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CHILE'S STATE-GUARANTEED STUDENT LOAN PROGRAM (CAE)

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By: Education Sector, Latin American & Caribbean Region, The World Bank

Analysis and evaluation

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ABBREVIATIONS, ACRONYMS AND DEFINITIONS

ACCES	*Proyecto de Acceso con Calidad a la Educación Superior del Banco Mundial*
AIEP	*Instituto Profesional de la Universidad Andrés Bello*
BBIC	Bicentenary Scholarship
BEA	Excellency Scholarship
BCU	Central Bank of Chile bonds denominated in an inflation-indexed monetary unit
BBIC	Bicentennial Scholarship
BEMES	Maintenance Grant
BHP	Scholarship for Children of Education Professionals
BI	Indigenous Scholarship
BIT	Scholarship for Territorial Integration
BJGM	Juan Gómez Millas Scholarship
BNM	New Millenium Scholarship (*Beca Nuevo Milenio*)
BP	Scholarship for high PSU scores
BPR	Scholarship from the President of the Republic
CAE	Chile's State-Guaranteed Student Loan Program (*Crédito con Aval del Estado*)
CAE's stakeholders	Students, tertiary education institutions, financial entities and the Government of Chile
CAGR	Compound Annual Growth Rate
CASEN	Survey of National Socioeconomic Characterization
CFT	*Centro de Formación Técnica*
CLP	Chilean Pesos
CORFO	Production Development Corporation
CAN	National Accreditation Council
CRUCH	*Universidades Miembros del Consejo de Rectores de las Universidades Chilenas*
DEMRE	Department of Education Evaluation, Testing and Registration
DICOMM	Chile's private Credit Bureau
DIPRES	Budget Office of Chile's Ministry of Finance
FFAA	Armed Forces
FSCU	*Fondo Solidario de Crédito Universitario*
FUAS	Unique Socioeconomic Accreditation Form
GDP	Gross Domestic Product
GPA	Grade Point Average
ICETEX	*Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior*
INGRESA	Administrative Commission for the Tertiary Education Loan System
IP or IPs	Professional Institutes
LAC	Latin American and Caribbean Region
MECESUP	Higher Education Improvement Project
MINEDUC	Ministry of Education
NEM	High school academic average
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development.
PISA	International Program for Students Evaluation

PPT	Powerpoint
PSU	Standardized university Scores
RUT	Unique personal identifying number
SE	Socioeconomic
SIES	Tertiary education information system
SOFES	Sociedad de Fomento a la Educación Superior
TE	Tertiary Education
TEIs	Tertiary Education Institutions
UFs	Inflation-indexed monetary unit in Chile
UNIACC	*Universidad de Artes, Ciencias y Comunicaciones*
UNICIT	*Universidad Iberoamericana de Ciencia y Tecnología*
WB	World Bank

Executive Summary

A. Overview

Chile's *Programa de Crédito con Aval del Estado* (CAE in its Spanish acronym) is uniquely positioned to help hundreds of thousands of qualified-but-financially-needy Chileans attend and finish tertiary education. Despite many virtues in its design and execution, it needs to be improved in some key areas to become a sustainable feature of Chilean tertiary education policy. This report proposes how this can be done.

The CAE program was designed to improve access to and equity in tertiary education. In 2010, after only four years of operation, the Program had 216,000 active borrowers, or 23% of the 940,000 students in *pre-grado*. Even as the annual number of new beneficiaries levels off, the portfolio will increase for the next several years until reaching a steady state with approximately 460,000 active borrowers by 2016.

To date, roughly 147,000 students are in tertiary education who would not have been able to attend without CAE assistance; another 69,000 who were likely to have enrolled anyway are having their studies facilitated by a CAE loan. The currently enrolled borrowers are expected to result in 151,000 graduates. Three-quarters of these students likely never would have graduated, and one-quarter likely would have graduated but only after undergoing much greater hardship to pay for their studies. Two-thirds of borrowers are from the lowest two income quintiles. These facts show a program that is transforming equity in Chilean tertiary education.

The cost-per-additional-graduate of the program to date is USD 9,300 (net present value, NPV), which leverages USD NPV 14,615 worth of tuition-per-graduate. This leverage rate of 1.74 could increase substantially—making CAE correspondingly more cost-effective-- if the program improves the efficiency with which loans are originated and repayment is managed.

As a young program, to date CAE has only a few thousand borrowers who have entered repayment. Nonetheless, 36% of these have already defaulted. Ultimately, half of all borrowers from this cohort will probably default. Fifty percent default is high by international standards, and CAE can do much better. Defaults are invariant across borrowers with differing educational backgrounds and socioeconomic statuses, strongly suggesting the cause is sub-optimal Program administration, rather than excessive debt burdens driving an inability to repay. The report contains a detailed analysis of student debt burdens; while these are higher than international averages, they are not so high as to unduly impede repayment for the average borrower. Key problems seem to include a lack of ongoing transparency into borrower obligations, lack of effective communication with borrowers as they enter repayment, and deficient incentives for those responsible for collection.

CAE is still a young program. Deficiencies can be fixed before they solidify into a "culture of default." Drastically improving repayment rates will significantly decrease costs and increase

cost-effectiveness. Failure to improve these rates will inculcate a culture of default that could cause the Program's costs to rise further, perhaps endangering its long-term viability.

The CAE program makes fixed schedule ("mortgage-style") loans with fixed interest rates available to qualifying undergraduates. Interest accrues during the study period. Borrowers must begin repayment 18 months after graduation. Unemployed borrowers are given a 12 month hiatus from repayments, as are borrowers for whom payments exceed 50% of income.

Students must study at accredited tertiary institutions that participate in the Program by agreeing to partially guarantee the loans of students prior to graduation. The institution's guarantee slides from 90% down to 60% as the student approaches graduation. Qualifying students may borrow up to the "reference rate" for tuition and they may renew loans for study periods equal to the minimum expected time to graduation plus not more than three additional years, depending on the degree type.

The CAE Program is not only getting numerous qualified-but-needy students into tertiary education, it is also helping students graduate. Dropout rates among CAE borrowers are one-third of rates for students without CAE loans. Some of this may be due to the extra scrutiny the admission applications of prospective CAE borrowers undergo from tertiary education institutions (TEIs). The bulk of the effect, however, is very likely due to the program achieving its core mandate: to make it easier for needy students to pay for school and to free them to concentrate more on their studies while enrolled. Lower dropout rates for CAE borrowers are consistent with evidence from other countries that student loans help raise graduation rates. The efficiency savings for tertiary education are considerable. Perhaps most importantly, more financially needy students become productive graduates; fewer leave tertiary education disillusioned and without the degree or skills to which they aspired.

This report includes numerous, specific recommendations which stand to attenuate CAE's costs. Their rapid adoption and implementation could reduce the overall costs of the Program by as much as 50%. Decreasing default constitutes the single most urgent and effective means of improving the program. Default rates might be brought down and a "culture of repayment" promoted by:

- Providing more complete and comprehensive information to students about the obligations they assume with their loans and assuring these are understood and appreciated by students;
- Assuring accurate and up-to-date contact information is maintained for all borrowers at all times;
- Making repayment easier through a variety of means;
- More actively pursuing recovery from defaulters under existing and revised legal procedures;
- Potentially outsourcing collection to specialized agencies; and
- Incenting stakeholders such as TEIs and banks to care about default through enhanced incentives and (where needed) disincentives.

Work has already begun on this front, and initiatives for this year include a redesigned loan collection process, a massive marketing and information campaign aimed at loan beneficiaries, and further efforts to collect and maintain updated borrower contact information.

Figure 1. Cashflows associated with CAE program operations, by scenario (millions of UF)
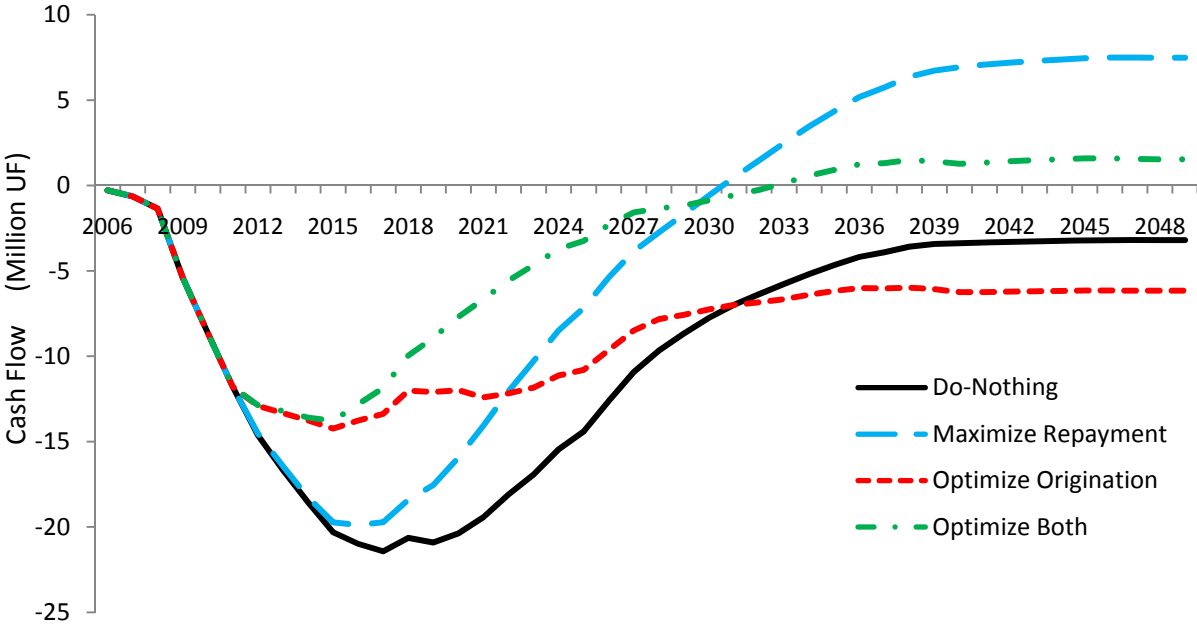
Default is not the only area for improvement. CAE has an innovative structure for risk-sharing which assigns the responsibility for originating and servicing loans to private banks. It also has an innovative "market-based" mechanism for allocating ownership of the loan portfolio. While these innovations are generally positive, especially in their intent, they include some perverse incentives which are contributing to CAE's excessive costs. The system as currently constructed permits banks to accrue a risk-free, profitable portfolio by saddling the Government with high costs segments and charging inflated premiums.

The main changes that would lower the costs of loan origination include:

- *Increasing the number of financial entities who bid each year for a slice of the portfolio.* Changes to the current CAE law could allow pension and investment funds to be considered eligible to serve as financial entities for CAE. Currently they are excluded;

- *Providing the Government with some control over the supply of loans sold.* Currently bidders know the Government must sell all loans at a single auction in a short time period. This knowledge gives a measure of price leverage, as any buyer has when negotiating with a seller who must sell. Various means could be instituted to put the

Government on more equal footing in these negotiations. The most substantial change—which requires new legislation—would give the Government the right to originate loans. In addition to leveraging better prices from private banks, it might allow the Government to use inexpensive capital to which it has access but currently cannot use for the CAE Program;

- *Separating loan origination from loan servicing.*   This action, which should lower default rates, could also create better bid prices for the Government as the true costs of origination versus servicing are revealed through separate auctions and specialized agencies take advantage of economies of scale and comparative advantage for collection;

- *Instituting more flexible auction procedures.*   Currently the Government holds a single-round closed auction and pays winning bidders the price they bid. Enhanced auction techniques that include multiple rounds of bidding and payment to all winning bidders of the marginal clearing price for winning bids merits attention;

- *Optimizing the size and composition of the Government-owned portfolio.*   The Government pays an annual mark up on the loans that it buys from the banks but which they continue to service. Banks are allowed to choose which loans they sell to the Government, so it is in their interest to sell as many loans as possible and to be sure all the longest-duration loans (those for university studies) are sold. This way a bank gets as many annual payments per loan as possible on a large portfolio of loans.   The Government can change the way it pays the mark up and thereby incent a different composition and overall size of loan portfolio; and

- *Remove liquidity obstacles.*   Banks are required by current legislation to classify their CAE loans in the highest risk category, despite their 90% guarantee. Compliance requires setting aside reserves even though true risk does not justify this. Changes to legislation could remove this inconsistency, and lower the costs of sponsoring CAE loans.   Also, as the portfolio matures, exploring securitization may increase the liquidity of the loans and further decrease costs of participating in CAE.

Tertiary education institutions benefit from CAE because it increases the number of prospective students who can afford to pay for studies.   TEIs do need to guarantee a percent of the loans, but low drop out and default rates mean that their new revenues both significantly and consistently exceed their costs.   If managed wisely, this should be an unambiguous benefit for any TEI.   If, on the other hand, TEIs overestimate future enrollment increases of CAE-sponsored students, and build out costly infrastructure dependent on those enrollment increases to be amortized, they may encounter serious financial difficulty. Some institutions are now experiencing "CAE-driven" enrollment expansions.   The Government should exercise appropriate financial and management oversight of these institutions to ensure revenues from CAE loans do not fuel unwise expansion practices that ultimately result in a descent into insolvency. To this end, bids for a TEI monitoring and auditing system were recently requested.

CAE is one of several new student financial aid vehicles created or enlarged in the past five years. Expanded student aid is giving needy students access to tertiary education and making it more equitable. Despite this laudable impact on access, student assistance for tertiary education in Chile is not well coordinated. Agencies and departments which make grants do not adequately communicate with each other or with loan providers. Little data has been collected on the efficacy of aid and how to maximize it. Institutional contributions to student aid appear to be changing, but the Government lacks information on how and to what extent. The Government's forms for assessment of student financial need are vulnerable to manipulation by aid seekers.

It will be critical to coordinate aid better. Well-coordinate aid allows the Government to meet more policy objectives cost-effectively while increasing the overall fairness of private contributions to tertiary education. The real power of aid coordination rests on the ability to lower (but not eliminate) debt burdens where absolute ability to pay will be lowest, while having the flexibility to reward merit or other special considerations. Grants and loans together can effectively give individually-tailored premiums to considerations such as geographic origin, membership in a traditionally-excluded social group, and low socioeconomic status of family of unit, among others.

The cornerstone of effective aid is a comprehensive and fool-proof needs assessment. Chile must be sure it is measuring student financial need correctly if it hopes to satisfy it. Once measured accurately, information can be routinely collected from students about the optimal combination of grants and loans. By analyzing and feeding this information back into the policy process, Chile can ensure that the highest number of qualified-but-needy students gain access to and complete tertiary education, and ultimately, repay their loans. The adoption of the recommendations of this report, not least of which is the centralization of aid allocation, should bring Chile closer to this important goal.

B. Background of the report

This report is part of the 2010 Joint Studies Program between the Government of Chile and the World Bank. The report is a joint effort between staff from the Ministry of Finance Budget Office and the World Bank Latin America & Caribbean Region Education Sector. The purpose of the study is three-fold.

> *First*, to evaluate the impact of this program on access to and equity in higher education, taking into account the effectiveness of targeting qualified but financially needy students and its complementarity with other major student aid mechanisms.

> *Second*, to understand the size of the economic commitment the Chilean Government has made with this program, both in terms of its investment to date and its contingent liabilities.

> *Third,* to formulate recommendations for improvements going forward.

Annex 2 reviews the Terms of Reference of the study and Annex 3 lists the World Bank team members.

C. Organization of the Report

The first chapter summarizes CAE's legal framework and institutional arrangement, explains how the CAE system functions, and describes the main characteristics of the loan product.

The second chapter presents a brief overview of CAE's structural cost according to current program design and briefly describes the model used to calculate CAE's actual cost. The results of the latter are then included throughout the rest of the report as appropriate.

The remaining parts of the chapter focus on CAE's stakeholders—students, tertiary education institutions, financial entities, and the Government of Chile—and explore and analyze the impact the CAE program has had on them.

The third and final focuses on recommendations for improving CAE: increasing loan repayment rates, lowering capital costs of loan origination, and increasing the coordination of CAE with other student aid programs. The end of the chapter then shows what the financial impact of these recommendations might be for the Government of Chile.

While Chapters 1-3 are the main body of the report, Annexes 1-14 are the technical backbones that support it. Annexes worth highlighting include:

- Annex 1, which discusses the rationale for student lending as it applies to Chile;
- Annex 4, which lists a few key excerpts of the law that governs CAE. This is important context for our recommended changes to this law;
- Annex 5, which details CAE's bidding history. This is the basis for our recommendation to institute more flexible auction procedures;
- Annexes 7 and 8, which suggest how loans and grants could be targeted and compare Chile's student aid programs in table format;
- Annex 10, which shows likely average debt burdens as a percent of income for CAE borrowers, by TEI and degree;
- Annex 13, which presents two alternatives with which to calculate the impact of CAE; and
- Finally, for those both brave and technically-savvy, Annex 14 explains the functioning of the financial model built for the CAE program. The annex gives an overview of model principals, explains core assumptions included, flags caveats that should be considered when analyzing the output, describes the process by which model itself was built, and discusses data trends and implications.

Chapter 1: Description of CAE Program

A. CAE legal framework and institutional arrangement

CAE was created by Law 20,027 in order to "support, in a permanent and sustainable way, access to financing for academically qualified students who lack sufficient means to finance their own tertiary education." Law 20,027 lays the groundwork for a system that intermediates resources between capital markets and students, in conditions that enable students to comfortably return the funds as their income rises. The *Comisión Ingresa* was created to manage this system.

The system in which CAE operates includes five major players: Ingresa, the Ministry of Finance, financial entities, TEIs, and students. The remainder of this section will focus on Ingresa and then briefly explain the duties and responsibilities of the other players.

> "The success and sustainability of the CAE system depends on the joint effort of all those involved: the participating TEI which guarantee the academic risk of their students; the financial sector which provides the resources; the State which provides guarantees that reduce the risk of the loans; and the students who ought to responsibly fulfill the financial obligations to which they are beholden." Regulations for Law 20,027

Ingresa is an autonomous State entity with its own legal identity, assets and budget. It is a mixed public-private collegial body comprised of representatives from both the State and TEIs. Ingresa is formally known as the Administrative Commission for the Tertiary Education Loan System, and its members are:

- Minister of Education, as chairman;
- Vice President of CORFO;
- General Treasurer of the Republic;
- Budget Director from the Ministry of Finance;
- A representative of the CRUCH universities;
- A representative of the private universities; and
- A representative of the IPs and CFTs.

Ingresa's mission is to expand opportunities to access Chile's tertiary education system, particularly for those students who meet specific academic and socioeconomic criteria. Its core responsibilities are:

- to design and implement instruments with which to finance tertiary education;
- to enter into the necessary agreements with public, private, national or international entities to roll out those instruments and leverage public and private resources for them; and
- to manage the system of state-guaranteed student loans.

Ingresa's specific functions include:

- Regulate the system of state-guaranteed student loans;
- Select the students who will benefit from these loans (hereafter, the beneficiaries);
- Require the provision of guarantees by TEIs, who are accountable for their students' loans vis-à-vis the loan owners;
- Determine the annual interest rate;
- Tender the loan portfolios in the financial system;
- Purchase the loans banks sell to the Government;
- Securitize the loans when deemed appropriate;
- Develop and implement management and information systems; and
- Disseminate these benefits and this program among relevant current and future stakeholders.

The administrative costs of Ingresa are financed through the contributions of TEIs who participate in the CAE system, the allocation determined each year in the Budget Law, and the donations given by public, private, national or international entities. TEIs must contribute a percentage of the volume of the CAE loans given to their students (both new and renewed loans).

The Ministry of Finance determines in the Budget Law the amount of resources available for the provision of loan guarantees and the amount of cash on hand for the repurchase of student loans from financial entities. The Office also bears the cost of the contingencies in case of unemployment, and contributes funding towards Ingresa's operations.

"Legal financial entities registered in Chile"—banks—bid for loan portfolios from Ingresa. Winning bidders are then responsible for interfacing with the students, originating the loans, disbursing the funds directly to the students' TEIs, choosing which loans to sell to the Government, servicing the loans, and collecting on the loans once the students' repayment period begins.

Tertiary education institutions guarantee a percentage of the loans of their students while they are pursuing their degree.

Students must verify (and maintain) socioeconomic need and academic merit to receive a CAE loan.

B. CAE characteristics

CAE is a fixed-schedule, or conventional mortgage-type, loan. The following pages will describe specific characteristics of the CAE loan system.

i. Eligibility

In CAE eligibility criteria apply to both TEIs and students. In the case of the former, all accredited TEIs who agree to guarantee part of the students' loans may participate in the system. Currently 71 institutions participate in the system, as shown in Table 1. Of these 23 are traditional CRUCH universities, 23 are private universities, 13 are IPs, 9 CFTs, and 3 military academies.

Table 1. Participating Tertiary Education Institutions

	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010
No. of TEI participants	40	51	59	65	71

Source: Ingresa

In the case of the students, CAE is open both to those entering their first year of tertiary education and to those who have already started their degree programs. Importantly, CAE is the only form of state-sponsored financial aid for which this last group of older students can apply. Several criteria determine eligibility:

- Chilean citizen or resident;
- At least 18 years of age when the loan documentation is signed (or sign with a legal guardian);
- Financial need, determined through the socioeconomic conditions of the family group
- Enrollment in an undergraduate degree program at an accredited TEI who participates in CAE;
- No prior undergraduate university degree financed by the *Fondo Solidario de Crédito Universitario* (FSCU) or by CAE itself; and
- Academic merit, as explained below.

Incoming first year university students must score above 475 points (language and math) in the standardized university entrance exam (*Prueba de Selección Universitaria* - PSU), regardless of the university or degree program they hope to pursue. Incoming first year students applying enrolling in IPs or CFTs may also qualify for CAE if their high school average was equal to or greater than 5.3.

Students already pursuing a degree must have satisfactorily fulfilled 70% of the total credits taken in the last two semesters and must be supported by the TEI in which they are enrolled.

TEIs may establish minimum requirements for new CAE borrowers: these requirements may be greater than those defined by Ingresa and greater than those required of other students. Private TEIs may also limit the number of spots allocated to CAE students.

Each year TEIs inform Ingresa how many CAE students they are willing to admit. This enables Ingresa to calculate how many CAE "spots" there are in the tertiary education system in any given year.

Students apply on the Ministry of Education's financial aid webpage (www.becasycreditos.cl). They fill out an online form (Unique Socioeconomic Accreditation Form or 'FUAS' in its Spanish acronym) where they describe their academic performance and the size and income of their family group. Applications are received twice a year, once in October from students already pursuing a degree and once in November from prospective students. Once students are selected to receive a loan, they must enroll or confirm their enrollment in an accredited TEI, and must accept the loan by signing a legally-binding contract with the financial entity assigned to them.

Table 2. Number of CAE beneficiaries per year
(includes new and renewed loans)

Year of Assignment	2005	2006	2007	2008	2009	2010
Beneficiaries	0	21,317	54,458	91,056	148,380	213,350
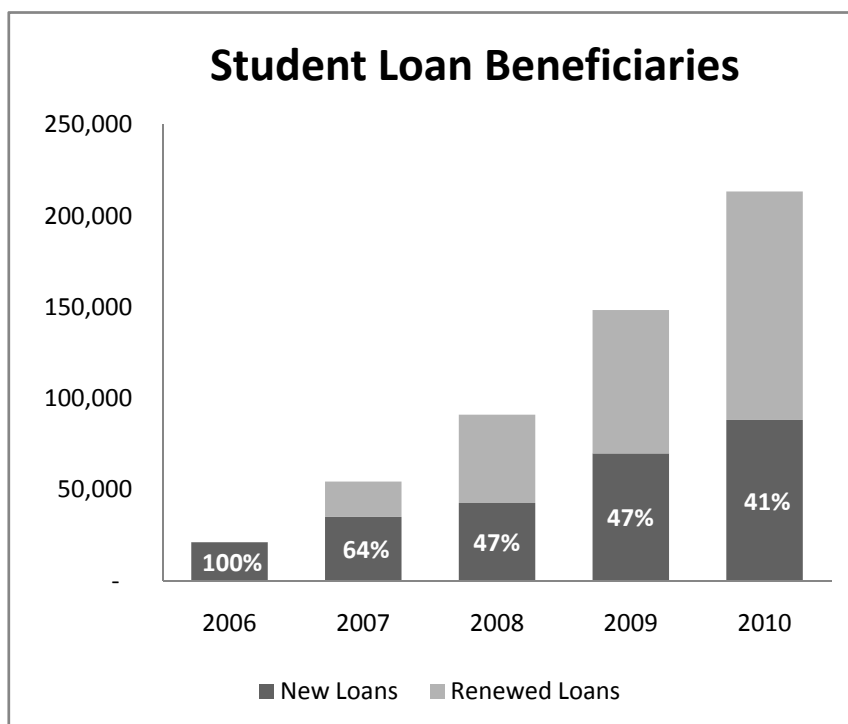
Source: Ingresa

ii. Source of capital

Financial entities and the Government of Chile provide the capital for CAE loans. Under the law that governs CAE (See Annex 4), the Government of Chile is not permitted to originate loans directly. Accordingly, the Government relies on collaboration with the financial sector to originate and service student loans. The number of new loans per year depends on a variety of factors:

- Desired student coverage, considering levels of academic performance and socioeconomic need, as determined by the Ministry of Education.
- Availability of budgeted fiscal resources, as determined by the Ministry of Finance.
- Experience and lessons gleaned from prior bidding processes;
- Prior analysis of investors' interest in financing educational loans; and
- Available CAE "spots" in TEIs.

Once Ingresa agrees on and gives approval to the rough number and amount of new and renewed loans for the year, it creates homogenous and equally-sized loan packages and tenders them in the financial system. Financial entities bid for these packages and originate the corresponding loans.

From academic year 2006 to 2010, a total of USD $1,424 million worth of loans had been given, with an average yearly loan size of $2600. Table 3 shows these numbers by year.

Table 3. Loans awarded 2006-2010

US dollars '000	2006	2007	2008	2009	2010	Total
CAE loans	**61,693**	**139,934**	**228,411**	**388,784**	**605,580**	**1,424,403**
New Loans	61,693	84,649	108,867	178,842	258,265	692,316
Renewed Loans	-	55,285	119,544	209,942	347,316	732,087

Source: Ingresa

iii. Loan amounts and limits

Loans are awarded for the duration of the degree. Students must renew their loan every year online (they need not apply for the loan anew), and as of 2009, must update their contact information in the process.

Student borrowers may request the amount that best serves their financial needs, and can update this value each year of their studies. The minimum amount to request is 200,000 Chilean pesos (around $400 USD) and the maximum is 100% of the Tuition Reference Rate. The loan does not cover the one-time enrollment fee at some TEIs. The tuition reference rate may be below the actual cost of tuition, as shown in Table 4.

Table 4. Tuition reference rate as a percentage of actual tuition cost, by type of TEI (2010)

TEI type	Minimum	Average	Maximum
CFT	57.9%	96.0%	100.0%
IP	54.9%	96.1%	100.0%
Cruch	46.3%	83.7%	100.0%
Private Universities	26.1%	78.7%	100.0%
Armed Forces	98.1%	99.3%	100.0%

Source: Ingresa

Students may complement or substitute the CAE loan with other types of financial aid. When the latter is Government-sponsored (such as grants and/or subsidized credit), students may only obtain up to 100% of the Tuition Reference Rate.

Importantly, once a student finishes a technical degree, they can begin a professional or licensed degree with the same loan or with a second loan. Students may also change TEIs and/or majors once with the CAE loan.

The law establishes a maximum number of years student borrowers can take to graduate:

- If the student enrolls in a degree program that results in a professional license, they are given the number of years for that degree plus 3 additional years in case of delays (i.e. if the degree lasts 5 years, the student may take up to 8 years);
- If they enroll in a professional degree program (no license), they are given the number of years for that degree plus 2 additional years; and
- If they enroll in a technical degree program, they are given the number of years for that degree plus 1 additional year.

iv.   Amount and form of subsidization

The interest rate on CAE loans is fixed for each year. While the average of all the rates is 5.48%, it ranges from 4.91% to 6.09%. Detailed rates for each year can be seen in Annex 6.

The interest rate charged on the loan depends on the length of its repayment period, as shown in Table 5. Interest starts accruing when the loan is formally issued by the financial entity (typically August) and ends when it is completely paid off. The interest may be capitalized monthly.

Table 5. Interest rate charged on loans*

Length of repayment (yrs)	Risk-free rate (Chile T-Bills)	Spread (basis pts)	Monthly commission (in UF)
10	**BCU-10**	220	0.03
			0.04
15	**BCU-20**	230	0.03
			0.04
			0.05
			0.06
20	**BCU-20**	230	0.04
			0.05
			0.06

* BCU = Central Bank of Chile bonds denominated in an inflation-indexed monetary unit

Source: Resolution (T.R.) number 3 from 2010: terms of 2010 CAE licitation

The student must also pay a "Stamp Tax" (*Impuesto de Timbres y Estampillas*) of up to 0.6% on the total amount of the credit. This amount can be paid up front by the student or can be added to the loan principal.

Regardless of the initial rate charged on the loans, if by the end of the loan disbursement period the average annual weighted real interest rate exceeds 8%, the financial entity must adjust the rate to 8%. The difference is then charged to the Government of Chile. This has not happened to date with any loan.

v.   The repayment obligation

The length of the repayment period of CAE loans depends on the type of degree, the year of study, and the amount borrowed, as shown in Table 6.

Table 6. Length of the repayment period of CAE loans

Degree level	Yr of study	Amount in UF	Length of repayment
License	**1 or 2**	0 - 40	15
		41 - 155	20
	3	0 - 40	10
		41 - 70	15
		71 - 155	20
	4	100 - 155	20
	5	100 - 155	15
Professional	**1 or 2**	0 - 70	15
		71 - 155	20
	3	0 - 70	10
		71 - 155	15
Technical	**1**	0 - 70	15
		71 - 155	20
	2	0 - 70	10
		71 - 155	15

Source: Resolution (T.R.) number 3 from 2010: terms of 2010 CAE licitation

There is no obligation to pay the loan while the student is pursuing a degree. If students stop studying for 12 consecutive months without valid justification, they must begin repayment the following month (on the 13th month after drop-out) or enroll in another eligible institution. If the student drops out altogether, their repayment period halves.

Beneficiaries who switch TEIs, degrees, and/or degree types while studying effectively take out a new loan for their studies. The old loan continues to accrue until repayment. The original loan can be serviced by one financial entity while the new loan can be serviced by another. This implies that upon entering repayment, a beneficiary may have two separate and distinct loans to pay off to different financial entities.

Once the student satisfactorily passes all the courses and fulfils all the credits necessary for their degree, they have an 18-month grace period before repayment begins. It is important to note that the actual degree need not be granted for the grace period to begin, as it is often the case that the degree granting process takes several months.

Every year leading up to repayment, the financial entity who services a student's loan is required to send a letter to the student describing the size of their loan, its interest rate, commission and general terms. The address to which this letter is sent is typically the one the student registered upon signing the loan.

Students may start prepaying their loan at any time, at no additional cost. If a student receives a government tuition scholarship over the course of the school year, the student's TEI may use the funds awarded to pay down their loan.

Payment is suspended for up to a year if the graduate is unemployed or if the monthly payments represent more than 50% of monthly income. The payments not charged to the graduate are paid by the Government. Once the graduate resumes payment of the loan and finishes paying off the balance, they must pay the Government back the same amount the Government paid for them.

Lenders are authorized to request borrowers' employers to deduct the loan payments from employee paychecks. Although CAE borrowers are not required to divulge their employer's information, lenders can request it from the Superintendence of Pensions and the Superintendence of Health.

Lenders may request the Chilean Ministry of Finance send them any tax returns a defaulting borrower may be entitled to, until that borrower is again current with their loan. Finally, lenders must report a defaulting borrower to the Credit Bureau (*Boletín de Informaciones Comerciales*).

Loans are considered in default when three consecutive monthly payments are missed.

vi.   Ultimate risk

Figure 2. Structure of Guarantees
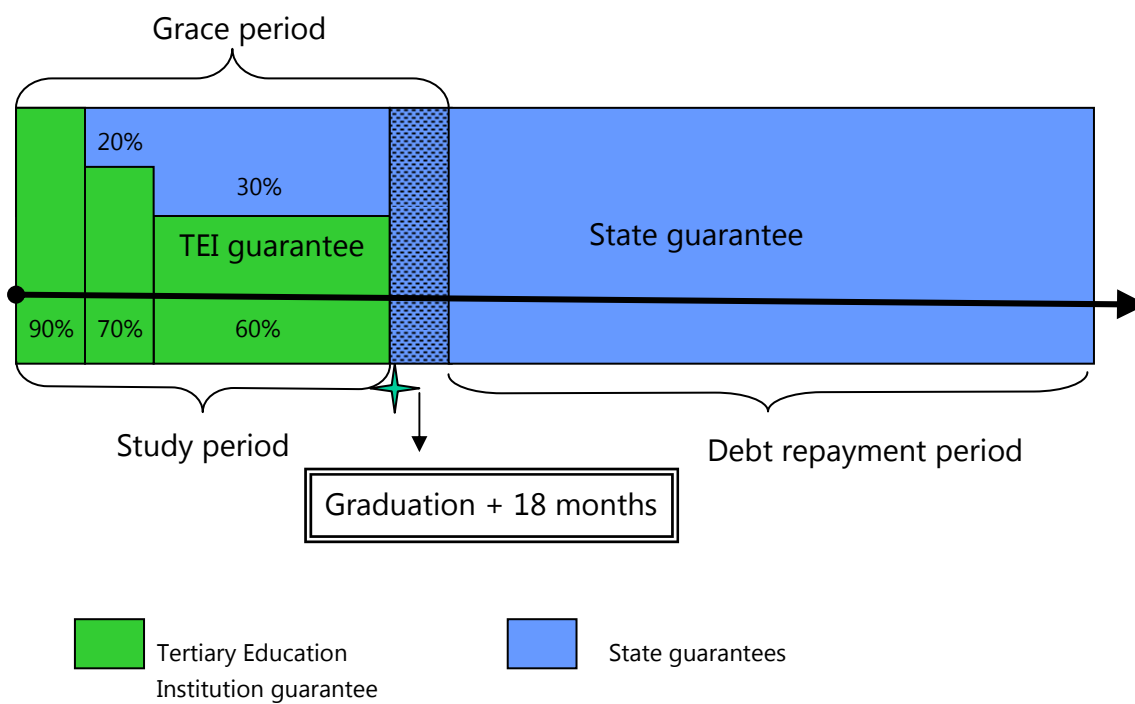
Source: Ingresa

TEIs must guarantee a portion of their students' loans while they study: 90% in the first year, 70% in the second year, and 60% thereafter. The TEIs must formally purchase a guarantee ballot or an insurance policy on the amount of funds they guarantee. That amount is calculated as follows:

- Amount of credit given to first year students * 90% * the historical drop-out rate of the TEI's degree program in which each student borrower is enrolled;
- Amount of credit given to second year students * 70% * the historical drop-out rate of the TEI's degree program in which each student borrower is enrolled; and
- Amount of credit given to students in their third year or beyond * 60% * the historical drop-out rate of the TEI's degree program in which each student borrower is enrolled.

The Government guarantees a small portion of the student borrowers' debt while they study: 20% in the second year of study and 30% from the third year until graduation. After a student graduates, the Government guarantees 90% of the loan. Since 10% of the students' loans are never guaranteed, the owner of the loan bears the loss upon default. The aforementioned guarantees apply to the total amount of financing a student accrues: (principal + interest + any other extras).

Guarantees may only be called once the following conditions are met:

- Three consecutive payments missed;
- Preliminary collection efforts have been exhausted, as certified by the legal representative of the company hired for this purpose. These efforts must include:
  - call log identifying phone numbers dialled, time and day of the calls, and a short message regarding the outcome of each one
  - certified copies of written communications sent to the borrower, including address and date sent;
- Request submitted to a court to proceed with legal actions for loan collection; and
- Judicial notice personally given to defaulted borrower, or at least two unsuccessful search attempts conducted in an interval of not less than a week, each duly certified by a judge. If not the latter, authorized copies of procedural documents issued by Court Clerks and following a judge's decision.

vii.   Bidding structure

Prior to loan origination in any given year, Ingresa divides the overall portfolio of loans awarded to students into homogenous and equally-sized packages. The loans for each of those packages are all up for bid simultaneously from the financial entities who wish to participate in the CAE loan system. Banks can bid for one or more of the packages, with no advance knowledge of the number of competitors or the pricing of those competitors. Banks submit their bids to Ingresa in a closed envelope, and Ingresa opens the envelopes and announces the winners.

Financial entities bid on two key metrics: the percent of the package they would like to sell on to the Government and the percent mark-up over the face value of that package. Ingresa multiples these two percentages, and uses this number to order the bids received from smallest to largest. The bids with the smallest numbers are awarded the loan packages.

The first metric mentioned— the percentage of the package to sell to the government — was fixed at 25% in the 2006 tender, and then was made to float in the 2007-2008-2009 tenders. In 2010, it was specified that no more than 50% of the package could be sold to the Government. This sale takes place within a few months of origination. Regardless of the actual ownership of the loan portfolios a financial entity wins at auction, it must originate, manage and collect on the student loans it is awarded. In effect, a financial entity retains the obligation to service the government-owned share of the portfolio it wins at auction for the life of the loan. The Government may terminate this servicing contract if it wishes.

Financial entities have the right to choose which loans to keep and which loans to sell to the Government. They may exercise this right at three points in time:

- <u>Upon origination under the terms of the auction</u>
  A few months after the financial entity originates the loans, it may sell part of the loans back to the government. The percentage of the loans it may sell back is determined as part of the original terms of its bid (in 2010, most of the bids came close to the 50% ceiling);
- <u>Upon student switching TEI</u>
  CAE beneficiaries who choose to switch TEIs, degrees, and/or degree types while studying are bid as out as new loans. The original loan can then be sold to the Government;
- <u>Upon student drop out</u>
  When a student drops out, the financial entity may sell that student's loan to the Government at 90% of its value (original principal + interest). Interest may be capitalized.

The second metric upon which bids are won—the percentage mark-up over the par value of the loan portfolio sold back to the government—has been made to float across every bid year. When the students whose loans are owned by the Government choose to renew their loans, the financial entities who manage the loans must disburse fresh resources. The Government then reimburses the financial entities for those new loan tranches at par value plus the same mark-up established in the terms of the bid for the initial tranche.

A mark-up is not paid on the loan portfolios owned by financial entities. Consequently, the mark-up on the loans originated and sold back to the Government is a key driver of the return to financial entities participating in CAE. The mark-up effectively compensates for the credit, capital, liquidity and servicing risks financial entities bear with the acquisition of a CAE loan portfolio.

The average result of the annual loan package bids to date can be seen in the Table 7. Annex 5 details the bidding history by year, financial entity, bidding terms, and success of the bid.

Table 7. Average terms for successful CAE loan portfolio bids

Year	# of beneficiaries	# of homogenous loan packages	beneficiaries per package	average % to sell back	average % mark-up	surcharge over total
2006	21,251	3	7,084	25.0%	43.0%	10.80%
2007	35,035	5	7,007	13.8%	13.1%	2.10%
2008	42,696	6	7,116	25.2%	34.8%	5.70%
2009	69,849	17	4,109	68.2%	52.6%	33.30%
2010	88,214	17	5,189	49.7%	30.1%	14.60%

Source: Ingresa

Chapter 2: CAE Analysis and Evaluation

Chapter 2 is organized into five parts. The first part estimates CAE's structural cost according to current program design and briefly describes the model used to calculate CAE's actual cost. The results of the latter are then included throughout the rest of the report as appropriate.

The remaining parts of the chapter focus on CAE's stakeholders—students, tertiary education institutions, financial entities, and the Government of Chile—and explore and analyze the impact the CAE program has had on them.

- In the case of students, the chapter looks at CAE's targeting, impact on access and equity, and fit with other sources of financial aid in Chile. It ends with an analysis of students' projected debt burdens and current default rates;
- For TEIs, the chapter looks at CAE's academic impact—dropout, remediation and accreditation—, financial impact—revenues and borrowing capacity—, and operational impact. This section ends with an analysis of the costs and benefits to date of CAE for TEIs;
- For financial entities, the chapter considers costs, incentives and systemic constraints that condition participation in CAE. The section ends with an analysis of the sustainability of that participation and the financial outcomes associated with it; and
- For the Government of Chile, the chapter describes CAE's impact on Ingresa, the Ministry of Education and the Ministry of Finance, both in terms of their operations and public policy decisions. This section ends with a detailed analysis of the cost of the CAE program to the Government of Chile.

A. Modeling of CAE: overview

i. Structural Cost of CAE

In many countries, student lending schemes contain a grant or hidden subsidy element to the students, through the terms of the lending. These subsidies are structural features of the loan programs, whereby the program sponsor does not pass the full costs of the lending along to the beneficiaries of the program. In programs with these embedded subsidies, even if the students fully repay their obligations through the program, the funds ultimately recovered can be significantly less than the value of the funds lent out.

Structural subsidies most frequently appear as favorable interest terms to the loan recipients, either through accrual-free spans of the loan (e.g., during the study period), or through rates charged to students that are below the actual cost of capital to provide the programs. In either case, the loan beneficiaries are shielded from the true cost of the program. Shen and Ziderman (2008) have developed a ratio intended to measure the actual recovery of student loan programs by comparing the value of the repayments from the students to the value of the costs of the program. The ratio converts the expected repayment stream from the students to a present value, and compares it to the present value of the cost of providing the student loan

program. The ratio does not contemplate the actual repayment behavior of beneficiaries, in that it considers only the terms of the lending, not the actual repayments that accrue in practice. A program with a high Shen-Ziderman ratio may in practice have very low recoveries if students fail to uphold their repayment obligations.

The Shen-Ziderman ratio depends principally on the interest rates charged to borrowers relative to the cost of capital to fund the program. A program that charges students an interest rate lower than the cost of capital will necessarily lose money, regardless of whether or not the students fully repay their obligations. Additionally, the duration of the grace period, education period, and repayment spans all affect the relative present values of the repayment and origination streams. Finally, any grace period in which interest does not accrue also reduces the ultimate value of the resources recovered by the program.

By design, CAE's terms of lending should lead to high recovery. With lending rates that exceed the Government's cost of capital by two hundred basis points, the program does not explicitly contain an embedded subsidy. The only feature of the program not explicitly shouldered by loan recipients is the cost of the mark-up paid by the Ministry of Finance to participating banks. As long as the mark-up does not again reach the high of 2009, CAE as designed should recoup all of the value of the funds lent out to students. As Table 8 and Figure 3 show, CAE's Shen-Ziderman ratio ranges from 93% to 125%, depending on the year's average mark-up.

Table 8. CAE's Shen-Ziderman Ratio

Chile - CAE 2006	113.67
Chile - CAE 2007	125.54
Chile - CAE 2008	124.28
Chile - CAE 2009	93.53
Chile - CAE 2010	109.23

Source: World Bank Team analysis

Figure 3. Student repayment as a percentage of the cost of the student loan program[1]
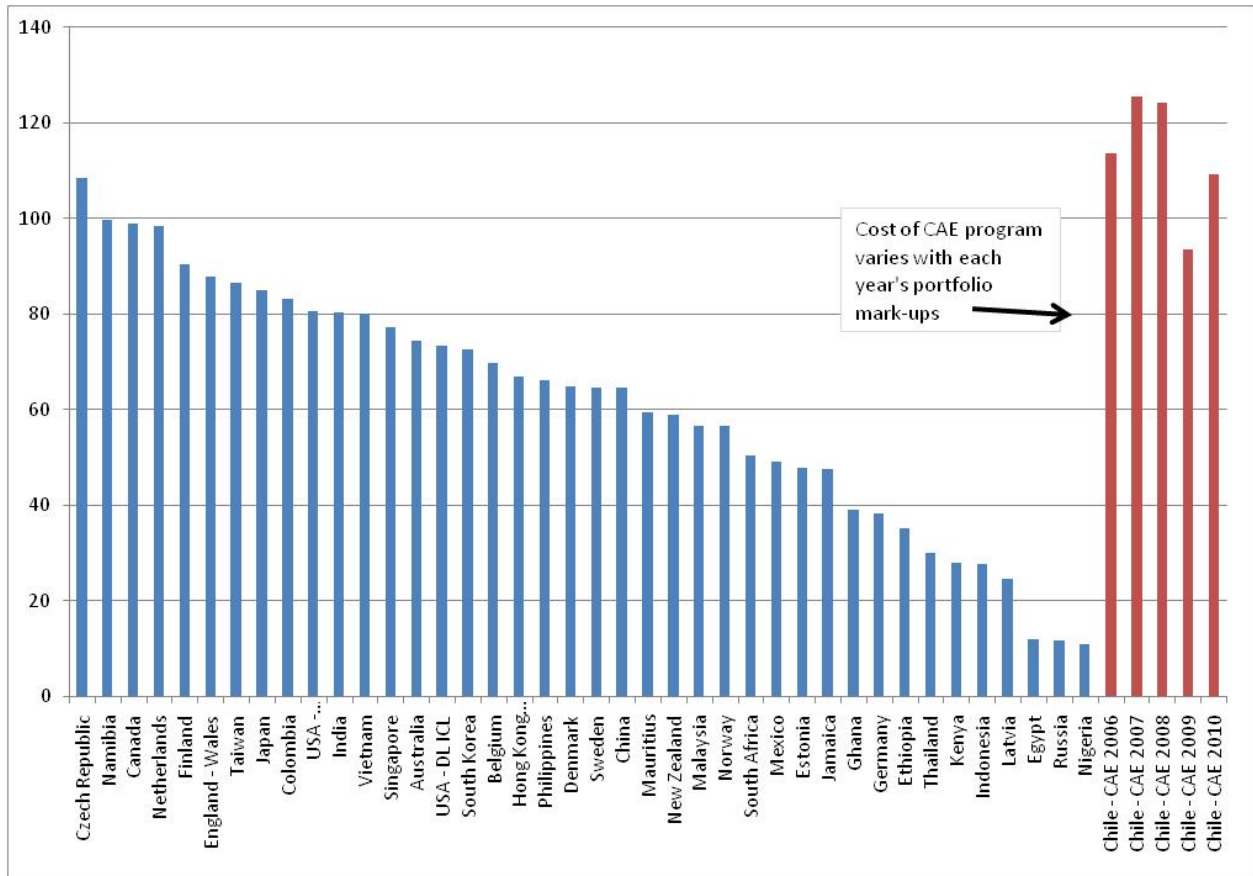
Source: Shen, Hua and Ziderman, Adrian, "Student Loans Repayment and Recovery: International Comparisons" and World Bank Team analysis

In practice, despite a high ratio, CAE may have significantly lower recovery numbers. The recovery of CAE is not just a function of the interest rates and education spans, but also the repayment, prepayment, and default behaviors of borrows. Some default is expected in any loan program, and necessarily decreases recovery. The timing of defaults is also a significant driver of costs; defaults late into the repayment window cost less, as those borrowers have already returned principal to the government. Early defaulters have large loan balances. To assess the true cost of CAE, a granular model has been developed.

ii.   Modeled Cost of CAE

The World Bank Task Team, hereafter, "the Team," has developed a model to assess the financial implications of the CAE program for each of the major stakeholders.[2] The model is used throughout the report to generate estimated costs for the CAE program under different

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[1] Shen, Hua and Ziderman, Adrian, "Student Loans Repayment and Recovery: International Comparisons", Forschungsinstitut zur Zukunft der Arbeit Institute for the Study of Labor, Discussion Paper No. 3588, July 2008.
[2] See Annex 3 for a list of World Bank Task Team members.

scenarios. These implications are analyzed by using Net Present Value (NPV) calculations and by examining the timings of program Cash Flows.

