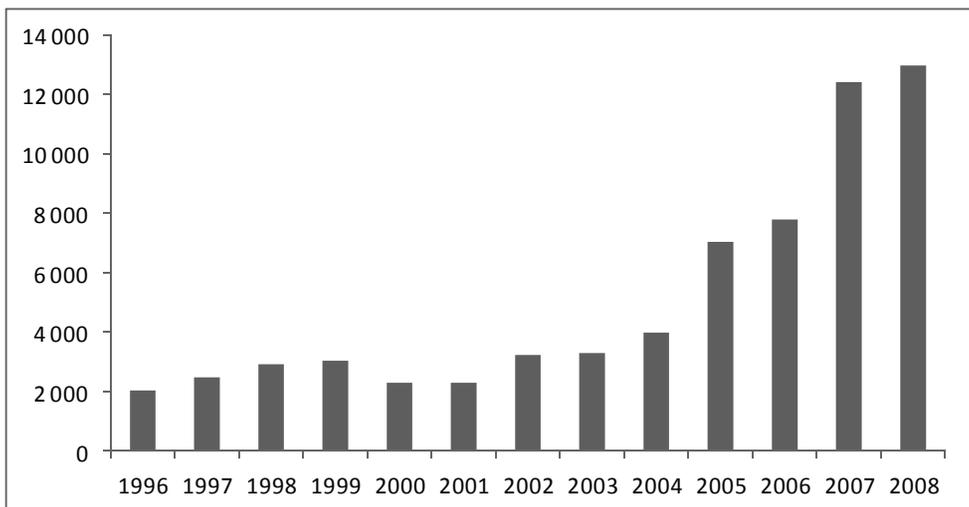
Foreign training has been a cornerstone of China's overall higher education strategy: over a million students and researchers left the country to study abroad between 1978 and 2006. In 1996, the State Sponsored Study

Abroad Programmes (SSSAP) was created, and under its auspices government scholarship programmes ramped up quickly. There is great variety among the 185 SSSAP: some programmes target rural Western provinces, others favour specific ethnic minorities, and still others are designed solely for the researchers and scholars of top universities and research centres. In 2008 China sponsored 12 957 students to go to more than 80 countries (Chinese Scholarship Council, Annual Report 2008, p. 8).

Figure 2.2 shows the increase in state-sponsored students, Figure 2.3 shows their distribution across programmes and Figure 2.4 shows how these numbers compare to the total population of Chinese students studying abroad. As the latter illustrates, a large portion of the students going abroad are self-funded: the Chinese government facilitates their departure, but does not necessarily contribute monetarily to it. Also of note is the large portion of scholarships which are given to scholars and doctoral students, contributing directly to the strengthening of domestic capacity in the tertiary education sector.

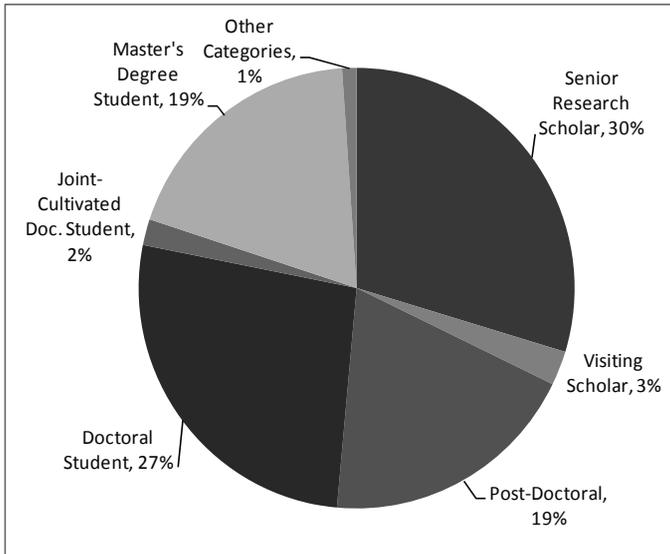
Despite having close to 80 times Chile’s population, the absolute number of state sponsored Chinese graduate students is within the same order of magnitude. The comparisons do not imply that Chile should change its target numbers for the BCP (see Box 2.1).

