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Accessibility and Affordability of Tertiary Education in Brazil, Colombia, Mexico and Peru within a Global Context

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Abstract

This paper examines the financing of tertiary education in Brazil, Colombia, Mexico and Peru, comparing the affordability and accessibility of tertiary education with that in high-income countries. To measure affordability, the authors estimate education costs, living costs, grants, and loans. Further, they compute the participation rate, attainment rate, and socio-economic equity index in education and the gender equity index as indicators of accessibility. This is the first study attempting to estimate affordability of tertiary education in Latin America within a global context. The analysis combines information from household surveys, expenditure surveys, and administrative and institutional databases.

The findings show that families in Latin America have to pay 60 percent of per-capita income for tertiary education per student per year compared with 19 percent in high-income countries. Living costs are significant, at 29 percent of gross domestic product per capita in Latin America (19 percent in high-income countries). Student assistance through grants and loans plays a marginal role in improving affordability. Moreover, the paper confirms previous findings of low access to tertiary education in the region. One policy implication of the findings is that Latin American governments could take steps to make tertiary education more affordable through student assistance.

Accessibility and Affordability of Tertiary Education in Brazil, Colombia, Mexico and Peru within a Global Context[1]

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1. INTRODUCTION

This paper analyzes the affordability and accessibility of tertiary education in four selected Latin American countries (Brazil, Colombia, Mexico and Peru) within an international context.

In the past two decades, countries in Latin America and the Caribbean (LAC) liberalized their economy. Together with technological advances and increased globalization, this policy has increased demand for knowledge and workers with tertiary education (Attanasio and Szekely, 2000; Sanchez-Paramo and Schady, 2003; De Ferranti et al, 2003; Goldberg and Pavcnik, 2005).

LAC governments also have increased investments in education in the last two decades. These investments sought to increase attainment of education and in particular for children of low-income families. As a result, graduation rates of primary and secondary education improved remarkably. This increased the pool of qualified students for tertiary education. Hence, the demand for tertiary education intensified.

As a consequence, the rate of enrollment in tertiary education in LAC has increased annually by 2 percent since 1985 (Holm-Nielsen et al, 2005). In LAC countries, such as Argentina, Chile, Colombia and Mexico, public and non-governmental universities expanded and diversified to absorb some of the increased pool of qualified students from secondary education. However, LAC countries continue to trail high-income countries in terms of enrollment. In 2001, the tertiary education enrollment rate in high-income countries was about 56 percent compared to 23 percent for LAC countries (World Bank, 2002).

What triggers a comparatively low enrollment rate in LAC? The main factors seem to be: (i) affordability and lack of financing of tertiary education, (ii) insufficient and unequal access to secondary education, (iii) the lack of information, and (iv) low expectations of attending tertiary education among youth from low-income families. Based on surveys of families in Colombia and Mexico, affordability and lack of financing seem to be the main obstacles for families (ICETEX, 2006; Suzuki, Blom, and Yammal,2006; UNESCO, 2006; World Bank, 2005).

Surprisingly, we hardly know how affordable tertiary education is in Latin America compared within a regional and global context. We know that Latin American countries differ in their policies on tertiary education finance. Some have tuition in public institutions, others not. Some promote non-governmental tertiary education with full tuition, others frown of non-governmental education. Some run large student assistance programs, others administer smaller programs. However, we do not know how these differences affect affordability and access for the students. Often, discussion of financing of tertiary education is limited to an ideologically driven debate for or against tuition in public universities. Nevertheless, financing of tertiary education is more than a discussion of the tuition level of public tertiary education. One needs to analyze a comprehensive set of factors when analyzing tertiary education finance.

Our goal of this study is to estimate affordability and accessibility of tertiary education in selected Latin American countries. This seeks to provide more objective information for policymakers. Also, the analysis enables us to better understand the impact of student assistance policies for increased enrollment. Especially, this paper seeks to answer the following research questions:

- What are the costs of tertiary education to Latin American families?
- How important are living costs for tertiary education?
- Is financial aid improving affordability of tertiary education at the national level?[3]

This is the first attempt to compare affordability of tertiary education across Latin American countries. A series of studies looks at how much governments and countries invest in tertiary education (UNESCO and OECD, 2002; Holm-Nielsen et al, 2005; UNESCO, 2006, among others). Very few studies examine the costs for the individual countries (ICHEFAP, 2007; World Bank, 2003). None of these compare costs internationally. We take into account not only the direct costs of education such as tuition, fees and other costs, but also financial aid to students. Further, we compare across countries.