The first of these (NPV) calculates the current worth of CAE's future streams of cash flows given a specified rate of return. This allows cash flows stretching over decades to be easily understood, thus allowing the future value of CAE repayments to be compared with the present value of the program's outlays. Calculations have assumed a 6% real rate of return, as specified by the Ministry of Finance.

A positive net present value indicates the CAE program has yielded a rate of return greater than 6%. Conversely, a negative net present value indicates the program has yielded a rate of return less than 6%. The Government of Chile chooses to invest in projects with rates of return greater than 6%. This means that if projects are expected to yield less than that, the Government prefers to invest resources elsewhere. Because of this, the rate of return is often referred to as the discount rate, the opportunity cost or the hurdle rate.

In this report, the six percent rate has been assumed for all participants in the program. To the extent that the opportunity cost of capital for TEIs and Banks differs from that of the Government, the perceived value of the program to them will differ from the estimates of this report.

The second way the Team assesses the financial implications of CAE is through a Cash Flow analysis, which provides a view of the timing of nominal cash outflows and inflows. A cash flow schedule allows the evolution of costs to be better understood, and estimates a date when ongoing CAE program disbursements stabilize relative to CAE loan repayments.

CAE loans are significantly more complex than standard loan products. They can vary in length of study, size of yearly loan amounts, interest rate, default behavior, and repayment rate, among others. The true cost of CAE is a direct function of the timing of each cash flow in each individual loan originated by the program. Simplifying assumptions were made to reduce the complexity to a manageable and transparent level. Real data was used to ground those assumptions wherever possible.

Annex 14: The CAE model, enumerates the assumptions made and describes how those assumptions are consolidated into output.

In essence, the model functions by aggregating thousands of loans into twelve representative loan types, and then tracks their expected cash flows. The cash flows are aggregated into a cash flow schedule, and a discount rate is applied to determine the net present value of the cash flows. To the extent that real behavior varies from the behavior assumed or extrapolated from CAE historical data, ultimate program cost will diverge from model output.

Throughout the report the present value of the CAE program to each stakeholder will be included, in addition to a brief discussion of the major sensitivities of each. Note that because

the model makes a wide range of assumptions on the behavior of CAE borrowers, readers are encouraged to always consider these figures in the context of the stipulations contained in Annex 14.

B. Impact on Students

i. Is CAE Improving Equity?

a. How many additional students and graduates will CAE produce?

The purpose of the CAE program is to allow financially needy but qualified students to attend tertiary education and obtain degrees.   A first measure of program success is the extent to which it enables students to attend and complete tertiary education who would not have been able to do so in the absence of the loan program.   A second measure is the extent to which it alleviates the burden of paying for tertiary education for those students who have legitimate difficulties paying at the time of study.   The ultimate impact to Chile of CAE will come as graduates who otherwise would never have attended tertiary education or who would have been unable to graduate have more productive careers, contribute more effectively in the public sphere, and enjoy greater personal satisfaction. In doing so, they will simultaneously promote growth and increase equity as they add to other social and private benefits. To start, the CAE and non-CAE tertiary enrolment figures in Figure 4 show the difference CAE has made on overall tertiary education between 2006 and 2010.

Figure 4. CAE and non-CAE undergraduate enrolment, 2006-2010
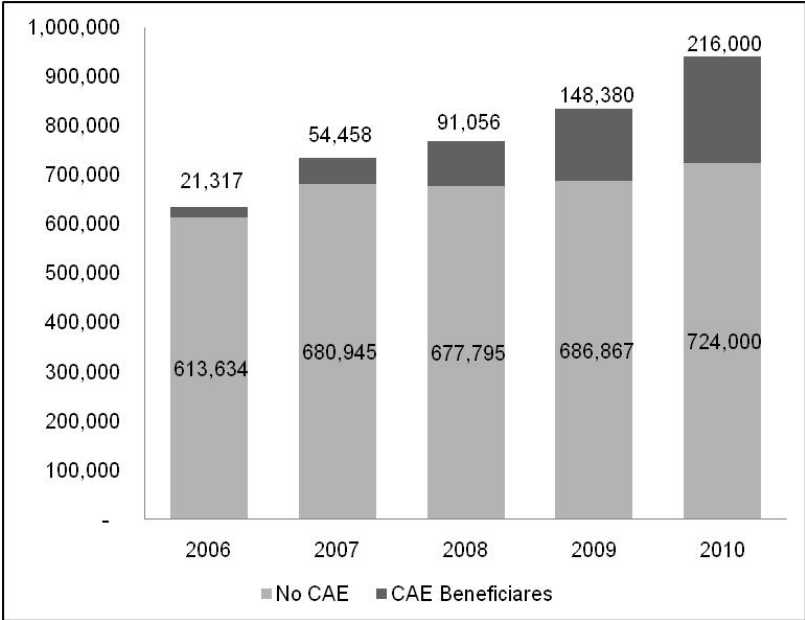
Source: Ingresa and SIES

The estimates below provide a "head count" measurement of students who are in tertiary education because of the CAE and additional graduates (drop outs avoided) due to CAE's lower dropout rates. It is beyond the scope of this report to attempt a second-order calculation of ultimate benefits, whose realization remains in the future as CAE graduates use their newly acquired skills in the course of their careers.[3]   Given existing data, even the "head count" estimate of CAE's impact is speculative.   However, the explanation of the methodology will provide guidance to allow Ingresa to precisely empirically measure CAE's impact.   If Ingresa acts quickly, it could have a fully accurate measurement of CAE's impact in 2012.

The best available figures estimate that there are roughly 147,000 students in tertiary education who would never have attended without a CAE loan.   It is expected that roughly **109,000** of these will graduate. Another roughly 69,000 beneficiaries who are predicted to have been enrolled in tertiary education have received CAE loans. Of these, roughly **24,000** are expected to graduate who otherwise would not have. As of October 2010, **18,000** CAE beneficiaries had already graduated. Taken together, the investment in CAE to date is expected to produce over **151,000 additional graduates**.   Given the net present value of the CAE program to the Government of Chile (which includes resources invested and value of expected future repayments at current default rates for the 2006-2010 cohorts), the cost per incremental graduate to the Government of Chile, per the above analysis, is **roughly USD 9,300 per additional graduate**.   Due to assumptions made for missing data, this estimate may vary from actual costs by +/- 10%.

This is the best available estimate and it needs to be considered with caution for several reasons.   First and most important, it values only additional graduates who never would have attended and students who would have enrolled but who would not have graduated (drop out avoided). It does not value the students who received CAE loans, and probably would have graduated anyway, but with much greater hardship.   Without CAE, many of these students would have been working or otherwise unable to concentrate on their studies. They likely would have had worse learning outcomes at higher costs in terms of anxiety and stress. While these benefits are difficult to value (in the absence of a sophisticated micro-economic survey), they are real and important.

The second reason to use caution when considering these numbers is that they are based on mean values in existing data and assumptions where data is not available.   Annex 13 explains how they are derived.   Also, CAE is only one of several new important student assistance options that have appeared or substantially expanded recently. (The others include but are not limited to the *Beca Nuevo Milenio*, the *Beca Bicentario*, and various other state-provided grants.)   Importantly, no information is available on the extent to which a CAE loan, other aid, or a combination of aid awards allowed a prospective student to enrol who otherwise would not

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[3] The question of CAE's cost-effectiveness is treated later in the report, because it is influenced heavily by repayment/default rates.   That section also looks at student debt burdens and ability to repay, and considers at what point loans would be more effective as grants.   This is a technical analysis, however, and does not consider whether the Chilean Government may wish to provide grants to the poorest students to accelerate improvements in equity.

have. This information can only be obtained through careful surveys of representative samples of prospective students; it is critical that such a survey be established as a regular activity.

If such a survey is combined with a reliable screening mechanism for determining the financial needs of prospective students, an analytics unit of a central tertiary student assistance agency could easily optimize the targeting and allocation of available aid. Chapter three provides a more detailed recommendation on the creation of a central aid agency with such a mandate. If in place, such an agency would be able to combine loans and grants in ways that maximize enrolment and graduation rates with minimal costs, while simultaneously contributing to other policy goals.

b. *Targeting of Loans*

The above conclusions regarding additional graduates attributable to CAE are affected by the accuracy of targeting of the CAE. To the extent that the program's beneficiaries are from the lowest quintiles, the probability that the loan is the determining factor in tertiary attendance increases. Enrolment rates and proportion of enrolment by quintile (both in TE generally and in the CAE) support the same conclusion: new TE enrolment is coming disproportionately from the lower quintiles, as Figure 5 shows. After the 2006 cohort CAE targeting has concentrated more on lower quintiles, as Figures 6 and 7 show.

Figure 5. Participation by quintile in TE 2003 and 2009
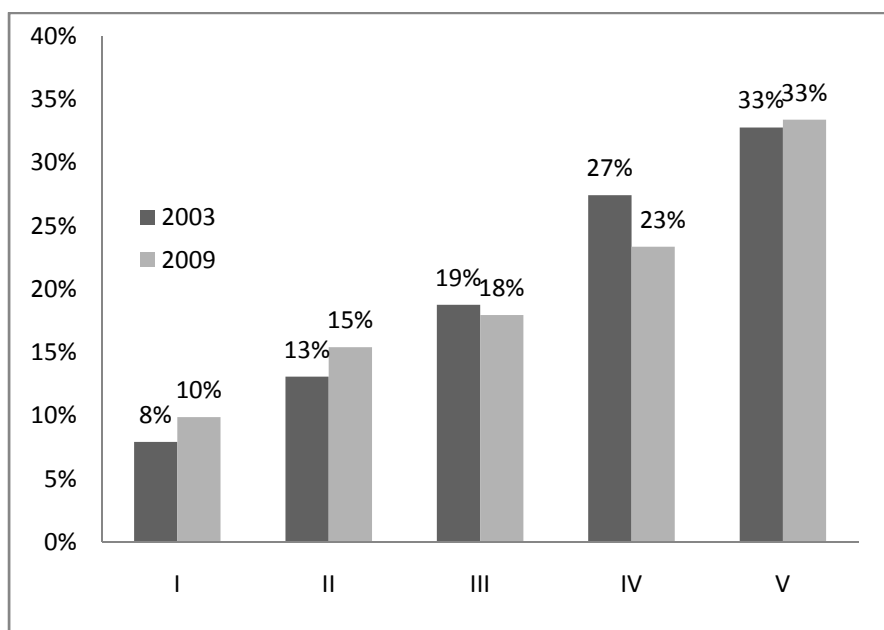
Source: Casen 2009

Figure 5 shows percentage enrolment share by quintile in 2003 before CAE was launched and in 2009 after three cohorts had enrolled. It is worth noting that only the lowest two quintiles made significant gains as a percentage of total enrolment.

Figure 6 shows that during its inaugural year, CAE did not target poor students sufficiently. The 21,000 loans made in 2006 were distributed roughly evenly between all five quintiles as, due to a procedural error, ineligible borrowers from the highest income quintile were allowed to borrow. In each subsequent year, CAE has increased the share of loans going to the neediest borrowers, as evidenced in Figure 7.

Figure 6. Proportion of new CAE beneficiaries by quintile
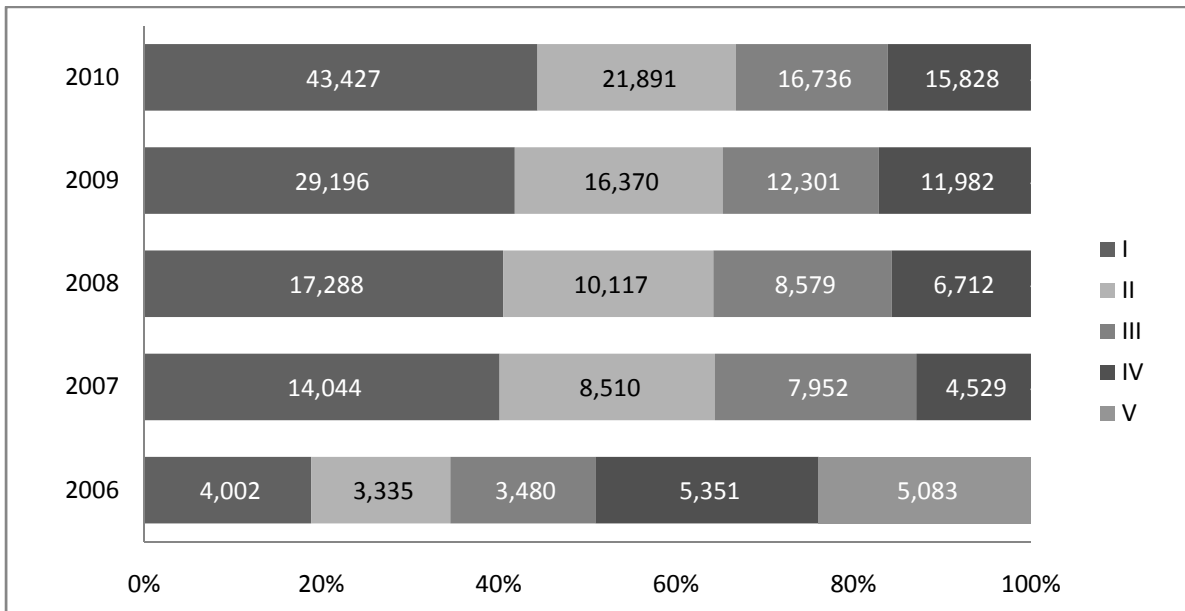
Source: Ingresa

Figure 7. CAE growth by quintile (new beneficiaries)
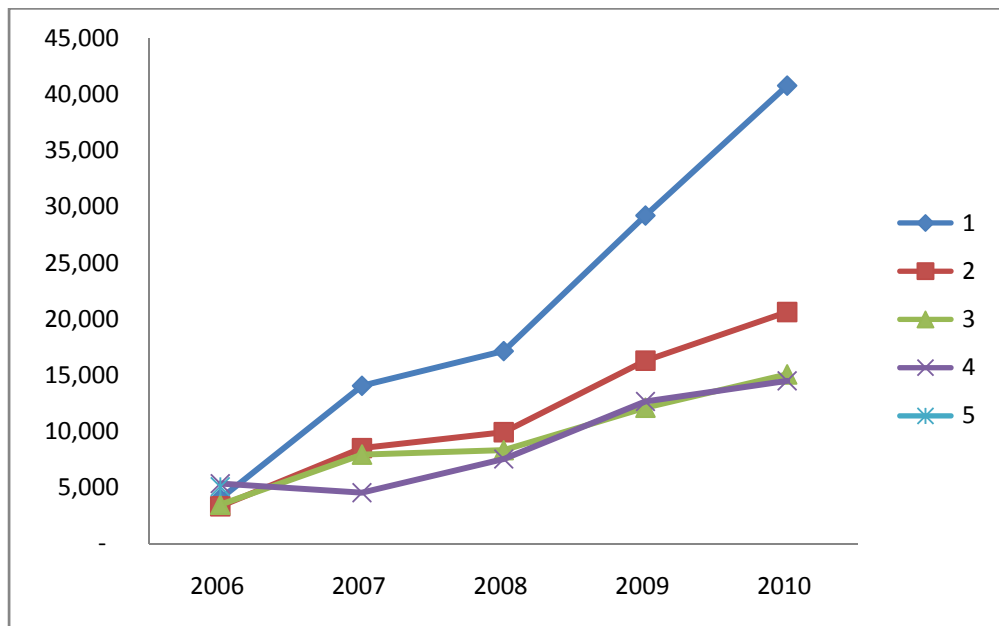
Source: Analysis of Ingresa databases

a. Enrolment Dynamics by TEI type and quintile

CAE beneficiaries are unevenly spread across TEI types. Private universities and IPs are the bulk of the enrolment at 73%, while Cruch and CFTs evenly split the difference. Table 9 shows the distribution of first-year CAE beneficiaries from cohorts 2006 – 2010 by TEI type and by quintile. Figure 8 illustrates this graphically.

Table 9. Sum of CAE first-year beneficiaries by TEI type and quintile

	Q1	Q2	Q3	Q4	Q5	Total	%
Cruch	6,358	5,180	6,205	13,709	2,535	**33,987**	13%
Privad	38,108	25,114	22,731	20,560	2,202	**108,715**	42%
IP	39,257	20,020	13,357	8,047	305	**80,986**	31%
CFT	21,254	8,267	4,536	2,178	45	**36,280**	14%
Bachil	37	44	59	75	-	215	0%
Total	105,014	58,625	46,888	44,569	5,087	260,183	100%
%	40%	23%	18%	17%	2%	100%	

Source: Analysis of Ingresa databases

As evidenced in Table 9 and Figure 8, quintile one CAE beneficiaries are enrolled evenly in IPs and CFT. CAE beneficiaries in quintiles 2, 3 and 4 largely enrol in IPs, while the sliver of quintile 5 CAE beneficiaries is split between Cruch and private universities.

Figure 8. Sum of CAE first-year beneficiaries by TEI type and quintile
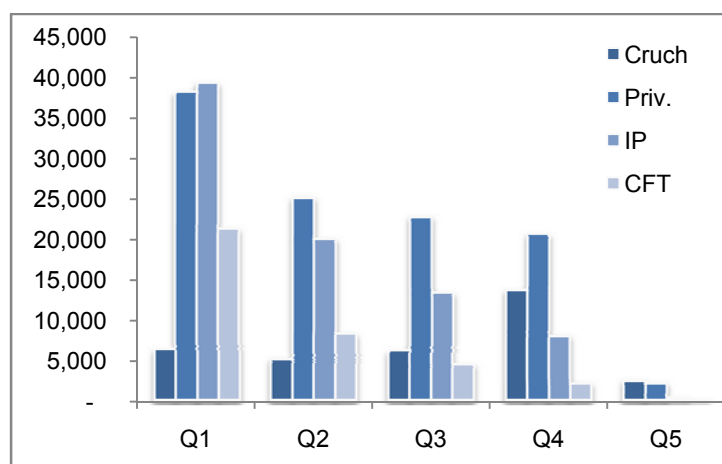
Source: Analysis of Ingresa databases

As the CAE program has grown, its borrowers have impacted TEI types disproportionately. The four graphs in Figure 8 show CAE versus non-CAE 1st enrolment in each TEI type, between 2004 and 2010. While Cruch universities have not been particularly affected, private universities

now have 42% of their enrolment coming from CAE beneficiaries. Non-CAE enrolment in private universities has declined, suggesting that a growing portion of CAE beneficiaries are "facilitated" students who would have enrolled regardless, albeit with much greater difficulty.

Figure 9. CAE versus non-CAE 1st enrolment by TEI type
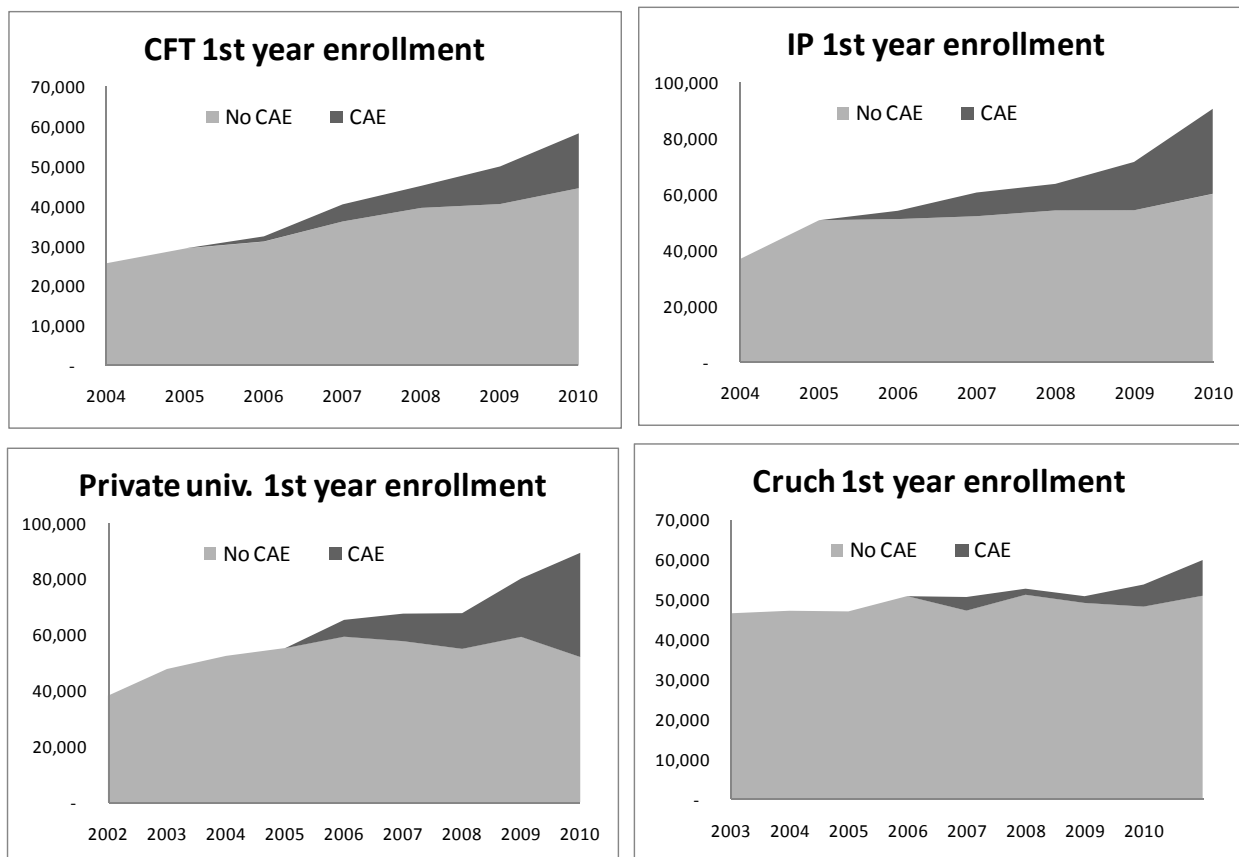
Source: Ingresa and SIES

b. *Academic performance and dropout of CAE students*

Interviews with TEIs do not present a conclusive picture regarding the academic performance of CAE beneficiaries vis-à-vis their non-CAE counterparts. In Cruch universities CAE beneficiaries were perceived to perform on par with the average and in private universities slightly above average (up to 3% higher). More careful tracking of students must be done to determine this with certainty.

International examples suggest student loan recipients do perform better academically, although the results cannot be interpreted as a purely causal impact since it likely reflects (self-) selection of students.

- In Mexico's SOFES program, researchers found that the impact of credit on student performance was mildly positive. SOFES-recipients had a 0.175 point higher GPA than students without a SOFES loan. This effect was statistically significant at the 1%-level, which meant a 2% improvement in academic performance.[4]

In Colombia's Icetex program, beneficiaries in their first semester passed 9-15% more subjects than did non-beneficiaries, depending on TEI type. This difference decreased over time.[5]

In terms of PSU scores, CAE beneficiaries in IPs and CFTs have slightly higher PSU scores than their non-CAE counterparts. In universities, the case is not clear cut. Table 10 illustrates this difference.

Table 10. 2010 PSU scores for first year students

Enrolled as first years students in 2010	CFT		IP		Univ.		Total
	Non-CAE	CAE	Non-CAE	CAE	Non-CAE	CAE	
Average PSU 2009	437.2		451.8		570.0		531.9
X < 450	57%	49%	48%	38%	7%	0%	30,948
450 <= X < 500	25%	30%	27%	31%	12%	17%	25,030
500 <= X < 550	13%	15%	17%	21%	23%	37%	30,804
550 <= X < 600	4%	5%	7%	8%	23%	26%	27,169
600 <= X < 650	1%	1%	1%	2%	18%	13%	19,945
650 <= X < 700	0.1%	0.1%	0.2%	0.2%	10%	5%	10,626
700 <= X < 750					5%	2%	4,962
750 <= X < 800					2%	0.5%	1,789
800 <= X					0.3%	0.1%	320
# of enrolled first years w/ a PSU score	17,968		28,635		104,990		151,593
# of CAE first year beneficiaries w/ a PSU score	8,417		15,500		28,705		52,622
% of first years with a PSU score	28.5%		30.1%		68.5%		48.7%
No PSU information	45,120		66,560		48,283		159,963

Note: excludes Universidad Mayor, Universidad Gabriela Mistral and CFT Infomed.
Source: Ingresa and Ministry of Education

The major difference between CAE beneficiaries and their non-CAE counterparts can be seen in potential dropout rates: the latter are 3 to 4 times lower for CAE borrowers. Table 11 compares 2008 first-year students who did not re-enroll with CAE beneficiaries who did not renew their loan. These are potential dropout rates rather than actual ones because better data for non-CAE students is not available.

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[4] Canton, Erik, and Andreas Blom, "Can student loans improve accessibility to higher education and student performance? An impact study of the case of SOFES, Mexico", World Bank Policy Research Working Paper 3425, October 2004, p.21-23
[5] See Annex 15 for additional information and graphs of student performance in Colombia.
Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior – ICETEX, "Programa Colombiano de Crédito Educativo: Impactos y Factores de Éxito", December 2010, Bogota, p.53.

Table 11. Comparison of potential drop-outs rates between CAE and overall students

2008 First-Year CAE Students	Non-CAE beneficiaries who did not re-enroll (A)	CAE beneficiaries who did not renew CAE (B)	Difference (A/B)	Difference (A-B)
Universidad	28%	9%	3.2	19%
IP	42%	12%	3.5	30%
CFT	40%	10%	4.1	30%

Source: Analysis of Ingresa data (CAE) and MINEDUC Figures (Non-CAE)

Importantly, as suggested by Figure 10, the percentage of CAE beneficiaries who did not renew their CAE loan was even smaller in 2009.

Figure 10. CAE first years who did not renew CAE
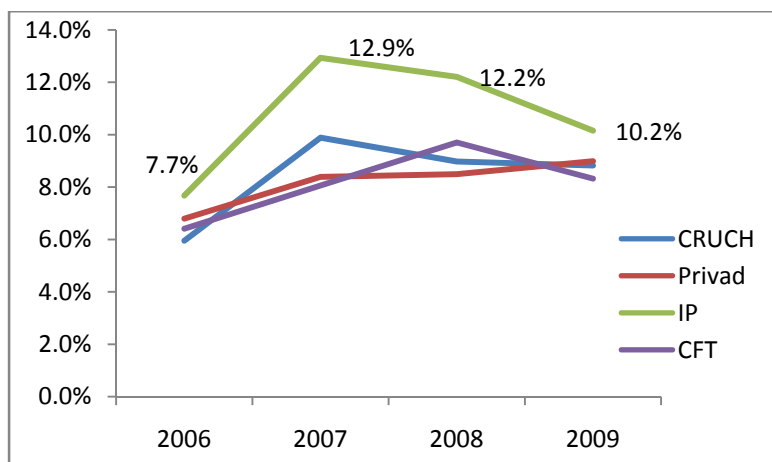
Source: Analysis of Ingresa data

Among those first-year CAE beneficiaries who do not renew their loan the following year, approximately half drop out altogether and the other half switch TEI or degree. This varies substantially by year and TEI type. Since the cohorts in 2006-2008 were relatively small compared to the more recent cohorts, the sample size is small and can easily vary.

Table 12. Percent of first-year CAE beneficiaries who do not renew their loan and eventually drop out

	2006	2007	2008
CRUCH	15%	21%	35%
Private Universities	60%	60%	51%
IP	70%	60%	56%
CFT	73%	74%	69%

Source: Analysis of Ingresa data

The difference in potential drop-out rates between CAE and non-CAE students are comparable to those seen in Colombia's student loan program (Icetex's ACCES). Beneficiaries there have a dropout risk that is 14-28% less than non-beneficiaries, depending on the semester in which they are enrolled.[6]

Greater granularity with regards to the performance of student loan beneficiaries versus non-beneficiaries both in Mexico and Colombia can be found in Annex 9.

c. *Direct equity effect of CAE*

Some have suggested CAE may be regarded as a direct equity tool for students from needier quintiles, where the resources received from CAE serve to complement income (similar to a cash transfer payment). We believe this view is incorrect for two reasons: first, CAE beneficiaries never see the money they are lent because banks transfer it directly to TEIs for tuition. Second, CAE is a loan that students must pay back in full with more than 5% real interest when they enter repayment. If low repayments rates are allowed in the CAE system and the loan becomes more like a grant, an argument can be made with regards to CAE as a direct equity tool.

For the purpose of comparison, Table 13 shows the quintile cut-off point and the average annual CAE loan per student by income quintile.

Table 13. Average annual CAE loan per student by income quintile, compared to quintile cut-off point[7]

Quintile	1	2	3	4
Average annual income for quintile cut-off	687,936	1,165,020	1,819,524	2,630,273
Average CAE 2010 Loan	1,251,037	1,315,791	1,390,098	1,456,946

Source: Ingresa and Ministry of Education

ii. Student financial aid in Chile

The Government of Chile provides other assistance to tertiary education students through one other major loan program and 12 scholarship programs. Students apply to these sources of financial aid, including CAE, through the FUAS. From 2006-2010, about 1,000,000 individuals (representing mostly aspiring new tertiary students but also some returning students) applied. Of those who sought aid, roughly one-third were offered a CAE loan, and about 260,000 became borrowers. Among those who did not borrow, there will be some who did not meet

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[6] Caballero, Alejandro, World Bank Task-Team Leader for Acces project, e-mail on February 2, 2010, Washington, DC.

[7] Note that CAE loan balances for 2010 are for new loans, not renewals, due to quality limitations in the quintile dataset.

CAE requirements, others who were awarded alternative sources of financing and others who chose not to enrol for a variety of reasons. Table 14 further illustrates this.

Table 14. FUAS applications and CAE awards

| Years 2006 - 2010 | Socioeconomic quintiles | | | | | |
	1	2	3	4	5	Total
student aid applicants	396,859	197,976	153,291	141,098	104,661	993,885
# offered CAE	142,881	79,284	63,933	58,575	6,440	351,113
% offered CAE	*36%*	*40%*	*42%*	*42%*	*6%*	*35%*
# who took CAE	105,185	58,715	46,945	44,621	5,083	260,549
% who took CAE	*74%*	*74%*	*73%*	*76%*	*79%*	*74%*
# who didn't take CAE	37,696	20,569	16,988	13,954	1,357	90,564
% who didn't take CAE	*26%*	*26%*	*27%*	*24%*	*21%*	*26%*

Source: Analysis of Ingresa and FUAS data

Including the CAE, student aid for tertiary education was approximately 504,000 million CLP in 2009 (See table in Annex 7). Approximately 462,000 aid awards where made: some students received multiple awards. A reasonable calculation of aid-per-student would be roughly 1,000,000 CLP, or close to $2000 US, but again this figure is not adjusted for multiple awards to the same student. These figures are the nominal outlays for aid: they are not adjusted to include the value of any future repayments of loans.

Chile is to be commended for the significant progress in provision of student aid for tertiary education. The investment represents a major increase in public finance for tertiary education. The financial aid programs appear to be a major driver of continued expansion and improved equity in Chile's tertiary education system, and they are likely to provide significant benefit to the country through improvements to its stock of human capital. The combination of loans and grants awarded according to need, merit, and special purposes also deserves general praise.

This section will touch only briefly on the main issues in overall tertiary student assistance, especially as they bear on the CAE program. A detailed analysis of overall student financial assistance for tertiary education is of course needed to more fully understand the situation.

> *a.   CAE fit with other forms of student financial aid*

Chile's two student loan programs, CAE and *Fondo Solidario de Crédito Universitario* (FSCU), account for more than two thirds of the nominal financial outlays of resources and two thirds of the awards made. The CAE program is by far the larger of the two loan programs, and is the largest aid program overall, both in terms of number of beneficiaries and amount of resources provided. The smaller loan program, the FSCU, serves about 40% as many students as the CAE but uses only 25% of the resources; the average FSCU loan is only two-thirds as large as the average CAE loan. Again, these figures are not adjusted for the value of any repayments. It was not possible to investigate and compare default rates of the FSCU with those of CAE, but such an analysis could stand to significantly change the net present value of the programs. The FSCU provides more generous lending terms to students and unconfirmed "stylized facts"

about student repayment behavior suggest high default rates.[8]   Hence an NPV calculation would likely raise the relative costs of the FSCU compared to CAE.

The FSCU existed before the CAE program.   It is available only to students at CRUCH universities. Apart from historical considerations and inertia, no sound reason can be found for its continued existence.   A single Government loan program would very likely meet all the Government's policy goals at a lower cost.   Administrative savings from the elimination of unnecessary duplication would be significant.   The elimination of a two-tiered system would also have positive overall effects, albeit intangible: chief among these would be the value of equal treatment for all tertiary students by the Government. We recommend that Chile adopt the recommendation from the OECD/WB report, "Reviews of National Policies for Education: Tertiary Education in Chile."   That report recommended that the CAE and FSCU programs be merged and students at all accredited tertiary institutions be eligible for loans under a single set of conditions.

A similar situation exists with grants. The *Becas Bicentanario* and the *Becas Nuevo Milenio* programs seem unjustifiably duplicative.   While different grant levels may be justified according to program cost or even institution type, it is not clear why two separate programs are needed. Aside from the question of limiting access to a subgroup of institutions (i.e., the CRUCH), the important questions regarding the grant programs are the extent to which they cover the range of needs and purposes. Providing different grant awards based on NEM versus PSU score may create a nicely diversified portfolio of aid options or may simply duplicate effort.   It is legitimate to have the special purpose grants available for particular subgroups, such as indigenous students or victims of human rights violations.   Further information, investigation, and analysis are needed to make informed judgments on the overall effectiveness of the aid portfolio. Likewise, the balance of grants and loans should be considered with a view toward overall student need and available resources for assistance. A diversity of grant vehicles is not in itself either good or bad aid policy. Annex 8 regarding loan targeting further expands on this.

Data on institutionally-provided aid (TEIs and other institutions) is not readily available.   The Report Team heard two different approaches regarding adjustments to its allocation after the establishment of the CAE program.   One group of institutions appears to be largely maintaining institutional aid but channeling it to expenses (living expenses, books, transportation, etc.) which CAE loans do not cover.   This is a generally positive development and may be partially responsible for the lower dropout rates seen among CAE borrowers.   A second group seems to be withdrawing institutionally-provided aid and simply substituting the Government-subsidized funds from the CAE.   Such substitution constitutes a net loss of assistance to needy students.

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[8] Terms of the *Fondo Solidario de Crédito Universitario* include: subsidised annual interest rate of 2% (after accounting for inflation) and a two-year grace period after graduation. Repayments are capped at 5% of 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.

b. Targeting instrument for student aid

Creating an optimal policy for student aid is only possible when real student financial need has been accurately gauged.   Perhaps the principal obstacle to improving aid policy in Chile is the continued lack of a fully adequate aid screening mechanism.   The FUAS has many virtues and its administrators appear to have worked diligently to maintain and improve its value. Nonetheless, several notable deficiencies remain.

Applicants seem able to "game" the FUAS by misstating the number of household members. It appears difficult in practice to establish a single, verifiable, and accurate means of having the need of all FUAS applicants judged in a comparable manner.   Families that have several students in tertiary education appear not to be awarded a higher "need" score than families with only a single student.

An important disconnect in the coordination of existing aid is the timing of award of the *Becas del Nuevo Milenio* (BNM).   The BNM grants come after the loans of CAE recipients have already been disbursed. Once BNM grants are awarded, the CAE loans are cancelled and the money returned to the banks who originated the loans. However, these cancelled loans are included in the calculation of loans on which the Government pays mark up.   The Government ends up paying a mark up on portions of loans that are never made, leading to a pure waste of resources.   The Report Team's calculations suggest such incidents are not isolated. It is very likely that tens of thousands such payments have been made, with annual unnecessary payments running now between twenty to thirty thousand loans. This specific instance of waste needs to be eliminated immediately through coordination of BNM and CAE awards.

More generally, the Government of Chile should consider creating a single agency for tertiary education financial assistance and scholarships. Such an agency could better address and coordinate Chile's student aid policy. This recommendation is fully developed in Chapter 3. The Team's suggestion regarding who aid should target is addressed in Annex 8.

iii. Financial considerations for students

a. Proportion of direct costs covered by CAE loan

CAE loans typical cover around 65% of the direct costs students bear to attend tertiary education. These costs include yearly tuition and program enrolment fee. Lodging and expenses are not included because they would have to be paid regardless, whether a student was in tertiary education or not. Table 15 illustrates this.

Table 15. Proportion of annual direct costs covered by 2008 CAE loans[9]

	Tuition	Enrolment fee	Total
Direct cost in UF	90.1	7.1	97.2
% of total	*93%*	*7%*	

	Loan given	Annualized values		Stamp tax	Total
		Interest	**Commission**		
CAE loan in UF	59.25	3.22	0.49	0.04	63.0
% of tuition	*66%*				*70%*
% of total direct costs					*65%*

Source: World Bank Team analysis with data from Ingresa

CAE loans can only cover up to 100% of the tuition reference rate, which is typically below the actual cost of tuition. Students may complement or substitute up to 100% of the Tuition Reference Rate with other Government-sponsored financial aid. For the remaining amount, students must find other resources. This means that although CAE certainly helps students from low income backgrounds attend tertiary education, the latter must still make significant financial sacrifices to attend.

b. Can CAE borrowers afford to pay?

Calculations suggest that few graduates employed at greater than minimum wage will have trouble paying their loan. After their monthly debt payment, 97% of employed CAE beneficiaries will have a residual income greater than 1.5 times minimum wage. If tertiary education graduates can adequately live off that amount, default will not be driven by debt burden.

CAE debts are nevertheless high by international standards. As Table 16 shows, CAE beneficiaries' ratio of total debt to annual income stands at an average of 180%, while that of other countries is less than half of that. CAE's monthly debt payments are also high as a percent of monthly income: 15% for 20 year loan repayment terms and 18% for 15 year repayment terms. Meanwhile, Netherlands stands at 2.6% and the US stands at 6.7%. Typical international best practice sets the threshold for reasonable levels of debt payments at 10% of graduate income.[10]

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[9] Tuition is calculated as the average tuition charged to 2008 CAE loan holders. Enrolment fee is assumed to be yearly, and is calculated as 7.9% of tuition. This was the 2010 average among 11,617 programs across Chile. The CAE loan was the average loan received by new beneficiaries in 2008. The interest was assumed to be 5.44%, an average of BCU-10 and BCU-20, plus a 225 basis point spread. The interest is not compounded monthly in this calculation. The monthly commission was assumed to be 0.04 UF per month, with no interest. The stamp tax (*Impuesto de Timbres y Estampillas*) was assumed to be 0.6% of the total loan amount.

[10] Maureen Woodhall, "Designing a Student Loan Programme for a Developing Country: the Relevance of International Experience" *Economics of Education Review* 1998: 158

Table 16. Comparison of Debt Levels at an Aggregate Level

	Debt to Annual Income Ratio	Avg. Debt Service Ratio (monthly payment / monthly income)
Germany	14%	3.10%
Netherlands	31%	2.60%
New Zealand	36%	6.40%
Australia	39%	4.00%
United Kingdom	40%	2.90%
Canada	50%	6.60%
United States	57%	3.6 - 6.7%
Sweden	79%	3.80%
Colombia	94%	
Chile (weighted average)	174%[11]	
15 yr repayment		18.00%
20 yr repayment		15.00%

<u>Source</u>: Colombia, information from Icetex, 2010. Chile, Futuro Laboral, 2009-2010; others from Alex Usher, "Global Debt Patterns", *Canadian Higher Education Report Series.* (Sept. 2005): 14

For Ingresa to give CAE beneficiaries a 12 month respite on their monthly repayments, they must be unemployed or their debt service ratio must reach 50%. While we currently do not see CAE beneficiaries reaching that 50% threshold, we believe some will struggle before that. Figure 11 plots graduates debt service ratio over the income left over after that debt payment is made (referred to as "residual income").

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[11] The previous draft of this report had an estimated 57% as the CAE program's debt to annual income ratio. The figures we were given that allowed us to arrive at this calculation had three major flaws: because they were debt burdens of actual CAE graduates (and few have graduated to date), they were biased towards short programs. Second, 80% of the sample was for technician degrees. Third, the debt burdens just represented the principal accrued, and not the interest and capitalized interest. This would underestimate the average accrued loan balance by 10-20%.

Figure 11. Debt service ratio against residual income[12]
(assuming 20 year repayment periods)
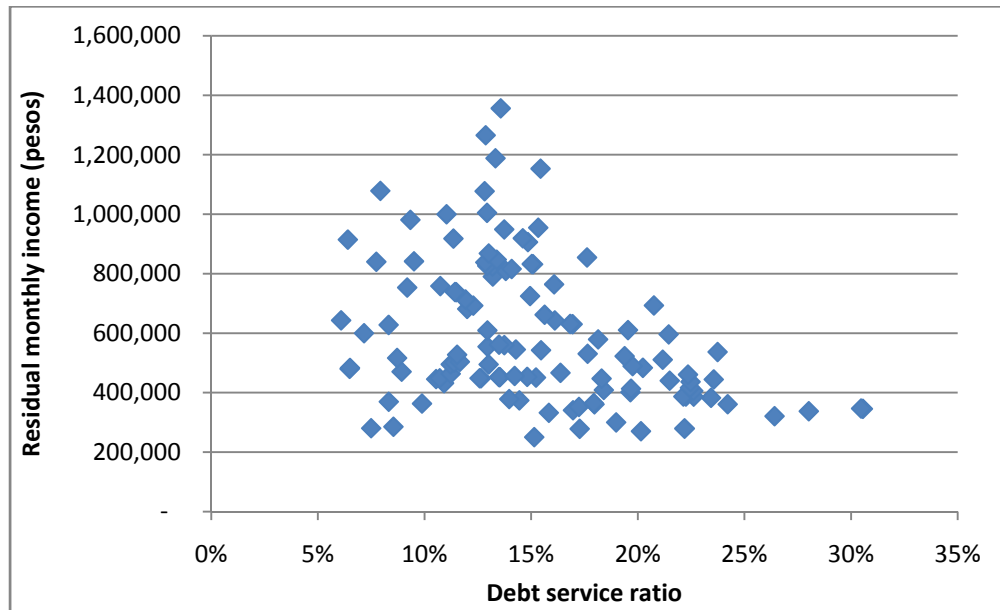
We do not see beneficiaries with less than a minimum wage (180,000 pesos) left over after their debt payment. This is comforting. Nevertheless, twenty percent of CAE beneficiaries will earn less than 286,000 pesos a month (1.7 times minimum wage) after paying their debt. As the program stands now, they have no recourse with which to renegotiate and rationalize their debt burden.

These numbers do not take into account CAE degree and/or TEI switchers: those students who borrow for one degree, switched, and then borrow for another. Since those students will have two loans, each accruing separately until repayment, their debt burden will be significantly higher.

These numbers also do not take into account unemployment. Two years after graduation, the weighted probability of employment for CAE tertiary education graduates is 85%. Because that 15% of unemployed graduates receives a 12 month respite from loan payments, we estimate that only half of them default when their payments restart a year later.

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[12] The available information permits a calculation of student debt levels measured against expected income prospects two years after graduation (approximately 6 months into the repayment period). We assume CAE beneficiaries take out a loan every year for the duration of their degree (actual duration, not supposed duration), and that the amount of the loan is equivalent to the average amount taken out by other CAE beneficiaries in the specific TEI and degree program. This average is lower than the tuition reference rate that can actually be borrowed every year.

When the percentage of graduates who will default due to an onerous debt burden (2.7% with a residual income less than 1.5 minimum) is combined with the default expected due to unemployment (half of the unemployed), the result is just over 10%. We believe this 10% is the minimum "natural" default in the CAE program.

Ultimately, beneficiaries' ability to pay off their debt will largely depend on the quality of the education they receive, as the latter will be closely tied to their labor market outcomes. In this regard, Ingresa should carefully monitor labor market outcomes to ensure CAE-financed degrees are not unduly burdensome.

Source of data and assumption used for calculations

Futuro laboral provides reasonably current and reliable data on expected future earnings for graduates of most degree programs. For graduates earning above a minimum wage, it reports on the likelihood of being employed in the first and second year after graduation, and the average gross salary in the first and 4th year after graduation. Additional information is available on salary distribution by category. No direct data is available for CAE borrowers who have entered repayment.