Figure 2.2 **Recruitment of state sponsored study abroad programme from 1996-2008**



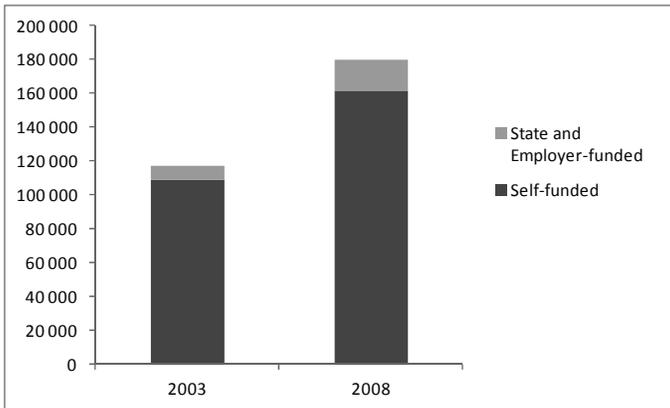
Source: Chinese Scholarship Council, Annual Report: 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007 and 2008.

Figure 2.3 The distribution of scholarships across programmes



Source: Chinese Scholarship Council, Annual Report 2008, p.8.

Figure 2.4 The population of Chinese students studying abroad, 2003 and 2008



Sources:

For 2008, quote from Zhang Xiuqin, Director-General of the Department of International Co-operation and Exchange under the Ministry of Education, WYSTC Blog, [www.wystc.org/docs/blog/?p=411](http://www.wystc.org/docs/blog/?p=411), accessed 3 August 2009.

For 2003, Ministry of Education, China, International Co-operation and Exchanges, “The Overall Situation of Studying Abroad”, accessed 2 April 2010, [www.moe.gov.cn/edoas/en/level3.jsp?tablename=1242702622613408&infoid=1253167200778185&title=The](http://www.moe.gov.cn/edoas/en/level3.jsp?tablename=1242702622613408&infoid=1253167200778185&title=The)

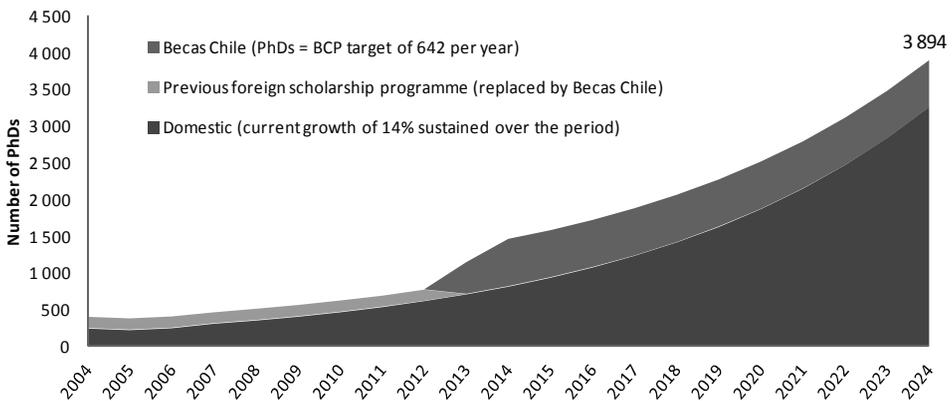
### Box 2.1 How much human capital should Chile produce?

A broad consensus exists that Chile needs more high quality human capital. But how much, and by when? How much can the labour market absorb in the short, medium and long term? No one knows for sure, but there are educated ways to guess. Sending 30 000 students abroad in ten years might at first sound excessive: but is it?