This report follows the methodology of Usher and Cervenan (2005) "Global Higher Education Rankings: Affordability and Accessibility in Comparative Perspective". This enables an international comparison of our findings for Latin American countries.[4] To measure affordability of tertiary education, we estimate education costs (tuition and other fees), living costs, grants, and loans. These elements are incorporated into four different affordability indicators: education costs, total costs, net costs, and out-of-pocket costs. To measure accessibility of tertiary education, we compute four indicators: participation rates, educational attainment, educational equality index and gender parity.

For the analysis, we chose Brazil, Colombia, Mexico and Peru. These countries seem well suited for an analysis given that: (i) they represent 66 percent of the region's population, (ii) these countries represent relatively different approaches to financing tertiary education, and (iii) information and data could be collected to a minimally acceptable degree. Further, the World Bank has on-going policy dialogue with these countries within tertiary education. We realize a broader selection of countries would enrich the study and make it more representative of the entire region, but it was not possible with the available information and budget.

Unfortunately, we have had to rely on different sources of data, in particular for tuition costs. We are comparing tuition information from administrative data, household survey

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[3] The paper does not rigorously evaluate the impact of student financial aid for the individual student. Other studies have done so: (ICETEX, 2006) and (Canton and Blom, 2004)

[4] High-income countries included are Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Sweden, the United Kingdom and the United States. Due to the limited availability of data on access to tertiary education, Japan and New Zealand are measured for affordability only.

data, and the institutional websites. As such, we recognize the criticism of comparing apple with oranges, and recommends that the findings be treated as indicative. Higher comparability of data is required to reach more reliable results.

We find that: (i) the direct cost of tertiary education is considerably higher in Latin America, 35 percent of GDP per capita, than in high-income countries, 10 percent. Therefore, tertiary education seems less affordable, (ii) the cost of living for accommodation and food is a significant share of costs of tertiary education, 29 percent in Latin America compared to 19 percent in high-income countries, (iii) there is a low level of grants and loans in Latin America. On average, student assistance lowers the costs of tertiary education by only four percent of GDP as compared to 11 percent in high-income countries, and (iv) we confirm the finding of previous studies showing a low level of access to tertiary education as compared to high-income countries.

The paper is divided into four sections and an annex. Section two describes the methodology and data for measuring affordability and accessibility for each country. Section three presents results and findings of the analyses, and section four discusses policy implications. The annex contains more information on data sources and tables with detailed information.

2. METHODOLOGY and DATA

2. 1. Methodology for Analysis
This section describes the methodology developed by Usher and Cervenan, 2005, to estimate affordability and accessibility of tertiary education.[5]

2.1.1. Affordability

We express the estimated costs of attending tertiary education as a function of ability to pay. This study uses GDP per capita at purchasing power parity of each country to express ability to pay[6].

We measure the costs of attending tertiary education by four indicators of affordability. We only take into account direct costs not indirect costs, such as opportunity costs. The four indicators are the combinations of five cost components: education costs, living costs, grants, student loans, and tax breaks. They are defined below (Table 1).

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[5] An important caveat in all cross-country comparison on tertiary education is the lack of information regarding quality and relevance of tertiary education. These factors are of course important to judge both affordability and access (Hanushek, 2006). As with other cross-country studies, we do not have a reliable indicator of quality or relevance. Therefore, the proposed methodology does not take these important dimensions into consideration.

[6] Ideally, ability to pay would refer to the amount of after-tax income per household, which can be used for consumption. However, this information is not available due in part to discrepancies both in the definition of household and in the reporting of after tax or disposable income.

Table 1. Affordability Indicators

Indicator (per GDP/capita)	Formulas
Education costs	Education Costs
Total costs	(Education Costs) + Living Costs
Net costs	(Education Costs + Living Costs – Grants) – Tax Breaks
Out-of-pocket costs	(Education Costs + Living Costs – Grants – Tax Breaks) – Loans

<u>Education costs</u>. Education cost includes not only tuition, but also any additional mandatory fees, payments for textbooks and other study materials, such as reading sets. It excludes one time fees such as academic record fee or registration fee.

The education cost per student is calculated separately for the public and the non-governmental sector. These two cost estimates are weighted according to the share of student population represented by the public and the non-governmental sectors.

<u>Living Costs</u>. Living costs encompass the cost of a living space and food.

Although the form of living varies from one country to another, students tend to live in dormitories, apartments, houses and, above all, parents' house. Usher and Cervenan, 2005 assumes all students live independently. However, this poorly reflects reality in Latin America. A study on tertiary education in Argentina revealed 80 percent of tertiary education students live with at least one parent (Rozada and Menendez, 2002). We therefore estimate a reasonable cost of housing in the following way. The household surveys include data on household expenditure at the national level including information on the monthly rent. If students live at their parents' house, they do not actually pay for the rent. However, it is a cost for parents, which is considered a living cost. We estimate the living cost by computing the family's monthly rent divided by the number of occupants. We calculate the rent for two semesters (approximately nine months), because we are only interested in the cost during the academic year.[7] We do not include the families who own a house or who do not pay a rent. This method is applied for the cases of Brazil, Colombia and Mexico. For Peru, the household survey explicitly collects information regarding the costs of accommodation.