Annex 10 details the monthly debt payments CAE beneficiaries must make as a percentage of their gross salaries, by TEI and degree program. It is important to note that the *Futuro Laboral* sample set used in these calculations is limited to 30 degree programs across 16 TEIs (thus 117 unique degree-TEI programs). In 2010, there were 38,675 CAE beneficiaries in these programs, representing just under 18% of the total pool.

Making this data public would be very useful for prospective students, as it is clear that labor market outcomes for some degree programs do not adequately compensate for the length and expense of their degree. Examples of degrees with particularly large debt burdens and high debt service ratios include veterinary medicine, agronomy, psychology, architecture, journalism, and school teachers, particularly in Cruch and private universities. Students in these universities take a long time to graduate, and since their balance starts accruing interest as of the first semester, by the time they graduate their debt has grown significantly.

c.   Default of CAE beneficiaries

There are two types of default from CAE beneficiaries. The first is default that happens prior to graduation when a student beneficiary drops out, does not reenrol in another TEI or degree, and fails to pay back their loan accrued to date. Among these drop outs, default is at 45% as of the end of 2010.

The second type of default is that which happens after graduation when a beneficiary finishes their grace period and formally enters repayment. As of October 2010, there were 2,100 CAE

beneficiaries from the 2006 and 2007 cohorts in this pool. Among these, the average default is well over 30%, spread relatively evenly across quintile and TEI types.

These 2100 students are not representative of the larger pool of CAE beneficiaries still studying. They are the ones who graduated quickly, which means they were in short programs or started their CAE loan when they were half-way through their degree. Subsequently, their loan balances were quite small because they had little time to accrue interest. In addition, whereas the 2006 cohort was evenly spread across quintiles, later cohorts were concentrated on lower quintiles. Finally, because these beneficiaries were not required to update their contact information while studying, they are hard to find and are likely to have missed most CAE-related mailings.

Figure 12 shows default from the 2006 and 2007 cohorts by the number of months from the start of their repayment. Worryingly, while the 2006 cohort is at an average of 31% default in their 27th month of repayment, the 2007 cohort is at an average of 37% default as early as their 18th month.

Figure 12. CAE 2006 and 2007 beneficiaries who have graduated, entered repayment and defaulted, by TEI type
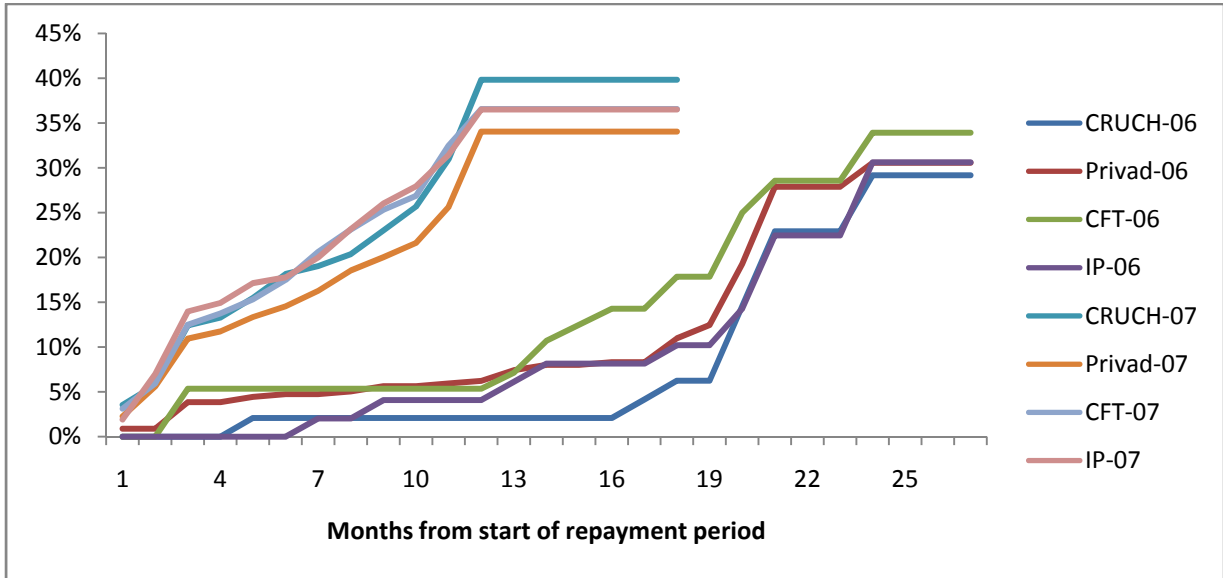
Source: World Bank Team analysis with data from Ingresa

When default is seen by quintile, no overarching conclusion emerges: Q1, Q2 and Q3 have higher default than average, while Q4 and Q5 have a lower default than average. Figure 12 illustrates these differences. By showing how many loans have been given to each quintile, and what the repayment behaviour of that quintile is to date, the importance of the relative default levels across quintiles becomes clear: 98% of loans are in the hands of Q1 through Q4 students, and among them, default behaviour hovers around the average.

Figure 13. Repayment behaviour and loans awarded, by quintile
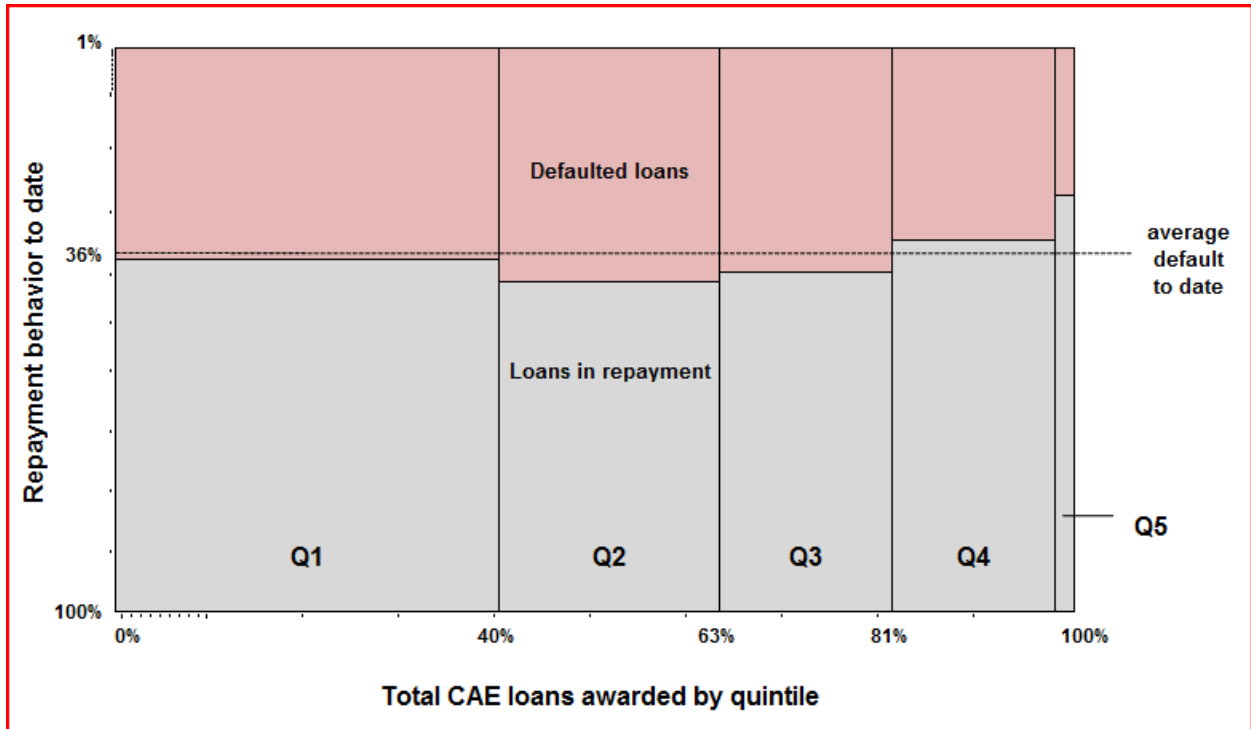
We believe the quality of the data gathered and the timing of its gathering may be affecting the current shape and magnitude of the default numbers. We also believe default is currently driven by lack of information, rather than by size of debt burden or by students' deliberate decision not to pay.

A non-representative, limited number of interviews with CAE borrowers still in school suggested limited financial literacy. Knowledge regarding interest rate, repayment period, and overall cost of debt relative to expected post-graduation earnings was lacking. Moreover, students interviewed had not received loan information from the financial entities that had originated their loans, did not know the approximate size of their balance, and had not been informed about their expected loan repayment behaviour post-graduation. This is expected to change as Ingresa rolls out a massive marketing and information campaign aimed at beneficiaries who renew their CAE loan.

In the next year many more CAE beneficiaries will have entered repayment. With an increasingly large data set, and better reporting requirements and systems in place for financial entities, more forward-looking conclusions will be possible. If misinformation is in fact the

primary driver of default, Ingresa would be well-served to increase contact with those CAE beneficiaries on the verge of repayment and make sure they are aware their first loan payment is due.

C. Impact on Tertiary Education Institutions

i. Dropout and remediation

Policymakers have been perennially concerned about high dropout rates for tertiary education. Before the existence of the CAE program, TEIs had no clear financial incentive to help students graduate. Many institutions were reported to enroll large first-year cohorts for purely financial reasons and were indifferent to whether those students dropped out or completed their studies. The CAE program appears to be changing this.

CAE was designed to give TEI's an incentive to admit only students who were capable of graduating, to monitor their progress and help them complete their degrees. This seems to be happening. Dropout rates among CAE borrowers appear to be 3 to 4 times lower than general dropout rates, and universities seem to have been most successful in reducing or achieving low dropout by CAE borrowers.

Some TEI's have introduced more stringent criteria for CAE students. Private universities have done this for both first-years seeking admission and students already pursuing a degree. Cruch has done this primarily for the former group while IPs have done it primarily for the latter. Greater selectivity increases the chances that admitted students will finish their degrees, but it also means that poorer students have to pass a higher bar for entry than their wealthier peers. Also, highly-qualified students are rarer in the lower quintiles. The practice of "matching" student ability to program requirements is laudable, but Ingresa should follow carefully the extent to which this creates a dual admissions system. Finally, enrollment increases in lower quintiles under CAE are even more impressive considering they have been achieved under at least partially tightened admission standards.

CAE also seems to be promoting remediation. The MECESUP program has helped initiate a trend in Chile whereby TEI's more systematically measure the capabilities of incoming students to succeed, and offer appropriate remedial help. The CAE program appears to be reinforcing and accelerating this general trend. The size of the impact is unknown because TEI's still do not have full information on CAE borrower versus non-CAE borrower behavior and attributes. As this data becomes available, Ingresa should seek to quantify the extent to which CAE students are availing themselves of remediation opportunities and the effect this has had on their degree completion rates and times.

Real decreases in dropout rates may be lower than the figures quoted here for three reasons. First, the system for reporting drop out is inefficient. TEIs report their enrollment to Ingresa on a yearly basis. The CAE program then stipulates that a student who has dropped out has 12 months to switch to another TEI or degree before they are considered an actual dropout with an

impending repayment schedule. This means it takes 15-23 months for students to be identified as actual dropouts and reported to their financial entities as such.

Second, TEI's have no incentive to report dropouts earlier. Since they must return the tuition of students who drop out, keeping students on their enrollment lists longer minimizes the amount returned. This loophole should be closed.

Third, it is theoretically possible—although not likely—that TEI's are lowering their academic standards to facilitate degree completion by borrowers. No evidence can be found that this is taking place. Indeed, since institutional tracking systems are often unable to distinguish between CAE-borrowers and other students, the only way to achieve greater pass rates would be to lower academic standards generally; there is no evidence that this is occurring. Nonetheless, it is worthwhile for TEIs and Ingresa to collect data on CAE versus non-CAE student academic progress. This data will be interesting for many reasons, and its collection should discourage differential treatment of students if Ingresa is vigilant.

ii.   Quality in tertiary education and accreditation

CAE loans are available only to students at accredited institutions. This requirement seeks to ensure that lending is used for quality education. In theory it should encourage institutions to seek and maintain institutional accreditation. In practice, the numbers of IPs and CFTs accredited annually has increased by factors of 2.4 and 3 respectively since 2005, while university accreditation is 1.8 times its 2005 level (see Table 17). One cannot attribute these increases exclusively to CAE's influence; accreditation in Chile owes its consolidation to numerous parallel trends. However, it is safe to conclude that CAE helps to promote institutional accreditation and that without the CAE program fewer institutions would seek or gain institutional accreditation.

Table 17. TEIs accredited by Dic.31 every year

Year	Univ.	IP	CFT	Armed Forces	Total accredited TEIs
2004	14	2	0	0	16
2005	30	7	4	0	41
2006	38	10	6	1	55
2007	45	11	8	1	65
2008	47	12	7	3	69
2009	46	14	8	3	71
2010	53	17	12	5	87

Source: National Accreditation Council (CNA)

Whether accreditation is leading to quality improvements in TEIs with numerous CAE borrowers is a more complex question. Seeking accreditation is now practically a standard practice for TEIs in Chile. Nonetheless, the CAE program's incentives cannot influence accreditation practices. Recent policy analysis has called for a redoubling of efforts to ensure the

effectiveness of Chile's accreditation system in improving education quality in TEIs (see World Bank and OECD, <u>Reviews of National Tertiary Education Policies: Tertiary Education in Chile, 2008</u>.)   Concerns persist that current accreditation practice is not sufficiently tailored to the needs and mandates of different tertiary institutions, and that it does not result in changes in classroom and pedagogical practices that most closely determine learning outcomes and relevance. The ultimate effectiveness of investments made under the CAE program will be influenced by the ability of the accreditation system to meet these principal challenges. As such, it behooves the Government of Chile to actively promote continuous improvement of the accreditation system, to ensure the highest possible return on its investment in tertiary education.

iii.   Student aid reallocation

Allocation practices for previously-existing student assistance seem to have been affected in two ways by the appearance of the CAE.   CRUCH universities have access to attractive concessionary aid programs for their neediest students (from quintiles 1, 2, and 3) and for the needier deciles of their Q4 students. The remainder of their Q4 students receive CAE loans, as evidenced in Table 18.   This could be a net positive trend; the neediest CRUCH students getting the most concessionary aid.   Ingresa should measure and monitor the actual needs of Q4 students, using the improved aid screening tool discussed in this report.

Table 18. Sum of CAE first-year beneficiaries by TEI and quintile (2006-2010)
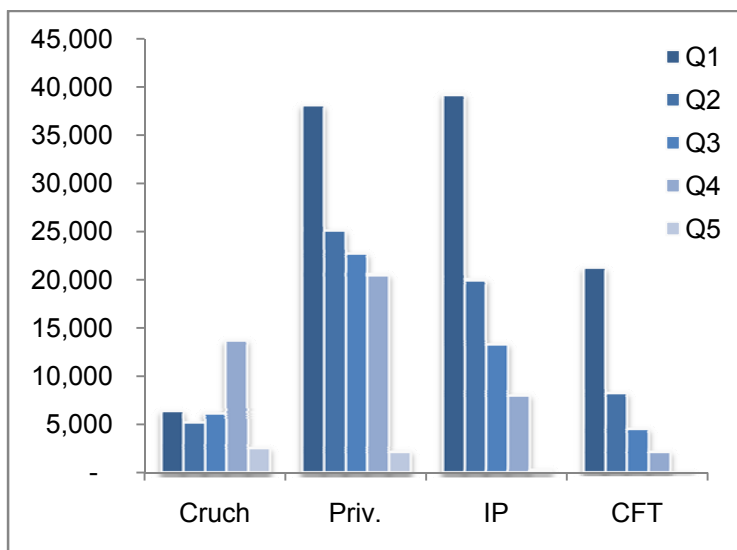
Source: Analysis of Ingresa databases

Also, interviews revealed both redirecting of institutionally-provided aid to student expenses that the CAE does not cover (living costs, transportation costs, books, fees, and the difference between tuition and tuition reference rate) and outright substitution of CAE loans for such aid. The former is likely a positive development and may be partially responsible for lower dropout rates.   The latter is a perverse consequence of CAE which future policies should discourage.

CAE regulations should acknowledge institutionally-provided aid and incentivize its continuation. In cases of outright substitution, it is likely that institutionally-provided grants are disappearing, replaced by publicly-subsidized loans. This scenario ought to be avoided, as it shifts the costs of education to needy students and tax payers in cases where institutions could have provided socially beneficial discounts. Without a reliable screening tool for student financial need, it is not possible to determine whether these aid reallocations are a net positive or negative. CAE policy, however, should find ways to encourage and incentivize institutions to provide maximum grant aid without losing the benefits of the CAE program.

If a TEI consistently supplements CAE with high levels of aid, the CAE program could, for example, lower the guarantee that TEI must provide in case their CAE beneficiaries dropout and default. Ingresa ought to monitor the total amounts of aid provided from all sources, and find ways to preserve and increase the aggregate amounts while seeking to promote its most effective allocation and use.

iv. Tuition reference rate

Chile maintains a "tuition reference rate" ("*arancel de referencia*") to guard against TEIs using aid availability to unjustifiably increase tuition. CAE loans cover only tuition up to the level of the reference rate. Institutions charging higher tuition must supplement aid or convince students to pay by other means.

The tuition reference rate is an important feature of the CAE. Tuition rates in degree programs frequented by CAE borrowers do not appear to have been inflated. Meanwhile, interviews suggested some above average increases in programs with few or no CAE borrowers, perhaps because TEI's know the enrollees of these programs have greater means.

In general, however, the reference rate appears to be doing what it is designed to do. Ingresa should continue to monitor trends in tuition levels throughout the system to discourage unwarranted price inflation.

v. Concentration of students in TEIs

The need for tertiary education financing ought to be spread relatively evenly among TEIs. Instead, as Figure 14 shows, CAE borrowing is heavily concentrated among a small number of TEIs. Six TEI groups alone account for 62% of the portfolio. Among these are large schools with important national profiles such as DUOC, INACAP and Santo Tomas. These three institutions alone account for 40% of CAE borrowers. The evidence does not suggest that this concentration reflects the actual distribution of needy students. Rather, it is most likely due to certain "first mover" advantages among a small group of well-organized TEIs. These institutions seem to be the most efficient at attracting CAE beneficiaries and/or the most generous in opening spaces for them.

While we do not believe this concentration necessarily poses a risk to the system, we do believe it requires a subset of TEIs be closely monitored. Recommendations on this are discussed further in the report.

Figure 14. CAE beneficiaries by TEI
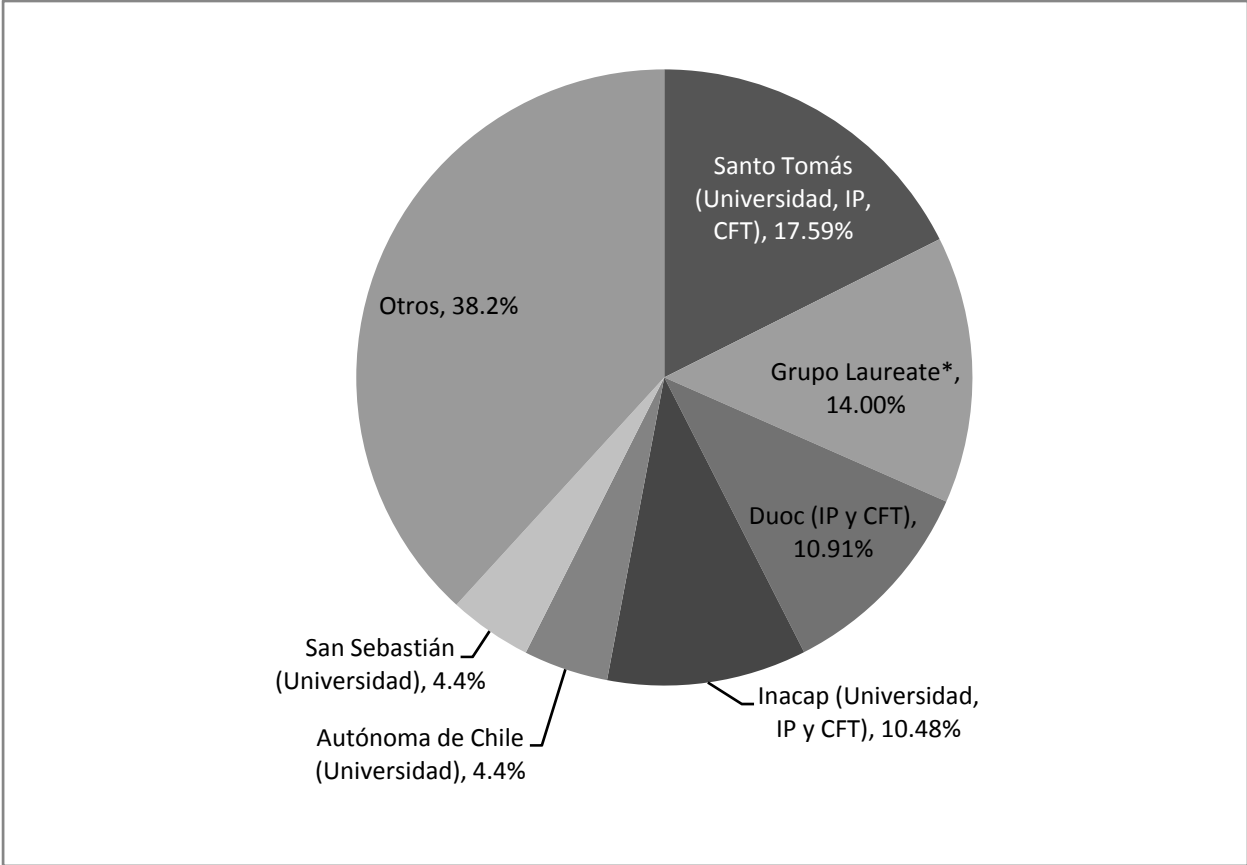
*The Laureate Group includes Andrés Bello University and CFT, Universidad de Las Américas, Universidad de Viña del Mar, and Instituto Profesional Aiep.
Source: Analysis of Ingresa databases

vi.   Increase in enrolment and revenue

Evidence suggests that the CAE program in its totality should be an unambiguous benefit for TEIs as well as for needy students.   With the exception of public (subset of CRUCH) universities, which must accept all CAE-eligible students who apply, TEIs are able to determine how many places they will offer to CAE-eligible students. Astute TEIs will expand access in programs where the marginal cost of expansion is less than the marginal revenue from CAE-borrowers. In the absence of CAE, students would be unable to enroll, and TEIs would have unused "excess capacity."   The results should be a significant increase in revenue for TEIs, and one that significantly exceeds additional marginal costs.

Not all TEIs benefit equally from the CAE program. Some private TEIs have enrollment growth of 20% year over year since CAE began. In these cases, CAE loans cover up to 50% of students and are among the top three sources of income. In some instances, this enrollment growth has been achieved while PSU score cut-off points have increased. This suggests this subset of institutions are creating more capacity and putting heretofore "excess capacity" to use. They are growing revenues while finding qualified, needy students to enroll.

Some TEIs are also encouraging current and future students who would have enrolled regardless—and financed their degree either by paying their way through or by receiving financial aid from their TEI—to use CAE instead. Table 19 details this substitution effect, showing how much of the change in enrollment from 2007 to 2010 in specific TEIs is due to CAE beneficiaries. Figure 15 then uses Universidad Santo Tomás as an example of student substitution.

Table 19. Change in number of students in specific TEIs, 2007-2010

Name of TEI	Change in number of students, 2007-2010			
	Total change	CAE beneficiaries	Non-CAE beneficiaries	% of incremental enrolment with CAE loans
Cft Inacap	15,984	9,392	6,592	59%
Univ. Nacional Andrés Bello	9,191	8,475	716	92%
CFT Santo Tomás	9,114	8,069	1,045	89%
Univ. San Sebastián	8,954	10,362	(1,408)	116%
Univ. Santo Tomás	8,256	10,330	(2,074)	125%
Univ. Autónoma De Chile	7,073	8,888	(1,815)	126%
Ip Duoc Uc	6,884	17,013	(10,129)	247%
Ip La Araucana	5,934	3,459	2,475	58%
Ip Inacap	5,813	6,606	(793)	114%
Ip De Chile	5,104	5,801	(697)	114%
Univ. Técnica Federico Santa María	4,283	580	3,703	14%
Pontificia Univ. Católica de Chile	4,105	1,408	2,697	34%
Univ.Católica de la Sant. Concepción	3,743	1,387	2,356	37%
Ip Dr. Virginio Gómez G.	3,539	3,718	(179)	105%
Univ. De Concepción	2,727	2,184	543	80%
Univ. Central De Chile	2,648	1,461	1,187	55%
Univ. Del Desarrollo	2,436	688	1,748	28%
Ip Providencia	2,225	3,031	(806)	136%
Univ. De Chile	2,120	2,148	(28)	101%
Unicit	2,018	1,486	532	74%
CFT Duoc Uc	1,945	1,764	181	91%
Univ. De Santiago De Chile	1,831	542	1,289	30%
Univ. Diego Portales	1,674	2,564	(890)	153%
Univ. Adolfo Ibañez	1,377	272	1,105	20%
Univ. Católica De Temuco	1,171	239	932	20%
Univ. Del Pacífico	1,110	1,197	(87)	108%
Univ. Del Bío-Bío	1,080	634	446	59%

Uniacc	1,035	685	350	66%
Univ. Alberto Hurtado	1,034	1,427	(393)	138%

Source: Analysis of Ingresa databases and SIES

Figure 15. Enrollment at Universidad Santo Tomás
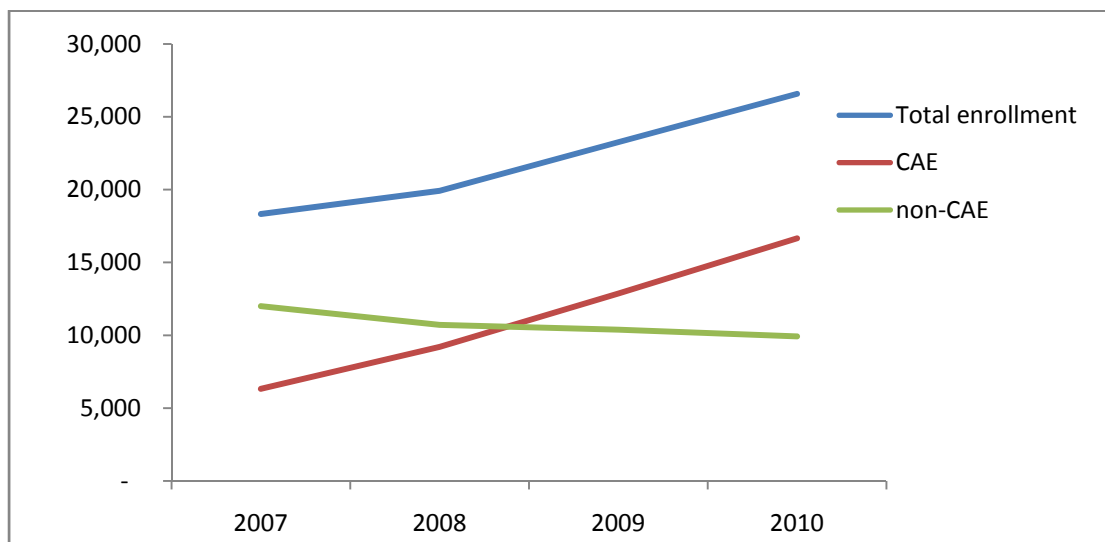
Source: Analysis of Ingresa databases and SIES

Some TEIs are quickly expanding their existing infrastructure to accommodate a growing number of CAE students. In order to adequately manage expectations, Ingresa should publish future expectations of CAE enrollment such that TEIs do not over-expand unknowingly. Equally important, Ingresa and the Government of Chile should be aware of a metaphorical TEI "real estate bubble" fueled by CAE.

vii.   Borrowing capacity

It is important to note that the revenues from tuition received by TEIs participating in CAE can approximately be twenty times larger than the guarantees that are actually called. As such, if TEIs are adequately managed, solvency should not be a concern. The TEI guarantee on CAE loans should therefore not constrain borrowing ability. This is important because TEIs have complained in this regard. Early in CAE's history, when dropout and default rates and behavior were completely unknown, this argument may have had some merit.   Even in this early case, however, the cause of any constraint on credit would likely have been poorly-functioning credit markets and not diminished creditworthiness of the TEIs.   As historical dropout and default trajectories become established, the claim by TEIs of CAE guarantees as a constraint on borrowing ability appears increasingly without merit.   The CAE program should continue to share risk with TEIs through the guarantee mechanisms without fear of unjustifiably affecting TEI's financial freedom.

Specific attention may be needed for CAE's effect on public TEIs, who are unable to limit the number of CAE-eligible students they admit. These institutions may find some instances where marginal costs of adding CAE-sponsored students outstrip additional revenue. Overall, if administration is efficient and reasonable efforts are made to limit dropout and default, public TEIs should benefit from CAE despite their inability to limit admission of CAE-eligible borrowers. TEIs and Ingresa should monitor actual practice to ensure it is consistent with this.

viii. "Red flag" system on TEI commitments levels and the financial sustainability of those commitments

Participation in CAE should be an unambiguous net benefit for any reasonably managed TEI. As such, Ingresa need only monitor a portion of the TEIs participating in CAE to ensure against systemic risk wrought upon by the reckless behavior of a few outliers. Robustness checks should include the top 12 TEIs by CAE enrollment, the TEIs where CAE enrollment is more than 25% of total enrollment, and the TEIs whose graduates are defaulting at greater than the average (currently 36%).

When tallied up, these amount to 33 institutions (see Table 20), or just under half of the TEIs participating in CAE. For those TEIs, Ingresa should monitor:

- Quality of information collected.[13] This is important because information underpins responsible decision making, both for the TEI itself and for the stakeholders of the rest of the CAE system;
- Extent to which institutional expansion is "CAE-driven" and sustainable;
- Extent to which efforts are being made to maintain or increase quality, particularly if there is significant institutional expansion;
- Dropout rates;
- Labor market outcomes of students;
- Adequate liquidity / cash on hand; and
- Adequate provisioning.

It is important to note that Ingresa has recently requested bids for such a monitoring and auditing system, and that the latter should be up and running by the end of the calendar year.

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[13] Student contact information, progress to degree, grades, previous TEIs, if any, dropout likelihood, default likelihood, debt accrued, other aid received, labor market outcomes of previous CAE graduates, administrative cost of CAE, etc.

Table 20. TEIs Ingresa should monitor[14]

	% of total CAE enrollment	CAE as a % of total 2010 enrollment	Default of graduates to date
Santo Tomás (Univ., IP, CFT)	**18%**		
Univ.	8%	63%	37%
IP	3%	54%	48%
CFT	7%	48%	40%
Grupo Laureate*	**14%**		
Univ. Nacional Andrés Bello	7%	42%	34%
CFT Andrés Bello	0%	8%	N/A
Univ. de Viña del Mar	1%	37%	N/A
Others	6%		
Duoc	**11%**		
IP	10%	44%	33%
CFT	1%	32%	54%
Inacap (Univ., IP y CFT)	**10%**		
IP	4%	27%	n/a
CFT	5%	27%	26%
Others	1%		
Univ. Autónoma de Chile	4%	60%	51%
Univ. San Sebastián	4%	53%	N/A
IP de Chile	4%	42%	N/A
IP Dr. Virginio Gómez G.	2%	58%	N/A
IP La Araucana	2%	35%	38%
Univ. Diego Portales	2%	35%	23%
Univ. Mayor	2%	28%	35%
IP Providencia	2%	70%	N/A
Univ. de Concepción	2%	16%	49%
Univ. Alberto Hurtado	1%	62%	54%
Pontificia Univ. Católica de Chile	1%	11%	33%
Univ. Academia de Humanismo Cristiano	1%	65%	30%
Univ. del Pacífico	1%	37%	32%
Unicit	1%	52%	20%
Univ. Austral de Chile	1%	13%	52%
Univ. de Talca	1%	13%	41%
IP Instituto de Estudios Bancarios Guillermo Subercaseaux	0%	33%	33%
Univ. Uniacc	0%	20%	N/A
IP de Arte y Comunicación Arcos	0%	46%	N/A
Univ. Católica de Temuco	0%	6%	49%
Univ. de Magallanes	0%	9%	N/A

Source: Analysis of Ingresa databases and SIES

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[14] It is not possible to show dropouts and defaults of dropouts by TEI due to unrepresentative samples and quality limitations in the data.

Ingresa ought to enforce minimum provisioning requirements for the aforementioned group of TEIs. This will help decrease the potential risk associated with high dropout and default levels.

Well managed TEIs typically smooth their financial exposure to drop-out defaults by setting aside funds to cover a fraction of the CAE loans they guarantee, in case the guarantees are called. This allows TEIs to comfortably cover their financial commitments with no surprise expenditures cutting into operational budgets. Minimum provisioning levels should be based on projected default rates of CAE dropouts. Ingresa should then monitor TEIs' "headroom" between the funds provisioned and the funds paid out in guarantees. Annex 11 explains such a system in detail.

For the remainder of TEIs who participate in CAE, the Review Team believes current requirements are adequate. Today, TEIs must purchase a traditional guarantee ballot or an immediately callable insurance policy on the amount of funds they guarantee. While the latter is more expensive, it is not considered a contingent liability and thus does not appear on a TEI's books. The ballot and insurance policy are both mechanisms to guard against TEI insolvency. Since these do little to guarantee appropriate TEI management of risk and protect solely against the worst case outcome—a TEI falling into bankruptcy—the Review Team is suggesting a "dual-track" system where some TEIs are monitored closely and others may just abide by minimum requirements.

ix.   Operational capacity

The best way for TEIs to avert risky situations is to collect comprehensive information on CAE borrowers and to use this information to manage their participation in CAE strategically and cost-effectively.

The ability of TEIs to track and monitor students with a CAE loan must improve. Tracking has not been done thoroughly before and many TEIs have been caught off guard with poor IT systems with which to manage and track their students. Drop outs take too long to be reported, and once reported, existing contact information for that student is outdated. This is starting to change in the CAE-heavy TEIs, but much more can be done in this regard.

As currently structured, the program permits TEIs to collect from those dropped out and defaulted students on whom they have paid a guarantee. TEIs are unlikely to be the most efficient agents of collection. While Cruch universities have collection systems in place due to the FSCU, few others do. Over the long term, Ingresa may wish to reassign collection to one or more specialized agencies, while continuing to "share" recoveries from defaulters with institutions that have guaranteed said defaults.

x.   Positive incentives

One lacuna of CAE's policies toward TEIs is the absence of positive incentives for positive performance. In effect, the best a TEI can do is enjoy additional revenue from CAE without

having to pay out its guarantee on defaults by current students. Ingresa may wish to consider a more complex set of incentives which promote and reward administrative efficiency, low dropout rates, provision of supplementary (grant) aid, and other "good behavior." At the same time, effective policy might limit access to CAE loans for institutions which fail to curb dropout, do not accurately and efficiently collect data or repayment from students, or otherwise fail to meet performance standards.

Ingresa currently may, according to the statute, exclude a TEI from the CAE system if its beneficiaries' default rates are 2.5 times higher than the average CAE default rates. Ingresa has not yet taken advantage of this for two reasons: first, because the number of graduates who have entered repayment is a sliver of the whole. Second, because with average default rates at 45% for dropouts and 36% for graduates, a 2.5 times higher than average default rate is almost impossible (as rates cannot exceed 100%). Ingresa should lower the default threshold or switch to a distribution driven mechanism in order to make this legal provision a more credible threat.

xi.   Financial impact of CAE on TEIs

There are three sources of cash flow for TEIs participating in the CAE program, as shown in Table 21. The largest one of these is the tuition paid for CAE beneficiaries. Because degree programs range from only a few years to nearly a decade in length, tuition disbursements for any year's cohort include cash flows well into the future. The two smaller cash streams are the guarantees TEIs pay out for students who have dropped out and defaulted, and the funds TEIs ultimately recover from them. The latter cash flow happens much further out into the future than the first two.

The model assumes relatively low recovery from dropout defaulters (see Annex 14 for more information); with no educational certification, they are unlikely to be able to realize higher salaries and thus are less likely to have the resources to make good on their debt obligations. Additionally, these defaulters are less likely to achieve a high degree of integration with the formal economy, making any collection effort low yield.

Table 21 shows the Net Present Value of the TEI cash flows for the six years of CAE cohorts, 2006-2011. Since we assume the growth and behavior of the CAE program has stabilized, the table also shows the NPV for a single year going forward. Note that these values do include the expenditures TEIs made to accommodate the CAE cohorts.

Table 21. Financial impact of CAE on TEIs

NPV (thousands of UF)	Accrued 2006-2011	Going Forward Annual Value
Total	**90,100**	**25,000**
Tuition	95,500	27,000
Guaranty payout from dropouts who default	-5,800	-1,700
Recovery from dropouts who default	400	100

Source: World Bank Team analysis

As summarized in the table, the present value of the CAE program to the TEIs stands at 90 million UF, which can be broken down into 95 million of tuition, six million of guaranty payouts (negative in the table because is it a cash outflow), and 0.4 million of recoveries from dropouts. For each incremental cohort of CAE awards (e.g., recipients of CAE loans in 2012), TEIs accrue 25 million UF, broken out into tuition of 27 million UF, 1.7 million paid out in guarantees and 0.1 million in recoveries from students who dropped out and defaulted. The size of these numbers can vary considerably depending on the rate of dropouts, default of dropouts, and recovery from dropouts.

D. Impact on financial entities

Participation in CAE by financial entities has steadily increased since program inception. Encouraging participation has not been a simple task, and each year Ingresa has improved the terms of lending based on feedback from different CAE stakeholders. Still today, the acquisition of a CAE loan portfolio presents important credit, capital, liquidity and servicing challenges for financial entities. For those who strategically manage their portfolio, however, participation in CAE can be a lucrative business opportunity.

i. Considerations for participation in CAE

Financial entities who participate in the CAE program must take a number of important steps:
- Win portfolios in a competitive auction managed by Ingresa;
- Reach out to those students who are awarded a CAE loan in order to have them sign and formally accept the loan.
- Originate loans;
- Manage portfolio exposure by selling some of the loans back to the Government under the conditions specified in the terms of the bid;
- Maintain adequate capital reserves for loans;
- Create an internal monitoring system to track portfolios;
- Service and collect on the loan portfolio of dropouts and graduates; and
- Manage recoveries on defaulted loans, including calling on Government and TEI guarantees as appropriate.

a. Cost associated with CAE participation

There are a number of systemic features that currently put a floor on the price that banks are willing to bid for CAE loans. Primary financial and operational expenses associated with CAE participation are summarized in Table 22 and listed below.

- The allocation of capital to loan principal;
- The cost of the fixed, below market interest rates on the loans, which is less than would typically be charged for consumer credit risk, particularly on secured loans;

- The high capital reserve requirements as student loans are categorized as 100% consumer credit under prevailing Basel 1 credit rules, despite the 90% Government guarantee (explained further on);
- The illiquid nature of the loans, due to the long holding periods before repayment (up to 10 years), the long repayment periods (10-20 years), and the lack of a secondary market in which to sell the loans;
- The risk of losing 10% of the value of the loan portfolio in case of default;
- The complicated portfolio modeling required to submit bids;
- The cost of loan servicing and collection in excess of the monthly commission each loan is charged (annualized to 70 -90 basis points for single year loans, scaling down from there for multiple year loans);
- The judicial procedures required to collect the guarantee when beneficiaries default; and
- The personnel, IT systems and additional overhead needed to properly manage the CAE loan portfolio (explained further on).

Table 22. Revenues and costs associated with CAE participation

Revenues from CAE	Costs associated with CAE participation	Profits
Principal returned through loan payments	**Financial expenses**	Profits must be equivalent or greater than they would be in other opportunities for banks to participate in CAE.
Interest paid on loans	Allocation of capital to loan principal (given directly to TEIs as tuition)	
Monthly commission charged per loan	Fixed, below market interest rates (~5.5%)	
	High capital reserves requirements	
90% of loan balance paid upon default	Lack of liquidity (long holding period of loans & no secondary market in which to sell them)	
Mark-up received on loans sold to Government	10% of loan balance lost in case of default	
	Operational expenses	
	Preparation of bid for auction	
	Servicing and collecting on loans	
	Judicial procedures required to collect guarantee on defaulted loans	
	IT and personnel needed to manage loans	
	Other overhead	

Source: World Bank Team analysis

The prevailing capital rules for Chilean financial entities drive up of the cost of participation in CAE by requiring unnecessarily high capital reserves. As Chile abides by the standards of Basel

1 and not Basel 2, financial entities cannot recognize the Government guarantee of 90% of the loan value. This means they must provision for 100% of the loan value, and not just the 10% that is actually at risk to borrower default.[15] Financial entities must therefore set aside much more capital than is reasonable to cover the risk of CAE. This drives up the real cost of participating in CAE, and clearly factors into the bids financial entities present.

Two actions can be taken to change this. First, the CAE law could specify that CAE loans ought to be considered part of the Category 2 risk level according to the General Banking Law. This category includes financial instruments originated or guaranteed by the Government. Currently CAE loans are in Category 5, which assumes full risk. Second, Chile could transition from Basel 1 to Basel 2. Unfortunately, this is not expected for a number of years.

With the implementation of either of these actions, we would expect that financial entities would be able to take full advantage of the Government guarantee on 90% of student loans, reducing the required capital to only covering the 10% of consumer credit exposure which remains. The lower capital requirements should result in increased interest from the financial sector in CAE and resulting pricing improvements.

Another factor that affects the cost of participation in CAE is that financial entities seem to have difficulty in evaluating and monitoring the credit risk in their student loan portfolios due to small incremental changes in the program rules since inception. Each change means that next year's cohort will have financial terms distinct from this year's. While these changes were done to improve the program overall effectiveness, it is important to reach a level of stability in program structure to reduce risk perception and minimize operating costs. An example of changes implemented includes the introduction of the ability to sell the loans of drop-out students to the Government at 90% of their value and the subsequent avoidance of reliance on TEI guarantee.

While the changes in the CAE program may be even beneficial to banks, the downside is that the information systems required to manage each cohort (2006, 2007, 2008, 2009, 2010) can be different. For all those involved in the CAE program, it means there are limitations on the economies of scale from one year to the next. For financial entities, these changes require that that the fixed costs of participating in CAE must be covered by the bidding terms each year. Incumbent financial entities cannot optimize economies of scale as the systems they previously invested in for prior auctions may have to be updated or replaced for future cohorts.

b.   Revenues associated with CAE participation

It is of primary importance that financial entities receive adequate compensation for the aforementioned financial and operational costs. For banks to participate, this compensation should cover those costs, and leave profits equivalent or greater than would other opportunities.

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[15] For additional detail see Annex 10: Futuro Laboral.

In the CAE system, such compensation happens through the combination of the upfront mark-up, the interest rate charged on loans, the partial Government guarantee, and the loan's ongoing servicing fees. Because the last three of these are fixed, the only variables financial entities can change are the percentage of loans sold to the Government and the mark-up received on them. Since a mark-up is not paid on the loan portfolios owned by financial entities, the mark-up on the loans originated and sold back to the Government is the main driver of the return earned for participating in CAE.

ii.   Financial sustainability

The long-term success of the financing structure for CAE depends on striking an equilibrium between meeting the needs of the Government and providing an appropriate risk-adjusted return for the participating financial entities. For the latter we assume key objectives include the following factors:

- Earn an adequate return on capital to cover the risk and responsibilities of participating in CAE;
- Avoid unexpected losses on loan portfolio; and
- Avoid undue burden of the program on the firm's servicing infrastructure, whether internal or outsourced.

In our review of the financing structure for CAE we have identified a number of important areas in which the financing environment appears out of equilibrium in providing what seems to be riskless returns to the banking system and conversely, requiring the Government to pay more than fair value for the services provided by the financial market in originating and servicing loans. Also, under the current system there seems to be a stark exposure for the Government-owned portfolios that if unaddressed could dramatically drive up the overall program cost. In particular, we are concerned about the current infrastructure to manage collections on Government-owned portfolios and optimize recoveries in the event of borrower defaults.

In auctions to date financial entities seem to have used the following techniques to maximize the total upfront mark-up collected. When bidding for loan packages, banks have an incentive to try to sell the highest percentage of the portfolio back to the Government as only these loans earn a mark-up. Loans retained in the bank's portfolio do not. Also banks have an incentive to sell back to the Government loans to students in longer academic programs, thereby maximizing their opportunity to earn the same mark-up on future tranches of the loan originated and sold back to the Government. Increasing both the total portfolio sold to the Government as well as the mark-up for the portfolio optimizes the total funds collected upfront by the bank for participating in each auction.

In the early years of CAE there was widely divergent pricing on packages of student loans explicitly constructed by Ingresa to be as homogenous as possible. Because this is not expected in an efficient market environment, it suggests widespread uncertainty among

participants regarding the actual value of the loans and the cost of participating in the CAE program. In the later years of CAE, pricing still ranges but winning bids largely converge.

As shown in Table 23, banks have bid for increasingly higher shares of each loan pool to be sold back to Government, beginning at the 25% cap in place in 2006, peaking at an average of 68% in 2009, and then falling back to near the cap of 50% introduced in 2010. The average annual mark-up has been volatile since the auctions began: initially declining as market participation increased in 2007, increasing during the financial market crisis of 2008 and 2009, and then declining again in 2010 as financial markets stabilized.

The combination of the bidding based on percentage of the total portfolio sold to the government and the average mark-up can be understood as a surcharge over the total portfolio at auction. As shown in Table 23, this figure peaked at 33.3% in 2009 and retreated to 14.6% in 2010.

Table 23. Average terms for successful CAE loan portfolio bids[16]

Year	# of beneficiaries	# of homogenous loan packages	beneficiaries per package	average % to sell back	average % mark-up	surcharge over total
2006	21,251	3	7,084	25.0%	43.0%	10.80%
2007	35,035	5	7,007	13.8%	13.1%	2.10%
2008	42,696	6	7,116	25.2%	34.8%	5.70%
2009	69,849	17	4,109	68.2%	52.6%	33.30%
2010	88,214	17	5,189	49.7%	30.1%	14.60%

Source: Ingresa

The market incentive to sell back as much of the portfolio as possible to the Government is concerning for a couple reasons. First, it circumvents the goal of syndicating the financing of the student loans through the banking system, which is at the heart of the CAE program. Second, and more concerning, is that the Government ends up being a holder of as much as 50% of the student loan portfolio originated, without the benefit of direct monitoring and servicing controls. Third, because banks can skew their portfolios and sell back to the Government loans of students in longer academic programs, the initial bid price does not represent the ultimate cost to the Government.