The review team believes the amounts foreseen are reasonable, provided that Chile enacts the critical corollary policies outlined in this report. The BCP represents a 20% increase in the number of graduate students in Chile.<sup>1</sup> Several different approaches to projecting graduates and absorption capacity suggest that the labour market can absorb the graduates, especially over the long-term. It is best to consider the numbers from two perspectives: (i) in absolute terms; and (ii) relative to a comparator group of countries.

Consider PhD production. Within Chile, the number of PhD graduates has been growing at 14% per year. If one assumes that Chile's economy grows by roughly 4-5% per year (equivalent to 3-4% at purchasing power parity – PPP), per capita income will increase by 60% in 15 years. If domestic PhD production grows at its present rate, and the BCP achieves its targets, Chile will be producing approximately 3 900 PhD per year by 2024. This would be about 200 PhDs per million of (future) population, a figure safely within the OECD average. Figure 2.5 shows this calculation graphically, including the relative contributions from the BCP and domestic systems.

Figure 2.5 Growth of annual PhD production in Chile

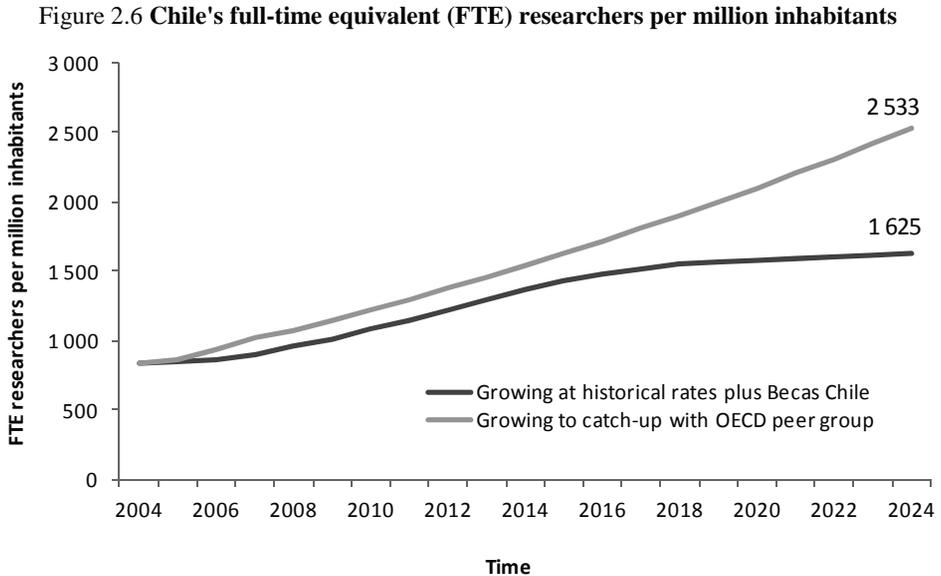


Source: Review team analysis.

The assumption of 14% growth over the next 15 years is unrealistic. In reality, the BCP and the domestic system are likely to compete for the same candidates, slowing enrolment rates and graduate production. Chile needs to pay close attention to this competition as it emerges and carefully adjust programmes to ensure harmonious growth of the domestic graduate system along with the BCP.

A more sophisticated model might be used to estimate the effect of the BCP on full-time equivalent (FTE) researchers per million of population. The current figure (2004) for Chile is 833. Staying with the 15 year time frame, one would want to look at the corresponding figure for OECD countries with roughly twice Chile's 2004 figure of USD 11 500 GDP per capita at PPP. The nine countries in this peer group<sup>2</sup> have an average of 2563 FTE researchers per million of population. Chile would need to triple its researcher population to equal this average.