To estimate the price of food consumption, we rely on the information available in the expenditure part of the national household survey. This was only available for Brazil, and not for Colombia, Mexico and Peru. For these countries, we approximate the cost of food with the cost estimate for Brazil, which is $1 per day for nine months –two semesters.

This method generates a conservative estimate because the cost of living would be considerably higher for students living outside of parents' house. Further, transportation costs are not considered in the methodology of Usher and Cervenan 2005, although it is often an important cost for the household.

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[7] For example, in a case of a student living in a household of four people and a monthly rent of $100; the rent per person per month is $25. Then, the rent per student a month is multiplied by the number of months the student attends university. The total rent per student for two semesters becomes $225 per year.

Grants (Scholarships). Grants is the term given to all non-repayable assistance to students. We include grants from national and sub-national public programs mainly financing undergraduate studies.[8] Grant per student refers to the expected grant amount that the average student can expect to receive – that is, total value of grants awarded nationally divided by the number of students in that country. Certain kinds of rent, housing and food subsidies which are commonly provided by the governments of high-income countries to reduce student living expenses are included as a grant.

Loans. Loan is the term given to all repayable assistance to students disbursed during the school year. It includes loans offered or supported by national and sub-national governments. In the majority of cases, loans include a subsidy. Loans therefore affect cost-benefit analysis of attending tertiary education. However due to data limitation it is impossible to calculate the grant element of the loan programs, therefore, we assume full repayment. Hence, in this study loans only affect out-of-pocket costs, and not net costs. Due to lack of data, we do not include student loans offered by commercial banks or educational institutions.

Tax Breaks. Another way that governments help households paying tertiary education is through tax breaks, which can be both tax-credits and tax deductions.[9] For the Latin American countries considered in this study, we do not include tax breaks, because tax breaks to families are not broadly used in Latin America as a policy. For high-income countries, this paper includes tax-breaks as part of the Net costs and Out-of-pocket costs of attending tertiary education.

Following Usher and Cervenan 2005, we create an overall index for affordability. This index involves weighting the above cost components and indicators to reflect the level of importance. The assignment of weights introduces an element of subjectivity in the analysis. Weights assigned to each indicator are based on findings in the literature and is summarized as follows:[10]

- Education costs are assigned a weight of 100 percent, since education costs have the most direct impact on students' decision making for tertiary education and are fully shouldered by families.
- Living costs (weight of 90 percent) are the second most important input because students have to find sources to finance their day-to-day living expenses.

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[8] Hence, scholarship programs financing studies at the master and PhD level, such as programs run by CNPq in Brazil and CONACYT in Mexico, are not included.

[9] This is usually a non-refundable financial assistance for families once a year when they file taxes. These are not usually directed to students but to households. Ten out of sixteen high-income countries offer tax breaks for education costs. On average, this tax break represents a comparatively small amount compared to the cost of education or student assistance, (Usher and Cervenan 2005).

[10] The above weight reflects one overall measure of affordability our of several. The annex provides the detailed data allowing for other weights to be applied. Given that affordability of education has not been defined uniquely, other weights and components could be included. If sufficient information were available regarding perceptions of affordable education, factor analysis could be applied to estimates components and weights of affordable education.

- Grants (80 percent) as a part of student assistance are given less weight than education costs and living costs. People are found to give more importance to costs than subsidies such as grants.
- Loans (40 percent) as a part of student assistance are given a smaller weight than grants, because loans only solve liquidity but do not relieve one's responsibility for repayment.
- Tax breaks (30 percent) are considered to be the least effective of all indicators. There is a wide spread skepticism on the efficacy of tax credits in promoting access to education.

The assignment of the weight for each indicator is shown in Table 2.

Table 2 Weights of cost components

Education component	Weighting
Education costs	100%
Living costs	90%
Grants	80%
Loans	40%
Tax breaks	30%

By following the methodology by Usher and Cervenan, 2005, the base year of our study is 2003. Costs observed in earlier or later years were inflated or deflated to the base year using the consumer price index for each country. Subsequently, currencies were converted into US$ using GDP at Purchasing Power Parity.