Critically, in managing its holdings the Government is currently represented by multiple banks, none of which are incentivized to collect, let alone reduce defaults and maximize recoveries on the Government's portfolio. If unaddressed, the performance of the Government's loan portfolio over time could deteriorate as borrowers begin to respond to the lax supervision of the loans by the banks that service them. Poor default behavior on government-owned loans could contaminate the entire portfolio, triggering large guarantee payments if a borrower culture of non-payment were to develop for both government-owned and bank-owned loans.

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[16] Annex 5 details the bidding history by year, financial entity, bidding terms, and success of the bid.

The current financing structure also seems to be generating riskless returns for the banks. As discussed above, the mark-up provided on the loans sold in each auction to the Government effectively also provides an excess return on the share of the loan portfolio retained. As shown in Table 23, in 2010 banks on average earned a mark-up of 30.1% on 49.7% of the portfolio sold to the government and retained 50.3% of the portfolio. If we were in fact to assume that banks would not incur more expenses in servicing the Government's portfolio than the monthly commission paid on the loans, then in effect the entire mark-up is available to cover the risks and responsibilities of the bank-retained portfolio.[17]

With a mark-up of 30% effectively to cover the risk of half of the portfolio retained where no more than 10% of the value of each loan can be lost, given the Government guarantees, banks are in a riskless position as of day one. In fact, banks may see a perverse benefit in having their own portfolio default as quickly as possible to collect the government guarantee and release the capital held against the loans for reinvestment. Given the level of mark-ups prevailing, banks have no pressure to seek to collect recoveries on defaulted loans given the high cost of collection and the fact that they are more than paid in full through the combination of the 90% Government guarantee upon default and the 30% mark-up paid up front. In fact, it may be more profitable for financial entities to trigger the 90% guarantee payment as quickly as possible, than to receive partial amortizations over a 10-, 15- or 20- year repayment period.

In sum, the current auction structure results in poor incentives for financial entities whereby they profit from the worst outcomes for the Government: high default rates on the portfolio owned by banks and benign neglect of the portfolio owned by the Government but serviced by the banks.

iii.   Financial outcomes

For financial entities who participated in the CAE program in the last three years, the return to their participation is unambiguously attractive. This section details their aggregate NPV and cash flows.

There are numerous cash flow streams for financial entities partaking in the CAE program. The most significant of these are the mark-ups paid out by the Government, the loan repayments made by the borrowers, and the guaranties paid out by the Government when CAE beneficiaries default. In each of these cases the cash flow to the financial entities is large and positive.

Less significant sources of positive cash flow for financial entities include the payouts of guaranties for dropout defaulters, and the cash ultimately recovered from dropout and graduate defaulters. The latter is small because financial entities only bear 10% of the risk in case of default, and thus the cash ultimately recovered from defaulters is a fraction of that percentage.

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[17] See Chapter 1, Amount and form of subsidization, for a full explanation of the monthly servicing commission charged on each loan.

The sole cash outflow from the banks is tuition. Table 24 shows the Net Present Value of those cash flows for the six years of CAE cohorts, 2006-2011. Note that though the mark-up has varied considerably from 2006 to 2011, the going forward annual value assumes mark-ups are slightly more competitive than those observed in 2010.

Table 24. Financial impact of CAE on Banks

NPV (thousands of UF)	Accrued 2006-2011	Going Forward Annual Value
Total	**11,850**	**2,750**
Tuition	-50,600	-12,600
Mark-up	14,900	3,500
Loan repayment	25,500	6,400
Guaranty receipt from:		
Dropouts who default	17,350	4,300
Graduates who default	4,100	1,100
Recovery from:		
Graduates who default	500	100
Dropouts who default	50	0

Source: World Bank Team analysis

The mark-up the Government pays on the portfolio of loans it owns is a principal source of the NPV realized by the financial entities. If the latter depended solely on repayments, guaranties, and recoveries, their participation in the program would lead to a significant loss (-700,000 UFs per year, according to the assumptions detailed in Annex 14). It is likely financial entities use a more aggressive discount rate than the Ministry of Finance, which would further widen the loss they would experience in the absence of the mark-up.

Under the assumptions made (see Annex 14), the average real return on capital for financial entities who participate in CAE for each year going forward is 9%. For banks who strategically manage their portfolio, the real return can exceed 12.5%. In these calculations we do not take into account any resources allocated to analyzing the value proposition of participating in CAE, setting up operational systems for it, provisioning as required by Basel 1, or calling guarantees upon student default. As mentioned before, we assume the cost of servicing the CAE loans is covered by the monthly commission charged on the loans.

E. Impact on Government of Chile

CAE has changed the tertiary education landscape in Chile, creating new opportunities and fresh challenges for all stakeholders. The Government is no exception: implementing CAE has wrought significant changes to key entities with regards to policy, finances and operations. Most obvious is the development of a new entity to administer CAE (Ingresa), but no less significant are the roles of the Ministry of Finance and the Ministry of Education.

The Government of Chile plays a major role in ensuring it realizes maximum leverage from the implementation of CAE. Nevertheless, because no one entity within the Government is responsible for the functioning of the CAE system as a whole, incentives among Government stakeholders are not well-aligned. In the ensuing discussion, we assume key long-term financial objectives for the Government of Chile include the following:

- Outsource loan origination and servicing effectively;
- Limit overall program costs, including upfront payments; and
- Limit underlying portfolio defaults and resulting guarantee payments; and
- Maximize recoveries.

i. Ingresa

CAE depends on coordination between students, banks, TEIs, and the Ministry of Finance for smooth function; Ingresa is the agency positioned to facilitate that. That CAE has expanded as rapidly as it has is a testament to the diligence of Ingresa's staff at anticipating potential issues and addressing them as necessary. As CAE continues to transform tertiary education in Chile, Ingresa's importance will only increase.

a. Budget and Governance

As specified by the law, the initial budget of Ingresa was financed entirely by the Government, with the expectation that TEIs' contributions would increase as the Government's decreased by 25% each year, from 100% in 2005, to 0% in 2009. The latter proved not to be the case, and today Ingresa's budget has stayed at the 2008 distribution: 25% Government, 75% TEIs.

No evidence suggested TEI "capture" was an issue, despite the 75% contribution of TEIs to Ingresa's operating budget. Going forward, the Review Team suggests that at least 51% of the budget come from the Government, particularly if the recommendations in this report—many of which run counter to short-term TEI interests—are implemented. Equally important, the operating budget of Ingresa should be increased so it can adequately deliver on its responsibilities. Too many resources are at stake in the CAE system, and investments in infrastructure, IT and human capital are urgently needed.

Although the Board of Directors is responsible for the functioning of the CAE system as a whole, to date they have focused—very successfully—on increasing opportunities for qualified students to access tertiary education via CAE loans, rather than on ensuring the financial sustainability of the CAE system itself. In order for CAE to function optimally, Board members need to proactively work to align CAE's outcomes with the interests of the entities they represent (e.g. MINEDUC and Dipres).

Regarding Ingresa's management as such, interviews suggested Ingresa operated with utmost independence and transparency. Its Board shared unified principles and goals. There had been continuity in its policies despite initial changes at the managerial level. It had maintained fluid

and efficient communication with TEIs, and had encouraged them to develop their information systems.

b. *Systems*

Serving as a central information repository and clearinghouse, Ingresa has rapidly developed systems that allow it to track and understand the behavior of each of the stakeholders in the system.

Unlike other stakeholders who can only track a sliver of the program, Ingresa is in a position to understand the entirety of CAE. Ingresa's systems could be further bolstered to facilitate this. At present, Ingresa is dependent on TEIs and Banks to provide it information in a timely manner. By developing standardized software platforms, Ingresa may be able to further facilitate information exchange and integration with the other stakeholders. Additionally, by integrating the databases that Ingresa does maintain locally, it would be able to perform more sophisticated analysis and better track potential sources of risk in the system. Because CAE depends on interaction between multiple stakeholders, Ingresa can function in an oversight role, collecting information from all of the stakeholders and verifying that all the numbers tie out. By embracing an oversight role, Ingresa can minimize attempts to game the system.

By tracking more program components and making them accessible to appropriate stakeholders, Ingresa could become a more dynamic and effective clearinghouse of information. For example, by actively tracking students through the education and grace periods, and providing transparency into accrued loan balances, Ingresa may facilitate student repayment. Additionally, Ingresa may be able to develop standardized software suites that stakeholders can implement in an off-the-shelf manner. To the extent that systems development only has to happen once, all involved in the system benefit. If systems are constructed ad-hoc and on a case-by-case need-driven basis, the result is likely to be a difficult to integrate hodge-podge solution.

Though Ingresa's drive to consistently improve the program is commendable, it is important that it understand that those improvements come at a cost. By constantly updating and optimizing the terms of the lending, Ingresa effectively destroys any scale that stakeholders could realize from deploying the same software for multiple cohorts. Ultimately, the cost of that incremental development is passed on to CAE, in the form of higher mark-ups.

c. *Continuous improvement*

Ingresa has focused primarily on managing CAE's rapid growth. Among other things, this has entailed lobbying financial entities for their increased participation in CAE, developing processes for students and TEIs, building out platforms to collect and analyze information, and coordinating CAE's different stakeholders through the program's tight timeline. As mentioned before, CAE's expansion is a testament to the diligence of Ingresa's staff at anticipating potential issues and addressing them as necessary.

Some of the improvements Ingresa is spearheading this calendar year include a massive marketing and information campaign aimed at beneficiaries who renew their CAE loan, a redesigned loan collection process, and a robust system for TEI monitoring and auditing. The first of these will be rolled out in the next few months, the second is being undertaken by a specialized loan collection agency, and the third is the midst of the adjudication process.

ii.   Ministry of Education

The Minister of Education (MINEDUC) is the Chairman of the Board of Directors for Ingresa. As such, MINEDUC should promote CAE as a tool to yield optimal educational outcomes. As detailed in previous sections, CAE has wrought major changes in enrollment at TEIs, and has significantly increased the tertiary education cohort. As TEIs and students continue to respond to this major new source of funding, MINEDUC can provide oversight to Ingresa to insure that the funds are optimally leveraged and lead to a competitive and improving higher education landscape.

As the driver of educational policy, MINEDUC is critical in processes on which CAE depends. Some of these include the administration of FUAS, the allocation of student aid, the subsequent distribution of student aid across TEIs, the policy towards TEI accreditation, and the relationship between the Government and TEIs. As CAE continues to evolve, opportunities to bolster and coordinate previously existing processes among these are likely to arise. It is important MINEDUC takes advantage of these opportunities and allocates resources to them in order to maximize the Government's leverage from CAE.

Although pursuing those opportunities is in the direct interest of MINEDUC, none of the resulting savings and operational efficiencies in CAE accrue to Ingresa. Because CAE outcomes are thus largely divorced from MINEDUC's budget, incentives are not properly aligned. A closer link between CAE and the tertiary education budget would go a long way in remedying this.

At present, MINEDUC has not yet been able to optimally leverage CAE for the purposes of its tertiary education policy. Further encouraging constructive behavior would be easy given the large portion of TEI funding now generated by CAE. Ambitious goals going forward could include using CAE to further enhance tertiary education quality. This could be done by more closely tying further increases in CAE beneficiaries to lower default and dropout rates, shorter programs, and better labor market outcomes.

iii.   Ministry of Finance

The Ministry of Finance, through its Treasury Office, is a pivotal actor in CAE in its present incarnation. The system is currently dependent on the Ministry of Finance in making large payouts to banks for the bidding mark-up, as well as disbursing funds for the large portfolio of loans held by the government. As envisioned, CAE contemplated largely privately held loans. This has not been borne out in execution in recent years, and the Ministry of Finance has had to assume ownership of a large portion of the loan portfolios.

The role of the Ministry of Finance is not just limited to capital provision. Though the law is ambiguous regarding the specific government agency involved in pursuing recovery of funds from defaulted students, the empowerment of taxation authorities to participate in that recovery seems to implicate the Treasury Office in the Ministry of Finance. The Treasury's authority as the agency in charge of pursuing recovery from defaulters must be firmly established. Without that unambiguous authorization, defaulted loan recipients experience no negative consequences, and the sense that CAE operates as a grant is reinforced among those who have not yet entered repayment.

Regardless of authorization, it is unclear that the Treasury Office possesses adequate resources to collect from defaulted students. Despite the fact that all necessary elements for collection are present within the Treasury, that entire functional apparatus is involved in processes and responsibilities that existed prior to CAE's inception. As increasing numbers of student loans move from the educational period into the repayment period, it is critical that the Treasury be availed of adequate resources to effectively reclaim funds from those who have chosen not to pay despite their ability to do so. The Treasury should be empowered and funded to allow it to implement systems to coordinate between its various branches (taxation and collection) for maximal efficiency.

iv.   Financial outcomes

The cash-flows to and from the Government are the most complex in the model because there are myriad sources of cash outflow and inflow. Cash predominately flows out for three major expenses: the payment for tuition cost, the payment to financial entities for the mark-up and the payment of the loan guaranty made for graduates that default. A much more modest expense is the payment of the partial guaranties to financial entities for students that dropout and default.

The dominant source of cash inflow to the Government is student repayments. Smaller inflows include recovery from defaulted graduates, payouts of guaranties from the TEIs to the Government, and recovery from students who have dropped out and defaulted. The results in NPV terms are summarized in Table 25.

Table 25. Financial impact of CAE on the Government

NPV (thousands of UF)	Accrued 2006-2011	Going Forward Annual Value
Total	**-44,250**	**-11,750**
Tuition	-45,000	-13,900
Mark-up	-14,900	-3,500
Loan repayment	22,450	6,900
Guaranty receipt from dropouts who default	2,900	950
Guaranty payouts from:		
Dropouts who default	-1,150	-300
Graduates who default	-17,350	-4,300
Recovery from:		

Graduates who default	8,650	2,350
Dropouts who default	200	50

Source: World Bank Team analysis

The large negative NPV for the Government can be attributed to two major factors: large mark-ups paid out to financial entities, and relatively low expected repayment rates from graduates. Low repayment rates are especially pernicious because they reduce the repayment stream from its maximum potential and increase the amount of guarantees the Government pays out. The recommendations in this report will provide guidance on how to bring the aforementioned costs under control. Annex 14 contains a discussion of default behavior and default curve construction, which is the major driver of the low repayment rates from graduates. Current CAE repayment behavior suggests cumulative defaults above 50%; at that level of default, CAE is destined to return little of the cash outlaid.

Importantly, although the 2010 and projected 2011 aggregate portfolios owned by financial entities and the Government are nominally of the same magnitude, in the latter's portfolio students are expected to be in school for an additional year. For the going-forward value, this drives the higher cost of tuition to the Government relative to that of the financial entities.

The timing of cash flows to the Government is just as important as the overall NPV figures. For each year the program is run, a significant number of the cash flow events happen in the distant future. For example, students in seven year programs with a CAE loan will require a disbursement for each of the next seven years. If those students' loans are also owned by the Government, the latter will also have to pay a mark-up for each of those seven years.

In order to fully gauge the cash flow requirements of the CAE program, we assume the program continues in a steady state for a number of years. At some point, the loans in repayment establish consistent behavior which can offset the required disbursements of the program. A cash flow schedule is included below as Figure 16. Under the currently modeled assumptions, the program cash flows will not stabilize until ~2040. More importantly for the near future, the required disbursements under the program are expected to accelerate rapidly. Assuming 2011 is repeated in perpetuity (same number of loans and same balances in UF), cash flows stabilize at 2040 at an expected outlay of 3.5 million UF / year.

Figure 16. Cashflow schedule, net inflows and outflows in millions of UF
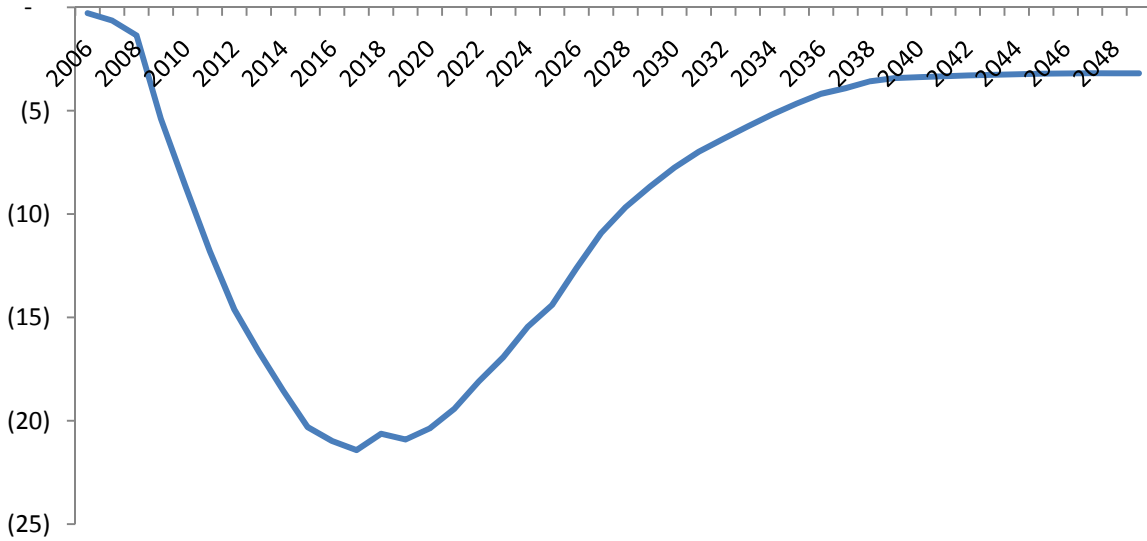
While Figure 16 shows the difference between the Government's outflows and inflows, Figure 17 shows these separately.

Figure 17. Cashflow schedule, inflows and outflows in millions of UF
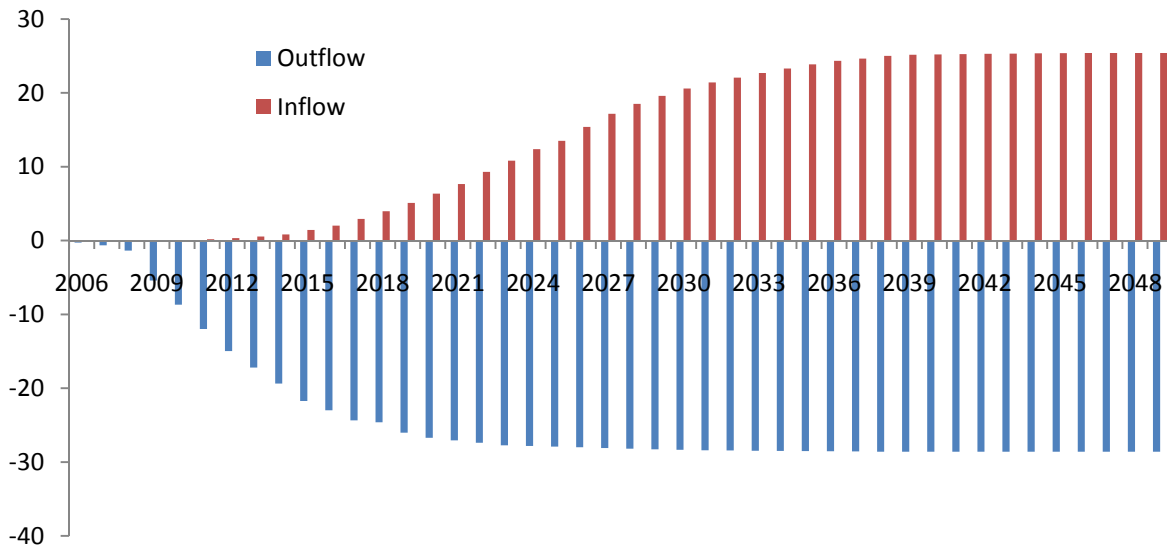
Chapter 3: Recommendations for Improving CAE

Recommendations for improving CAE focus on three principal areas: increasing loan repayment rates, lowering capital costs of loan origination, and increasing the coordination of CAE with other student aid programs.

The ultimate cost of CAE to Chile depends heavily on the efficiency with which it is managed. The currently high default rates are first and foremost a structural result of actions taken by the administrators of the program and their agents. They are only secondarily a function of borrowers' ability to pay. Increasing administrative efficiency to the point where ability to pay becomes the driver of default should be a top priority.

CAE's cost-effectiveness can also be improved by lowering the cost of origination of loans. This will require modification of the rules and even the legislation governing CAE.

CAE is only one part of a broad set of programs that provide aid for tertiary education. Coordinating all publicly-provided aid would expand the impact and improve the cost-effectiveness of both the CAE program and student aid in general. Such coordination would depend on a single entity having access to all aid-related information and being able to modify or consolidate individual awards or programs in ways that serve the overall goals for tertiary student assistance.

The body of this chapter addresses the above recommendations at length, in the following order:

- creating a single agency for the administration of all tertiary student financial assistance;
- maximizing repayment of borrowers; and
- optimizing the amount of capital committed to the CAE program.

Additionally, this chapter includes an estimation of the financial impact to the Government of Chile of the latter two recommendations. Because the systemic quantitative impact of the first recommendation is difficult to estimate, our model estimates include only those direct capital savings from aid coordination.

It is important to note that the order of the recommendations in the chapter is not an indication of their temporal priority. CAE will improve most if all three recommendations are adopted, and proportionally more so as more recommendations are implemented, through synergies. Increasing repayment rates is particularly time sensitive. With large groups of borrowers poised to enter repayment soon, a culture of repayment is critical to the long-term financial viability of CAE. Vigorous actions should be taken immediately to positively influence the type of culture associated with CAE. It is much easier to establish a positive culture at inception than to change a negative one, once established.

A. Create a Centralized Tertiary Student Assistance Agency

The cost of the CAE program to the Government can be lowered by increasing the coordination between various student aid benefits and by improving the targeting of those benefits. The best way to do this would be through the establishment of a single entity for the administration of all tertiary education financial assistance. The entity should not be a wholly new creation; it should preserve the institutional memory and experience gained from running the individual programs. Its core could be an expanded version of Ingresa, perhaps with the units in the Ministry of Education currently responsible for the grants programs appended and coordinated.

Several potential advantages would be derived from centralizing student assistance:

i. Coordinate Student Aid.

Grants and loans serve multiple purposes. Some reward merit. Some have special purposes, such as the promotion of TE attendance among indigenous Chileans. Some target need, and others combine all three goals. However, the general goal of all state-provided student assistance should be to maximize the number of qualified but needy students who attend and finish tertiary education. If state-provided loans and grants were administered by a single agency, an overall portfolio of instruments could be used to meet this general policy goal.

Grants, loans, and combinations of the two could be provided to prospective students in ways that consider family background, need, likely future earnings, public priority for certain degrees, merit, and special purposes.[18] The first advantage and most important advantage of having a single entity would be the ability to accurately target aid in a way that increases its impact.

A second benefit would be the elimination of unnecessarily duplicative efforts in aid administration. Highly redundant programs (such as CAE and *Fondo Solidario*) could be merged or administratively combined and share common features of program implementation. For instance, collection for CAE and *Fondo Solidario* could be outsourced to a single set of agents. Cash flows among various loans and scholarships could then be coordinated.

A third benefit of a single entity would be the ability to use data and lessons from past years to improve aid performance in future years. Aid allocation can only be optimized if program administrators have an accurate understanding of how aid offers affect tertiary education attendance and outcomes. This understanding can only be gleaned by regular analysis of actual decisions made by prospective students based on their entire aid offers, and by the actual number of students who either drop out or complete their studies. It is critical to establish the role that financial assistance plays in promoting attendance and graduation of different subgroups in different circumstances. Because the outcomes are dependent on the entire aid package for each student, a single entity must be able to easily assess each student's entire aid offer.

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[18] Annex 16 elaborates on the ideal targeting of loans.

To obtain this third benefit, the single entity should have a robust analytics unit that carries out annual surveys of prospective and actual students to determine how aid factors into student decision making. The unit should create a comprehensive survey instrument which it administers each year and whose findings are analyzed and communicated to the aid entities' managers and supervisors. Additionally, the unit should be funded to support complex systems and analytical capabilities, so that the appropriate data can be easily tracked, and the appropriate analysis can be performed to drive changes going forward.

Many of the recommendations that follow could be better and more efficiently accomplished by a qualified single aid entity. However, they should be adopted regardless of whether or when such an entity is created.

ii. Assess Needs Accurately and Holistically.

Chile needs a comprehensive and reliable aid screening tool that accurately indicates the socioeconomic status of prospective tertiary students. The instrument needs to uniformly and reliably measure:

- Prospective students' income sources. This should include a way distinguish with appropriate gradations the extent to which students are dependent on their birth family for financial support; and
- Overall financial burden on the income source. Whether this is the family or the student, the instrument needs to measure: (i) income and assets (including home and vehicle ownership among assets, and receipt of transfers and social benefits as part of income); (ii) number of financial dependents; (iii) the number of financial dependents in tertiary education simultaneously; (iv) existence of extraordinary circumstances that add to financial burden, such as unemployment of principal income earners or expensive medical costs for family members.

The administrators of FUAS currently perform three checks on the accuracy of information provided, using the Civil Registry, *Chile Solidario* and the Tax Authorities. Nonetheless, the Report Team perceived a consensus among stakeholders that FUAS is not sufficiently accurate. FUAS data shows significant numbers of students dramatically changing income quintiles between years, and a sizable proportion of aid-seekers are said to misrepresent their principal source of financial support and/or to exaggerate or falsify the number of family members dependent on that support.[19] Such inaccuracies need to be eliminated.

The FUAS differs from other Chilean tools for measurement of socioeconomic status or need. The *Ficha de Protección Social*, for instance, measures income and vulnerability while the National Socioeconomic Survey (*Encuesta de Caracterización Socioeconómico Nacional* (or "CASEN" in its Spanish acronym) provides information regarding students and quintiles in Chile. Each was created to serve a particular purpose and each uses a particular methodology,

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[19] From 2006-2010, among the ~1 million FUAS applications, there were ~ 200K repeat applicants. Of those, 25,000 shifted more than two quintiles between applications.

creating discrepancies among measurement of need by socioeconomic status. For example, as a survey CASEN asks students to indicate the type of TEI in which they are enrolled, and responses often reflect inflated enrolment in more prestigious TEI-types.[20] The result of this is that these three instruments produce very different numbers for figures that should be equivalent, thus complicating the understanding of actual need.

Chile needs an accurate, reliable instrument to comprehensively and uniformly assess the financial needs of tertiary education students and prospective students.

iii.   Verify Needs Assessment and Impose Sanctions for Non-Compliance.

The FUAS and its related websites have gone a long way to creating a single, virtual interface for students with the state-provided tertiary financial assistance programs. The system for verifying reported information still has several deficiencies:

- Some criteria lack clarity. No precise definition, for instance, is said to be available to determine who should be considered a family member;
- The verification system is inadequate. More comprehensive verification should be undertaken, including a sanity check upon submission. Additionally, this ought to include annual comprehensive independent audits of the veracity of information from a randomly selected sample of forms. If necessary, peer committees organized by TEIs could confirm SES of students;[21]
- No clear sanctions policy exists. Prospective students who complete the needs assessment form should sign affidavits testifying to the veracity of information provided. A policy with clear penalties—including disqualification from eligibility for student aid—should be communicated to all applicants; and
- No dissemination of enforcement efforts. Once a clear policy of sanctions is announced, it should be enforced. Cases of non-compliance that have been sanctioned should be disseminated so that future applicants appreciate the possible consequences of failure to comply.

Eliminating deficiencies and taking these suggested actions are critical in ensuring that grants and loans go to the neediest.

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[20] Increasingly, a single TEI will have a mult-institutional character. It may be, for example, simultaneously a university, an IP, and a CFT. Individuals surveyed by CASEN will tend to indicate the most prestigious among these subcategories when asked what type of tertiary education institution they attend. As a result, CASEN data tends to overstate the number of students in universities and understate the numbers in IPs and CFTs.

[21] Fully accurate determination of student SES is can be very difficult in some contexts. Where reliable documentation does not exist, some systems have used "peer committees" to verify reported data. This method identifies a committee of responsible fellow students who interview their peers, asking questions about reported data. Normally, a twenty minute interview will allow the committee to make an accurate assessment of the veracity of information provided, based on answers to questions such as the neighborhood or origin of the interviewee, parents' professions, secondary school attended, etc. Peers are thought to have the most accurate reference information and this information is hard to codify.

iv.   Supervise and Audit TEIs.

As explained in Chapter 2, supervision of TEIs is less a question of financial audits than it is of management audits.   Since participation in the CAE should be an unambiguous net benefit for any reasonably managed TEI, Ingresa's job should be to gauge whether TEI's are engaging in overall risky behavior.

TEIs with a large concentration of CAE borrowers as a fraction of their overall student bodies should be pre-screened to determine the likelihood of risky investment of CAE revenues. Those at risk—or a significant sample of this group--should be subject to audits as a condition of continued participation in the CAE program.

A potential risk for such TEIs is their dependence on enrolling successively larger cohorts of CAE borrowers to fill places created through otherwise unsound investments in academic infrastructure. Since CAE has grown at 20% or more per year since its inception, some TEIs have likely expanded beyond erstwhile-unused capacity to accommodate increased enrollment. Continued enrollment growth is only likely if CAE and/or other aid sources maintain double digit annual growth rates. If the latter plateau, TEIs that have overbuilt through borrowing may have trouble servicing their loans. Measures taken to remedy this may result in:
- Increasing tuition for existing students;
- Retrenching staff or increasing the (already high) reliance on low-paid adjunct faculty;
- Increasing class sizes;
- Eliminating programs with high marginal costs; and
- Reducing the amount and quality of academic services offered.

None of these options are in the best interest of the students, nor do they promote high quality education.   In extreme cases, unsound investments could undermine a TEI's overall financial position, thus preventing it from paying any guarantees due on defaulted loans from drop outs. Reckless TEI expansion has thus the potential to create the equivalent of a "real estate bubble" in tertiary education, and Ingresa should guard against this.

Ingresa's supervision should also assess the role of TEIs in promoting a culture of communication with lenders and repayment among students, and in complying with reporting requirements to verify student-provided information.   Work on this front has already begun: Ingresa recently requested bids to build out a robust monitoring and auditing system. To the extent this system applies for all aid rather than for just the CAE program, it will be more consequential as it is more administratively efficient.

v.   Outsource Collection.

The recommendations in this chapter propose a variety of approaches to outsourcing collection of student information and repayment. Options vary from having all collection outsourced to specialized collection agencies to having only some proportion outsourced when banks prove

incapable of handling this task efficiently. Regardless of the final decision, a centralized entity with a single national loan program would likely have greater market power and supervision leverage. Work in this area is underway: Ingresa recently hired a specialized loan collection agency to redesign the loan collection process.

vi.   Coordinate Domestic and Foreign Graduate Assistance to Tertiary Education.

Although outside the scope of the report, it is worth considering what economies of scale and efficiencies in savings could be gained from consolidating the administration of undergraduate and graduate assistance programs (i.e. Becas Chile or other scholarships for graduate research and training).

B. Maximize Repayment

A straightforward way to increase the financial viability of the CAE program is to promote the highest possible level of loan repayment by borrowers. Government stakeholders (Ingresa and the Ministry of Finance) can influence repayment behavior directly through the management of the program, and stakeholders (TEIs, Banks, Students) can be incented to adjust their behavior to reduce the likelihood that borrowers default. The most effective ways to increase repayment are listed below and explained in turn.

- Track and keep in contact with borrowers;
- Ensure borrowers understand they have a loan that must be repaid;
- Facilitate repayment;
- Create consequences for defaulters;
- Incent stakeholders to minimize default; and
- Track and proactively manage student debt burdens.

i.   Track and Keep in Contact with Borrowers.

A first step in preventing default is knowing where each borrower is and how to contact them. Since 2009, CAE borrowers are asked to update their contact information when they renew their loan. For those to whom this change did not apply, additional efforts must be made to secure their information. Ingresa should make a concerted push to update its records and touch base with each beneficiary. This will enable Ingresa to implement all the other recommendations listed here.

Contact should be made at least twice a year with each beneficiary. Ingresa may wish to contact beneficiaries more frequently as they enter their repayment period. Monthly messages can easily be sent to graduates reminding them payment is due. Simple, low-cost experiments should be run to see which form of communication—text message, e-mail, printed letter and/or phone call—and which message content is most successful in increasing repayment.

ii. Ensure Borrowers Understand They Have a Loan that Must Be Repaid.

High repayment rates depend on borrowers understanding the nature of their obligation and the terms of their loan. If borrowers are unable to easily track their commitment to the program, they are unlikely to meet those obligations. There are many ways to make expectations more transparent to student borrowers; it is critical that they be rapidly implemented. The upcoming roll out of a massive marketing and information campaign aimed at beneficiaries who renew their CAE loan should be helpful in this regard.

Make Loan Balances Transparent
Ingresa should coordinate with the banks to provide an alternate means for students to track their loan balances, expected monthly payment levels, and expected payment schedule. Though these are all functions the banks themselves should fulfill, the massive potential liability of default guaranties should provide adequate incentive to the Government to commit whatever funds may be necessary to create a contingency information clearing system.

Remind Students of the Terms of Lending
Ingresa should coordinate with the Banks and TEIs to develop a system to annually remind renewing students of the future requirements of their CAE loan. At present, the many-year lapse between the signing of the loan and the first date of repayment makes it easy for a student to forget the terms of the lending, and creates potential issues in finding borrowers when their repayment term begins. The annual renewal process presents a natural point at which students could be required to demonstrate a grasp of their commitment to their CAE loans and update contact information.

Inculcate Payment Behavior Prior to Graduation
CAE should require a nominal monthly payment from the inception of the loan until the first date of "real" repayment as a condition of renewal. For many years, Colombia's Icetex required this "culture quota" of its beneficiaries. By forcing students to participate in repayment prior to the actual repayment of the loan, Ingresa can expect students to more clearly understand the nature of their obligation both with respect to the non-grant nature of the product, as well as the actual financial process involved in paying down the balance. Creating the habit of repayment is key: in a study regarding student loans, it was concluded that repayers borrowed more frequently and had a greater debt than borrowers in default.[22] Practice makes perfect.

Institute "exit interviews" upon graduation
Upon graduation, TEIs should conduct mandatory "exit interviews" for borrowers to ensure full understanding of future repayment obligations, repayment start dates, and repayment mechanisms, among others. Borrowers should also be made aware of the consequences of default and the options available to them if their debt burden becomes too onerous.

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[22] Dolores Cross, "Student Loan Payers and Defaulters". December 1984: 1

**Box. 1 Elements of a Strategy for Creating a Culture of Repayment and
Reducing Default Rates**

1. Maintain comprehensive and accurate contact information from students
   a. Collect and maintain cell phone and email as well as physical addresses for borrowers;
   b. Collect and maintain addresses of borrowers' relatives and family members;
   c. Ascertain whether TEIs are required or willing to share student contact information;
   d. Emphasize obligation to stay in contact with lender during grace period after graduation;
   e. Collect and maintain employer contact information once students are employed;
   f. Verify cell phone and email contacts through robo-calls, automatic emails and websites, and by other technological means; and
   g. Institute mandatory "exit interviews" for borrowers, conducted by TEIs, to ensure full understanding of future repayment obligations, repayment start dates, etc.

2. Institute registration payments ("quotas") as a means to habituate repayment behavior
   a. Publicize early-on that borrowers who do not pay quotas will be disqualified;
   b. Nominal amount for quota -- $5000 pesos or less – and incent up-to-date contact information by reducing or forgiving quota payments;
   c. Combine quota payments with financial education, providing credit counseling to borrowers who are delinquent with quota payments; and
   d. Analyze quota payment behavior as a potential predictor of loan repayment behavior.

3. Facilitate repayment
   a. Provide for automatic monthly payments linked to borrowers' bank accounts as specified in the terms of lending; and
   b. Provide other straightforward mechanisms for repayment, including web-based, credit-card, or call-center repayment.

4. Incent Desired Behavior
   a. Provide appropriate "discounts" for borrowers who scrupulously maintain contact information or whose contact information is regularly verified as accurate;
   b. Provide other discounts to incent good behavior, including for registration for automatic monthly payments, for providing contact information for extended family members, and for borrowers who "induce" other borrowers (friends and colleagues) to use automatic payment, web updates for contact information, etc.
   c. Provide incentives for TEIs who share borrower information with banks and Ingresa, and who undertake comprehensive activities aimed at creating a culture of repayment.

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iii.   Facilitate Repayment.

Making the repayment process as easy as possible for borrowers to navigate should boost repayment rates. If students have to expend effort for the privilege of giving away their earnings, they are less likely to do so. Hurdles to repayment should be lowered as much as possible; there are a number of ways to do so, and these should be implemented as soon as possible.

Make Access to Direct Debit Mandatory

Ingresa should revise the terms of the contract such that banks are compelled to offer direct debit to all borrowers, not just at their discretion. If students are required to physically visit a bank branch to make their payment, their time effectively becomes a secondary cost in addition to whatever payment is made. Direct debit from borrower's accounts allows the student to expend minimal effort in repayment.

Develop Infrastructure to Allow Paycheck Withholding

Ingresa should ensure its systems can accommodate registration of borrower's employers, and that its systems can facilitate withholding from borrowers' future paychecks. The easiest methods of repayment are those which require no work, and routing money for repayment prior to it even entering the account of a borrower requires no effort on the part of the borrower.

Encourage Registration for Withholding

Ingresa should ensure that students know that the withholding option exists, and encourage them to sign up for it. By providing information to advertise to and guide borrowers through the registration for withholding process, Ingresa can likely steer borrowers into a system likely to maximize timely repayment. To ensure withholding is possible, Ingresa should require all students to report their employer information and/or give Ingresa permission to request it from the Tax Authorities.

iv.   Create Consequences for Defaulters.

Borrowers who enter the repayment period and fail to make good on their obligations must face consequences. If there is no drawback to not paying, the program will rightly be perceived as a grant program, and default rates will increase. By having a rational, effective, and prepared system in place to deal with defaulted students, the Government can reduce future default levels.

Responsibility for Default Collection must be clarified

The Treasury Office in the Ministry of Finance must be unambiguously legally empowered to collect debts from defaulted borrowers. At present, the statute lacks clear authorization for the Treasury to collect from defaulted students. The legal basis for collection through the Treasury must be firmly established.

Systematize Collection from Defaulted Borrowers

The Treasury Office should establish a streamlined process to ensure collection from defaulted students. Because of the complex system of guaranties, at present it is unclear which entities (TEIs/Banks/Treasury) are responsible for collection from defaulters, and what the disposition of any collected funds must be. A general process for collection should be outlined, structured such that all entities receiving funds from defaulted students defray the costs of collecting those funds.

Collect from Defaulted Borrowers

The Treasury must pursue recovery of funds from defaulted borrowers. If borrowers are able to elect not to pay, and face no consequences, there is no rational economic reason not to do so.

If borrowers know they will undergo an unpleasant collection proceeding that will ultimately result in the collection of their debts, they become less likely to default in the first place.

Ensure Defaulted Borrowers Face Consequences:

Student borrowers who fail to repay should be reported to DICOMM, and should be alerted in advance that this is a consequence of non-repayment. Future deprivation of credit access is a serious disincentive to default. Ingresa should, in annual reminders, alert students to this consequence of non-repayment.

Renegotiate Terms for Hardship Defaulters

Collection can be maximized by defining in advance a system to deal differentially with elective defaulters vs. hardship defaulters. If a borrower lacks sufficient income to meet their repayment obligations, the Treasury should be empowered to maximize future collections through alternate mechanisms. Ingresa and the Ministry of Finance should define a collection mechanism to maximize recovery; an income contingent withholding system may be most effective. Other mechanisms are explained later in this section

v.   Incent Stakeholders to Minimize Borrower Default.

The Government can influence system stakeholders (TEIs, banks and students) to indirectly increase repayment rates. Two ways of doing this are:

- Creating disincentives for behavior that increases default; and
- Creating positive incentives for stakeholders that reward behavior that reduces the likelihood and cost of default

Each of these is explained below.

Penalize TEIs for high student default rates

TEIs with high default rates should be made to bear additional costs. Though the structure of CAE does not allow that to occur on a direct basis, TEIs can share risk through other means. The default guaranty requirement for institutions with low borrower repayment levels should be increased. If this proves an insufficient incentive to improve borrower behavior, TEIs should be denied future access to CAE funds. Right now, Ingresa entertains this possibility.

Ingresa may exclude a TEI from the CAE system if its beneficiaries' default rates are two and a half times higher than the average CAE default rates. Because the number of graduates who have entered repayment is a tiny fraction of the whole, Ingresa has not yet taken advantage of this. Ingresa may consider lowering the default threshold if the worst performing TEIs prove to be comfortably below it. Alternately, Ingresa may consider moving from an absolute threshold (two and a half times the average) to a mechanism that considers the distribution of default rates by institution. At present default rates, an institution would need to have near-total default to be excluded. Moving to a distribution dependent system where institutions well outside the distribution were warned and then penalized may be more sensible across a range of default rates.

Actual institutional default rates should be closely tracked, and the specific criteria for exclusion from CAE should be frequently revisited in light of the data.

Reward TEIs for low student default rates

TEIs with better than average borrower default rates in concurrent cohorts should be rewarded with lower default guaranty requirements. Lower guaranty requirements effectively lower the cost of CAE to those TEIs. Further, an aspirational low lifetime default rate in the single digits should be encouraged, and institutions that can meet it over a multi-year span should have their default guaranty lowered even further. This would create a positive incentive for TEIs to teach consistent repayment behavior.

Ensure TEIs carefully monitor students

TEIs should be provided guidance in lowering default rates; an effective way to do so is to know where borrowers are by maintaining updated contact information at all times. In the event of default, up-to-date contact information is more likely to yield some recoverable funds with considerably lower costs.

Oblige TEIs to educate students about their repayment obligations

If the TEIs provide information of obligations of CAE borrowers, they become one more voice making clear to students what they must do. If students are able to easily understand their obligations with little effort, they are more likely to repay.

Ensure banks carefully monitor students

Banks should require contact information to be updated on an annual basis, so that at the time of repayment, they can easily contact the student in case of non-payment.

Penalize banks for not keeping student records up to date.

Going forward, the banks should not be paid guaranties for defaulted borrowers they have not kept current records on. This would create a significant incentive to banks to track borrowers over their educational span; Ingresa should carefully consider how best to facilitate this tracking to minimize the costs to the system. Though this may increase costs to the system, it is unlikely to rival lack of student repayment in magnitude.

Rescind the collection rights of Banks that fail to collect

Going forward, collection should be put up for bid to entities that are incented to maximize collection and are significantly rewarded for performance. Because the banks accrue the mark-up payment during the study period and not on an ongoing basis as the loans move through repayment, they have little ongoing incentive to collect from CAE graduates, particularly if they manage to extract a high mark-up for their efforts.

Reward students for staying in contact with Ingresa

Students should be able to directly update their contact information, educational status and employment status through Ingresa, and could be rewarded for doing so through nominally lower fees. CAE would benefit from Ingresa having an up-to-date information stream directly from the students. In cases where students withdraw from a TEI, alerting Ingresa to that fact

would allow partial refunding of the tuition for the year, lowering the ultimate cost if the student should drop out and default. The lower debt burden realized from reporting the change in status should function as a positive incentive.

vi.   Track and Proactively Manage Student Debt Burdens.

Though an analysis of debt burdens suggests that monthly payments will not exceed 50% of a borrowers income, borrowers with relatively low incomes may still find their payments to be significant burdens on an absolute basis. We encourage Ingresa to explore mechanisms for loan renegotiations for hardship on a more nuanced scale than the simple 50% figure. High income borrowers may find that 30% of their income is insignificant; for lower income borrowers making 300,000 pesos, a thirty percent debt burden will reduce their income to minimum wage. Ingresa should be aware of these issues, anticipate them, and develop a means to resolve them.

Allow students flexibility beyond a 50% payment/income ratio:
Having a binary threshold for suspension of payments increases the likelihood that students struggling to meet their obligation will eventually default. Program recoveries may be increased if terms are renegotiated for those struggling with repayment, potentially by way of an income contingent loan that allows greater percentage recoveries at higher income levels.

Avoid Creating Unsustainable Debts
Potentially withholding CAE loans to students in high tuition and low income study areas may be an effective way to obviate these issues. If the labor market outcomes for certain study areas are insufficiently positive to support the cost of tuition, students are more likely to enter default. We encourage Ingresa to explore the feasibility of tracking labor market outcomes and either not funding, or adjusting the amount of the Tuition Reference they are willing to fund for programs likely to lead to low repayment outcomes.

The *Futuro Laboral* data in Annex 10 is explicit about the labor market outcomes for some institution and degree programs with CAE students. Unfortunately, this data is not public. If it were, students would be better able to evaluate the value proposition of tertiary education, and some TEIs would likely have to increase their quality or decrease their tuition in order to retain current students and attract new ones.

Consolidate and Monitor Debts of Transfer Students
Though proportionally small, transfer students accrue multiple debts prior to entering repayment. Given the high proportion of repayment to income for students who haven't transferred, it is likely that students transferring into lower expected income programs are likely to eventually default. CAE should withhold further funds from students transferring into high debt burden programs, as those debts are unlikely to ever be recovered.

Monitor the debts of dropout students
Today the repayment period of CAE beneficiaries who drop out automatically halves. Ingresa should closely monitor debt burden of dropouts to ensure it stays at manageable levels. If students drop out towards the end of their degrees, they are likely not to get a salary premium

for the time studied and will have a hard time paying back their loan, even without a reduced payment window.