Figure 2.6 projects Chile's increase in FTE researchers over the period, with a few simple assumptions: (i) two-thirds of BCP PhD grantees finish their degrees and return to Chile, and 70% of all PhD graduates (BCP and domestic) become researchers; (ii) three-quarters of BCP Master's grantees return to Chile and 25% of all Master's degree recipients (BCP and domestic) become researchers; (iii) Chile's population grows at 1% per year; (iv) three point three percent (3.3%) of current FTE researchers retire or otherwise leave research per year. Under these again optimistic assumptions, Chile will only close half the gap that currently separates it from the peer group.



Source: Review team analysis.

Two things should be kept in mind: first, the peer group spends 0.39% more of its GDP on R&D than Chile does (1.06% versus 0.67%). Unless Chile further raises its investment in R&D, it will be hard pressed to absorb these researchers. In fact, experience shows that public investment usually precedes private investment in R&D. The Chilean government doubled public spending on R&D between 2005 and 2009, and a new tax was introduced to encourage greater business R&D investment. Continuing efforts will be required to further enlarge gross national R&D spending as a percentage of GDP.

Second, despite their proportional consistency, large absolute numbers of graduates will come onto Chile's labour markets. The single most important thing Chile can do to absorb these is continue investing in R&D, but it is critically important to implement the other measures discussed in this report to incentivise and facilitate return and reintegration of graduates. It is also important to think strategically and flexibly about short-term, medium-term and long-term mechanisms that can be used to help Chile achieve its goals.

Of course, other assumptions will lead to other figures. What is most important is that Chile monitors the relevant figures and uses the information in an ongoing manner as it considers how to fine tune its overall human capital development policy.

*Notes:*

1. Chile has roughly 21 000 Master's Students, most of whom are enrolled in two year programmes. Annual new enrolments are slightly more than 10 000 and the BCP provided close to 1 200 Master's scholarships in 2009, or 12%. PhD domestic enrolment is about 3 600, and PhD programmes take about four years to complete. Annual new enrolments are about 900. Becas Chile provided 939 PhD scholarships in 2009, or roughly 100% of new domestic enrolments. The weighted average of the two percentages equals 20% of overall graduate enrolment.
2. Spain, Greece, New Zealand, Korea, the Czech Republic, Portugal, Hungary, Slovakia and Poland comprise this group: their average GDP per capita at PPP is USD 21 700.

## ***Key statistics***

### *Applications for scholarships abroad*

Applications in 2009 totalled 4 655, of which 73% were for Master's degree courses (the technicians programme was only called in 2010). There was a reasonable gender balance, except in the case of PhD applications where males were strongly represented. The ratio of Master's to Doctorate applications possibly reflects two main factors, the length of time that applicants are willing to spend abroad, and their preparedness for PhD study. As shown in Table 2.7, there was a reasonable gender balance at the Master's level, but for all other scholarship types males commanded a larger share than females. Nevertheless, this still represents significant progress compared to the situation previous to Becas Chile, when on average only 34% of Master's and doctoral scholarship holders were female, according to MIDEPLAN figures for the period 2000-2005. The gender shares of scholarship recipients reflected the application shares.

Table 2.7 Applicants by gender and type of scholarship

Gender	Master's	Doctorate	Post doctorate	Doctoral Sandwich programmes	Master's Education Professionals	Total	Total (%)
Female	1 665	405	17	49	66	2 202	47.3
Male	1 717	627	23	53	33	2 453	52.7
Total	3 382	1 032	40	102	99	4 655	1

Source: Becas Chile Executive Secretariat.

### *Scholarships awarded*

In the first round of doctoral scholarships, a broadly consistent apparent relationship can be seen between the shares of applications and awards. In some cases (*e.g.* mining, tourism, biotechnology, education, environment) the share of awards is less than the share of applications. The reverse is the case in other areas (*e.g.* public safety, food industry, global services) including for applications where a priority was not specified. The largest participating areas are the social priorities of public policy, education, health and environment. In the economic priorities there are much smaller numbers.