C. Reduce Costs by Optimizing Origination

Optimizing the capital committed to CAE requires using funds more efficiently. This would allow the same ongoing outlays to create even more value, or alternately, would allow those outlays to be reduced while creating the same value. The Government spends money both in purchasing loans from banks (an investment) and in paying the mark up associated with origination and/or its guarantee commitment (a cost). The recommendations seek to reduce both types of outlays, while recognizing that the Government may have reasons to prioritize one type over the other. The overall lowering of capital commitments can be accomplished by:

- Adopting the aid coordination recommendations made in this report;
- Increasing competition in the CAE loan market;
- Improving the loan auction mechanis;
- Controlling the size and composition of the Government's loan portfolio; and
- Reducing liquidity constraints.

The costs to the Government associated with origination and servicing of loans have significant room for improvement. However, the Team notes that outcomes from the most recent auctions (both of the 2010 cohorts) show things to be moving in the right direction. The international financial crisis of 2008/09 impacted CAE's costs, and it is difficult to separate those effects from correctable structural deficiencies in the CAE program design. The recommendations here pertain to the latter, though it should be kept in mind that in the absence of the former, overall costs would likely have been lower.

i. Adopt Aid Coordination Recommendations.

This chapter recommends measures to coordinate all publicly-provided aid to tertiary education. Adoption of these recommendations will have a variety of consequences. A principal consequence will be the reduction of outlays for loan origination (as overall aid targeting improves), and the likely decrease of default rates through better overall management of borrower debt burdens. Both phenomena decrease the cost of the CAE program to the Government, while increasing its effectiveness.

Better coordination of aid will also directly reduce some of the capital requirements of the CAE program. At present, recipients of CAE loans may receive other types of government aid. Because the timelines of the aid programs vary, a student with an initially high CAE loan balance may, upon receipt of other government aid, immediately have their balance paid down. While this appears to be a simple case of inefficiency, it actually has significant implications for the total program cost. For loans bought back by the Government, the mark-up is paid on the initial balance. Coordinated aid would reduce those balances, and thus CAE costs.

ii.   Increase competition in the CAE loan market.

CAE's auction mechanism strives to create a market price for loan provision that reflects the actual capital costs of origination and the operational costs of servicing. In an ideal world, that market price would reflect the marginal cost to the banks of providing these services. In reality, market structure and dynamics influence price, and can lead to large divergences between price and costs. In the case of CAE, the market price falls somewhere between marginal cost and an expected price driven by the bidders' assessment of the Government's willingness-to-pay and expected auction behavior of other participants.

Auction participants know that the Government is required to sell the entire portfolio of loans for a given year's cohort at auction, and under strict time pressures.   They also know the Government has ample resources to dedicate to the program, faces a political cost if it limits access to the program, and is legally barred from originating loans. These dynamics lead to divergence of bid prices from marginal costs toward a best assessment of the highest price the Government will pay.

Moving bids back down toward marginal costs should be a main goal of the Government. Four actions will increase competitiveness by raising the number of bidders: (i) changing the definition of eligible participants to allow investment houses, pension plans, and insurance companies to bid along with banks and officially recognized financial entities; (ii) lowering the costs of participation by providing free "public goods-style tools" to all bidders, such as Ingresa-developed software for loan management or other IT platforms, that can be shared rather than developed individually by each successful bidder; (iii) changing the auction schedule to increase the time between the auction and the date when loans must be originated, so that banks who win have more time to design and build the infrastructure needed to originate and service CAE loans; (iv) stabilizing the rules and regulation of the programs to minimize the changes to loan administration from one cohort to the next.

Numbers (ii), (iii), and (iv) above make bidding a more straightforward and attractive proposition. Bidders will save by not incurring duplicative investment costs in systems and will face lower logistical barriers to participation [as per (ii)]. They will be able to more efficiently deploy their capital regardless of their success in the auction [as in (iii)]. Finally, by stabilizing program regulations over several years of CAE cohorts, banks can use similar procedures and systems from year to year to manage several portfolios.

At present, whenever regulations change, managing a new CAE cohort requires banks to incur new system costs to account for the differences of that cohort from its predecessors. Economies of scale are not possible to realize with frequently changed program rules. We recommend that changes to the program be clustered in larger "packages", and that Ingresa announce that changes will occur only every third year. This would allow banks to realize the economies of scale through recommendation (iv) above, and price those savings into their bids.

iii.   Improve the Auction Mechanism.

Increasing the number of auction bidders is a necessary but not sufficient action for driving bid prices toward marginal costs. To the extent that structural defects favoring bidders or incenting inefficient behavior remain in the auction, prices may remain high.

As currently structured, the auction favors bidders because they know that the Government must sell the whole portfolio quickly, has deep pockets, and cannot originate loans. We recommend three lines of action to improve the auction mechanism:

- Creating Government ability to control or vary the proportion of the portfolio sold to banks;
- Enhancing the Government's ability to separate the origination and servicing functions; and
- Moving to more flexible auction procedures.

Increase Government control over loan supply
CAE's legislation prevents the Government from originating loans, despite its access to very low-cost capital. This obligates the Government to accept the results of the auction, even when it considers bid prices to be excessively high. Selling the portfolio at these high prices may create a self-inflating price cycle, as winning prices are known to all participants, and will inform future bidding strategies. Thus next year's bidders seek to move the prices even higher based on their awareness of the Government's lack of alternatives.

Banks who bid below the highest accepted bid regret that they did not price higher, and may make plans to do so the following year. One hopes the high prices attract additional bidders to create countervailing pressure on pricing (and some evidence suggest this has occurred recently). However, the main dynamic in pricing is the captive relationship of the Government to the private banks. Without improving the auction structure, prices are likely to remain well above the marginal costs of loan origination and servicing.

At present, though the Government does not nominally originate any of the loans, its purchase of a portion of banks' portfolios results in effectively the same outcome. If the Government had the explicit authority to originate loans itself, it could effectively control the supply of loans to the auction to attain more favorable pricing. The value of having private capital originate portions of the loan portfolios should be determined; bids priced higher than the value they provide should not be filled, and the Government should originate those loans itself.

This would have the effect of setting a reservation price range, which would at least cap bids at some maximum level. The Government would need to be prepared to hold a substantial portfolio of own-originated loans, but by definition, if the bid-in expense of private origination is significantly higher than the value provided to the Government, the overall program costs will fall if those bids are not awarded loans. However, this would require changes to CAE's legislation

and the Team is uninformed of the political implications of this. Additionally, the cultural impact on repayment of expanded Government lending should be carefully weighed.

Separate loan servicing from loan origination

Ingresa is creating an option to outsource loan servicing and collection to specialized non-bank agencies. This is in keeping with best international practice and is likely to have several salutary effects on the portfolio. First, it is likely to improve servicing and collection efficiency. Banks, which are currently exposed to maximum losses of 10% on the loans they hold and no losses on the loans they service for the Government, are not incented to be efficient loan servicers or collectors. In fact, the economically-rational course for banks may be to do the minimum to collect in hopes that massive early defaults will trigger rapid repayment of 90% of loans by the Government through the guarantee mechanism. Together with mark ups paid, this 90% would likely secure a sufficient profit while rapidly returning capital for new lending. There is no incentive to incur any costs to collect on the Government-owned loans.

The lack of incentives to collect on the Government's part of the portfolio can be fixed, to the extent that Ingresa can transfer collection from the banks to a more efficient specialized collection agent. To further incent collection, or penalize lack of collection, Ingresa should plan to create efficiency benchmarks for banks which, if not met, could trigger transfer of the collection function to collection agencies. We recommend moving forward vigorously with outsourcing of collection because:

- it stands to increase collection efficiency through the elimination of perverse incentives for banks;
- it may increase efficiencies through economies of scale and through comparative advantages enjoyed by agencies devoted exclusively to a narrower aspect of the loan process; and
- it will more clearly reveal the costs of collection distinct from the other costs rolled into the banks' bids.

In addition to outsourcing collection for banks with an established record of substandard performance, the Government may wish to separate the origination and collection functions altogether from the beginning. By creating the option to bid out collection separately from origination on the Government portfolio, collection could be assigned from the beginning to the lowest-priced qualified bidders. This would generate direct savings, and have the double effects of revealing collection prices and driving bids toward those prices. As mentioned before, unbundling collection from origination would allow for clearer competition on both functions, instead of the current approach which can lead to obscured costs.

Indeed, as part of legislative changes to CAE, the Government may wish to create the right to separate origination and collection from any part of the portfolio. This would allow the Government to auction origination separately from collection on all loans. The effect might be to create two more specialized actors: financial institutions who originate loans and collection agencies who service them. Such changes would require strict definitions of the scope of both

origination and collection, but stand to increase the auction options significantly.   Under an optimized scenario, the Government might see three types of bids: from banks that want to originate and service loans, from banks that want only to originate loans, and from banks and other servicing providers who want only to service loans.   Faced with a greater diversity of bids, the Government could choose the top bidders in each category such that overall costs are driven down.

Change Auction Procedures: Uniform Marginal Clearing Price Auctions
Currently the Government holds a single-round, closed bid auction in which identical packages of loans are sold to the lowest bidders at different prices. The lowest bids are matched to the number of packages, and each winner receives the package at the submitted bid price. When the number of bidders and other factors create high levels of competition, such a mechanism may work well. But other auction structures may also hold advantages. We recommend the Government study the modification of bidding procedures to optimize pricing.

In the current structure, because participants are paid at their bid, there is a strong incentive to avoid being underpaid relative to other participants. There is no reward for pushing bid prices closer to the marginal cost of originating a portfolio of CAE loans. Instead, participants with low bids review the results, and see that they have agreed to provide the same set of services as another participant that has gotten a much better price. The incentive is to avoid that outcome in the future, and bias bids upward. Historical bid price variation from 2006-2008 reflects this outcome, with winning low-bid participants returning with much higher bids in future years.

One way to fix this misdirected incentive and encourage bid prices to reflect marginal costs is to base a uniform award price for all clearing bids on the marginal clearing price. Because all bidders receive a uniform price for providing the same service, the incentive to bias future bids upward is avoided. Instead, bidders are incented to bid around their costs plus whatever profit levels they require, safely knowing that if they can provide their services at a lower cost than CAN other market participants, they will be rewarded for that lower cost with a larger margin. In the long term, this will incent competition around costs, not around ability to divine the likely auction clear price and then cluster bids at that level.

The uniform marginal clearing price mechanism is employed in a variety of auctions, including those for U.S. Treasury bonds, as well as across many energy markets. Concerns arise with marginal pricing in cases of markets that are prone to manipulation; if a handful of participants can collude to set price at a favorable level, the seller realizes a bad outcome. For this reason, marginal clearing price auctions are unlikely to be appropriate unless the competitiveness of the market can be increased. However, some concerns of manipulation can be decreased by varying the supply in an auction.

Manipulation of marginal price requires the bidders to coordinate their bids (more difficult if there are many bidders), and to know with a high degree of certainty how much the seller wishes to sell. By increasing uncertainty around the latter, the Government can frustrate attempts to game the auction. To the extent that the Government is given authority to self-originate a portion of the

auction, it already has some control over the amount sold, and can match that amount to competitive bids. As illustrated in Figure 18, a small variation of supply has the potential to lead to a large price change, depending on the bids of auction participants.

Figure 18. Effect of Supply Variation on Marginal Clearing Auction Price
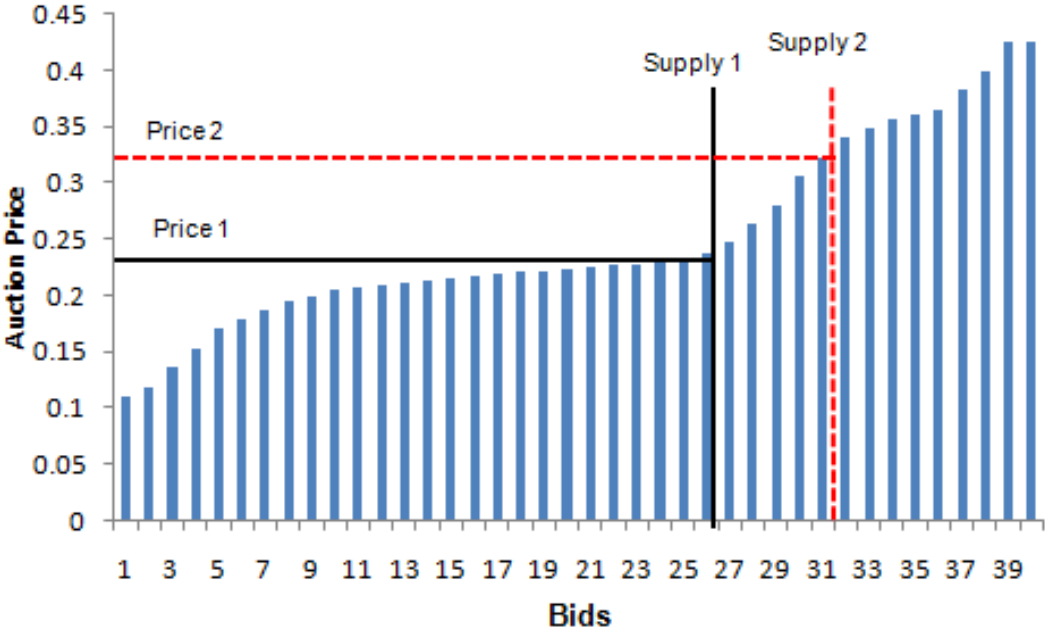
Source: World Bank Team analysis

Alternately, the auction could be held across several rounds, with the actual amount to be transacted in each round left unclear for participants. The Government can then analyze the bids of a round, and decide how much of the portfolio to auction in a given round. It is expected that bids will display two different profiles: cost-driven bids and opportunistic bids. By cutting off supply in a round as the bids become more opportunistic, the Government can secure favorable pricing. A multi-round auction would also have the virtue of allowing for some degree of price discovery. Bidders that miss out in early rounds are incented to move their bids closer to the marginal clearing price. This should result in flatter bid curves and ultimately, in more advantageous pricing.

Examining the bids from the 2010 auction suggests that the immediate effect of implementing a uniform marginal price mechanism would be to increase auction costs slightly. Going forward, with participants' incentives directing their bids closer to marginal costs, auction costs would be expected to fall much closer to the true cost of originating and servicing portfolios.

iv.   Control the size and composition of the Government's portfolio .

The Government is incurring more costs than necessary because it accepts bid prices and then concedes the right to banks to sort the package into two subgroups: one they retain and one

they sell to the Government.   The mark up to be paid on the Government-owned loans has already been established by the accepted bid when sorting is done. Since the mark up is paid on each yearly installment (renewal) of each Government-owned loan, banks can maximize their profits and minimize their exposure by keeping all the short maturity loans and selling back to the Government all the long maturity loans (with correspondingly higher total mark up costs due to their longer duration).   This is a pure additional cost to the Government that brings no discernable benefit except to the banks' profit margins. Additionally, this cost is not currently captured in the auction pricing; equivalent bids, depending on how the portfolios are sorted, may have entirely different total costs.

The Government could change the way it pays the mark up, and thereby reduce its costs. For instance, if it paid the mark up not on Government-owned loans, but on bank-owned loans, banks seeking higher mark up payouts would be incented to hold more and longer maturity loans. The Government's cash outlays would decrease, and its overall obligations might— depending on the exact mark up and the repayment profiles—decrease as well.   Many different options exist; any changes should allow the mark up to be a lever for creating the type of portfolio the Government seeks, rather than the windfall it currently can be for banks.   The Government's priority for the type of portfolio it wants will be conditioned by the different accounting categories of mark up (expense) versus loan (asset), and so the way it uses the mark up may vary according to the balance of expenses and assets it seeks in its portfolio.   If the use of the mark up is changed, it is recommended that changes be instituted on the same 36 month calendar recommended for other administrative changes to the CAE.

v.   Reduce liquidity obstacles.

The report has noted that banks have high reserve requirements for CAE loans because of their risk category classification.   It makes little sense for an asset with a 90% guarantee to be categorized as a high risk vehicle, as a CAE loan presently is. The move from Basel I to Basel II regulations should eliminate this problem, but this move may be five or more years in the future. Legislative revision of the loans status could move loans from Category 5 (high risk) to Category 2 (low risk) with a corresponding significant decrease in reserve requirements. This would be a desirable change, and would improve the capital allocation consequences of participating in CAE.

Likewise, the eventual securitization of CAE loans will create a means for more rapid restitution of funds for banks that have originated CAE loans. A liquid market for a securitized product would increase the liquidity profile of the banks that participate. CAE loans could be moved off the books of the banks and the Government and sold to savers who seek their combination of risk and return.   Ingresa and the Government are aware that a certain depth of historical information is required to foster optimal market prices for the sellers of securitized loans.   The Report Team endorses the existing plans to bring securitized CAE loans to secondary markets when those conditions are in place. If participants that bid into the auctions are confident that they can manage their capital burdens in part through a securitization market at favorable pricing, their perceived liquidity costs will be lower.

The liquidity savings that these recommendations foster should be passed on in part to the Government in the form of lower cost bids for purchase of loans.

Box 2. Legal Changes Suggested to the CAE Law

Change the financing mechanism for Ingresa such that it has a sufficient budget with which to deliver on its responsibilities.

To optimize origination
- Reduce capital requirements for banks. This can be done by specifying that CAE loans ought to be considered part of the Category 2 risk level according to the General Banking Law. This category includes financial instruments originated or guaranteed by the Government.
- Allow non-financial entities to participate in CAE.
- Allow the Government of Chile to originate loans in case unfavorable lending environments arise in the future.
- Confer the Government guarantee currently given to CAE loans to the financial instruments issued in a future securitization process.

To increase repayment
- Specify and allow an entity within the Government of Chile to recover and collect on CAE loans, and to outsource these functions as needed. These activities must also be adequately funded.
- Allow Ingresa to exert greater leverage on TEIs, banks, and students, including imposing additional requirements and punishments as needed.

D. Financial Impact of Recommendations

We estimate that implementing the recommendations enumerated in this chapter would have significant fiscal consequences for the CAE program. Figure 19 below shows the effect of implementing either or both slates of recommendations (Maximization of Repayment, or Optimization of Capital Commitments). Implementation of both slates would allow the program to self-fund, and would significantly reduce the maximum necessary outlay of the unchanged case.

Figure 19. Cashflows associated with CAE program operations, by scenario (millions of UF)
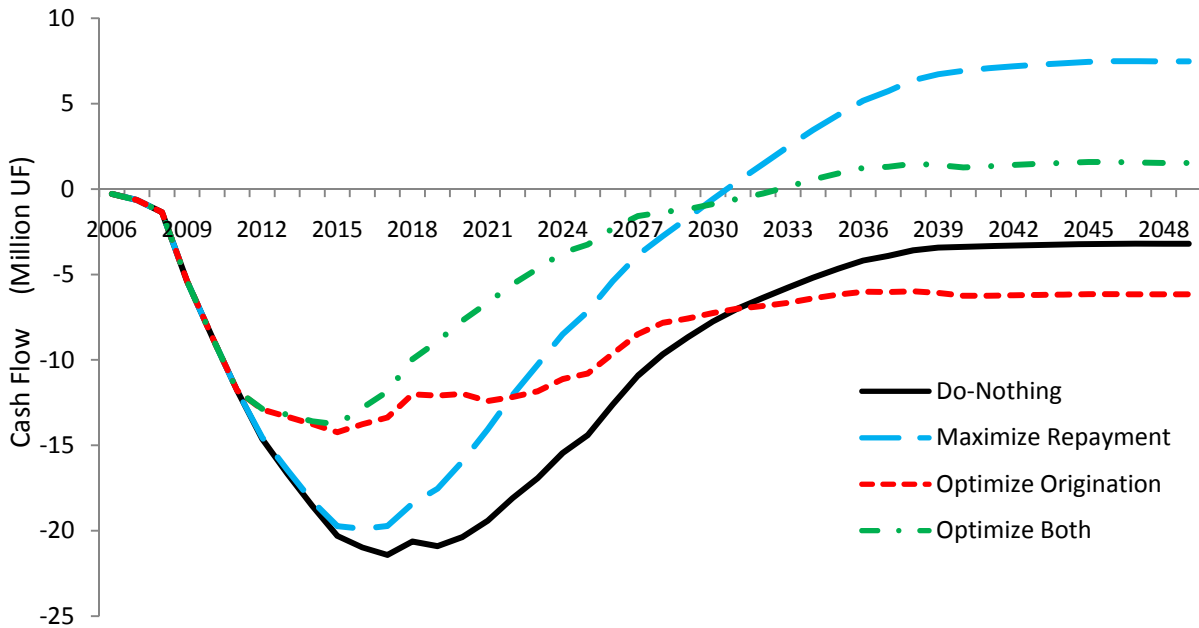
Source: World Bank Team analysis

Table 26. Cashflows associated with CAE program operations, by scenario (thousands of UF)

UF ('000)	Do-Nothing	Maximize Repayment	Optimize Origination	Optimize Both
2006	-280	-280	-280	-280
2007	-640	-640	-640	-640
2008	-1,360	-1,360	-1,360	-1,360
2009	-5,390	-5,390	-5,390	-5,390
2010	-8,640	-8,640	-8,640	-8,640
2011	-11,800	-11,800	-11,800	-11,800
2012	-14,620	-14,530	-12,910	-12,860
2013	-16,650	-16,430	-13,330	-13,210
2014	-18,540	-18,260	-13,760	-13,590
2015	-20,310	-19,730	**-14,240**	**-13,780**
2016	-20,980	**-19,890**	-13,770	-12,810
2017	**-21,420**	-19,720	-13,380	-11,850
2018	-20,630	-18,410	-12,010	-9,960
2019	-20,910	-17,540	-12,090	-8,910
2020	-20,370	-15,940	-11,990	-7,700
2022	-18,100	-12,060	-12,180	-5,570
2024	-15,450	-8,500	-11,120	-3,730

Peak cashflows

2026	-12,610	-5,380	-9,640	-2,310
2028	-9,670	-2,750	-7,830	-1,340
2030	-7,750	-580	-7,250	-880
2032	-6,360	1,470	-6,840	-260
2034	-5,180	3,460	-6,390	570
2036	-4,180	5,180	-6,010	1,240
2038	-3,580	6,370	-5,980	1,480
2040	-3,380	6,930	-6,240	1,280
2042	-3,300	7,200	-6,220	1,420
2044	-3,240	7,370	-6,170	1,530
2046	**-3,200**	7,490	-6,150	1,590
2048	-3,200	**7,490**	**-6,160**	**1,540**

Stable cashflows

Source: World Bank Team analysis

As expected, Optimization of Origination has an immediate and significant impact on the total amount of capital required to fund the program. Because the portfolios held by the Government decrease in size, the maximal outflow can be expected to decrease by nearly 30% from the maximum realized under the do-nothing scenario. However, if the Government holds smaller portfolios, smaller repayment streams accrue in the future, which means that the steady state realized after the program's cash flows stabilize actually becomes more negative.

In the Maximization of Repayment case, just as much capital is expended in the near term, but greater repayments accrue in the future. This leads to the twin effects of reducing the future outflows required in fulfilling the guaranty for the bank portfolios, as well as increasing the future inflows from repayments of the loans held by the Government. Because the portfolio held by the Government remains relatively large, these future inflows actually overwhelm ongoing capital outlays.

If both slates are implemented, both sets of benefits are realized; the program requires less capital in the near term, and quickly requires less funding as robust repayment streams accrue. Because the Government-held loan portfolio becomes smaller than in the Maximization of Repayment case, the steady state is less positive than it would be; that is the trade-off for the lower near-term capital outflows.

Implementing the recommendations would also have significantly positive impacts on the net present value calculations for each incremental year the program operates. It is estimated that though the present value to the Government remains negative at the specified six percent discount rate (a necessary outcome given that the interest rates of the program are less than six percent), implementation of all recommendations would reduce the NPV cost to the Government of each incremental year by more than half. Results are summarized in Table 27 below.

Table 27. NPV of a single year of ongoing CAE program operations, by scenario, in UF

Stakeholder	Base Case	Optimized Origination	Maximized Repayment	Both
Government	-11,758,600	-8,995,743	-6,927,621	-4,975,327
Banks	2,740,983	1,622,264	2,980,064	1,937,700
TEIs	24,946,195	22,338,793	24,810,083	22,252,956

Source: World Bank Team analysis

The model output is simply the result of the set of assumptions and program structure that have been input. This section describes at a high level the inputs to the model for both the base case and the recommendation cases. For greater detail, please refer to the model annex.

i.   Base Case Input Assumptions.

Fifty percent of borrowers default
Approximately 36% of the 2100 graduates who have entered repayment have already defaulted. The behavior of this sample is not expected to diverge from that of the rest of the pool in any consistent directional way. The 36% observed rate is assumed to be a floor from which defaults will only increase. Thus the 50% modeled default rate allows for incremental default over the many remaining years of repayment.

Most default occurs in the first five years of the repayment window
International comparisons (developed from publicly available U.S. data sources) suggest cumulative default rates increase rapidly during the first two years and then begin to descend to stable levels by the fifth year. The actual fraction that occurs in the early years was adjusted upward from U.S. rates to reflect the high initial observed CAE default rates.

Recovery rates from defaulters vary based on TEI type from ~20-50%
These recovery assumptions were based on expectations that defaulters ability to pay would have some correlation with the type of TEI they attended, and that the rates would generally imply a significant loss of the defaulted funds, given the current inability to closely track borrowers.

Two thirds of dropped-out students default
This rate is grounded on the current 45% default rate of dropped out borrowers in repayment. It is assumed that students dropping out will have a harder time finding a means to repay than graduates, leading to a higher default rate than graduates. Additionally, the shortened span of repayment for drop-outs should also lead to elevated rates relative to graduates.

Recoveries from student drop-outs do not exceed 10%
At present, the two year delay between drop-out and default suggests that lenders and collection agents will have a hard time collecting from students that have dropped out because of difficulties locating the borrower. Additionally, even if the borrower can be found, non-payment will likely stem (at least partially) from an inability to pay. Both of these factors lead to an assumption of very low recovery rates from drop-outs.

ii.   Assumptions Shared Between Base Case and Recommendation Cases.

Student drop-out rates vary based on TEI type, and range from 3-8% annually

Actual drop-out behavior from the 2006-2008 CAE cohorts was analyzed and included in the model, by institution type. The drop-out rates vary by year of study and institution type, and reflect directional trends observed from 2006-2008.

iii.   Recommendation Cases.

Changes to the base case inputs are summarized in Table 28 below. Additionally, changes in the underlying logic of the model were made, as were adjustments to the actual balance of loans disbursed. These logic or fundamental changes are described below, along with the reasons for the input changes noted in the below table. For the repayment maximization case, cash flow schedules were assumed to change little for 2006 and 2007, and to only modestly improve for the 2009 and 2010 cohorts, with full improvement only occurring with the 2011 cohorts and future cohorts going forward. Origination improvements were assumed to accrue only on a going forward basis.

Table 28. Key Model Inputs for Base Case and Recommendation Scenarios

	Base Case	Optimized scenarios		
		Origination	Repayment	Combination of origination & optimization
Beneficiaries who graduated				
Default Rates	50%	45%	25%	20%
Default Timing (% occurring in first 5yrs of repayment)	85%	85%	50-65%	50-65%
Default Recovery	20-50%	20-50%	30-75%	30-75%
Beneficiaries who dropped out				
Drop-out Default Rates	65%	65%	45%	45%
Drop-out Recovery Rates	10%	10%	10-25%	10-25%
Mark Up				
% Mark Up	25%	15%	25%	15%
% Total on which mark-up is taken	50%	75%	50%	75%
Marked Up Portfolio	Gov.	Bank	Gov.	Bank

Source: World Bank Team assumptions

Repayment Maximization Case

Repayment maximization depends mostly on the changes noted in the table. Default rates are assumed to come down to median U.S. rates, and the timing of those defaults are assumed to be slightly less concentrated in the first few years of repayment, as is observed in the U.S. data. Recovery rates are expected to edge up as borrowers are better tracked. Drop-out default rates are assumed to fall modestly as borrowers are better tracked, and this drives a modest uptick in recovery rates from those borrowers.

Finally, logic adjustments were made such that dropouts are reported earlier, and student drop-out in the first semester results in a return of tuition for those students from the TEIs to the lenders.

Origination Optimization Case

Origination Optimization implies disbursing capital as effectively as possible. The most significant effects from that optimization are not captured in the above table, and rely instead on adjustments to the balances of loans that are made on a going forward basis.

Through better coordinating aid programs, it is estimated the annual amount paid out to originate loans will decrease, particularly in the cases of IPs and CFTs where the Millennium scholarships result in early payment at present. Additionally, better targeting grants to the neediest students (i.e. not giving Q4 students a generously structured *Fondo Solidario* loan) and offering CAE loans to the less needy should further reduce the loan portfolio originated.

Putting grants in the hands of those least able to pay should reduce the debt burdens of the students with the least familial means; this effect accounts for the mild decrease in default rates from the base case to this case.

Additionally, logic adjustments were made such that the mark-up is paid on portfolios originated by banks, not the Government. This was estimated to reduce the portfolio held by the Government by at least half.

Combination Case

As Table 28 indicates, this case represents a linear summation of the other cases. Though the inputs change linearly, once propagated through the model, the logic functions and model architecture results in non-linear output changes.

Note: Further explanation of the underlying assumptions can be found in Annex 14.

Annex 1: Rationale for student lending

Tertiary education generally has positive economic returns. Tertiary education is a profitable investment for the individual: it provides an opportunity to develop specialized skills and qualifications, opening the way to a wider range of career opportunities, greater employability, higher earnings and improved quality of life. Thanks to their large contributions to the improvement of firms' productivity, highly educated individuals are highly valued in labor markets. In most developed and developing countries, individuals with higher education degrees enjoy substantial wage *premia* and are less prone to experience unemployment spells. For OECD countries, calculations for the private real internal rates of return[23] to upper secondary and university education show that in all countries, it is higher than the real interest rate or the rate of return on physical capital investments. Although with significant cross-country variation, the average private returns to higher education in OECD countries is around 11 percent (OECD, 2010).

For Latin America and the Caribbean, the estimated returns are significantly higher, 19.8 percent on average (Psacharopoulos and Patrinos, 2002).

The increasing complexity of production and the rapid spread of technology are seen as drivers of a global trend of increased demand for highly educated workers. As skill-biased technological change raises the relative demand for tertiary education graduates with respect to less educated workers, wage premiums associated with tertiary education grow, unless the supply of graduates grows apace. In the OECD, the wage premium for workers who complete tertiary education relative to those that complete only secondary education has been rising over the past 10 years and was, on average, above 50 percent in 2008 (OECD, 2010). In Latin America data on wage premia is more difficult to obtain, but some sources indicate that wage premiums for workers with tertiary education relative to workers that only complete high school ranges from 17% in Brazil to 54% in Chile, the median being 36%.[24]

Economic theory predicts that young people will be aware of the increased private returns to tertiary education, and will seek it in rising numbers. This is consistent with decades-long trends of increased enrollment in tertiary education in Chile, in Latin America, and worldwide. Figure 20 illustrates this for Chile.

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[23] The internal rate of return in real terms is the discount rate that equalizes the future flows of real benefits and real costs associated with investment in upper-secondary or tertiary education. In its comprehensive form, the costs equal tuition fees, foregone earnings net of taxes adjusted for the probability of being in employment minus the resources made available to students in the form of grants and loans. The benefits are the gains in post-tax earnings adjusted for higher employment probability minus the repayment, if any, of public support during the period of study. (BlondalOECD2002p59).

[24] Unpublished calculations by Maria Retana de la Peza, World Bank, 2010 based on Brambilla et al., who used data for 16 Latin American countries between 2000 and 2006.

Figure 20. Gross tertiary enrollment rate (%)
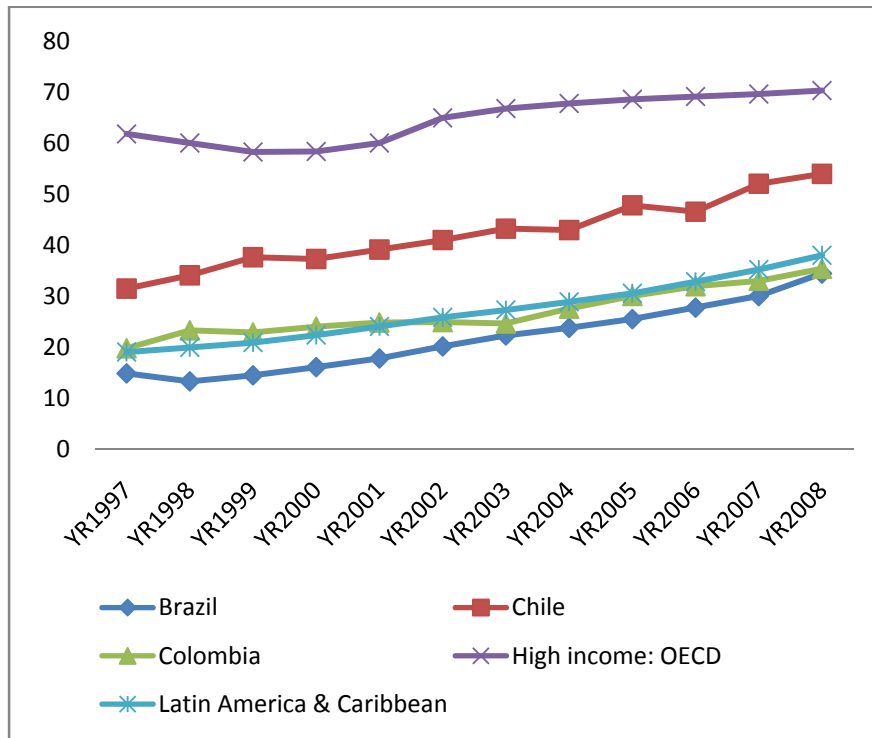
However, obtaining a tertiary degree is not easy. It generally requires: (i) sound intelligence and a willingness to sustain academic effort over a period of years; (ii) high-quality prior education through secondary school; (iii) availability of accessible TE programs in one's area of interest; (iv) ability to forego current income for the period of study; (v) ability to pay the cost of the degree.

Individuals from wealthy families often possess all five characteristics. Hence, they are the first to respond to signals of high returns to tertiary education. When tertiary education enrollment rates begin to rise, new students are typically drawn from upper income quintiles. This was the case in Chile from the 1980's until very recently. As this happens, equity in tertiary education worsens and the prospects of overall equity in society worsen as wealthier individuals disproportionately increase their human capital and earning power.

Governments are charged with maximizing prosperity and ensuring equity. They are concerned that all students who are capable of cost-effectively succeeding in tertiary education should have the chance to do so.   The measure of overall cost-effectiveness would be the present value of the incremental output a person could produce if she obtained a tertiary degree.   To the extent the present value of this sum is greater than the present value of the cost of obtaining the degree, the economy will be better off if the person obtains the degree.   This is the efficiency reason for concern to optimize tertiary education attendance.

Private returns to tertiary graduates do not always reflect increased productivity. In some case, tertiary graduates are merely more adept at finding high paying work but not at producing additional output. This rent-seeking behavior may alter income distribution without growing the economy as a whole. Governments are concerned with the overall distribution of wealth and income, so they are concerned with tertiary education access even when it does not promote economic growth.

In a transparent and risk-free world, efficient capital markets would be expected to make capital available to prospective students whose time-adjusted future income exceeds the time-adjusted cost of capital required to pay for their degrees. Prospective students would barter away a fraction of their potential future earnings as interest payments to owners of capital who provide student loans. The cost of capital reflects the opportunity cost of foregone uses of that capital. Loans should be made until the cost of financing the marginal student's education equals the portion of the expected return the student is willing to give to earn the remainder. In this situation, markets would promote the optimal outcome without any government intervention.

The real world is neither risk free nor completely transparent. The future return is difficult to determine or even estimate with accuracy. Various risks exist: (i) the student will not find a job or be able to work; (ii) the salaries for the jobs for which she has been trained will drop; (iii) the graduate will decide not to pay; and (iv) the real value of the loan will erode. The risks are tied together with a common thread: the lender may not recuperate either capital or the interest payments that compensate for the deferral of use of the capital.

Sometimes, risks can be accurately estimated beforehand, usually based on accumulation of historical data on repayment behavior and a reasonable assessment of the likelihood that future conditions will mirror past conditions. When this is the case, borrowers can simply add a risk premium to the rate they charge for loaning capital.

If the risk- and time-adjusted cost of capital is still below the student's willingness to pay for a loan (based on an accurate perception of incremental future earnings), again the capital markets should clear with no extra-market interventions. However, in practice this rarely happens. Governments sometimes choose to intervene with a subsidy or a guarantee to increase the amount of capital available to prospective students. They do this for equity reasons rather than to optimize economic efficiency. By allocating access to tertiary education to prospective students from poor families, they can improve income distribution and increase social mobility.

Again in the real world, risk is not easy to accurately quantify. Sometimes the problem is asymmetry of information. Prospective students may know their own risk well but may have no means or no incentive to disclose this to lenders. Historical data on repayment behavior may be proprietary or go uncollected. If the problem is asymmetry of information, the most cost-effective intervention will usually be the creation of mechanisms to make information available. Among the options is the subsidization or creation of credit bureaus, or of markets for credit information, or the direct reform of policies that inhibit credit creation.

When it is not possible to make the market "reveal" ex-ante who is a good credit risk and who is not, but the aggregate risk is known, the government can provide a guarantee. Suppose that historical data show that 10% of loans will not be repaid, but it is impossible to determine which 10%. A government guarantee on the amount of lost capital will allow the market to optimize the amount of credit provided. Notice that the government need only provide a "fairly-priced" guarantee—one that makes creditors whole for the losses they cannot avoid through ex-ante due diligence. The provision of such a guarantee should return the price of credit to the market level while incurring the least cost to the government.

The extension of a guarantee by the government avoids two potentially undesirable situations: excessive risk aversion by lenders or a negative externality for diligent borrowers. In the first case, lenders cannot discriminate between good and bad credit risks, so, in the absence of overwhelming evidence of good credit, they do not lend. The result is that many potentially profitable loans will not be made. In the second case, lenders spread the costs of defaults among the students who do repay. Diligent borrowers pay the additional costs created by defaulters along with the real cost of capital for their own purposes.

Banks and lenders often seek to mitigate risk by enforcing payment or collateralizing loans with assets. Poor prospective students often do not have collateral, so the government guarantee of their loan takes its place. Governments may have the means to oblige payments, such as deducting it from wages via the tax system. When this is feasible, it provides a means for governments to force actual costs of borrowing to approximate optimal costs, by eliminating any "unnecessary default." The Government of Australia has used this mechanism for students loans, with reasonable initial success.

In summary, empirical evidence suggests tertiary education is a perennially good investment, but many qualified prospective students lack the means to invest. Governments can seek to make credit markets function better by increasing their transparency with information, obliging payment, or by providing a guarantee when likely loss levels are known but lenders cannot be sure what portion of the losses will fall in their part of the portfolio. These actions will increase the amount of credit until it nears the level that permits all profitable investments in human capital to be funded. Government may also use student loans or other interventions to redistribute wealth or opportunity for the sake of equity and income distribution, without affecting overall economic output.

The preceding discussion has viewed the cost of tertiary education to the student as fixed and implicitly unsubsidized. In reality, it is usually neither. Many governments decide to seek to meet equity goals by subsidizing tertiary education directly, rather than some students' ability to pay for it. This strategy is reinforced by the fact that tertiary institutions often produce important public goods through research, which is often connected to their educational missions. This leads to a situation where governments directly pay for most or all the costs of tertiary education. On average in 2007, 68 percent of expenditures in tertiary education institutions in OECD countries were made by the government, down from 77 percent in 1995 (OECD, 2010).

Table 29 shows public subsidies for education to households and other private entities as a percentage of total public expenditure on education, by type of subsidy.

Table 29. Public subsidies for education in tertiary education (2007)
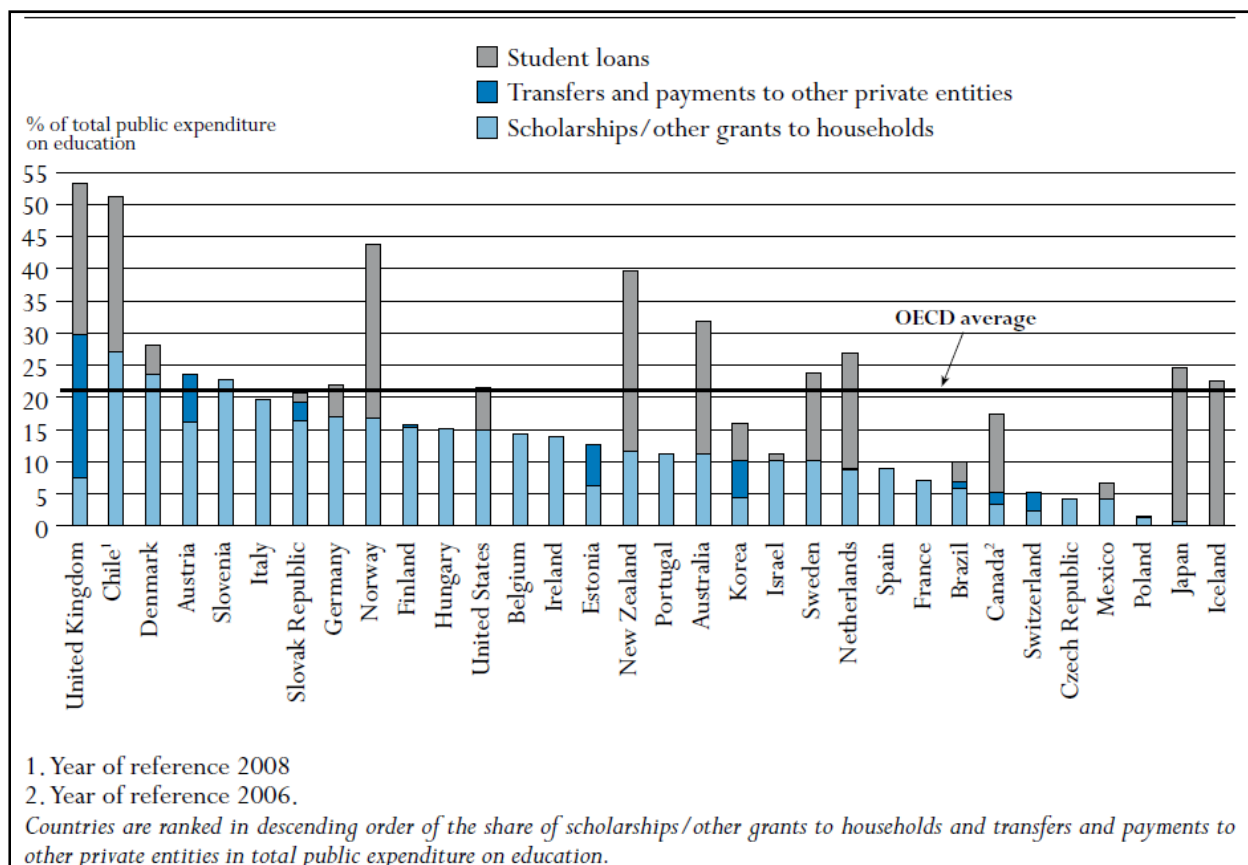
Source: OECD Education at a Glance 2010 (www.oecd.org/edu/eag2010), p. 249

This strategy of direct government provisions has many drawbacks. It tends to unnecessarily subsidize the rich as many qualified students are from wealth families. Also, since individuals who access tertiary education generally reap substantial private benefits from it, financing this investment entirely from the public budget tends to be highly regressive (Chapman2006) because the better off have access to and benefit from a service paid for by all taxpayers.

The large private returns to tertiary education make it possible to seek ways to raise the ratio of private to public contributions. Numerous current practices seek to diversify revenue source and/or decrease shares of public financing. These include tuition fees for public institutions and the proliferation of fee-charging private institutions. The goal of policy should be to raise reasonable revenue from those who can pay. Revenues policy should still allow prospective students to expect their time-adjusted future income will exceed the time-adjusted cost of their education sufficiently to justify the students' effort to obtain the degree.

Chile has been a leader in promoting private contribution to higher education. It is one of the few Latin American countries where public tertiary education institutions (TEIs) charge high tuition fees. While overall spending on tertiary education is roughly in line with average spending by countries with comparable per-capita GDP, the proportion of public to private spending is one of the lowest in the world.

Chile's tertiary education gross enrollment rate increased by twenty percentage points between 1998 and 2008. This increase represented the notable success of rigorous and sustained policy efforts. Four main types of TE institutions exist in Chile (Technical Training Centers, Professional Institutes, Private Traditional Universities, and new private universities: in their Spanish names these are respectively *Centros de Formación Técnica* (CFTs), *Institutos Professionales* (IPs), *universidades miembros del Consejo de Rectores de la Universidades Chilenas* (CRUCH) and *universidades privadas*. As per Figure 21, enrolment grew in all four types of institutions.

Figure 21. Enrolment Growth in Chile by Type of TE Institution (1983 - 2009)
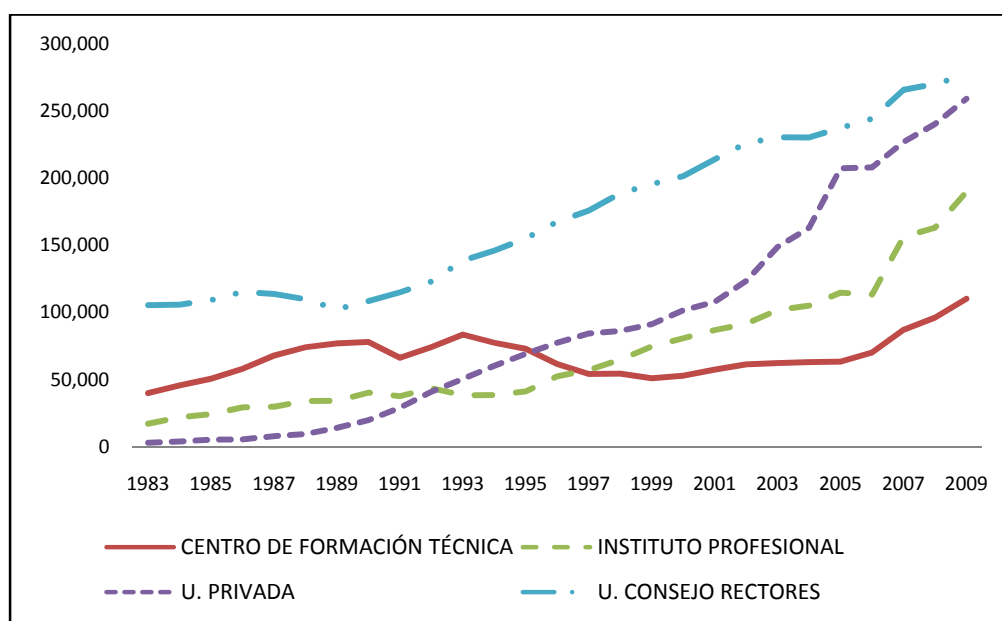
Source: SIES

Enrolment increase came from all income levels. Albeit starting from a low base, enrollment from the lowest two income quintiles grew fastest, increasing by 196% from 2000 to 2009. Figure 22 illustrates this.

Figure 22. Enrolment by Quintile, 2000-2009
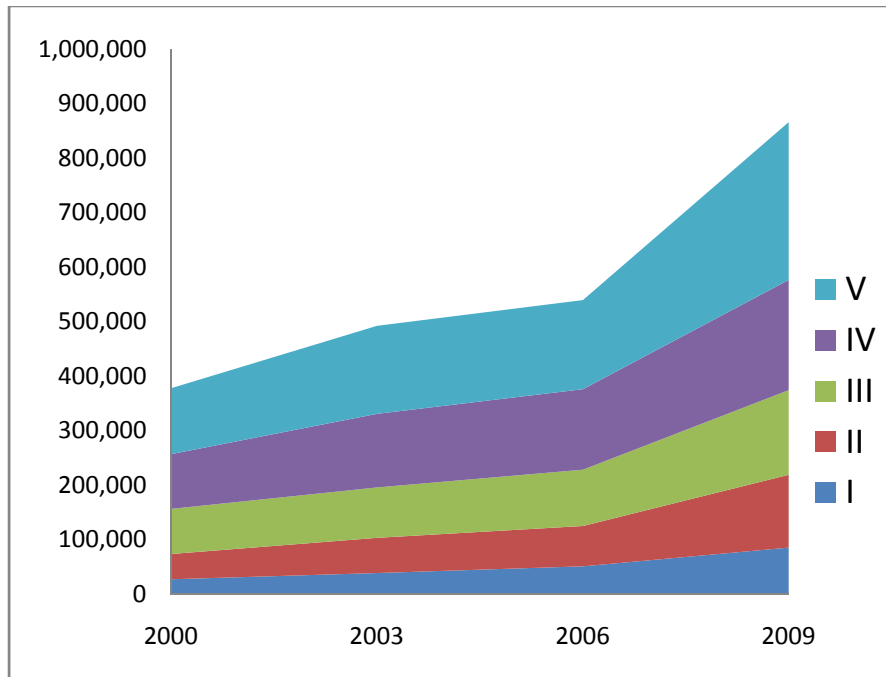
Despite this increase in enrollment by students from lower quintiles, the latter have disproportionately attended CFTs and IPs, while students from higher income quintiles have disproportionately attended universities. Figure 23 and 24 illustrate this.

Figure 23. TEI enrollment by quintile, 2009
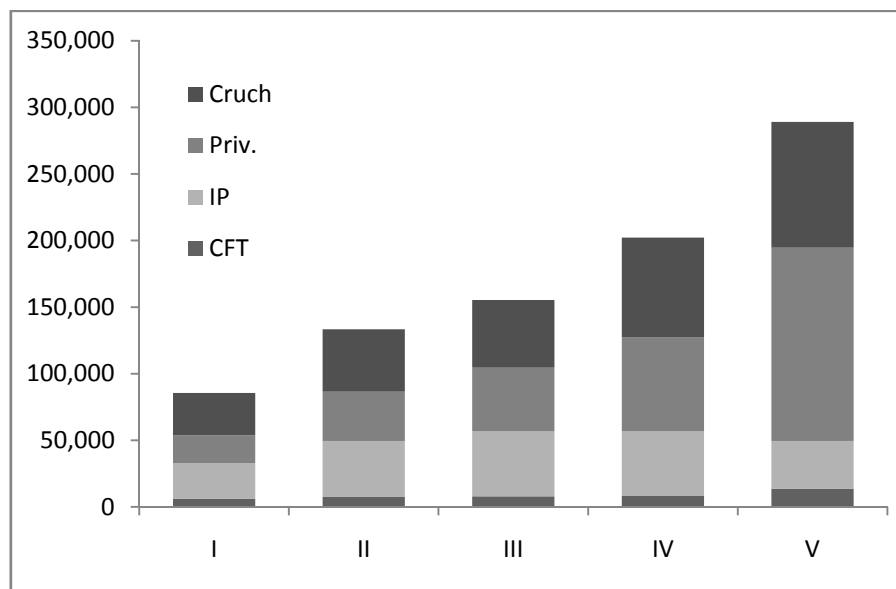
Figure 24. TEI enrollment by quintile, 2009
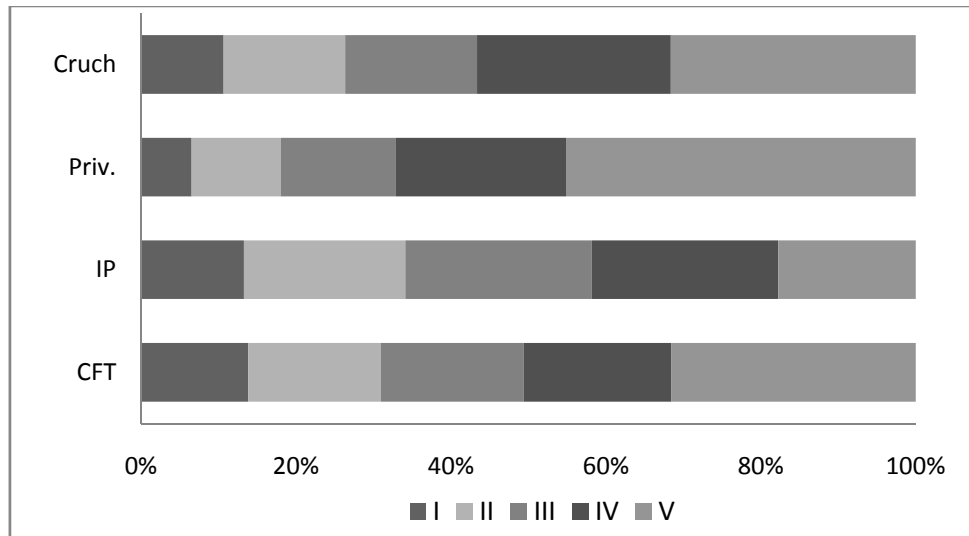
Source: CASEN

In and of itself, this is not problematic because students ought to choose the course of study that most fits their needs and interests. Nevertheless, since CFTs and IPs have lower future earning potential than do universities, mass tertiary education is limited in its ability to reduce the earnings gap between the haves and the have nots. Figure 25 illustrates this.

Figure 25. NPV of tertiary education in Chile and in developed countries (thousands of USD $)
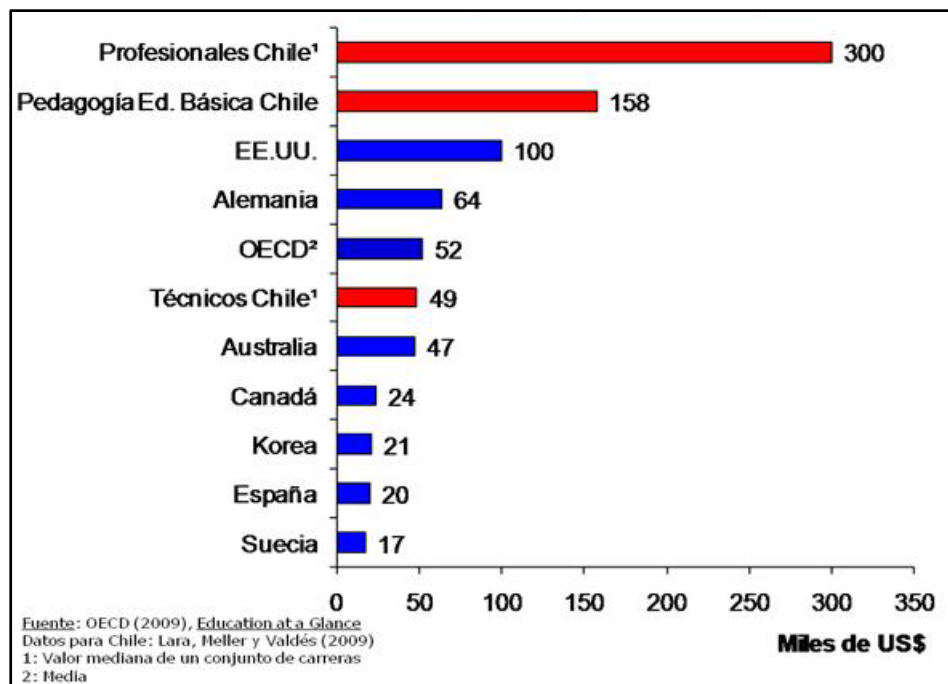
Fuente: OECD (2009), Education at a Glance
Datos para Chile: Lara, Meller y Valdés (2009)
1: Valor mediana de un conjunto de carreras
2: Media

Students from lower income quintiles face difficulties attending universities for two reasons: first, their tuition is high and has been rising. Average annual fees are about double those of an IP or a CFT. In addition, since the length of the degree is longer, the opportunity cost is greater.

Second, students from lower income quintiles tend to have lower scores on the national university entrance exam (the *Prueba de Selección Académica* or PSU). This means that a lower percentage qualify to attend the very prestigious—and partially subsidized—CRUCH universities. Table 30 illustrates this.

Table 30. Distribution of average PSU language, math and communication scores by family income group, 2010

Family group income (thousands of pesos)	< 432	> 432 to < 864	> 864 to < 1,296	> 1,296	**Total**
Under 450	72,614	7,135	1,252	700	**81,701**
450-600	92,608	21,582	6,301	5,668	**126,159**
601-700	16,154	8,283	4,251	7,390	**36,078**
Over 700	1,774	1,341	1,010	3,269	**7,394**
TOTAL	**183,150**	**38,341**	**12,814**	**17,027**	**251,332**

Source: Figure from DEMRE available on website http://www.demre.cl/estadisticasP2010.htm

Students from lower income quintiles with average PSU scores generally have three options: (1) search for enough financing to attend a TEI – a university if possible, but an IP or CFT if the former is too expensive, (2) study part-time or at night and work during the day, (3) postpone tertiary education and work to save up for it.

The first option is clearly ideal, and Chile has been increasing its scholarship programs and the resources devoted to them at a rapid pace. Today, 17% of enrolled students receive scholarships that cover a portion of the cost of attending tertiary education. Figure 26 shows this growth.

Figure 26. Scholarships in Chile by Public Resources and Beneficiaries
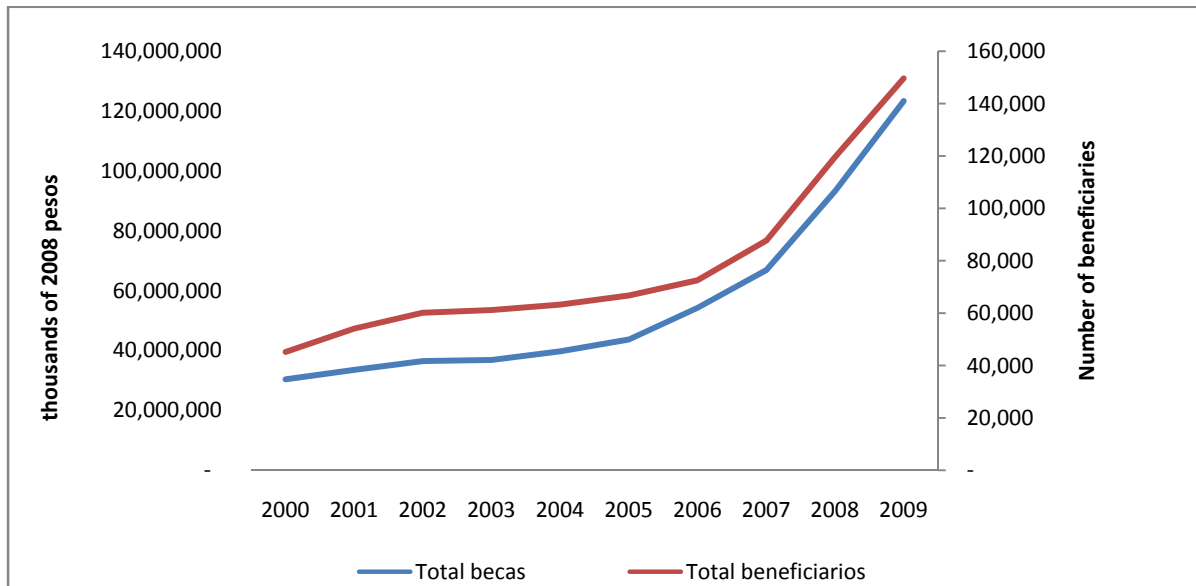
Source: SIES

Scaling this up further is possible, but would clearly require a very large and sustained commitment of fiscal resources to be rapidly deployed. Given the Government of Chile's budgetary considerations, scholarship programs will not suffice, and student loans—whether they be public or private in nature—must be part of the mix.

Student loan schemes can have several different aims. The first three below mirror the factors discussed at the beginning of this annex; the last three are unique aims of the CAE program.

Facilitating access to tertiary education and broadening the ability of all qualified students to attend different types of tertiary institutions. This is particularly important for those students whose financial situation limit their decision-making ability.

Increasing equity in enrollment by helping students from traditionally disadvantaged backgrounds (i.e. low income quintiles, underdeveloped regions, and/ or indigenous groups) attend tertiary education.

Freeing up resources by implementing a degree of cost-sharing with students. This shifts some of the costs of instruction and/ or student maintenance from either the government or the family to the student.

Increasing enrollment in priority disciplines and/ or degree programs (e.g. teacher education, nursing, or engineering) or specific institutions (e.g. rural, or newer, or non-university institutions) by making loan eligibility contingent upon their selection by the recipient.

Increasing the quality of tertiary education institutions by making loan eligibility contingent upon students' selection of accredited TEIs. The latter then encourages institutions to adopt the parameters and standards mandated by accreditation.

Encouraging constructive behaviors during the period of study or after it by forgiving portions of principal. Such behaviors include academic progress, graduation, or post-graduation employment in certain sectors or geographic areas.

Goals of Government of Chile in establishing CAE

CAE was created in June 2005 by law 20,027. As said in the text of the law, its aim was to "support, in a permanent and sustainable way, access to financing for academically qualified students who lacked sufficient means to finance their own tertiary education." Its motivation was straightforward: provide loans to a significant and growing number of students each year, catering not only to traditional CRUCH universities but also to private universities, IPs and CFTs. Importantly, it hoped to solve the limitations of Chile's existing loan programs: their dependence on public resources and coverage of only certain institutions, in the case of the FSCU, and their need for significant collateral, in the case of the Corfo loans.

Although CAE's primary goals were clear—increasing equity in TE and facilitating access and choice for prospective low-income students—its provisions catered to additional secondary goals. CAE aimed to increase the quality of tertiary education by making loan eligibility contingent upon students' selection of accredited TEIs. It also hoped to even out the playing field between CRUCH and non-Cruch universities, and between universities and IPs and CFTs, by extending CAE participation to all TEIs who were accredited.

Finally, CAE hoped to encourage constructive behaviors by both students and TEIs. Student eligibility was made contingent upon high academic standards prior to and during tertiary education, thus encouraging sustained academic excellence. TEIs were asked to guarantee a percentage of the loans of student borrowers while they were in school, thus encouraging TEIs to decrease their drop-out and accelerate their graduation. This was important for the Government because 69% of students do not reenroll after the first year and on average they take 5.5 years to complete a degree.

Annex 2: Terms of Reference

Background

This report on Chile's State-Guaranteed Student Loan Program (CAE - *Crédito con Aval del Estado*) is part of the 2010 Joint Studies Program between the Government of Chile and the World Bank. The report is a joint effort between staff from the Budget Office (Dipres) of Chile's Ministry of Finance and the World Bank's Latin America & Caribbean Region Education Sector.

Objectives

The purpose of the study on the State-Guaranteed Student Loan Program (CAE) is three-fold.

First, to evaluate the impact of this program on access to and equity in higher education, taking into account the effectiveness of targeting qualified but financially needy students and its complementarity with other major student aid mechanisms.

Second, to understand the size of the economic commitment the Chilean Government has made with this program, both in terms of its investment to date and its contingent liabilities.

Third, to formulate recommendations for improvements going forward.

Expected results

The work should provide an overview of student loan programs:

- Review of the public interest and / or market failures that justify the existence of CAE and point toward its main objectives;
- Review of national and international student loan program experiences. This review should draw upon the main accomplishments of each program, particularly with regards to program operations, loan recovery, fiscal cost, social impact, equity of access, and quality of tertiary education.

The work should evaluate CAE's main characteristics:

- Analysis of the main financial considerations for each of the parties involved in the tertiary education financing system: Chilean Treasury, *Comisión Ingresa*, students, tertiary education institutions, and financial entities;
- Analysis and evaluation of the public and private institutions involved in the system: incentive structure each one faces, key financial considerations, operational capacity, and degree of fit within the system;
- Analysis of the system's design and operations, including provision of guarantees; marketing and outreach; targeting of beneficiaries; selection of beneficiaries; disbursement and collection of resources; academic accompaniment; and monitoring and evaluation reporting; and

- Analysis of the financial implications of the State-Guaranteed Student Loan Program, focusing primarily on the efficient use of financial resources, the current and contingent liabilities of the Government of Chile, the repayment capacity of the students entering the system, and the quality of the loan guarantees provided by tertiary education institutions.

The final report will include the following deliverables:

- Evaluation of the effectiveness of the Program's coverage, focus and targeting, and the academic performance and labor market outcomes of its beneficiaries;
- Analysis of the financial viability of the State-Guaranteed Student Loan Program from the point of view of the Government, the students, the TEIs, and the financial institutions. It will be particularly important to ascertain if there is demand for credit on behalf of students and TEIs and if there is an adequate supply of credit on behalf financial institutions;
- Analysis of possible overlaps with existing financial aid programs, such as the *Fondo Solidario de Crédito Universitario*, CORFO credits and the various tuition scholarships;
- Evaluation and formulation of recommendations regarding the current content of credit agreements, including eligible expenses, the need and/or sufficiency of collateral, and the loan's financial conditions, characteristics, and repayment mechanisms;
- Proposal regarding the conditions and criteria for student eligibility, including their profile, level of study, type of program and institution;
- Preliminary analysis of the targeting instrument used to determine student eligibility;
- Action plan to increase the impact of the program as a whole;
- Loan recovery, including suggestions for repayment modalities and mechanisms with which to minimize default;
- Proposal regarding appropriate accounting rules with which to record government/ fiscal liabilities;
- Early warning system regarding commitments levels of tertiary education institutions and the financial sustainability of those commitments; and
- Proposal for external supervision of the system, including audits, financial regulations, routine institutional supervision, political oversight, and public reporting requirements.

Sources of Information

The team requested two large databases to carry out the relevant analyses.

- Database with descriptive characteristics of more than 250,000 student loans. It will include the periodicity of their interest and principal payments, their amortization schedule, their origination date, maturity date, grace period (months), initial and current loan balances, and expected debt-to-income ratio for each student, among other characteristics. In addition, it will include aggregate information on default rates, recovery rates, restructuring and rescheduling policies, non-performing loans, and statistical rating data used to manage the loan portfolios; and

- Database with descriptive characteristics of more than a million students and graduates. It will include socioeconomic characteristics, region of origin, gender, type of school (municipal, private, etc.), age, high school average, university entrance exam score, tertiary education institution, degree program, grants and loans received, time to graduation, and labor market results, among others.

In addition, the team pulled on student loan literature and programs from across the world in order to find useful comparisons for different parts of the Chilean program.

Annex 3: World Bank Task Team Members

The following people are part of the World Bank Task Team in the Education Sector of the Latin America and Caribbean Region, The World Bank.

- Michael Crawford, Task Team Leader, Senior Education Specialist;
- María Paulina Mogollon, Consultant;
- Christopher Sharp, Consultant; and
- Beatrice Sibblies, Consultant

Annex 4: Excerpts of Law 20.027

Article 1
Creates Administrative Commission for the Tertiary Education Loan System, whose purpose is:
- to design and implement instruments with which to finance tertiary education;
- to enter into the necessary agreements with public, private, national or international entities to roll out those instruments and leverage public and private resources for them; and
- to manage the system of state-guaranteed tertiary education student loans.

Article 2
The State, through the Treasury, guarantees the loans that finance tertiary education studies. The amount guaranteed by the State each year may not exceed the amount established in that year's budget law (*Ley de Presupuesto*).The loans guaranteed by the State may not be originated by the Treasury.

Article 3
The State, through the Treasury, will guarantee up to 90% of principal and interest of loans that financial institutions grant to students who meet the minimum requirements set by the law and who are enrolled in eligible tertiary education institutions.

Article 5
The Treasury may purchase loans used to finance tertiary education studies, regardless of the institution that originated them, and sell them on to third parties. The Treasury may purchase these loans up to the maximum amount annually established by the budget law. The Treasury will give guarantees to the securitized loans, such that the preferred bonds that are issued backing said loans are given at least international investment grade.

Article 7
The provisions in this Law do not alter in any way the *Fondo Solidario de Crédito Universitario* established by Law No. 19.287.

Article 9
Student eligibility requirements must include, at least, an indicator of family group socioeconomic status and an indicator of academic merit for each level tertiary education.

Article 10
Among the students that meet the academic requirements for this loan, preference will be given to students whose socio-economic conditions and the socio-economic conditions of their family group are less favorable.

Article 11
The loans covered by the state guarantee must have insurance for disencumbrance and invalidity. No additional guarantees may be required.

Article 12

The loans shall have an 18-month grace period. The state guarantee shall continue regardless of changes in creditor.

Article 13

Payment obligations may be suspended temporarily, in case of inability to pay or severance of the debtor. Unpaid balances will not prescribe, and the State must proceed to fully collect the balance.

Tertiary education institutions, whose graduates have above average percentages of non-compliance with respect to the payments initially agreed upon, shall be excluded from the loan system and may only re-enter the system when this condition is reversed. The regulation of this law will indicate, publicly and on the basis of objective criteria, the degree of noncompliance that constitutes an above average percentage.

Article 14

Tertiary educational institutions, by themselves or through a third party, must guarantee the risk of student drop out, through a financial instrument approved by the Commission Ingresa. This guarantee will cover up to 90% of capital plus interest of the loans awarded to students in their first year, up to 70% of capital plus interest of the loans awarded to students in their second year, and up to 60% of principal and interest on loans awarded to students in their third year and beyond. In the cases where the guarantee given by tertiary education institutions is less than 90% of a loan's principal and interest, the Treasury will make up the difference.

In the event a dropout guarantee is made effective, the tertiary education institution retains the right to collect the debt. The resources collected will be shared between the tertiary education institution and the Treasury, in the same proportion in which the guarantees were paid.

Tertiary education institutions must publicly annually announce their participation in the system and inform the number of "*postulantes*" they will guarantee and the academic requirements that will be required of them.

Article 15

If a tertiary education institution fails to pay its guarantee obligations, it shall be excluded from the system until it redeems itself.

Article 16

The State guarantee can only be granted to debtors who, by special, irrevocable and delegable mandate, empower their respective creditor to request their employer, in writing, to deduct from their loan payments from their wages. If the employer fails to withhold the requested amount, or withholds it but does not give it in its entirety to the respective creditor, the employer will be fined 1 UF per month.

<u>Article 17</u>

The Treasury may withhold from debtors' annual income tax refunds unpaid loan amounts, as reported by their creditor, and apply those withholdings to the mentioned debt. The money withheld by the Treasury must be sent to the respective loan creditor.

<u>Article 22</u>

The Ingresa Commission:

- may give specific degrees priority access to the state-guaranteed loan system;
- in the case of securitized loans, it shall draw up contracts or warranty policies on behalf of a separate entity, between the financial managers (those who structure the bonds) and the Treasury of the Republic;
- must verify that the guarantees given by tertiary education institutions in case of student drop out have sufficient backing to adequately fulfill them;
- may enter into agreements with other entities, public or private, in order for them to originate, manage, and collect state-guaranteed tertiary education student loans; and
- may enter into agreements with other entities, public or private, in order for them to buy and sell student loans with the purpose of structuring financial transactions that allow re-financing of tertiary education student loans.

Annex 5: CAE bidding history

Table 31 details the CAE program's bidding history by year, bidding round, financial entity, bidding terms (% to sell back to the government and % mark-up over the par value of that amount), and success of the bids. 2007 was an anomalous year because Ingresa had financial entities bid on loan packages separately (i.e. first loan package # 1, then loan package # 2, etc.). Table 32 further details the 2007 bids.

It is important to mention that 2008, 2009 and 2010 unexpectedly had two rounds of bidding: the first two years had second rounds because there were insufficient bidders in the first rounds to take all the loan packages. The last year (2010) had a second round for those students who were victims of the February 2010 earthquake. Noticeably, the former were very unfavorable to the Government and significantly above the first round bids, while the latter was favorable and below the first round bids.

Table 31. CAE Bidding History

Year	Round	Financial entities	% sold back to Gov.	% mark-up	Cleared = 1 Not cleared = 0
2006	1	Banco BCI	25.00%	-2.00%	1
		Banco Estado	25.00%	62.00%	1
		Banco ScotiaBank	25.00%	69.00%	1
2007	1	Banco BCI	3.00%	20.00%	1
				45.00%	0
		Banco Estado	27.00%	72.00%	0
		Banco Falabella	3.00%	-0.50%	1
		Banco Ripley	27.00%	61.00%	0
				100.00%	0
		Banco ScotiaBank	21.00%	11.61%	1
				14.34%	1
				17.50%	0
				20.12%	1
				23.34%	0
2008	1	Banco Estado	3.00%	14.00%	1
				56.00%	1
			5.00%	73.00%	1
		Banco Falabella	15.00%	10.00%	1
		Banco ScotiaBank	25.00%	40.96%	1
	2	Banco Estado	100.00%	15.00%	1
2009	1	Banco BCI	49.90%	90.00%	1
		Banco Estado	50.00%	27.90%	1
				32.90%	1
				42.90%	1
		Banco ScotiaBank	50.00%	46.00%	1
				53.00%	1
				60.00%	1

	2	Banco BCI	100.00%	36.00%	1
		Banco Estado	100.00%	60.00%	1
		Banco ScotiaBank	70.00%	46.00%	1
			90.00%	34.00%	1
			100.00%	30.00%	1
2010	1	Banco Estado	50.00%	52.00%	0
				55.00%	0
				60.00%	0
		Banco Internacional	33.52%	51.74%	0
				68.86%	0
		Banco Itaú	49.80%	26.00%	1
				28.00%	1
				30.00%	1
				32.00%	1
				33.00%	1
				35.00%	0
				45.00%	0
				50.00%	0
				55.00%	0
				60.00%	0
		Banco Santander	49.15%	34.09%	1
					0
				35.71%	0
				42.44%	0
				49.57%	0
		Banco ScotiaBank	50.00%	27.80%	1
				29.90%	1
				32.90%	1
				35.90%	0
				39.90%	0
				41.00%	0
				50.00%	0
				60.00%	0
				70.00%	0
				80.00%	0
		Penta Vida	30.00%	60.00%	0
			49.90%	60.00%	0
				70.00%	0
				80.00%	0
			59.90%	35.00%	0
			60.00%	30.50%	0
	2	Banco Internacional	35.07%	37.38%	0
		Banco Itaú	45.00%	22.21%	0
		Banco ScotiaBank	50.00%	19.89%	1

Source: Ingresa

Table 32. CAE 2007 Bidding History

Year	Loan package	Financial entity	% sold back to Gov.	% mark-up	Cleared = 1 Not cleared = 0
2007	Nómina 1	Banco ScotiaBank	21.00%	11.61%	1
	Nómina 2	Banco ScotiaBank	21.00%	14.34%	1
	Nómina 3	Banco BCI	3.00%	45.00%	0
		Banco Estado	27.00%	72.00%	0
		Banco Falabella	3.00%	-0.50%	1
		Banco ScotiaBank	21.00%	23.34%	0
	Nómina 4	Banco BCI	3.00%	20.00%	1
		Banco Ripley	27.00%	100.00%	0
		Banco ScotiaBank	21.00%	17.50%	0
	Nómina 4	Banco Estado	27.00%	72.00%	0
	Nómina 5	Banco Ripley	27.00%	61.00%	0
		Banco ScotiaBank	21.00%	20.12%	1

Source: Ingresa

Annex 6: Interest rate charged on CAE loans

Interest rate of the loans (annual in UF)	
Licitation 2006	5.74%
Renewal 2007, loans originated 2006	5.25%
Licitacion 2007	5.74%
Renewal 2008, loans originated 2006	5.20%
Renewal 2008, loans originated 2007	5.43%
Licitation 2008	6.09%
Renewal 2009, loans originated 2006	5.19%
Renewal 2009, loans originated 2007	5.33%
Renewal 2009, loans originated 2008	5.33%
Licitation 2009 (10 year repayment term)	5.08%
Licitation 2009 (15-20 year repayment term)	5.59%
Renewal 2010, loans originated 2006	5.58%
Renewal 2010, loans originated 2007	5.83%
Renewal 2010, loans originated 2008	5.83%
Renewal 2010, loans originated 2009 (10 year repayment term)	5.34%
Renewal 20010, loans originated 2009 (15-20 years repayment term)	5.91%
1st Licitation 2010 (10 year repayment term)	5.18%
1st Licitation 2010 (15-20 years repayment term)	5.63%
2nd Licitation 2010 (10 year repayment term)	4.91%
2nd Licitation 2010 (15-20 years repayment term)	5.41%

Source: Ingresa

Annex 7: Financial Aid in Chile[25]

	Name of Programme		Number of Beneficiaries[1]					Average per beneficiary pesos[2]	Amount as a % of CAE loan	Total millions of pesos[3]	Rank by program value	Rank by number of students
	Spanish	English	CFT	IP	Pr.Univ	Cruch	Total					
Loans	Crédito con Aval del Estado (CAE)	State-Guaranteed Student Loan Program	27,617	65,990	94,734	27,785	**216,126**	1,305,973	100%	282,255	1	1
Loans	Fondo Solidario de Crédito Universitario (FSCU)	University Credit Solidarity Fund	-	-		87,317	**87,317**	836,752	64%	73,063	2	2
Total			27,617	65,990	94,734	115,102	**303,443**			**355,317**		
Scholarships	Beca Bicentenario (BBIC)	Bicentenary Scholarship				47,566	**47,566**	1,471,477	113%	69,992	3	5
Scholarships	Beca Nuevo Milenio (BNM)	New Millennium Scholarships	40,058	27,614	3,728		**71,400**	397,525	30%	28,383	4	4
Scholarships	Beca Juan Gómez Millas (BJGM)	Juan Gomez Millas Scholarships	47	108	2,223		**2,378**	950,635	73%	2,261	11	11
Scholarships	Beca de Excelencia Académica (BEA)	Academic Excellence Scholarships	1,000	1,760	10,329		**13,089**	915,941	70%	11,989	6	7
Scholarships	Becas Puntajes PSU (BP)	Scholarship for High PSU scores	-	-	155		**155**	n/a	n/a	n/a	n/a	n/a
Scholarships	Beca Vocación de Profesor	Scholarship for Future Teachers	-	-	794		**794**	957,734	73%	760	12	13
Scholarships	Beca para Hijos de Profesionales de la Educación (BHP)	Scholarships for Children of Education Professionals	88	321	8,955		**9,364**	488,833	37%	4,577	10	8
Total			41,193	29,803	26,184	-	**144,746**			**117,963**		
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Beca Indígena (BI)	Indigenous Scholarships (BI)					**8,085***	579,767	44%	4,687	9	9
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Beca Presidente de la República (BPR)	Scholarship from the President of the Republic					**17,007***	457,101	35%	7,774	8	6
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Programas de Reparación	Scholarships for victims of human rights violations					**4,864***	2,201,991	169%	10,710	7	10
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Beca de Mantención para la Educación Superior (BEMES)	Maintenance Grants (BM)					**83,011****	155,000	12%	12,867	5	3
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Beca de Integración Territorial (BIT)	Scholarship for Territorial Integration					**1,187****	n/a	n/a	n/a	n/a	12
Total			-	-	-	-	**114,154**			**36,039**		

1. Year 2010 unless otherwise noted. Source: Ministry of Education
2. Calculated with 2009 numbers, using real August 2008 pesos. Source: SIES
3. Unless otherwise noted, 2010 beneficiaries by 2009 average amount per beneficiary (in Aug. 2008 pesos)
* Number of 2009 beneficiaries. Source: SIES
** Number of 2007 or 2008 beneficiaries. Source: WB-OECD Review of Tertiary Education in Chile

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[25] Figures are a composite of latest available years but constitute a good approximation of 2009 aid levels. The source of program information is "Guia 2011 Becas y Creditos".

	Name of Programme		Institutional Eligibility	Academic Criteria	Other Criteria	Eligible expenditures
	Spanish	English				
Loans	Crédito con Aval del Estado (CAE)	State-Guaranteed Student Loan Program	All accredited institutions	PSU > 475 or NEM > 5.3 and additional academic requirements as determined by each TEI	Quintiles I, II, III, IV	Up to tuition reference rate
	Fondo Solidario de Crédito Universitario (FSCU)	University Credit Solidarity Fund	CRUCH	PSU above 475	Quintiles I, II, III, and IV in a decreasing fashion	Up to tuition reference rate
Total						
Scholarships	Beca Bicentenario (BBIC)	Bicentenary Scholarship	CRUCH	PSU 550	Quintiles I & II	Tuition reference rate
	Beca Nuevo Milenio (BNM)	New Millennium Scholarships	Institutions who offer advanced technical degrees (técnico nivel superior), or accredited institutions who offer professional degrees.	NEM above 5 for technical degrees and 5.5 for professional degrees	Quintiles I & II	Up to 500,000 pesos a year for tuition
	Beca Juan Gómez Millas (BJGM)	Juan Gomez Millas Scholarships	All accredited institutions	PSU above 640	Quintiles I & II graduates of municipal or private-subsidised high	Up to 1,150,000 pesos a year for tuition
	Beca de Excelencia Académica (BEA)	Academic Excellence Scholarships	All accredited institutions or IPs and CFTs in the process of accreditation.	Top 5% of the best graduates from municipal and private subsidised high schools.	Quintiles I, II, III , IV	Up to 1,150,000 and 500,000 pesos a year for tuition at university and IPs / CFTs, respectively.
	Becas Puntajes PSU (BP)	Scholarship for High PSU scores	All accredited institutions or IPs and CFTs in the process of accreditation.	Best national or regional PSU score	Quintiles I, II, III or IV graduates of municipal or private-subsidised high schools	Up to 1,150,000 pesos a year for tuition
	Beca Vocación de Profesor	Scholarship for Future Teachers	Accredited institutions with accredited Pedagogy degrees whose minimum PSU admission requirement is 500.	PSU above 600	-	Up to real tuition + enrollment fee + 1 semester abroad + monthly allowance of 80,000 pesos
	Beca para Hijos de Profesionales de la Educación (BHP)	Scholarships for Children of Education Professionals	All institutions with autonomy	PSU above 500 and NEM above 5.5	Quintiles I, II, III , IV children of professionals and assistants who have valid contracts with municipal or private-subsidized educational establishments	Up to 500,000 pesos a year for tuition
Total						
Special Purpose Scholarships (Junta Nacional de Auxilio Escolar y Becas)	Beca Indígena (BI)	Indigenous Scholarships (BI)	All institutions	NEM above 5.5	Child of at least one indigenous parent from one of the indigenous ethnicities that live in Chile. Students from 5th básico onwards	Yearly allowance of 588,460 pesos
	Beca Presidente de la República (BPR)	Scholarship from the President of the Republic	All institutions	NEM above 6.0	Needy students from 8th básico onwards	Monthly allowance of 46,630 pesos
	Programas de Reparación	Scholarships for victims of human rights violations	All institutions	-	Victims of human rights violations (includes children and grandchildren of victims)	Real tuition + enrollment fee + monthly allowance of 46,630 pesos
	Beca de Mantención para la Educación Superior (BEMES)	Maintenance Grants (BM)	All accredited institutions or IPs and CFTs in the process of accreditation.	Beneficiaries of the scholarships: Bicentenario, Juan Gómez Millas, Excelencia Académica and Puntaje PSU Nacional.	Quintiles I & II	Yearly allowance of 155,000 pesos
	Beca de Integración Territorial (BIT)	Scholarship for Territorial Integration	All institutions	Students from isolated areas of the country who cannot continue their high school or tertiary education because their area does not offer the level of education, type of study or area of interest the student seeks. Must have income per capita < less than 212,361 pesos.		Monthly allowance of 70,321 pesos and yearly living allowance that varies between 700,000 and 140,000 pesos.
Total						

Annex 8: Targeting of loans and grants

The analysis regarding student financial aid poses a set of provocative questions:

- Who should CAE loans be targeting? Are the neediest students in tertiary education actually the ideal beneficiaries?
- And more broadly, what is the best way to distribute grants and loans among tertiary education students and what criteria should guide this distribution?

On this matter, the Review Team believes that the overriding goal for the allocation grants and loans should be to maximize the number of qualified but needy students who attend and finish tertiary education. In this regard, Chile should regard grants and loans as part of the same continuum, rather than as separate tools. More importantly, no distinction should be made between Cruch and non-Cruch students.

Many combinations of awards can lead to overall policy outcomes. Chile must decide to what extent to privilege family income at time of study versus expected future income, recognizing a correlation between the two.

Awards should be considered after taking a measure of adjusted income based on solid needs assessment. This would yield "adjusted" quintile levels and would more accurately represent real need. Guidelines for awarding financial aid based on "adjusted income quintiles" may include:

- A larger proportion of grants given to Q1 and Q2 students. Small loans could also be given such that the burden of tertiary education is partially shared;
- Q3 receive an even mix of grants and loans, and the loans contain some sort of subsidy;
- Q4 largely receive loans. These loans contain some sort of subsidy; and
- Q5 only receive loans, if at all. These loans reflect their cost as much as possible (little to no hidden subsidy).

Financial aid awards based on merit might seek to reward stellar performance under adverse conditions (top performers in municipal schools), and perhaps in a limited number of cases, stellar performance in the absence of adverse conditions (top PSU scores). Because merit is correlated positively with privilege, care should be given when creating merit-based awards.

This previous suggestions do not imply Chile need discontinue financial aid allocated on the basis of merit and specific special purposes, but rather that the latter could be periodically reviewed to ensure it supports well-defined policy goals. Special purposes may include but need not be limited to:

- Ethnicity;
- Isolated regions;

- Public priority of certain degrees (teaching);
- Children of education professionals; and
- Human rights victims

In general, Government should manage debt burdens "democratically," respecting the value of all accredited degree programs. Where certain positive discrimination is desirable, grants could be used to encourage enrollment in priority disciplines. In the absence of strong social concerns about debt burdens, the Government should refrain from using aid to "track" students into particular programs.

Annex 9: Academic impact of student loans:

<u>Colombia:</u>[26]
Excerpt from translated document of "*Programa Colombiano de Crédito Educativo: Impactos y Factores de Éxito,*" *Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior* – ICETEX, December 2010, Bogota, p.43-45.

"Since 2006, it has been proved that the educational credit of ICETEX, especially the ACCES facility, produces a positive effect over the retention of the students in higher education institutions: Out of 100 students who are ICETEX beneficiaries from last semester, 15 drop out, while out of 100 students who are not ICETEX beneficiaries 33 drop out. Those who continued studying felt that credit was important to remain in the institution.

In 2008, conclusions of 2006 are confirmed and strengthen since it is demonstrated that the ACCES credit reduces four times the risk of desertion, "The global average desertion rate for students who have received ACCES credit, is 9.41% while the same rate for non-beneficiaries is 34.37%". It should be noted that even if desertion increases with semesters, the ACCES beneficiaries always have a longer retention as compared to non-beneficiaries: Students who are beneficiaries of ACCES show desertion rates three times lower in the first semesters and five times lower in the last semesters.

Figure 27. Dropout rates of beneficiaries and non-beneficiaries who receive one or more loan disbursements per semester (2008)

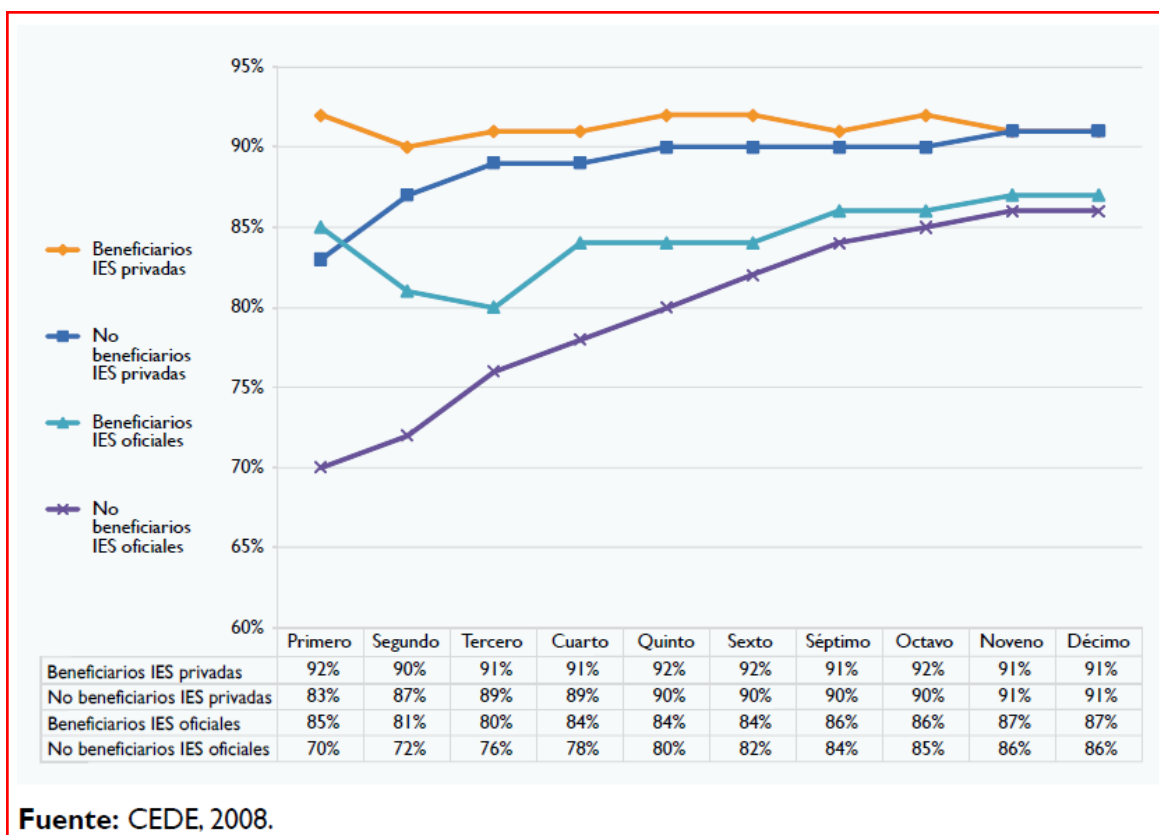|	Tercero	Cuarto	Quinto	Sexto	Séptimo
Beneficiarios	4%	6%	8%	10%	12%
No beneficiarios	18%	25%	30%	35%	40%

Fuente: CEDE, 2008.

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[26] Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior – ICETEX, "Programa Colombiano de Crédito Educativo: Impactos y Factores de Éxito", December 2010, Bogota, p.43-45.

Studies conducted show an interesting finding, that is, to the extent ICETEX renews the credit and makes more than one disbursement, the risk of dropping out decreases. 13% of beneficiaries of a disbursement dropped out in fourth semester while the rate of desertion for those receiving two or more disbursements is three times lower (4%). In the case of a semester such as the seventh the differential is 14 percentage points. Therefore, the ACCES credit not "only reduces the risk of desertion but the effect is greater to the extent the beneficiary receives more disbursements".

Academic performance

Lower desertion is also related to academic performance. In fact, it was found that ICETEX recipients have higher rates of approval of subjects as compared to non-beneficiaries, probably because they have high levels of academic excellence and because the credit may give easeness in the economic field, preventing students from being forced to work. However, with the advance in semesters the differential in the approval of subjects between beneficiaries and non-beneficiaries is reduced, as can be seen in the following Figure.