Table 2.8 Doctoral applications and awards, first round

Priority areas	Applications		Awards	
	Number	%	Number	%
Public Policy	216	20.9	93	21.0
Education	237	22.9	90	20.4
Health	111	10.7	49	11.10
Environment	103	10.0	42	9.50
Energy	43	4.2	25	5.70
Information and Communication Technology (ICT)	46	4.5	16	3,6
Biotechnology	46	4.5	18	4.10
Public Safety	29	2.8	15	3.4
Food Industry	23	2.2	12	2.70
Global Services	17	1.6	10	2.30
Housing	15	1.5	6	1.40
Aquaculture	14	1.4	7	1.60
Mining	21	2.0	6	1.40
Tourism	14	1.4	5	1.10
No declared Priority Area	98	9.5	48	10.90
Total	1 033	100.0	442	100.0

Source: Becas Chile Executive Secretariat.

Table 2.9 **Doctoral applications and awards, second round**

Priority Area	Applications		Awards	
	Number	%	Number	%
Aquaculture	23	1.88	7	1.30
Food Industry	33	2.70	12	2.23
Biotechnology	61	4.99	27	5.01
Education	263	21.50	106	19.67
Energy	49	4.01	21	3.90
Environment	167	13.65	90	16.70
Mining	25	2.04	9	1.67
Public Policy	216	17.66	86	15.96
Health	108	8.83	42	7.79
Public Safety	16	1.31	5	0.93
Global Services	12	0.98	4	0.74
Information & Communications Technology	53	4.33	26	4.82
Tourism	8	0.65	4	0.74
Housing	21	1.72	10	1.86
No declared Priority Area	168	13.74	90	16.70
<b>Total</b>	<b>1223</b>	<b>100.00</b>	<b>539</b>	<b>100.00</b>

Source: Becas Chile Executive Secretariat.

Similar patterns can be observed in the second round. The economic priorities are relatively lower than for the first round. Non-declared applications achieved a higher success rate.

In the first round of Master's applications there was no identification of priorities. In the second round, as shown in Table 2.10, a pattern of prioritisation similar to that seen for Doctorates can be found but, surprisingly, with an even lower representation of economic priorities. Around 60% of Master's awards were in public policy, education and environment fields.

Table 2.11 shows that health, education and environment were strongly represented in sandwich programmes, with biotechnology featuring at a much higher level than for other scholarship types. Post-doctoral scholarships, at a much lower volume, were more evenly spread.

Table 2.10 Master's applications and awards, second round

Priority Area	Applications		Awards	
	Number	%	Number	%
Aquaculture	52	1.22	9	1.16
Food Industry	88	2.07	10	1.29
Biotechnology	56	1.32	10	1.29
Education	836	19.67	165	21.24
Energy	249	5.86	42	5.41
Environment	520	12.23	120	15.44
Mining	111	2.61	23	2.96
Public Policy	879	20.68	174	22.39
Health	397	9.34	65	8.37
Public Safety	45	1.06	10	1.29
Global Services	280	6.59	30	3.86
Information & Communications Technology	204	4.80	35	4.50
Tourism	88	2.07	9	1.16
Housing	197	4.63	28	3.60
No declared Priority Area	249	5.86	47	6.05
<b>Total</b>	<b>4251</b>	<b>100.00</b>	<b>777</b>	<b>100.00</b>

Source: Becas Chile Executive Secretariat.

Table 2.11 Sandwich and post-doctoral programme applications and awards

Priority Area	Sandwich programmes				Post-doctoral programmes			
	Applications		Awards		Applications		Awards	
	Number	%	Number	%	Number	%	Number	%
Public Policy	4	3.88	3	3.57	3	7.14	3	10.34
Education	12	11.65	10	11.90	8	19.05	4	13.79
Health	30	29.13	21	25.00	7	16.67	6	20.69
Environment	12	11.65	10	11.90	5	11.90	2	6.90
Energy	5	4.85	5	5.95	3	7.14	3	10.34
ICT	7	6.80	5	5.95	3	7.14	2	6.90
Biotechnology	15	14.56	14	16.67	1	2.38	1	3.45
Public Safety	1	0.97	1	1.19	1	2.38	1	3.45
Food Industry	4	3.88	3	3.57	2	4.76	1	3.45
Global Services	0	0.00	0	0.00	0	0.00	0	0.00
Housing	0	0.00	0	0.00	0	0.00	0	0.00
Aquaculture	2	1.94	2	2.38	1	2.38	1	3.45
Mining	3	2.91	3	3.57	2	4.76	1	3.45
Tourism	0	0.00	0	0.00	0	0.00	0	0.00
No declared Priority Area	8	7.77	7	8.33	6	14.29	4	13.79
<b>Total</b>	<b>103</b>	<b>100.0</b>	<b>84</b>	<b>100.0</b>	<b>42</b>	<b>100.0</b>	<b>29</b>	<b>100.0</b>

Source: Becas Chile Executive Secretariat.

As seen in Table 2.12, a noticeable feature is the youth of participants, with some 60% being aged less than 30 years. Thus the BCP does not merely promote the transfer of talent abroad; it also promotes a concentration of young talent abroad. It is not that there are skewed incentives in the points system for encouraging younger participants but rather that the circumstances of younger people, in the rounds conducted so far, enable them to take up wider mobility options than those with family responsibilities. The age imbalance may be corrected to some degree with the future offering of technical, teacher education, post-doctoral and health speciality scholarships, which tend to involve shorter-cycle programmes.

Table 2.12 Selected students by age (2009 second round)

Age	Master's	% Master's	PhD	% PhD	Total	Total by %
20-24	57	8.9	62	12	119	10.1
25-29	387	60.6	254	47	641	54.4
30-34	147	23.0	141	26	288	24.4
35-39	39	6.1	60	11	99	8.4
40-44	7	1.1	14	3	21	1.8
45-49	1	0.2	7	1	8	0.7
50-54	0	0.0	1	0	1	0.1
55-59	1	0.2	0	0	1	0.1
Total	639	1	539	1	1 178	100

Source: Becas Chile Executive Secretariat with data provided by CONICYT.

As shown in Table 2.13, five countries (United States, United Kingdom, Spain, Australia and Canada) represented the destination of choice for 85% of Master's scholarships and 80% of Doctoral scholarships. Latin American countries (Argentina, Brazil, Mexico) accounted for only 3% of Master's and 2% of Doctoral scholarships. The review team was advised that the leading six universities in the United States and top five in the United Kingdom account for some 60% of PhD students with BCP scholarships. The question arises, as discussed in Chapter 4, whether the operational design of the BCP, particularly through its weightings for whole-of-university reputation, limits study opportunities for students by field.

Table 2.13 Selected students by destination country as stated in their first preference (2009 second round)

Master's			Doctorate		
Country	Number	Percentage	Country	Number	Percentage
United States	180	28.17	United States	194	36.0
United Kingdom	176	27.54	Spain	89	16.5
Spain	76	11.89	United Kingdom	85	15.8
Australia	68	10.64	Australia	33	6.1
Canada	40	6.26	Canada	29	5.4
Germany	23	3.60	Germany	28	5.2
France	16	2.50	France	23	4.3
Netherlands	10	1.56	New Zealand	17	3.2
Argentina	10	1.56	Italy	7	1.3
New Zealand	9	1.41	Argentina	6	1.1
Mexico	6	0.94	Brazil	5	0.9
Switzerland	6	0.94	Switzerland	5	0.9
Italy	5	0.78	Netherlands	4	0.7
Belgium	3	0.47	Denmark	4	0.7
Brazil	3	0.47	Ireland	2	0
Ireland	2	0.31	Belgium	1	0.2
Sweden	2	0.31	China	1	0.2
China	1	0.16	Czech Republic	1	0.2
Denmark	1	0.16	Norway	1	0.2
Norway	1	0.16	Austria	1	0
South Africa	1	0.16	India	1	0
			Portugal	1	0
			Sweden	1	0
Total	639	100	Total	539	100

*Note:* In the case of Master's and Master's for Education Professionals, missing data was not provided by selected candidates.