Figure 28. Proportion of subjects approved by beneficiaries vs. non-beneficiaries

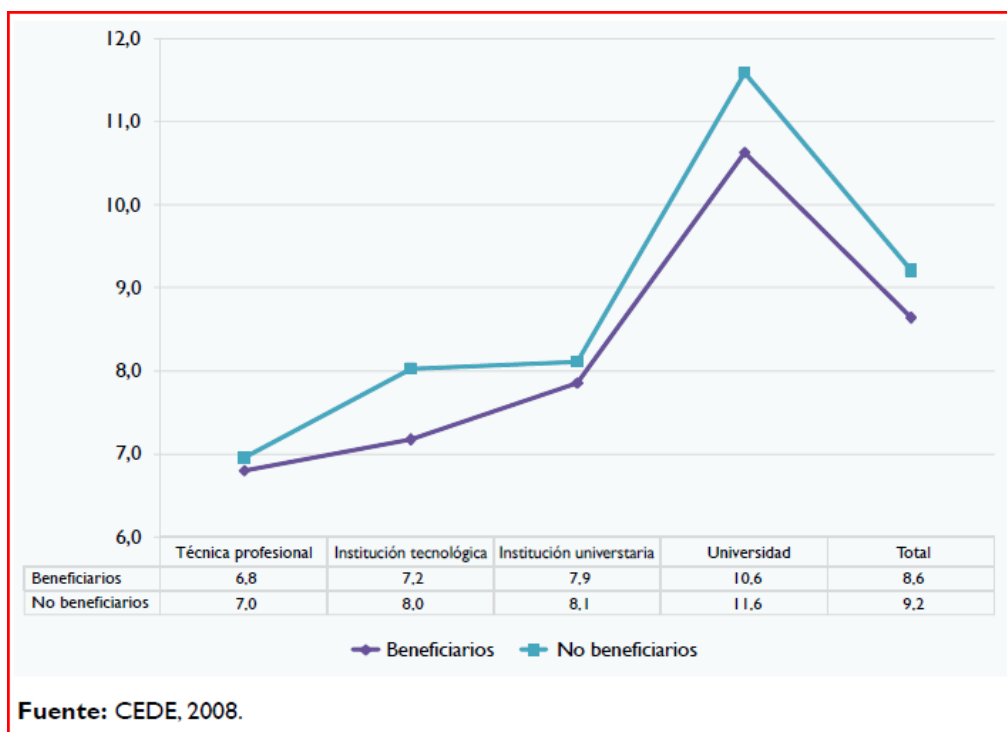|	Primero	Segundo	Tercero	Cuarto	Quinto	Sexto	Séptimo	Octavo	Noveno	Décimo
Beneficiarios IES privadas	92%	90%	91%	91%	92%	92%	91%	92%	91%	91%
No beneficiarios IES privadas	83%	87%	89%	89%	90%	90%	90%	90%	91%	91%
Beneficiarios IES oficiales	85%	81%	80%	84%	84%	84%	86%	86%	87%	87%
No beneficiarios IES oficiales	70%	72%	76%	78%	80%	82%	84%	85%	86%	86%

Fuente: CEDE, 2008.

It was also found that a better academic performance affects the time for graduation, without neglecting aspects such as a plan of life that motivates advancing as fast as possible towards the labor world. Therefore, students that have accessed loans graduate, on average, one

semester before the non-beneficiaries, presenting a greater differential in the case of those who studied at the university level and in technological institutions as compared to those who did it in technical professional and university institutions.

Figure 29. Time to graduation of beneficiaries vs. non-beneficiaries (# of semesters)

	Técnica profesional	Institución tecnológica	Institución universtaria	Universidad	Total
Beneficiarios	6,8	7,2	7,9	10,6	8,6
No beneficiarios	7,0	8,0	8,1	11,6	9,2

Fuente: CEDE, 2008.

Mexico:[27]
"Empirical results suggest that SOFES recipients show better academic performance than students without a credit from SOFES. However, the results cannot be interpreted as a purely causal impact of the student loan program, since the impacts also could reflect (self-) selection of students."

- The impact of credit on student performance is positive at DS=0.30. A coefficient of 0.234 means that the higher credit level for students above the threshold increases their GPA by 0.234 points (on a 10 point scale). This corresponds to a 3 % improvement in grades obtained, which is a relatively large effect. However, statistical significance is lost when educational background controls are included;
- SOFES-recipients have a 0.175 point higher GPA than students without a SOFES loan. This effect is statistically significant at the 1%-level. This is a 2% improvement in academic performance. Also, female students, older students, and students with a

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[27] Canton, Erik, and Andreas Bloom, "Can student loans improve accessibility to higher education and student performance? An impact study of the case of SOFES, Mexico", World Bank Policy Research Working Paper 3425, October 2004, p.21-23

higher grade point average at upper secondary school show higher GPAs at university; and

- With regards to student's failure rate (the number of courses that a student had to redo as a fraction of the total number of courses the student has attended), we find that SOFES recipients score better than students without a SOFES loan. The chance that the student has to redo an exam is for SOFES-recipients about 0.5%-point lower than for students without credit from SOFES (with an average failure rate of approximately 5% that would be an effect of something like 10%), although the effect is not statistically significant.

Annex 10: Futuro Laboral

| TEI	Carrera	# of 2010 Loans	2yr employment probability	2nd YR Income (months)	Length of study / Actual Yrs	Average accrued debt w/ actual degree duration	Avg Debt Burden as a % of Monthly Income		Residual income w/ actual degree duration
							15 year loan repayment	20 year loan repayment	
CFT Santo Tomás	Técnico en Enfermería	4381	79%	303,350	3.2	3,225,056	9%	7%	280,615
Univ. Santo Tomás	Psicología	1762	82%	476,686	6.9	16,374,598	29%	24%	361,254
Ip Inacap	Ingeniería en Prevención de Riesgos	1636	90%	570,416	5.5	9,430,316	14%	12%	503,938
CFT Inacap	Técnico en Enfermería	1528	80%	312,369	3.2	3,784,636	10%	9%	285,690
Ip Duoc Uc	Diseño Gráfico	1215	65%	440,185	5.9	11,219,977	21%	18%	361,091
Univ. Nacional Andrés Bello	Enfermería	1154	98%	1,082,048	6.1	14,329,792	11%	9%	981,031
Univ. Nacional Andrés Bello	Derecho	1066	88%	874,670	8.8	25,750,201	25%	21%	693,147
CFT Inacap	Técnico en Gastronomía y Cocina	1031	48%	295,293	3.8	6,342,938	18%	15%	250,579
Ip Duoc Uc	Ingeniería en Computación e Informática	993	95%	833,729	6.5	13,582,151	14%	11%	737,982
Univ. Santo Tomás	Trabajo Social	934	79%	410,524	6.0	9,876,769	20%	17%	340,899
Univ. Nacional Andrés Bello	Tecnología Médica	855	91%	1,171,410	6.5	13,172,855	9%	8%	1,078,550
Univ. San Sebastián	Kinesiología	789	100%	700,110	6.4	12,858,188	15%	13%	609,467
Univ. Santo Tomás	Medicina Veterinaria	775	69%	499,123	8.4	21,573,531	36%	30%	347,042
Ip Duoc Uc	Contador Auditor	745	94%	596,439	5.8	9,750,923	14%	12%	527,701
Ip Duoc Uc	Ingeniería en Prevención de Riesgos	654	93%	523,217	5.5	10,040,619	16%	14%	452,437
Univ. San Sebastián	Tecnología Médica	610	95%	789,816	6.5	13,764,497	15%	12%	692,785
Univ. Santo Tomás	Ingeniería Comercial	584	83%	644,757	6.7	16,139,652	21%	18%	530,982
Univ. Nacional Andrés Bello	Pedagogía en Educación Física	547	86%	569,104	6.0	10,497,608	15%	13%	495,102
Ip Duoc Uc	Ingeniería en Administración de Empresa	542	88%	532,014	5.6	11,178,330	18%	15%	453,213
Univ. de las Américas	Psicología	541	93%	499,987	6.9	16,620,812	28%	23%	382,820
Ip Santo Tomas	Ingeniería en Computación e Informática	529	83%	513,407	6.5	9,208,667	15%	13%	448,491
Univ. Nacional Andrés Bello	Ingeniería Comercial	523	96%	1,123,810	6.7	17,582,422	13%	11%	999,864
Univ. Nacional Andrés Bello	Contador Auditor	510	97%	774,614	6.6	13,181,821	14%	12%	681,690
Ip De Chile	Pedagogía en Educación de Párvulos	500	71%	403,258	4.7	5,650,986	12%	10%	363,422
Ip Inacap	Diseño Gráfico	447	60%	370,648	5.9	9,981,943	22%	19%	300,281
Univ. Nacional Andrés Bello	Ingeniería en Computación e Informática	425	95%	758,929	8.4	18,240,178	20%	17%	630,347
Univ. Nacional Andrés Bello	Psicología	419	93%	537,106	6.9	17,099,780	27%	22%	416,562
Univ. San Sebastián	Psicología	417	95%	525,108	6.9	16,836,456	27%	23%	406,421
Ip La Araucana	Ingeniería en Computación e Informática	397	98%	684,824	6.5	8,076,493	10%	8%	627,889
Ip La Araucana	Ingeniería en Prevención de Riesgos	392	92%	516,832	5.5	6,543,010	11%	9%	470,708
Ip Virginio Gomez	Ingeniería en Prevención de Riesgos	384	91%	502,539	5.5	7,637,390	13%	11%	448,700
Ip La Araucana	Contador Auditor	359	93%	646,282	5.8	6,565,382	8%	7%	600,000
Univ. de las Américas	Medicina Veterinaria	351	71%	497,979	8.4	21,584,737	36%	31%	345,820
Univ. San Sebastián	Pedagogía en Educación Básica	312	82%	338,909	5.6	9,685,987	24%	20%	270,628
Univ. Diego Portales	Ingeniería Civil Industrial	312	96%	1,153,956	8.1	21,163,974	15%	13%	1,004,762
Ip Inacap	Contador Auditor	308	85%	558,011	5.8	8,886,018	13%	11%	495,369
Univ. de las Américas	Pedagogía en Educación Básica	303	82%	359,353	5.6	11,308,150	26%	22%	279,637
Univ. Diego Portales	Derecho	285	92%	1,037,447	8.8	25,930,299	21%	18%	854,653
Ip Virginio Gomez	Ingeniería en Administración de Empresa	283	78%	498,270	5.6	7,450,018	12%	11%	445,751
Univ. Diego Portales	Contador Auditor	274	98%	809,889	6.6	13,687,983	14%	12%	713,396
Univ. de Concepcion	Derecho	255	89%	1,076,505	8.8	22,304,283	17%	15%	919,273
Univ. Nacional Andrés Bello	Pedagogía en Educación Básica	250	87%	444,706	5.6	11,315,074	21%	18%	364,942
Univ. Diego Portales	Ingeniería Comercial	241	94%	961,666	6.7	17,523,047	15%	13%	838,139
Ip Virginio Gomez	Ingeniería en Computación e Informática	241	83%	566,021	6.5	9,144,980	13%	11%	501,554
Ip Duoc Uc	Ingeniería en Computación e Informática	238	95%	833,729	6.5	13,511,054	14%	11%	738,484
Univ. de las Américas	Ingeniería en Computación e Informática	232	95%	910,620	8.4	17,049,574	16%	13%	790,431
Univ. San Sebastián	Ingeniería Comercial	217	96%	784,624	6.7	17,396,878	18%	16%	661,986
Univ. de Concepcion	Medicina Veterinaria	204	74%	581,657	8.4	19,441,866	28%	24%	444,604
Univ. Santo Tomás	Contador Auditor	203	91%	558,187	6.6	12,964,086	19%	16%	466,798
Univ. San Sebastián	Medicina	203	96%	1,568,830	7.7	30,199,650	16%	14%	1,355,940
Univ. de las Américas	Ingeniería Comercial	201	89%	949,654	6.7	17,432,653	15%	13%	826,765
Univ. de Valparaiso	Ingeniería Comercial	196	94%	849,729	6.7	12,943,620	13%	11%	758,484
Univ. Nacional Andrés Bello	Arquitectura	193	84%	704,072	8.5	23,710,670	28%	24%	536,926
Univ. Diego Portales	Psicología	193	88%	606,513	6.9	17,413,079	24%	20%	483,761
Ip De Chile	Contador Auditor	193	96%	485,165	5.8	7,511,724	13%	11%	432,212
Univ. San Sebastián	Trabajo Social	173	82%	425,658	6.0	10,409,165	20%	17%	352,280
Univ. Diego Portales	Periodismo	164	85%	609,886	6.7	17,092,712	23%	20%	489,392
Univ. de las Américas	Pedagogía en Educación Básica	157	82%	359,353	5.6	11,316,768	26%	22%	279,577
Univ. de las Américas	Pedagogía en Educación de Párvulos	154	69%	336,872	5.5	8,254,342	20%	17%	278,684
Univ. de Valparaiso	Ingeniería en Construcción	154	91%	637,286	8.0	11,707,824	15%	13%	554,753
Univ. de Concepcion	Ingeniería Comercial	150	91%	766,427	6.7	17,512,239	19%	16%	642,977
Univ. Nacional Andrés Bello	Pedagogía en Educación de Párvulos	145	82%	395,154	5.5	8,872,106	19%	16%	332,611
Univ. de Concepcion	Medicina	139	98%	1,452,133	7.7	26,500,902	15%	13%	1,265,317
Univ. Nacional Andrés Bello	Periodismo	132	69%	560,994	6.7	17,105,829	25%	21%	440,408
Pontificia Univ. Catolica de C	Química y Farmacia	132	100%	938,979	8.3	18,392,890	16%	14%	809,320
Univ. de las Américas	Psicología	128	93%	499,987	6.9	16,044,461	27%	23%	386,883
Ip Virginio Gomez	Ingeniería en Computación e Informática	127	83%	566,021	6.5	6,994,725	10%	9%	516,712
Univ. de Valparaiso	Medicina	118	98%	1,100,054	7.7	21,434,946	16%	14%	948,950
Univ. de Valparaiso	Derecho	117	95%	978,227	8.8	18,572,776	16%	13%	847,300
Pontificia Univ. Catolica de C	Derecho	116	96%	1,370,714	8.8	25,906,846	16%	13%	1,188,086
Univ. Diego Portales	Diseño	115	80%	497,425	6.7	15,619,645	26%	22%	387,315
Univ. Nacional Andrés Bello	Ingeniería en Construcción	114	91%	998,124	8.0	18,418,944	15%	13%	868,281
Pontificia Univ. Catolica de C	Enfermería	114	94%	930,227	6.1	12,540,773	11%	10%	841,822
Ip Duoc Uc	Ingeniería en Prevención de Riesgos	113	93%	523,217	5.5	10,014,997	16%	13%	452,617
Univ. de las Américas	Ingeniería Comercial	113	89%	949,654	6.7	17,758,580	16%	13%	824,467

Annex 11: TEI provisioning

Well managed TEIs typically set aside a fraction of the CAE loans they guarantee in case the guarantees are called. This allows TEIs to comfortably cover their commitments and ensures the financial sustainability of the TEI portion of the CAE system. For TEIs considered to be engaging in reckless behavior, Ingresa should establish a minimum provisioning level and then carefully track TEIs' "headroom" between the funds provisioned and the funds paid out in guarantees.

Tracking this "headroom" is important because the timing of cash flows between the revenue from CAE and the guarantees paid out are a disincentive to adequate provisioning.

In the first years of CAE TEIs receive a tuition windfall due to the increases in enrollment. Because it takes a long time to go through the cycle of student dropout, student default and the subsequent calling of the guarantee, TEIs may lower the amount of funds they provision because so few guarantees are called in the first years of CAE. As long as enough provisioning is done when the bulk of the guarantees are called, TEIs are not at risk. Figure 30 illustrates this. If TEIs provisioning levels decrease such that the guarantees paid out surpass the amount provisioned, then there is reason for concern. This is particularly true if part of the tuition windfall has not been properly invested and saved.

Figure 30. CAE TEI Provisioning in UF
Amount provisioned versus amount paid out when guarantees are called
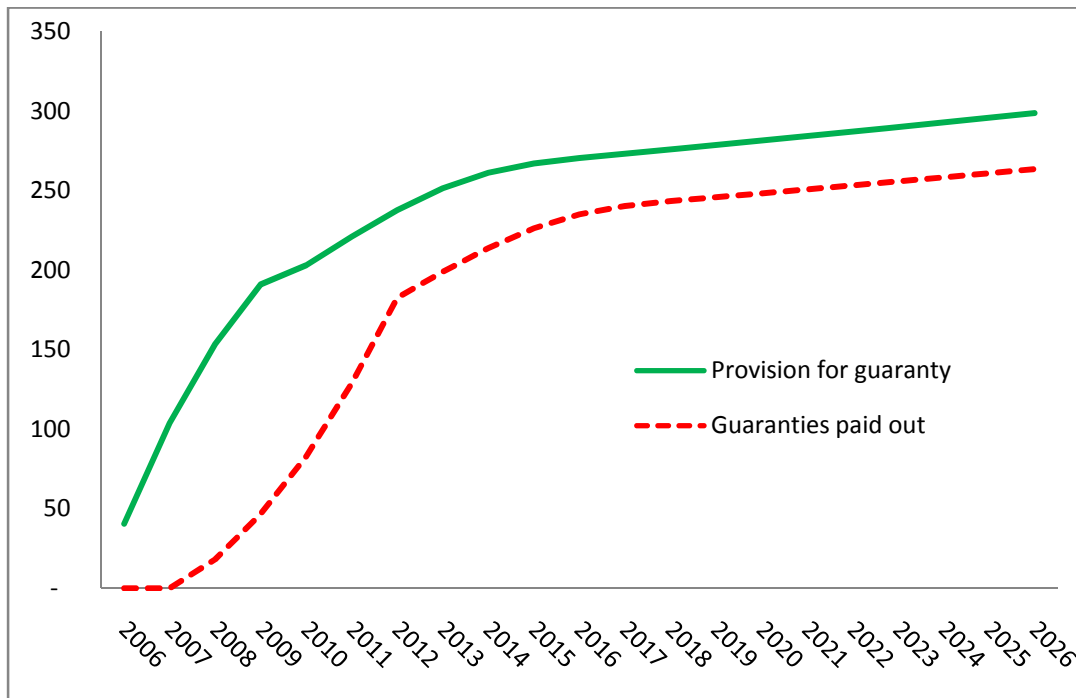
Source: World Bank Team analysis

The "headroom" Ingresa should track is the difference between those two lines, shown graphically in Figure 31. The difference should always be positive, and should comfortably cover unforeseen (but not unreasonable) scenarios.

Figure 31. Headroom between provision and guaranty (UF)
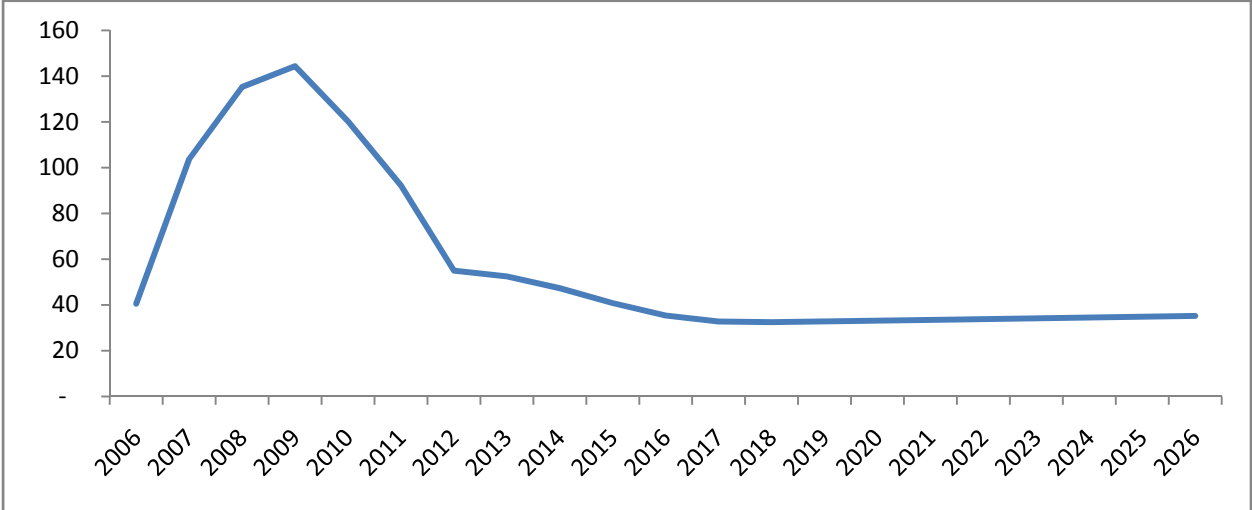
Source: World Bank Team analysis

It is important to note that the revenues from tuition received by TEIs participating in CAE easily are twenty times larger than the guarantees that are called. As such, if TEIs are adequately managed, solvency should not be a concern. Figure 32 illustrates this.

Figure 32. Difference between tuition revenues, provisions and guarantees (UF)

Legend:
- Tuition revenue from CAE
- Provision for guaranty
- Guaranties paid out
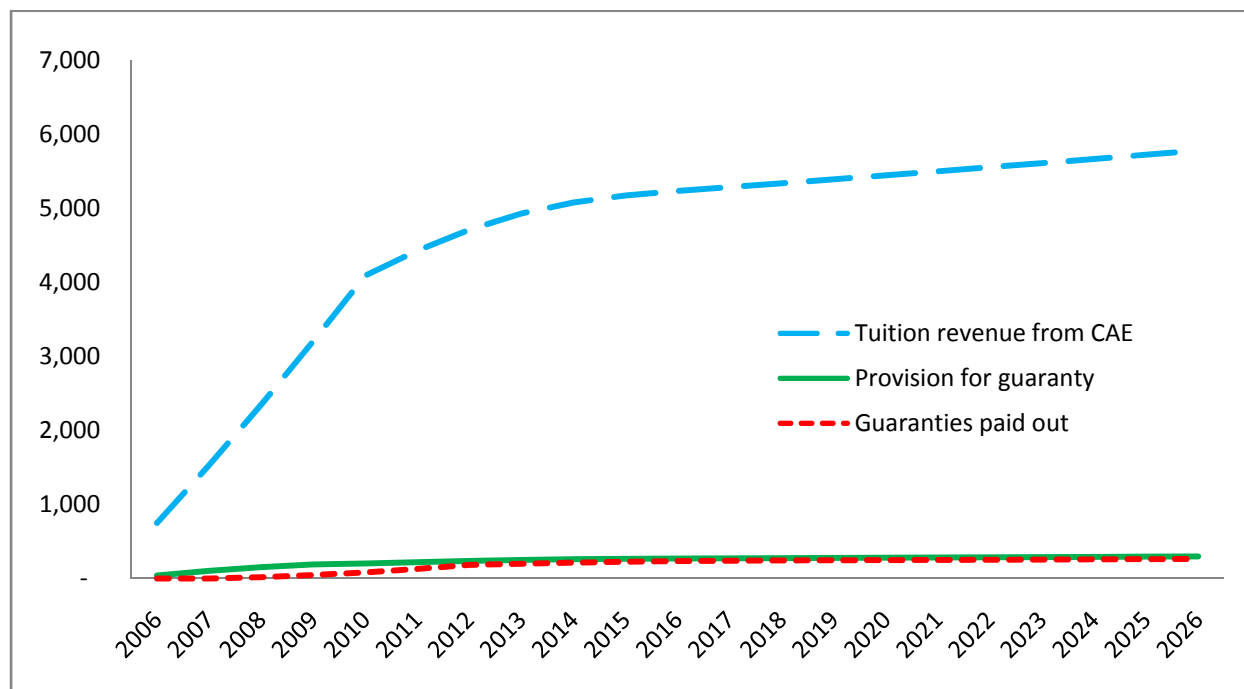
Source: World Bank Team analysis

Model assumptions

	CAE beneficiaries enrollment growth	Provision Rate	Dropout Rate
2006		6%	6%
2007	10%	6%	6%
2008	10%	5%	6%
2009	10%	4%	6%
2010	8%	3%	6%
2011	5%	3%	7%
2012	2%	3%	8%
Terminal growth	1%	3%	9%

Dropout Rate	6%
Dropout Default Rate	45%
Tuition Growth Rate	0%
Number of CAE students in TEI	1
Average loan balance per student (UF)	750

Source: World Bank Team analysis

Annex 12: Basel 1 versus Basel 2 capital requirements

Basilea rules in Chile say that financial institutions must have:

translation

$$\frac{\text{Patrimonio efectivo}}{\text{Activos ponderados por riesgo neto de provisiones}} = \frac{\text{Capital, reserves, subordinated bonds, and other provisions}}{\text{Risk-weighted assets, net of provisions}} \geq \mathbf{8\%}$$

The risk of financial instruments issued or guaranteed by the Government can be risk-weighted at 10%. The term "financial instruments" refers to: documents that testify to a debt or credit, such as notes, bonds, certificates of deposits, stocks, etc. Because CAE loans do not fit this definition, they must be risk-weighted at 100%.

Therefore, if:

Balance of CAE loans =	60
% set aside as provisions for those loans	5%
Risk of assets under Basilea 1	100%
Risk of assets under Basilea 2	10%

Since "patrimonio efectivo" must be ≥ 8% of "activos ponderados por riesgo neto de provisiones" then the minimum "patrimonio" is:

Under Basilea 1	4.56
Under Basilea 2	0.24

These two numbers differ by a factor of: 19.0
and thus CAE loans tie up that much more capital in financial institutions.

Source: Minuta: Clasificación como activos bancarios de los créditos de educación superior con aval del Estado. Por: Ministerio de Hacienda, Dirección de Presupuestos. Abril, 2010

Annex 13: Calculating the impact of CAE

Methodology for calculating additional graduates attributable to CAE

The number and quality of high school graduates directly affects tertiary education enrolment. The estimate of additional students in tertiary education considers the trend rate of enrolment in two periods: 2000-2005 (Period 1) and 2006-2010 (Period 2). In Period 1, high school graduates grew by about 4.4% per year, while TE enrolment grew at 7.5%. The result is that enrolment growth was 2.9% greater than high school graduate growth. This 2.9% is the amount of enrolment not explained by the growth of the pool of (high school graduate) candidates for tertiary education, or the "non-pool related" rate.[28]

Table 33. Trends by period

Years	CAGR of Enrollment for Tertiary Education
2000-2010	8%
2000-2005 (period 1)	7.4%
2006-2010 (period 2)	10.3%
Difference period 2-1	**2.9%**
Year	**Enrollment**
2005	622,127
2010	940,237
Difference between 2000 and 2010	**318,110**
Growth Decomposition	
Enrolment Following trend 1	719,040
Above trend	**221,197**

Source: World Bank Team analysis based on SIES

In Period 2, the number of new high school graduates was flat or slightly negative. Given that the "pool of candidates" did not grow in this period (in fact, it shrunk slightly), one would expect the rate of tertiary enrolment to equal the "non-pool related" rate of 2.73%. In fact, it grew at 8.5% per year, or 5.77% above the expected trend. It is assumed that the availability of student financial assistance (CAE and other additional aid) are primarily responsible for this "unexpected" 5.77% growth. The difference between the two rates translates to 82,000 additional students in TE in 2010.

In both periods, secondary education quality (as measured by PISA scores) improved. The increments were slightly larger in Period 1 than in Period 2, but the figures are close enough that the effect on tertiary enrolment is likely to have been the same in both periods. Figure 33 illustrates this.

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[28] These are Compound Annual Growth Rates unless otherwise noted.

Table 34. Selected Factors Influencing Potential Tertiary Education Enrolment Growth

Factor	2000- 2010	2000-2005	2006-2010	Comment
14-19 yrs old cohort size (CAGR)	0.96%	1.89%	-0.17%.	Negative growth during CAE period. Argues for positive role of CAE in maintaining and exceeding enrolment trends averages.
Secondary school graduation rates (excludes 2010)	2.61% (2000 - 2009)	4.39%	0.18% (2007 - 2009)	Compare with CAGR for TE enrolment. Equal or higher CAGR supports TE enrolment CAGR historical trend. Note that new graduates are disproportionately from lower SE quintiles
Secondary school quality (PISA scores)	Score average increases 36.7 points from 2000 to 2009.	Score average increases 27.8 points from 2000 to 2006	Score average increases 8.9 points from 2006 to 2009	Growth during CAE period increases but at slower rate. Tests are taken at age 15, meaning more TE-ready students during CAE period.
Number of student aid benefits given (includes CAE)	2,833,817 total benefits	1,043,211 total benefits	1,790,606 total benefits	Significant growth during CAE period. Difficult to disentangle effect of CAE from effect of other aid.

Source: 14-19 year-old age cohort, from World Bank Edstats. Secondary school graduation rates from Ministry of Education. PISA scores from OECD. Number of student aid recipients from SIES.

Figure 33. Chile Pisa scores 2000-2009

PISA - MATH

PISA - READING

PISA - SCIENCE

LAC average — CHILE — OECD
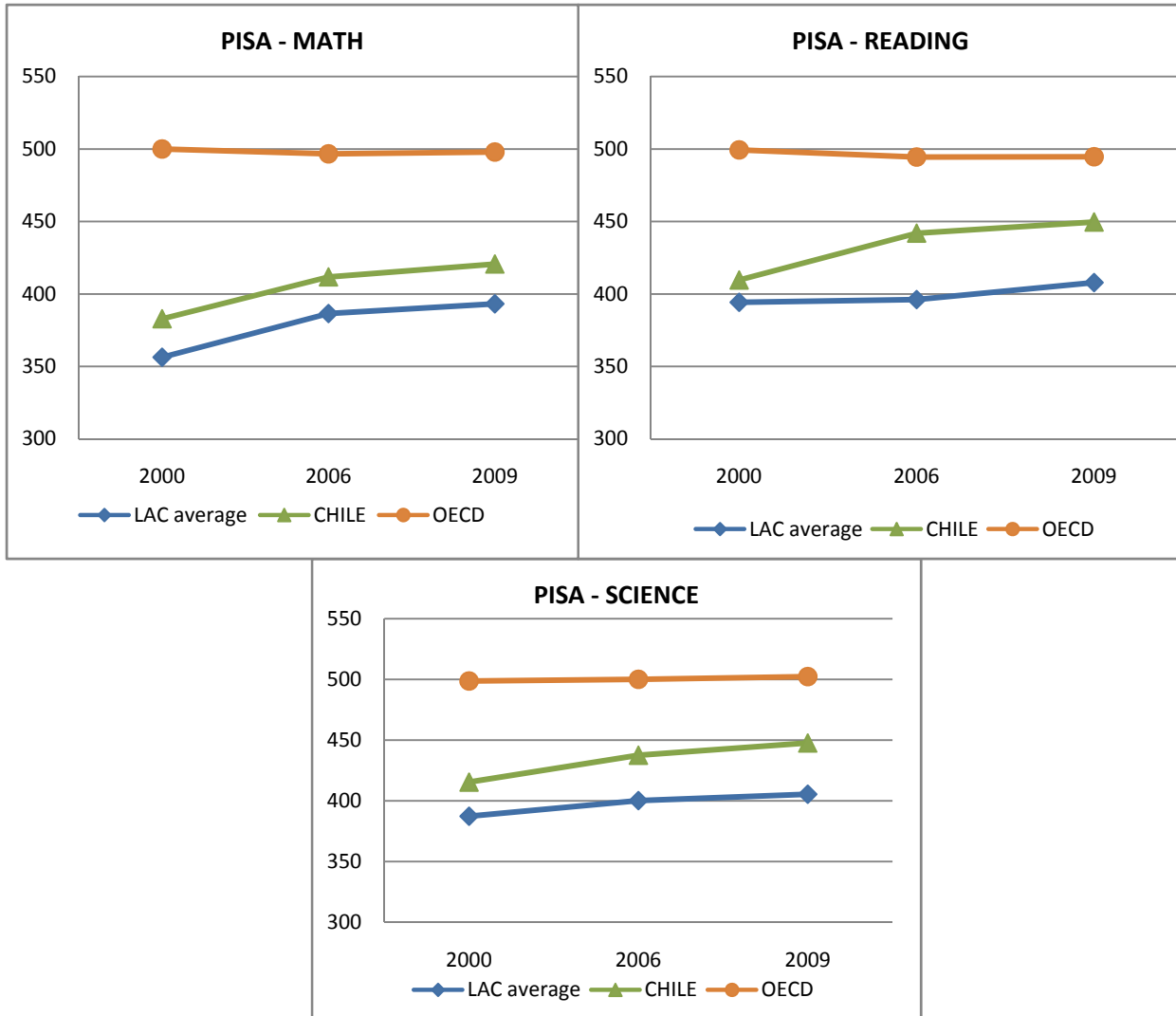
In 2010, roughly 317,000 more aid awards were made than in 2005.[29] One can estimate that these awards led to 221,000 additional enrolments, or roughly one new enrolment for every 1.4 awards. (The remaining awards were either part of multiple awards to the same person, or were awards that facilitated a student who would have enrolled anyway, or both.) Since CAE accounted for two-thirds of the additional awards, both in number and value, two-thirds of the additional students in tertiary education can be attributed to CAE's assistance.

The 147,000 students in tertiary education because of CAE are expected to drop out at the overall rate for CAE borrowers, which is roughly one-third of the general dropout rate. Based on

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[29] This is the in the number of new benefits given between 2005 and 2010, and includes CAE, *Beca Bicententario, Beca de Excelencia Académica, y Beca Nuevo Milenio*)

the 5.5 average number of years-to-degree for all tertiary education, 109,000 are expected to graduate.[30]   Sixty-eight thousand (68,000) students were given CAE loans who would have been expected to enrol even without CAE's help. However, they would have dropped out at the much higher rates at which non-CAE students drop out. The differences, calculated in Table 35, mean that 24,000 of them will graduate who would otherwise not have. Taken together with the graduates from additional students, and the current 18,000 CAE beneficiaries who have already graduated, CAE is leading to an extra 151,000 graduates.

Table 35. Graduates attributable to CAE

Change in beneficiaries between 2005 and 2010	216,000				

	Year 1	Year 2	Year 3	Year 4	Year 5
Beneficiaries who would not have otherwise enrolled					
With CAE dropout rate	147,327	132,594	123,313	117,147	108,947
With regular dropout rate		92,816	74,253	63,115	56,803
Difference btw these		**39,778**	**49,060**	**54,032**	**52,143**
Beneficiaries who would have enrolled regardless					
With CAE dropout rate	68,673	61,806	57,479	54,605	50,783
With regular dropout rate		43,264	34,611	29,419	26,478
Difference btw these		**18,542**	**22,868**	**25,186**	**24,305**
Graduated beneficiaries					18,000
Number of graduates due to CAE					**151,252**

	USD	UF
CAE cost (NPV)	1,400,000,000	32,558,140
cost per graduates	9,256	215

Source: World Bank Team analysis

The numerous caveats that accompany these estimates must be kept in mind. However, an accurate figure could replace these estimates within 12 months, if a survey of prospective students is undertaken. This survey would be invaluable for policy, inter alia, because it would permit: (a) an understanding of who is getting aid as a substitution for resources from elsewhere; (b) who is attending tertiary education only because they have a CAE loan; (c) who is attending tertiary because of other aid or a combination of CAE and other aid.

Methodology for calculating enrolled students attributable to CAE

Every year Chile's prospective new tertiary students decide whether to enrol while current students decide whether to continue their studies.   Their decisions determine overall enrolment.

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[30] This calculation uses SIES data for overall time-to-degree for all tertiary students. A more sophisticated estimate would break out CAE borrowers by degree type and use the individual times-to-graduation and dropout rates per institution and degree types.

Two general factors will influence ultimate tertiary education enrolment: the size of the pool of available candidates and the sum of their decisions on whether or not to enrol.

The first part of the methodology involves determining the size of the pool of candidates for tertiary education and the factors that affect their decisions. The key measures are:

- The size of the age cohort;
- The number of high school graduates;
- The qualifications of high school graduates;
- The aspirations of high school graduates; and
- The size, qualifications and aspirations of the pool of potential tertiary students from outside the age cohort.

The size of the age cohort times the graduation rate gives overall graduates. In Chile age cohorts are expected to remain stable but the behaviour of graduation rates is not.

Improvements in quality of education also partially determine the number of aspirants to tertiary education. Students whose higher quality schooling enables them to score better on university entrance exams, are capable of gaining admission to and completing more difficult degree programs, and will be attracted by the potential returns to additional schooling. Chile is witnessing an upward trend in PISA scores, indicating that 15-year olds have learned more in school. Better learning outcomes in primary and secondary school will drive more Chileans to enrol in tertiary education.

Aspirations of potential students constitute a third category. This category includes such phenomena as perceived labor market value of tertiary education, peer group effects, parental and personal expectations, quality, availability, relevance, and price of tertiary education, and predilection or vocation for continued study. This category contains many indicators that can only be measured by surveying potential students about their decision making deliberations, but it is no less important. Most of the growth in Chilean tertiary education over the past decades has likely come from greater aspirations driven by the factors listed above.

Reliable information is needed on all of these factors. Age cohort sizes and graduation rates are routinely collected, but decision processes of prospective students are not. These should be surveyed routinely.

The four factors above also apply to potential students from outside the age cohort. These include students who may have dropped out of tertiary education earlier in their lives and students who were not interested in or able to study when younger. It might also include a statistically insignificant number of students who begin tertiary education before their eighteenth birthdays. Taken together these two groups determine the potential pool of tertiary students. It is important to note that as more young Chileans attend tertiary education immediately following high school, the pool of potential students outside the age cohort shrinks. Chile has been drawings students from outside the age cohort in large numbers, but will likely draw fewer

students from this group in the future.   Nonetheless, the same survey administered to prospective tertiary students who are in high school should be administered to this outside-the-age-cohort group.

All potential students must decide whether or not to enrol. All enrolled students must decide whether or not to continue.   A myriad of factors influence these decisions, but costs and availability of financial assistance are perennially among the most important.   Some students will enrol almost regardless of cost or aid availability, but most students have limited assets and means.   These will only enrol if the aid-adjusted costs and payment terms seem favourable.

The existence of the CAE program will have tipped this equation in favour of higher enrolment than in its absence, but determining the exact size of the impact is difficult in the absence of survey data documenting what influences students decisions.   Enrolled student can be divided into five groups for the purpose of analysis:

- Wealthy students [W_{rich}]: students of means who do not receive financial assistance and for whom price and cost do not affect the decision to attend;
- Facilitated students [W_{facil}]: students of limited means who receive aid but who would have attended even if they did not get this financial assistance. Receiving aid makes attending TE easier but it is not the determining factor;
- CAE- Sponsored students [P_{cae}]:   students of limited means whose only financial assistance was a CAE loan and for whom the CAE loan was the difference between enrolling or no;
- Recipients of Multiple Aid Awards [P_{multi}]: students who received CAE and other aid and for whom the overall aid awards were the difference between enrolling or not; and
- Recipients of Other Aid Awards [P_{oaa}]: students who did not receive CAE but did receive other aid awards and for whom these others aid awards were the difference between enrolling or not.

Figure 34. Tertiary education students
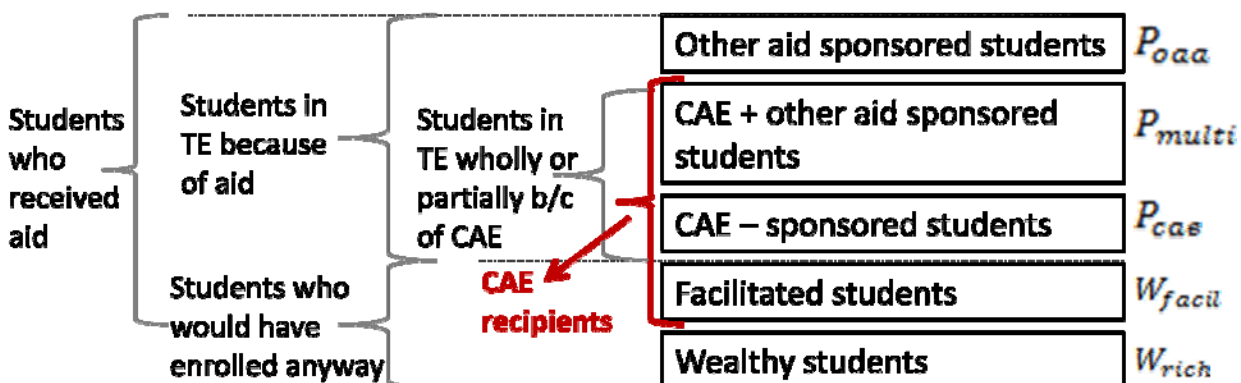
Stated formally, one can consider that:

- Total tertiary enrolment = $W_{rich} + W_{facil} + P_{cae} + P_{multi} + P_{oaa}$
- Total Enrolled Aid Recipients = $W_{facil} + P_{cae} + P_{multi} + P_{oaa}$
- Net enrolment due to aid provision = $P_{cae} + P_{multi} + P_{oaa}$
- Net enrolment due to the CAE = $P_{cae} + P_{multi} * X$ [where X = weighted role of CAE]

Solving these equations and thereby determining the impact of aid programs in general and CAE in particular on enrolment can only be done if information is obtained from students on the factors that influenced their decision to enrol. Such information should be collected from an annual survey of prospective and enrolled tertiary education students.

Annex 14: The CAE model

This annex is intended to make the functioning of the model more transparent, from its architecture to its assumptions. The annex is organized as follows:

1) General Overview of Model Principals;
2) Core Assumptions in the Model;
3) Implementation of Assumptions from the Recommendation Scenarios;
4) Model Output and Development of A Cash Flow Schedule; and
5) Data Trends and Implications

1) <u>General Overview of Model Principals</u>

    a. Simplification

The model was developed to allow the fiscal implications of CAE to be easily understood and to capture the behavior of the program as it stands now. It takes aggregate data from an extensive dataset (characteristics of over a quarter million loans) and uses a subset of representative assets as stand-ins for the actual constituent loans in the CAE portfolios.

The model develops all future cash flows and the current net present values for a single CAE cohort at a time. The model tracks the balances originated for a cohort of new recipients, grows them as the students progress through their educations (or alternately, as they drop out), provides a grace period prior to students entering repayment (during which interest accrues), and then tracks the balances as the students pay down their loans. Currently, there are five CAE cohorts, 2006, 2007, 2008, 2009, and 2010. Each of the 260,000 students belongs to the cohort in which their status was "*Licitado*." Additionally, because the 2011 cohort is in the process of being put together, an attempt was made to model expected cash flows and NPV of that cohort as well.

    b. Aggregation

In order to reduce the complexity of the underlying assets of the CAE program, they are aggregated such that the cash flows of a handful of loan profiles function representatively. The goal of the aggregation was to generate that small number of loan profiles that would faithfully represent the cash flows of the actual loans in the program without significantly diminishing the resolution.

More explicitly, if a loan that was expected to enter repayment after two years of study were grouped with a loan entering repayment after ten years of study, the cash flows of a loan with that average study length (six years) would not look similar to those of the underlying two loans. On the other hand, if a loan entering repayment after two years of study was grouped with a loan entering repayment after three years, then an aggregate loan with a study length of 2.5 years would look very similar in terms of timing to each of the underlying loans.

A handful of assumptions were made in order to aggregate the loans, in hopes of grouping them by similar cash flow and repayment behavior.

i. Term of Repayment – The number of years the borrower has for repayment determines the number of years the repayment cash flows are spread over, which in turn affects the relative magnitude of each of those payments. Loans of different repayment terms (ten, fifteen, and twenty year terms) were grouped separately. This allows the timing of distinct cash flows to be accurately represented.

Additionally, because the loan burdens were expected to vary by repayment term, which in turn could affect repayment behavior, grouping loans with similar terms also allows any differences in repayment behavior to be attributed on the basis of those terms.

ii. TEI Type – It was assumed that repayment behaviors would vary by TEI type, as employment prospects and salary levels would be expected to vary by TEI type, and these would in turn affect the amount of money left over to apply to loan repayment. Further, it was expected that the duration of education within TEI types would be similar, and that across different types of TEIs it would be highly variable.

iii. Indirect Aggregation – TEI/Repayment Term mixing – It was anticipated that the combination of TEI type and repayment term would help to specify borrowers with similar times to graduation and thus similar timing profiles as tuition costs were paid out and as repayment streams began to accrue. For example, CRUCH students with a ten year repayment term vs. those with a twenty year repayment term are likely much closer to graduation, so the combination of specific TEI type and repayment term should make the cash flows of the model very similar to the actual cash flows.

The quality of the aggregations in grouping like loans is treated in further detail in section 2, below. The levels of aggregation result in a total of twelve asset lines used to represent the program cash flows. Those twelve asset lines are:

Table 36. Aggregation Groups for CAE Modeling

Asset	TEI Type	Repayment Term
1	CRUCH	10
2	CRUCH	15
3	CRUCH	20
4	Privad	10
5	Privad	15
6	Privad	20
7	IP	10
8	IP	15
9	IP	20
10	CFT	10
11	CFT	15
12	Military School	20

c. Structure

Because the ultimate cash flows for the loans underlying the CAE program vary depending on whether or not the loans are owned by the Government or a bank, there are two versions of the model, one that tracks bank loan performances, and one that tracks government loan performances. Much of the content of the underlying models is identical; in each case, the balances of the loans must be grown, and then paid down. However, the final step of apportioning the various cash flow streams differs depending on the owner of the portfolio.

The sheets within the model are numbered for ease of reference. A detailing of the specific sheets within the model, organized by their ascending reference number, follows, with the names of particularly critical sheets in bold:

1. **Inputs**

This sheet allows the specifics of each of the assets to be specified, (balance, rate, mark-up (for government loans), dropout default and prepayment data, as well as the discount rate to be used, and the guarantee structure for students still in TEIs.

The asset characteristics (balance, rate, education span, term, and markup) can be adjusted in rows 11-24.

The discount rate is in cell E8.

The prepayment, default and dropout behavior can be specified in rows 27-39, including prepayment curves, a prepayment scalar (to increase or decrease the magnitude of

prepayments – currently set at zero), the total amount of default, the default shape for the first five years, the percent of defaults occurring in the first five years, the recovery percentage from defaulted loans, the curve for drop-out rates, a scalar for dropout rates (to increase or decrease the magnitude), the default rate of dropouts, and the recovery percentage for dropouts.

Finally the guarantee structure can be found in rows 55 through 65.

Graphs scattered throughout the page are meant to provide some high level transparency into the models functioning, but do not represent a complete survey of model output.

2. Theoretical Disbursement Flow

The theoretical disbursement sheet covers the growth of the loan balances through the education and grace periods for the twelve assets. The final figure for each asset line on this page is what the balance would grow to just before repayment if there were no students dropping out and no drop-out students defaulting. The "theoretical balance" developed here can be used as a comparator to understand the effects of dropouts and defaults on the ultimate loan balance, but other than that is not further used in the model.