*Source:* Becas Chile Executive Secretariat with data provided by executing agencies.

## Key design principles

### *Becas Chile as a comprehensive approach to advanced human capital formation abroad*

The BCP provides support for students to undertake academic, professional and technical training, and it recognises the utility of graduates for public and private employment. Operationally, the BCP is intended as an umbrella programme covering a variety of types of support for students abroad.

### *Becas Chile as a student-driven initiative*

The BCP is designed interestingly as a student driven initiative, to the extent that individual participants in post-graduate studies identify what and where they want to study (technician and teacher participants are more directed to areas of study). Payments are made, like vouchers, directly to the selected students themselves in the case of stipends for living costs, and by the BCP administering agency on behalf of the student in the case of grants for tuition costs. This student demand driven model contrasts with conventional models where institutions are funded for the programmes they supply. The former design promotes greater student choice and is more responsive to varying student needs and circumstances, but lacks the predictability of the latter approach. Fully student demand-driven systems can result in shortfalls of graduate output to meet labour market requirements. However as the BCP supplements Chile's primarily supply-driven approach to domestic higher education, it can work to augment opportunities for students and stimulate innovation in the domestic system as local institutions take notice of student interests.

### *Becas Chile contributing to national innovation needs*

At the core of the BCP design is a duality of purpose. Alongside the student-driven incentives, the government has articulated specific purposes of the BCP. Of particular interest are the intentions to synchronise the BCP with the higher education policies of the Ministry of Education and coordinate the BCP with the National Innovation Strategy. Yet, as seen in Figure 2.7, there appears to be very little weight – typically 1 point out of a possible score of 33 points – given to national priorities in the assessment of applicants for scholarships. The points for relevance to national priorities are awarded following the evaluation of academic record and programmatic quality. The operational implications of this shortcoming in the policy design are considered in Chapter 4.

### *Becas Chile as an innovative exemplar in public policy and administration*

Within the Chilean context the BCP is administratively innovative in several respects. It offers a one-stop-shop for applicants and a single web page for on-line applications. It provides a framework that permits a consolidation of general criteria for selection processes, benefits and payback. And it enabled absorption of pre-existing scholarships programmes, including the Programme for Technicians Abroad and the *BECAS Presidente de la Republica* (MIDEPLAN).

The BCP contains a number of equity features, including tuition waivers for foreign language learning for participants from low income quintiles, incentives for women, and reduced obligations of returning participants who take up employment in regional areas, whether with public or private organisations. It provides scholarships for technical training and professional development, with a systemic benefit of helping to raise status of Technical and Vocational Education and Training (TVET).

The BCP is designed also to enhance the quality of learning experiences, firstly by opening up opportunities internationally for students to access new ideas and different cultures, and secondly by giving preference to universities that are rated among the top 200 in the world.

The assessment of applications by field experts relies on judgements about the quality of particular areas of scholarship within universities, but, as discussed below, such judgements can be variable. With regard to the weight given to the reputation of universities as part of the selection process, the currently available “league tables” and other world rankings have notable drawbacks. In particular, as institution-wide aggregates they tend to reflect the Anglo-American variants of the research university model, especially those with medical schools and large natural science departments, for which the available metrics are mostly suited. As a consequence, the rankings can miss very prominent peaks of intellectual capacity and performance in particular fields outside the model research universities. Even for PhD students the use of world rankings can limit student choice, but it is especially narrowing for those seeking professional, creative and technical skills development.

A more nuanced approach to identifying the quality of education and training by field of research and education would be more appropriate. Field-specific indicators are published by various disciplinary bodies and by research publishing companies (*e.g.* citations impact metrics).

## **Assessment of applications**

Individual student applications are assessed by appointed evaluators, themselves selected on the basis of their expertise in particular fields of education, research and/or professional experience. The evaluators are asked to assign points for each applicant against set criteria. The criteria are set and the allocation of the weights is determined in the particular application guideline for each process.

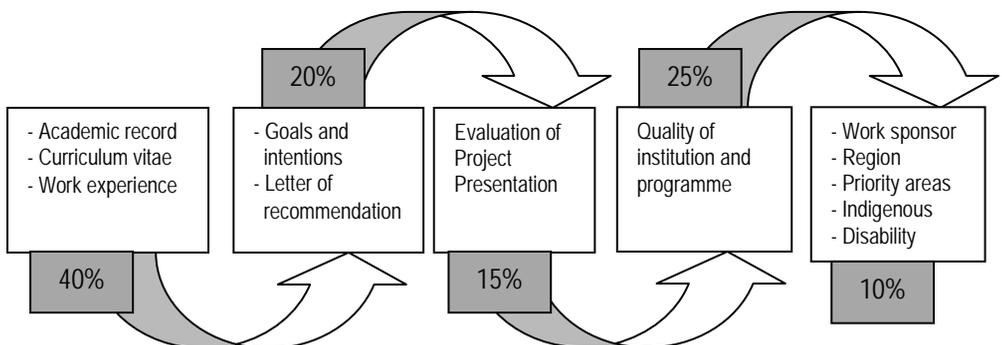
Applications are first processed administratively and then passed to two evaluators, whose judgements are translated into a single numerical score. The evaluator judgements are made with reference to:

- Academic excellence of the applicant;
- Student background: *Curriculum Vitae* and letter of recommendation;
- Letter of intent: academic coherence and research project;
- Quality of the institution at which the applicant seeks to study.

Applications are then sent back for final administrative checking, including the award of bonus points for particular characteristics of applicants and proposed study areas (work sponsor, regions, indigenous, disabled, and priority areas). The applicants for each scholarship type are then ranked by their final score. The rankings are then considered by a single selection committee which sets the “cut-off” point for a scholarship type, having regard to the quality of the students just above and below different cut-off point options. The committee’s finally determined cut-off score is applied across all applications for a particular scholarship type, (e.g. all PhD scholarships), irrespective of fields of study within a scholarship type.

Figure 2.7 shows the broad process for the evaluation of BCP applications and the award of scholarships. This schematic shows that the total of criteria shares exceeds 100%. The bonus points reflect the new features of the programme design, intended to increase equity and relevance of study opportunities. The bonus points are given after the evaluators have provided their assessments.

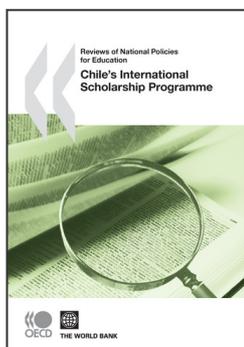
Figure 2.7 BCP General Evaluation Process for post-graduate studies



*Note:* Weights and items may vary by scholarship type.

*Source:* CONICYT, Illustration of second round for PhD applications.

Compared to many OECD countries, Chile's history has given rise to a high level of unease with regard to the exercise of discretion in decision making. Subjective judgements are seen to be opaque and prone to bias. Hence, deliberate efforts have been made to make the evaluation process as objective as possible. This effort is reflected in the points-based approach to participant selection and the use of metrics to guide judgement. Nevertheless, there is considerable room for individual judgement, for instance in weighing the value of different letters of recommendation, and in appraising the quality of international institutions and programmes. The numerical point system is under particular stress because applicants have no standardised test available to measure academic aptitude or achievement. In this respect, the guidelines envisage institutional and programme quality being based one-third on available metrics (*e.g.* world university rankings) and two-thirds on professional judgement.



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