3. Actual Disbursement Flow

As above, tracks the growth of loan balances through the education and grace periods, but this sheet accounts for the impact of students dropping out and of some of those students defaulting. Additionally, this sheet tracks any recovery from those students that default in the education span. The final balance from this sheet is used as the starting balance to be paid down on the Theoretical and Actual Asset Cash Flow sheets.

4. Theoretical Asset Cash Flow

This sheet tracks the loan balances for the twelve assets through the repayment span. It is "theoretical" in that it does not account for defaults, prepayment, or recovery from defaults. It is used later in the model to develop amortization schedules for the loans that are performing as expected. It can also be used as a basis for comparison against the actual repayment, to understand the effects of prepayment and default on the cash flows that would have otherwise materialized.

5. Actual Asset Cash Flow

This sheet tracks the loan balances for the twelve assets through the repayment span and includes the effects of defaults, prepayment, and recovery.

6. Consolidated Cash Flow

This sheet consolidates the actual cash flows of the program into nominal and NPV cash flow streams. It aggregates the figures for each of the twelve assets into a consolidated cash flow

stream, but does not yet allocate the cash flows to the participants to which they accrue. The information in this sheet can be used to understand all of the streams of payment (or nonpayment) in the program, from a participant-agnostic perspective.

7. Apportioned Cash Flow

Using the logic inherent in the terms of the CAE program, this sheet allocates the cash flows from the consolidated cash flow sheet to the appropriate participants in the appropriate percentages. (For example, for the bank owned portfolio, the cash flows from payouts of default guaranties for dropouts in their second year of study would be allocated at +90% to the banks, and at -70% to the TEIs, and at -20% for the Government). The output on this sheet is what is necessary to construct a cash flow schedule. For each entity, each of the sources of cash flow is broken out separately.

8. Terse Output

This sheet refers to the apportioned cash flow to show a handful of NPV figures for the program for the single year of operation that is modeled.

9. Vectors

This sheet is related to the input sheets. A number of curves are used in the model, and those curves in the vectors sheet. Any changes to curve shapes must be made here, and will trickle through to any asset using the specified curve. The curve templates at the top of the page (rows 5-17) do not include any scalar multiples. Scalars are included in the expanded month by month curves constructed in rows 22-690.

10. Input Vetting

This sheet allows the curves constructed in rows 22-690 to be easily visualized so that the model operator can vet the inputs and ensure that they are working together sensibly.

The model makes extensive use of nested logic statements "(IF(IF))" to generate appropriate content for each cell. Particularly in the asset level disbursement and asset cash flow sheets, the value of each cell is dependent on a large number of factors. The logic statements have been carefully crafted to mimic the cash flow timing of the program as closely as possible. Changes to these statements should be avoided, as the effects of changes are not transparent.

In general, changes to the model should only consist of input changes on the Inputs page, or input changes in the few cells at the top of the Vectors page.

2) <u>Core Assumptions in the Model</u>

This section is devoted to making transparent the assumptions that fed into the actual model runs, as well as clarifying the sources of all of the inputs.

    a. Cohort Input Analysis

Each of the twelve representative asset lines in the model require a number of characteristics to be input. The model itself does not perform the aggregation of information necessary to generate those inputs; all aggregation and development of appropriate inputs were done in a combination of SQL/Excel, and were then transferred into the model.

The model inputs associated with each of the assets are: the principal balance paid down in the first year for tuition for the loan recipients (in UF) – additional future years of payouts for tuition are handled within the logic structure of the model, the interest rate (in %), the average duration of study (in years – can be fractional; note that this is not time until repayment, but time until graduation), as well as the repayment term in years. Additionally, in the case of the Government loans, a mark-up also needs to be input. For more on the mark-up assumptions, see section 2j below.

To minimize the extent of the logic throughout the model, and to reduce the flexibility that needed to be built in, there are limits to the ranges on certain inputs. No loan balances can be input as zero. (If an asset line does not need to be used, the same effective result can be obtained by inputting a very small number, like 0.01) The model sets a maximum education length of 15 years (that is expected to be far more than necessary).

    i.   Education Duration and Principal Balances

The actual inputs fed into the model were developed from the databases provided to the World Bank from Ingresa. Certain underlying data-issues were noted, many were resolved with Ingresa's help, but some issues remain outstanding. See Section 5 of this annex for a brief accounting of those issues.

Ingresa provided two databases with loan balances, one titled "*Base Banco Mundial*", the other titled "*Ingresa Beneficiados*". To determine the initial balance of each of the twelve underlying assets, the "*Ingresa Beneficiados*" database (henceforth "IB Database") was used (for reasons explained in Section 5).

To model a cohort, each credit amount from the IB Database with a student status of "*Licitado*" in the first year of the cohort was aggregated on the basis of TEI type and repayment term. Additionally, for the 2006-2008 operation years, because the loan terms did not vary (all are 20 year term loans), additional granularity was introduced to the data set by checking the repayment schedule database for the date that each RUT entered repayment. All RUTs with education spans less than four years were aggregated into a

single principal amount, and the average of those education spans was taken. The same operation was performed for those RUTs with educations longer than four years. To the extent that the loan repayment schedule provided by Ingresa is inconsistent with the actual dates that students enter repayment, this analysis of education spans will be inconsistent with the actual education durations, and the timing of cash flows as modeled will be incorrect.

For the 2009-2010 operation years, the loan repayment terms vary from ten years to twenty years. It was assumed that these repayment terms would correlate highly with the education span (as explained in (d) below), and thus all credit amounts were aggregated solely by TEI type, and repayment term. The education spans for each one of these aggregations was evaluated for both the Government held and bank held portfolio, and that was input as well. The calculation of education duration was done by comparing the education start date of the cohort with the date eighteen months prior to the start of repayment (i.e., the start of the grace period). This was done through use of the repayment database, and records were pulled on the basis of RUTs. The average for the cohort was taken, though the tightness of the distribution was evaluated (see section (d) below).

ii. Ownership – Govt/Bank Breakout

Loan balances and education durations were apportioned to Government and bank aggregate portfolios through loan ownership data. Ingresa provided loan ownership data in the form of a database of RUT, Balance, Bank, and "Sold/Financed". Most RUTs appeared in this dataset only a single time, and were thus easy to attribute to the Government or bank aggregate portfolios. In the case of students that had transferred institutions, and another eight thousand loans (out of ~270K) that had multiple entries in the table despite not appearing to have transferred, an algorithm based on ascending loan balances and the evolution of the loan status was used to attribute the loans o an owner. These 8K loans may not be correctly apportioned. (See section 5 for more information) This represents a small percent of the loans, and any error in apportionment is not likely to significantly affect the results of the model.

Additionally, ownership database indicated that all 2010 loans originated through Scotiabank had been retained by it; assuming that this was wrong, those loans were split half and half between the Government and bank portfolios. To the extent that that masks meaningful variations in education terms (as was the case in the portfolio held by another bank in 2010, discussed further in section 5(a) below), the model output will not reflect the incremental costs or savings that may derive from disparate educational terms, by way of the mark-up or disproportionate finance costs borne by Scotia or the Treasury.

Finally, all loans owned by the government for a specific cohort were fed into the Government model on the aggregated basis described above. All loans retained by the

banks were grouped in a single "Bank Portfolio", and then fed into the the bank model on the aggregated basis described above.

iii.   Loan Balance – Pesos/UF

The IB Database contains loan balance information denominated in Pesos. Because the interest rates contemplated in the CAE program are applied against UF balances, those peso figures needed to be converted to UF. The second database that Ingresa provided the World Bank team was incomplete because it had initial balances on many but not all loans, in UF (see Section 5 below for more details). This database was used to derive a conversion factor between UF and Chilean pesos for each loan cohort appropriate for the date at which the loans were originated. This was done by examining loans that appeared in both databases, and comparing them to determine an average conversion factor. Though the conversion factor did vary across loans in a single cohort, from max to min, the actual conversion factors as compared to the average usually varied no more than +/-5% of the average conversion factor. Finally, the conversion factor was applied against all peso balances to determine the initial UF principal.

iv.   Calculation of Interest Rate

Initial interest rates were provided for each cohort and for each subsequent year of renewal those rates changed. The variation of these rates across years increases the complexity of the program. For the purposes of simplifying the model, each cohort is assigned the average interest rates for cohort to-date, and that is applied to all balances, both first year and renewal years. Though this will cause modeled cash flows to vary from actual cash flows, given the limited variation in the interest rates (5.5%, +/-0.5%) the effect is expected to be small.

b. Evolution of Principal subsequent to First Year

As students progress from their first year of study into later years of their programs, their annual loan renewal amount can potentially change. This section describes how the evolution of renewal balances was handled in the model.

Though the databases do contain information about the renewal amounts of loans in years subsequent to the licitation year, this data was not used on a loan by loan basis as an input. Instead, an analysis of those subsequent renewal levels was performed to understand the evolution of balances in aggregate, and then this behavior was applied to all loans. This approach was used because the largest program years (2009, 2010) lack much in the way of renewal data (having only one or two years of history).

The average loan balance for renewal years for the 2006, 2007 and 2008 cohorts were compared against the first year average balance, for each of the twelve subgroups identified above. Though the balance increased in nominal pesos each year, once converted to UF, there was no consistent upward trajectory. Becabalances and there

was no observed upward drift in the average loan balance per subgroup, the model contemplates no tuition growth. The data was segmented on the basis of TEI type and still revealed no consistent trend.

The sole factor influencing the tuition disbursed each year subsequent to the first year is the drop-out rate. By definition, students that drop out will not require tuition to be paid out on their behalf in the subsequent year. Each subsequent year in the disbursement section of the model, the percent of students that drop out are assumed to not have their principal renewed.

The actual drop-out curves used to inform the evolution of tuition and the methodology used to derive them are described below in section 2g.

c. Cash Flow Timing

In reality, the cash flows underlying CAE are complex and staggered in time. Because of the tight timetable, the TEIs accept students on the basis of something akin to an promise of later repayment. Instead of receiving payment at the start of the first term, the TEIs must wait until September or October, at which point the financial entities pay out the tuition balances. Shortly afterwards, the financial entities are reimbursed by the Government for whichever loans the Government owns. In subsequent years, the timing of the payments to the TEIs for the loans are more closely aligned with the dates that students start their studies. The cash flows from the Government to the banks still lag by a month or two.

The model does not reflect this complexity, and assumes that each cash flow only occurs at a single distinct point in time, and that for tuitions, that date is approximately the start of the academic year, with cash flowing in March. This should have no meaningful effect on annual cash flows in aggregate (the amounts will be right on a yearly basis, despite being mistimed on a monthly basis). It will have some effect on NPV, but given that only a very small number of cash flows are timed more than a few months off, the effect on NPV is expected to be limited.

Repayment cash flows are modeled as starting eighteen months after the final program year. As education spans vary from asset to asset on the basis of the average education span of that asset group, all borrowers do not enter repayment in the same month (i.e., September), but instead derive a repayment start date from the education span.

d. Interest Rate Assumptions

No attempt was made to model forward changes to the interest rates, despite their variability from one program year to the next. If interest rates continue to evolve away from the averages that were used (as described above), then the modeled program costs will diverge from the actual program costs.

e. Correlation of Loan and Education Terms

In section 1b above, it was asserted that loans with the same repayment term and TEI type were aggregated because the education duration for those loans tended to be very similar. This results in students within each subgroup entering repayment at approximately the same time. To verify this assumption, the actual distribution of education durations was examined on the basis of TEI type and repayment term. In most cases, 60-80% of the loans within a TEI/Term group started repayment in a +/- 1 year span. Thus the average for those groups does a good job of representing the actual timing of cash flows for the constituent loans.

The following figures illustrate the resolution provided by grouping on a TEI/term basis. In the first figure, all loans from the 2010 cohort are shown, with no aggregation. The X axis shows the number of years until students graduate, and the Y axis shows the percent of the loans that fall into that category.

Figure 35. Distribution of Time to Graduation for all TEIs (2010 Cohort)
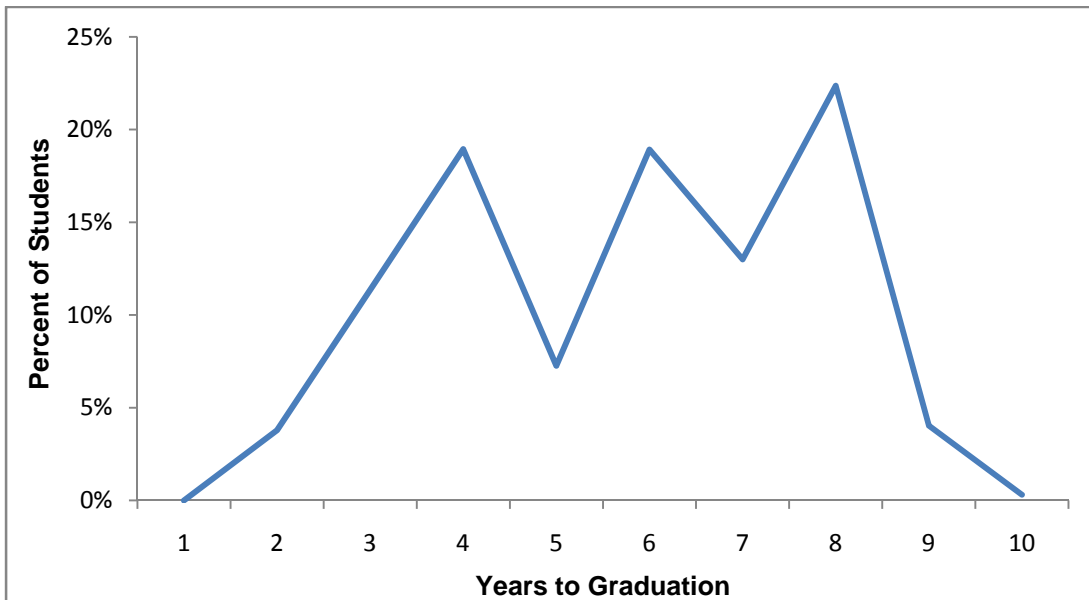
Source: World Bank Team analysis

As is readily apparent, the loans have a wide distribution of education times. If the loans of all non-CRUCH students are excluded, the distribution tightens, but still shows substantial dispersion. That graphic is just below.

Figure 36. Distribution of Time to Graduation in CRUCH (2010 Cohort)
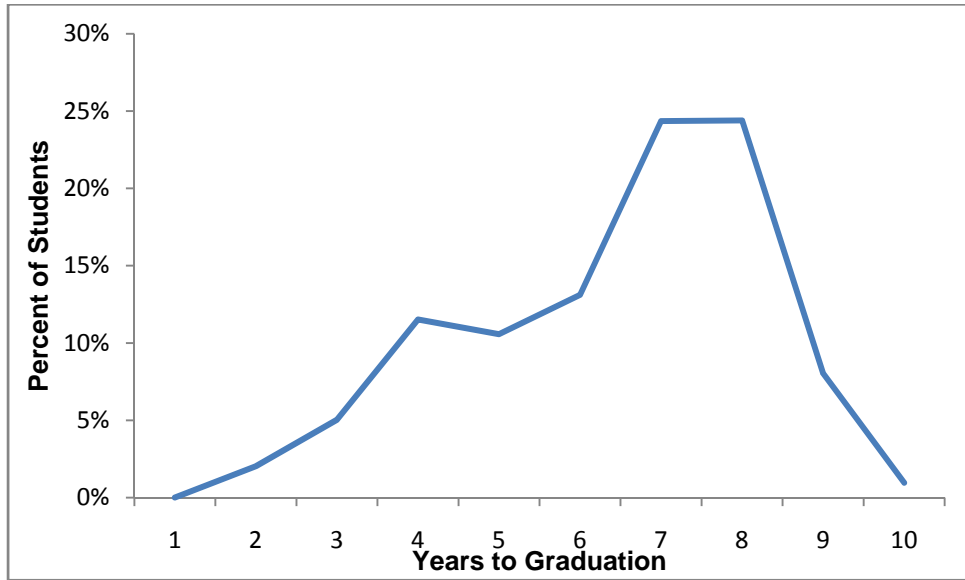
Source: World Bank Team analysis

The resolution can be further improved by then segmenting CRUCH loans on the basis of repayment terms. As can be seen below, aggregating by the repayment term pulls together loans with similar times until graduation. Some issues still remain (small numbers of loans fall outside the tight distribution), but generally, 60-80% of loans within a bracket are within +/-1 year of the graduation date.
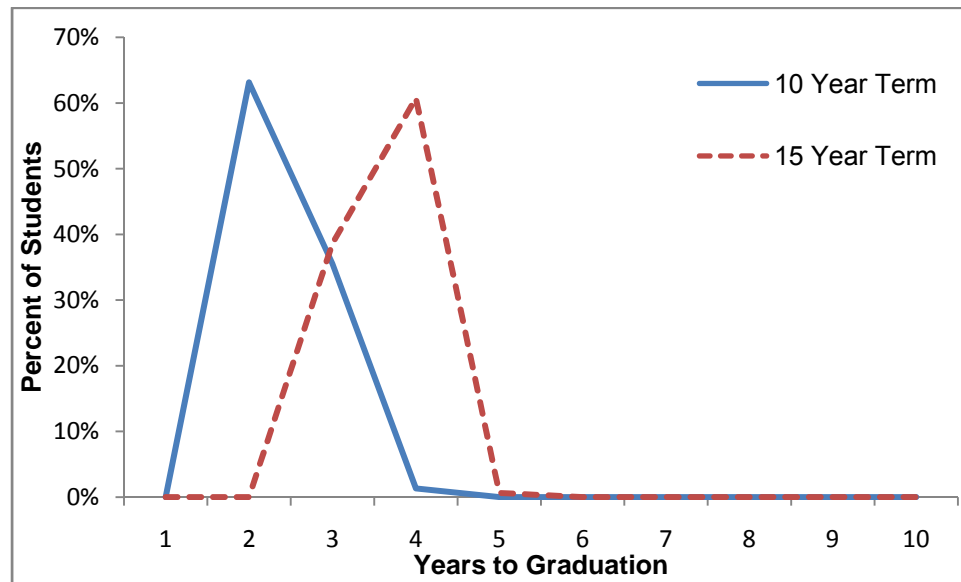
Figure 37. Distribution of Time to Graduation in CRUCH by Term (2010 Cohort)
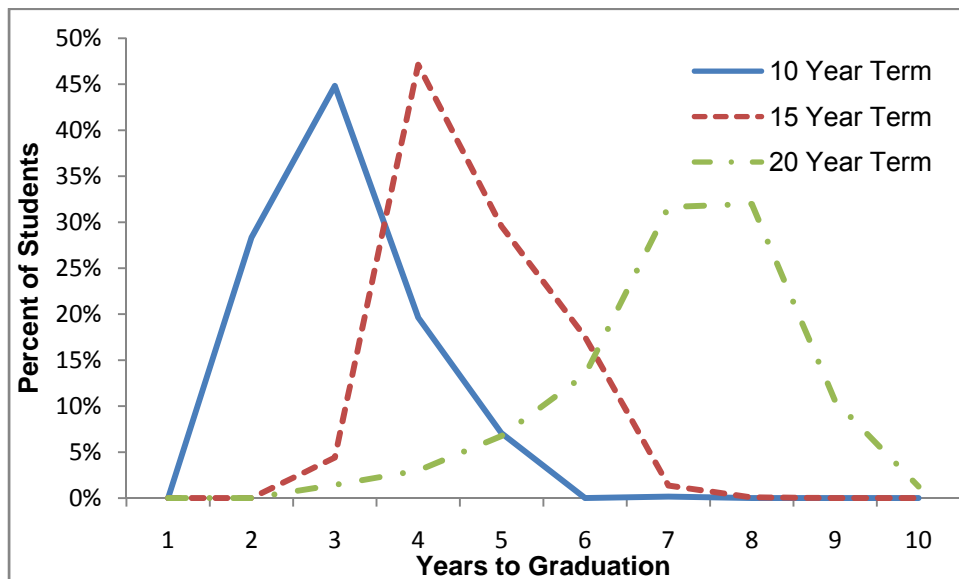
This analysis was repeated for all TEI types. The clustering for the CRUCH cohorts (above figure) was the most diffuse. The CFTs showed the tightest distributions, with 99% of loans within a +/-1 year span. See below.

Figure 38. Distribution of Time to Graduation in CFT by Term (2010 Cohort)

Though the level of aggregation will not entirely capture the timing of all cash flows, it does allow most of the complexity of the program to be modeled without requiring a more nuanced approach.

   f.   Default Behavior and International Comparisons

Default behavior is a critical model input, both in terms of how many borrowers ultimately default, and when those borrowers default. Default is critical to the program cost for two reasons; borrowers in the Government portfolio who do not repay their loan drive down future cash flows back to the Government, and borrowers in the bank-owned portfolio who default lead to higher future payouts from the Government for the guaranties to the banks. The timing of default is a critical input; students that default later in the program are less costly, as they have paid down interest and some of their balance prior to default. Early defaulters are very expensive. Student default tends to occur early in the repayment span.

Two sources of data were used to inform the default assumptions fed into the model: actual CAE borrower repayment behavior observed to-date, and U.S. student loan repayment data provided by Sallie Mae, for Federal Family Education Loan Program (FFELP) loans, which are U.S. government guaranteed student loan debt.

The actual CAE borrower behavior was analyzed by way of two databases provided by Ingresa: a "Default" database, listing amounts and dates that borrowers default, and the *Ingresa Beneficiados* database, which indicates the year that students graduated, and thus by implication, when they should have entered repayment. This data needed to be processed to indicate default behavior.

The U.S. student loan data did not require processing. The acquired data corresponds to actual default rates of student loans that have been bundled into trusts and issued over a number of years. For each of those trusts, a dataset with the cumulative default rate by quarter was available.

The model uses three distinct inputs to model defaults;
- gross cumulative default;
- the shape of defaults over the first five years; and
- the percentage of the total defaults occurring in the first five years.

Defaults are modeled as a curve that can be varied for each of the twelve assets. Based on the U.S. data, default rates show significant variability in the early years of repayment, but then tend to even out at a steady value after the fifth year of repayment. Thus the model input allows a user to specify the total amount of default, the shape of the defaults in early years, and the concentration of total default in early years.

The conversion of these two datasets (CAE/U.S.) into the three model inputs and all the underlying assumptions in that process are detailed below.

    i. Aggregate Cohort Default Rates

The cumulative default rate for an asset line is the total amount of the balance that will ultimately default. Because default can occur over the entire life of a loan, and because the CAE loans that have entered repayment have only accrued one or two years of repayment behavior, relative to a total repayment term of twenty years, it is unclear what the ultimate cumulative loss will be.

To generate the cumulative loss input data for the model, the current CAE default levels were analyzed. By checking the *Ingresa Beneficiados* database for the year that students graduated, it was possible to back out the date of their first expected payment (the October of the following year). This was confirmed through the Loan Pay Schedule database, which shows all loans entering repayment in October.

The total number of students entering repayment was compared with the number of students in the default database, and the date of their defaults. Defaults were aggregated by the month that they occurred, and were calculated cumulatively.

As incremental students default, the cumulative rate goes up. This analysis was performed for all loans in repayment with no aggregation, and then was performed on a disaggregated basis by TEI type. This analysis (the results of which are in the body of the report) indicated no meaningful variation in repayment behavior by TEI type. It also showed a cumulative default level of ~35-40%. That figure was assumed to be a floor to the total cumulative default. With no reason to expect default levels to change going forward, and room for further defaults among the students in repayment, a conservative cap of 50% was used as the default input for the model. This is approximately two to three times the level of defaults seen in the U.S. datasets.

ii. Default Curve for the first Five Years

The actual default curves for CAE borrowers appear to reflect circumstances other than the borrowers' ability or decision to repay. The concentration of a large number of defaults in the same two month span for both the '06 and '07 graduates suggests that a policy change led to more defaults being acknowledged by the banks. Because of this unreliability in the data, the U.S. data was used to inform the shape of the curve.

Defaults in the U.S. datasets tended to fall over the course of five years from initially high levels to more static levels. The exact scale of the fall-off varied from year to year – in some low default cases, the fall was only ~ 30% from the initial default rates to the steady state rate. In other cases, default fell ~85% from the first year to the steady state rate.

Given the very high level of initial CAE defaults, the steeper fall-off seen in the U.S. data was used to create a template curve for the CAE defaults, and was biased slightly upward. The template curve has the magnitude of the fall-off at close to 90% when the steady state rate is achieved.

Though the nature of the fall-off is generally linear in the U.S. data, the large number of first and second year defaults among CAE borrowers led to a more exponential curve being used; as modeled, defaults start at a very high level and then quickly come down toward the steady-state.

These curves can be altered, and other alternative curves are provided on the vector change. As more data becomes available about borrower behavior, it will be possible to use better or more precisely tailored inputs.

iii. Default Timing

The default curve described above sets how the defaults in the first five years are shaped. The amount of defaults described by the first five year curve depends on

another input; that is the percentage of the total default amount that is allocated to the first five years.

The U.S. data was again analyzed, and the steady state was trended out through ten, fifteen and twenty years of repayment. The relative amount of defaults in the first five years was then compared to the amount in the later years. The exact percentages varied, but in general, between 50 and 70 percent of defaults occurred in the first five years.

Because of the large number of defaults occurring in the first and second year of the CAE program relative to the U.S. loan programs, the decision was made to increase the number from U.S. levels to closer to 85% of total default occurring in the first five years for CAE borrowers. This has the effect of frontloading default levels, as has been observed.

Model users should be aware that there is no built in sanity checking to ensure that their inputs can be rationalized with each other. This means that users can specify values that can't actually be converted into an intelligible output. For example, it is not possible to have a cumulative default rate of 100% if no defaults occur in the first five years of repayment (because in those first five years, some of the principal would be paid down). However, a user can specify inputs that would appear to allow that. It is incumbent on the user to understand the implications of the inputs they specify, and ensure that they interact as expected.

g. Drop-out Rates and Timing

Drop-out rates are a critical input for the fiscal modeling of CAE. The capital costs of CAE stem largely from the outlay of tuition to TEIs. Students declining to re-enroll lead to lower capital costs, as they require less tuition to be paid out. However, they increase contingent costs, as drop-outs are more likely to default than students that complete their degree program.

Analysis of drop-outs was performed using the *Ingresa Beneficiados* database, which provides the annual situation of a student as one of five options: "*Licitado,*" "*Renovante*," "*Egresado,*" "*Desertor,*" or "*Otro No Renovante.*" The database tracks every student through the system until they reach a terminal disposition: "*Desertor,*" or "*Otro No Renovante.*" At that point, the student falls out of the system.

The two pieces of analysis necessary to model the behavior of dropouts are described below; construction of drop-out curves by year of study for each TEI type, and calculation of default rates for dropped-out students.

i. Drop-out Curve Construction

Drop-out curves with a drop-out rate corresponding to year of study were constructed on the basis of TEI type, and were used in the model for the evolution of tuition after the first year.

The Ingresa Beneficiados database was used to perform the analysis. For each RUT, the database lists a status of the loan for every year. It also lists the year that the students started their studies. The drop-out curve analysis was based on students in loan cohorts 2006-2008. For all students in the 2006-2008 cohorts, all records in the database where the student status was "*Licitado*" or "*Renovante*" were pulled, and the year they started their study was subtracted from the operation year. The records were then aggregated on the basis of TEI. The result was a list of the number of loans by institution by year of study. Effectively the tally showed how many students in the database had ever attained a given year of study. These figures were the denominators in the dropout rate calculations.

The analysis was repeated for students that had dropped out. Because drop-outs are only reported the second year after the drop-out has taken place, those drop-out students were traced back to their year of study by subtracting 2 from the dropout year, and then subtracting the year they started their studies. The records were then aggregated based on the type of TEI. Effectively, the tally showed what year of study the decision to drop-out had been made in. This was the numerator in the calculation of drop-out rate.

For each TEI, the number of records fell dramatically for later years of study. At some point, the noise introduced by the limited number of records was deemed too great for the figure to be credible, at which point the previous values were extrapolated out linearly. Figures were extrapolated after year six of study for CRUCH, after year five for Privad, after year four for IPs, and after year three for CFTs.

Additionally, for the purposes of the model, students were only considered to be dropped out if their status was changed to "*Desertor*," not if they simply withdrew for a year (status "*Otro No Renovante*"). "*Otro No Renovante*" students are assumed to resume studies if they do not progress to S*Desertor*" *s*tatus. This means the model may somewhat overstate tuition costs, as it will assess tuition for some students for a year for which they may have withdrawn.

Finally, the base case model does not contemplate any return of tuition from the TEIs to the banks or Government when students drop out. Because of the delayed and uncertain nature of drop-out reporting, there is limited transparency into when the drop-out actually occurs. This is likely to lead to TEI retention of the tuition fees for drop-outs.

    ii.   Drop-out Default Rates

The default rates of drop-out students were calculated by comparing the number of drop-outs that had defaulted relative to the number of students that had dropped out. We found that 45% of the students that had dropped out had already defaulted. Because we expect more students to default over time, and because we expected the default rates of drop-outs to reach higher levels than graduates (which were assumed to reach 50%, from a current level of ~35-40%), we set the default rate of drop-outs to 65% in the base case.

Because of the limited increase in resolution of the model compared to the increase in complexity required to model them in more detail, defaults from dropped-out students are not modeled as occurring over a span of time, and are instead assumed to occur at a single point in time. Because the overall dropout rates are relatively low, the magnitude of these defaults relative to the total program costs is small. The lack of appropriate timing for these costs does not significantly affect the calculation of total program cost. Also, it is expected that defaults from these loans are even more likely to occur in the exact period that students enter repayment (relative to graduates), so modeling them as occurring 100% in that interval is not wholly inaccurate.

Default of drop-out students is modeled as occurring at the end of the year after the student has dropped out. That is the latest point that the student would be expected to enter repayment.

h. Lack of Prepayment

No credible international comparator data was available to understand prepayment of student loans. Additionally, the limited prepayment data furnished by Ingresa (primarily concerned with prepayment resulting from incremental grants or aid sources) appeared to be incomplete. For this reason, despite the model containing the functionality to incorporate prepayment, zero prepayment was assumed.

As prepayment data becomes available, it will be trivial to incorporate it into the model. Generally, prepayment will have the effect of modestly increasing the NPV by accelerating the return of capital, though it will also lower later-year nominal cash flows.

i. Recovery from Loan Defaults and Timing

With the program still in its infancy and issues around loan recovery still needing to be worked out, no good data existed from within the CAE program to estimate probable recovery amounts. Additionally, the team was unable to find good international comparator data for recovery from student loan programs. Because of this, estimates were made to ballpark the potential recovery amounts. If the actual amounts collected diverge from these estimates, the model's fiscal results will vary from actual results.

Additionally, the way that recovery is modeled is likely to diverge from actual recovery payment streams. To reduce overall modeled complexity, instead of allowing for recovery of a debt over an extended period of (i.e., another multi-month or multi-year payment stream associated with each default), the cash flows from the recovery were condensed into a single point of time. The specifics of this condensing are addressed below.

The model inputs for recovery are broken out separately for drop-out defaulters compared to defaults occurring in the repayment period. It is expected that the recovery percentages and timing behavior of these two groups will not be similar.

Students who drop out and default, because they lack the credential that comes with graduating, are less likely to find high paying employment, and are expected to potentially be less integrated in the formal economy. These factors are likely to lead to low recovery amounts from dropped-out students. They will be harder to locate, and will likely have fewer resources to allocate to paying down their debt. For these reasons, a recovery rate of 10% was applied for all drop-outs in the base-case scenario.

However, drop-out defaulters are less likely to have large loan balances, as they will have spent less time at their TEIs than graduates. In the cases where recovery is possible, less money will need to be extracted. It was estimated that for students able to make repayments, those payments would accrue over a ten year span. Recovery is likely to slowly occur over many years through collection via the tax authorities. To reduce modeled complexity for relatively small numbers in the context of the overall model, those multi-year cash flows are modeled as occurring at a single point in time. With repayment expected evenly over a ten year span, at a six percent discount rate approximately half of the present value is accrued by the fourth year. Thus the recovery cash flow is recorded four years after the collection starts. Additionally, it is estimated that proceeding through the collection process will take at least a single year. Thus the recovery of drop-out defaults is assumed to occur five years after the default is declared. Additionally, the amount that is estimated to be recovered is simply the amount at the time of the default, with no incremental interest assessed. As there will be a cost of collecting from defaulters, this lack of ongoing interest collection should not meaningfully affect model results.

Borrowers who default in the repayment span are assumed to be more likely to be integrated into the formal economy. With the credential of their degree, their employment is more likely to come from an entity with a relationship with the tax collection authorities. The team estimated that the likelihood of a borrower's integration with the formal economy would vary by the institution type they had attended, thus recovery rates scale from 20% in the case of CFTs up to 50% in the case of CRUCH. These variations stem from variable expectations of employment prospects, as well as the nature of that employment.

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Because borrowers in the repayment span are likely to have higher balances, they are likely to take longer to pay down whatever amount can be collected. Thus it was assumed that recovery would occur over a fifteen year span. Those cash flows over a fifteen year span are again condensed into a single cash flow. In this case, at a six percent discount rate, approximately half of the NPV has been recouped by year six. Thus cash flows are booked at the sixth year after collection efforts start. Again, it is estimated that initiating the collection process will take a year, thus the actual date of the cash flow is seven years after default.

  j. Mark-Up Assumptions

The mark-up is handled at present as an independent characteristic of each of the twelve asset lines. However, in execution, the team looked at the average mark-up assessed over the entirety of the portfolio, and then attributed that same value to each of the different asset types. To the extent that each of the asset lines is not held in equal proportion by each of the financial participants, and the mark-up varies across financial participants, then the average assumption will not reflect reality, and the costs of the program will diverge from the model.

As detailed in 5a below, some participants have clearly sorted their portfolios to maximize their revenues. This non-random biasing will result in a breakdown in the average mark-up assumption made above. In order to appropriately account for this, it would be necessary to have a specific mark-up associated with each of the loans, so that it would be possible to determine an expected mark-up for each of the twelve asset types with greater precision. That data was not available to the team, thus actual results may diverge from modeled results.

For the 2011 portfolio (which is in the process of being put together now), the team assumed that the mark-up level would fall hallway between the initial mark-up in 2010 and the earthquake portfolio's mark-up. For this reason, it was pegged at 25%, relative to the ~29.6% first round mark-up, and ~20% second round markup.

3) <u>Implementation of Assumptions from the Recommendation Scenarios</u>

The body of the report describes very generally the changes made to the structure of the model to accommodate the recommendations. This section describes in greater length how those suggestions were implemented, and what analysis lay behind them.

  a. Repayment Maximization

Maximizing repayment included tracking students more closely through their educations. This tracking applies equally to students who progress to graduation and who drop-out.

The implications of tracking graduates more closely are straightforward to capture; a simple decrease in the default rate suffices. However, there are several factors to consider with drop-outs. Their default rate is likely to dip if all students are more closely tracked, but beyond that, their status as defaulted is likely to be known sooner. This has implications for whether or not TEIs return dropped-out students' tuition to banks and the Government. Additionally, it affects when students that drop out and do not pay are declared in default.

The model was altered so that instead of drop-outs being reported once for each year, they are reported once each semester. The same drop-out rates from section 2 of this annex were used, but half of the drop-outs were applied to the first semester and half to the second semester. The actual distribution of drop-outs was not known and thus could not be used. It was assumed that the TEIs would return the tuition for the second half of the year for students dropping out in the first semester. For students dropping out in the second semester, there continues to be no tuition return. The tuition return is handled as a negative tuition payment, and shows up on the 'Actual Disbursement' sheet halfway through the year.

With students dropping out at two points, there are two points at which drop-out borrowers would be expected to start paying, and thus two different times at which drop-out default could occur. Students that drop-out in the first semester of their first year that don't pay are considered in default halfway through the second year. Students that drop-out in the second semester of their first year are handled as before, and declared in default at the end of the second year.

Otherwise the underlying functionality remains the same, and the sole differences are captured on the input page as lower default rates.

b. Origination Optimization

Three principal changes were incorporated into the Origination Optimization model.

i. Moving Mark-up to the Bank-Owned Portfolio

Transferring the mark-up to the bank-owned portfolio required changes in the logic of the model. In the Government model, the mark-up term was simply moved down to zero. For the bank model, new logic and input cells needed to be created to accommodate the mark-up. Fundamentally, they work the same way that the mark-up worked in the original Government loan model.

ii. Coordination of Millennium Scholarships with IP/CFT Students

Some analysis was necessary to gauge the probable effect of coordinating the Millennium Scholarships with CAE. At present, a CAE loan is originated, and

months later, money for a Millennium Scholarship is disbursed, thus the balance of the loan falls. The fiscal impact of this is higher near-term capital outlays for Government owned loans, and mark-ups being paid on larger balances than is necessary for Government-owned loans.

Our estimates suggest that in 2010, approximately 80% of CFT CAE loan recipients, and 75% of IP CAE loan recipients would have fallen into an income quintile likely to qualify for a Millennium Scholarship. Each Millennium scholarship was ~ 400,000 pesos, which was subtracted from the average loan balance of ~1,000,000 pesos, but only for the fraction of recipients in the appropriate income quintile. The net effect of the coordination translated to a 30% drop in the balances of loans going to CFTs and IPs. This does not reflect a reduction in funds going to those schools, simply the benefits of coordinating aid mechanisms. The 30% drop in the CFT/IP balances translates to a 10% drop in the overall program tuition expense.

  iii. Coordination of *Fondo Solidario*

At present, students in the fourth income quintile are eligible for funds through *Fondo Solidario*. Though nominally a loan, these funds are provided at more attractive rates than CAE. Better coordinated aid should result in the more favorably priced loans going to those less able to pay; the result should be removal of *Fondo Solidario* from quintile four, with CAE loans available to make up the difference.

We expect that this shift may result in a small decrease in CAE loans to CRUCH students. If the quintile four funds are allocated to lower income quintiles, we would expect those lower quintiles to need less in CAE lending. However, we would expect that former quintile four recipients of the *Fundo Solidario* would then subscribe to CAE, potentially entirely offsetting that reduction. However, the higher rates and less favorable terms may incent some of the quintile four students to lessen the amount of aid they take. We estimated this effect as likely to lower the originated balance of CAE loans to CRUCH universities by not more than 7%. This was determined by lowering the balances going to CRUCH universities by 5% of the value of the *Fondo Solidario* funds going to quintile four. If the scale of the non-substitution is even higher, then the balances going to CRUCH universities will fall further.

4) Model Output and Development of a Cash Flow Schedule

As described above, the model produces cash flows for a single cohort at a time. Because of time constraints, the focus of modeling efforts was on getting outputs as quickly as possible, not on cultivating the most user-friendly or repeatable configuration.

With each cohort modeled through separate copies of the model, creating cash flow schedules for the entire program at once is a very manual process.

A template excel file for Government cash flows was created separate from the model. Output from each model cohort was then transferred into this template, and logic was developed to aggregate cash flows by month, and then by year. In order to create a cash flow schedule, output from each of the cohort years must manually be pasted into the excel template, offset at the appropriate number of months, resulting in a massive matrix of cash flows. The logic operations condense this manually assembled dataset down to single line cash flows.

Transferring the data into the template and then developing the cash flow output is a tedious and manual process, but ultimately results in a useable cashflow schedule. A more robust and repeatable approach to model is required if the development of cash flow schedules is to be operationalized.

5) Data Trends & Implications

The team encountered certain interesting trends in the data, as well as some issues in the datasets. They are detailed in this section.

   a. Portfolio Tenure Issue

A close examination of the 2010 cohort's loan ownership information indicated that one of the banks has identified the incentives in the program, and has actively responded to them to maximize their income stream.

Because the mark-up at present is paid annually on loans sold to the Government, a bank that sorts its loan portfolios so that the Government holds loans for students with longer education spans will receive greater markup payments than a bank that does not sort its portfolio.

Though the aggregate bank held portfolio is similar in education span to the aggregate Government portfolio (5.7 years vs. 6.6 years), one of the participating banks has generated a portfolio with much more favorable metrics. That bank has sorted loan ownership so that the education term on the loans it holds is less than two-thirds the term of the Government loans (4.6 years vs. 7.7 years).

A substantial increase in costs would result from all banks performing a similar sorting. The costs stem from two effects; increased government disbursements for tuition, and increased mark-ups. Because the sorting results in the Government holding loans for students in school longer, the government ends up having to pay out more tuition in the first place. Additionally, because the schooling lasts longer, the student enters repayment much later. This significantly decreases the net

present value of these loans relative to other loans. Finally, as the mark-up is paid for every year of tuition, and in the sorted case there are more years of tuition, mark-up costs also increase.

b. Loan Credit Amount Data Mismatch Issues

Ideally the team would have been provided loan balance information in such a way that it would have been possible to understand how the loan balances had evolved from the time of origination to the present. This would have allowed some understanding of prepayment without having to rely on the prepayment database that had been provided to the team, or would have allowed its contents to be audited.

Only limited data was available to track loan balances over time. One of the two databases provided to the team ('*Base Banco Mundial*' – henceforth 'BBM') did in fact have current balance and original balance information, which would have allowed some assessment of balance evolution to be performed. The BBM database would have been the ideal database to use for a second reason; the loan balances were listed in UF, not in pesos. However, this dataset appeared to be incomplete, and was thus not used.

Instead of this dataset, the *Ingresa Beneficiados* database (henceforth IB) was used. This listed only the original solicited credit amounts, in pesos. The IB database was used instead of the BBM database because it had significantly more entries in it, suggesting incompleteness on the part of the BBM database. The IB database breaks out new lending on an annual basis for each RUT; from 2006 to 2010, the 260,000 students involved in CAE corresponded to ~530,000 distinct single year loans (count of all IB data with a status of '*Licitado*' or *Renovante*'). The BBM database has data on only 350,000 single year loans across the same time span. The mismatches are highly variable by year of operation and renewal. The table below summarizes the mismatch.

Table 37. Data Mismatch Between IB and BBM Databases

Licitation Year	Operacion Year	Credit by Credit (CBC) database - count	Ingresa Beneficiados (IB) database - count	Coverage of IB by CBC
2006	2006	19,512	21,263	92%
2006	2007	11,602	19,066	61%
2006	2008	10,223	16,247	63%
2006	2009	8,299	12,805	65%
2006	2010	3,666	9,430	39%
2007	2007	32,630	35,432	92%
2007	2008	11,000	30,405	36%
2007	2009	9,451	25,263	37%
2007	2010	5,169	19,120	27%
2008	2008	43,694	44,298	99%
2008	2009	31,421	38,549	82%
2008	2010	25,942	32,343	80%
2009	2009	71,276	72,065	99%
2009	2010	26,244	61,962	42%
2010	2010	39,214	93,462	42%
Total Coverage:		**349,343**	**531,710**	**66%**

Source: Ingresa databases

c. Untangling Loan Ownership

As described above in section 2a(ii), each loan is allocated to an owner, and was allocated on the basis of a database provided by Ingresa. For RUTs with only a single loan (~250,000), the database was straightforward to use. However, for RUTs with more than one loan, there was no differentiator in the database to allow us to attribute it to an owner; the entries in the database did not indicate the year of origination of the loan, or the start of the education. Thus assumptions had to be made to associate a loan with an owner in those cases.

Aside from specifying a RUT, a bank RUT, status (sold or financed) the only other information in the database was the balance. For the ~6,000 loans with more than one owner, it was assumed that the smaller loan balance corresponded to the first owner, and the larger balance corresponded to the second owner. This method was used for all RUTs with multiple loans. To the extent that that assumption doesn't tie out, then this 2% of loans will be poorly modeled.

d. Prepayment Data Provided by Ingresa

Ingresa provided a database with prepayment information that the team ultimately declined to incorporate in the model. The data as provided was formatted as "Rut, Prepaid Amount, Date, Name IES, Rut IES".

Upon closer examination, some issues seemed to exist within the dataset:

i.   Incompleteness

The expectation of the team was that the Millennium *Becas* would result in large numbers of CFT and IP students having their balance paid down early. Conversations with staff and Ingresa and MinEduc led to these expectations. However, the number of distinct students in the prepayment database was only 18,000, and of those, only ~12,000 were students at IPs and CFTs. This number was well below our expectations, and suggested the data was incomplete. Additionally, the total value of the prepayments was well below what it should have been if the overlap between CAE and the Millennium program is as large as the team had been lead to believe.

ii.   Inaccuracy

For >1% of the Ruts, the amount of prepayments exceeds the disbursements made to the students through CAE, sometimes by 3-4 times. This suggests that the datasources for the database were not sanitized, and may be inaccurate for all entries.

iii.   Temporal Overlap

A large number of Rut/Repayment pairs have multiple payments on the same day. This further suggests a potential issue in the dataset.

If clean prepayment data could be incorporated into the model, it would serve to significantly increase the NPV of the program, as it would both lower the balances that students can later default on, and also recoups payments sooner. Depending on the scale of the prepayment (which is currently unclear because of the data issues) this could affect total program costs by 5-10% per cohort.

e. Student Transfer Handling

The databases provided by Ingresa track student transfers in an inconsistent way. When students transfer institutions, they can be listed as having re-licitated, or alternately, their original licitation year can be preserved.

Students who have their licitation year preserved are handled appropriately by the model. Their future payment streams and future tuition requirements continue to be attributed to the cohort they first joined with, both in reality and in the model.

Students who are issued a new licitation year upon transfer are not handled correctly by the model. In reality, some future payment streams will be attributed to the new year that they have joined, and as their balances are paid down, any debts from their original cohort year will be attributed to that original cohort year. Effectively, the cash flows for these students should be split across cohorts. Instead, because of the syntax of the aggregation methods, transfer students are only attributed to their original cohort, not their new cohort.

An analysis of student status by year suggests that less than 2.5% of students will be affected by these issues. The model will appropriately handle all fiscal implications for the new licitation year for the student, but it will not handle their fiscal impact on their original cohort appropriately. The model will err in its handling in two principal ways: it will grow the balance for these students in their original cohort to a larger figure than it should have, and it will incorrectly time the start of repayment streams. Additionally, it will not attribute a transfer student to the cohort that student joins upon transfer. A best estimate is that costs for this 2.5% of students will be understated by ~30%.

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