2.1.2. Accessibility

Four indicators are selected to capture different aspects of access to tertiary education. The indicators are widely available, which is necessary for global comparisons. Anisef, 1985, discusses two types of access to tertiary education: Type I quantifies extent of access, while Type II refers to the social background and composition of participants with access. We follow Usher and Cervenan, 2005, in measuring Type I access by the participation rate of tertiary education and by the attainment rate of tertiary education. Type II access is gauged by the education equity index and the gender parity index. See the Annex for a mathematical formula for each indicator.

Participation Rate. The Participation rate is the fraction of population of a certain age group enrolling in higher education. Usher and Cervenan, 2005 only includes tertiary-type A, which is defined to have a minimum cumulative theoretical duration at the tertiary level of three years' full-time equivalent, although they typically last four or more years. It includes post-bachelor degree such as master and doctoral degrees (OECD, 2002).[11]

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[11] Type A programs are in most cases offered by Universities, but occasionally technological institutions and other professional tertiary level institutions equally offer Tertiary type A degrees. In contrast tertiary type B programs, which are often short-term degree programs, such as associate degrees, are not included in this study. Such education programs are often taught by community colleges and technical colleges.

This study measures the participation rate of the four year age group that has the highest rates of participation. This enables comparisons between countries with different official age groups.[12]

Participation rate is an incomplete indicator of access because it only measures participation, but not completion. Further, the rate does not reflect the participation rate outside of the selected four year age group.

Educational Attainment Rate measures a percentage of population that attains a particular educational level. We calculate the ratio between the people aged from 25 to 34 years who completed a type A tertiary education degree in relation to the total population in the same age range. The advantage of Education Attainment Rate is that it measures completion of tertiary education prior to the age of 34, regardless of when the education was attained.

Educational Equity Index is an indicator to measure socio-demographic determinant of access to education which traditional indicators have difficulties capturing. There are at least four possible ways to measure socio-economic status (SES): parental occupations, parental income, geographical location and parental education level. Because education is highly correlated with income level and social status of the household, Usher and Cervenan, 2005 use Education Equity Index (EEI), which was proposed by Usher (2004).[13] The EEI uses the parental education level as a measure of socio-economic status. Succinctly, the formula for EEI is the ratio of students' SES to the SES of the general population. Generating EEI requires two indicators: (i) the percentage of students in tertiary education whose fathers' have a tertiary education degree. This measures the SES of the student population, and (ii) the percentage of men aged 45-64 who have a tertiary education degree, which measures the SES of the general population. The index is a ratio of the first indicator to the second indicator, and then multiplied by 100, which produces the EEI score.[14] The higher the EEI score, the more the SES of the student population resembles that of the general population between the ages of 45 and 65. Hence, access to tertiary education is deemed more equitable. The lower the score, the lower is equity.

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[12] Defining a participation rate creates problems because the typical age of the student body differs from place to place. For instance, in predominantly-Anglophone countries, the "normal" age of students is 18-21 whereas in Scandinavia it is often 20-23. Hence, cross-national comparisons done at a certain age range are liable to under- or over-state the true participation rate depending on the age range chosen for comparison. In order to best ensure comparability, Usher and Cervenan, 2005 uses the described methodology to look at participation in a cross-national comparison.

[13] It is important to note that there might be alternative methods to measure a link between socio-economic status and access to education.

[14] The EEI compares the SES of the students' farther and compares that to the SES of the expected age-cohort of the fathers, male population to be between 45 and 65. The chosen age-group may introduce a minor bias in Latin America, because parents are traditionally younger in Latin America than in high-income countries. This bias would tend to over-estimate inequity of tertiary education in Latin America.

Gender Parity Index. Gender Parity Index (GPI) is defined as the ratio of the number of female students enrolled at a given level of education to the number of male students at the same level. A gender parity of less than one indicates higher share of male students, whereas a gender parity greater than one indicates higher share of female students. Consequently, a gender parity value close to one indicates parity. To calculate the GPI, we use the Gross Enrollment Ratio (GER) by gender. UNESCO defines GER as the total enrollment as a percentage of the population of the age group for the education level. It also defines the population used for GER at the tertiary level is that of the five-year age group after the secondary school leaving age. GPI is the ratio of GER of female students at tertiary level to GER of male students at tertiary level.

To create one measure of access, we weigh the proposed four indicators into one overall indicator. As with the case of the overall affordability indicator, this weighing involves a degree of subjectivity when assigning weights. We follow the weighing of Usher and Cervenan, 2005 to ensure comparability between the results for Latin American countries and the high-income countries. Equal weight (and importance) is given to Type I (quantity of access) and Type II access (composition of access). For Type I access, participation rate and education attainment rate are assigned equal weights. For Type II access, socio-economic equity is assigned greater weight than gender equality (Table 3).

Table 3. Accessibility Indicator Weights

Indicator (per GDP/capita)	Weight
Participation Rate	25%
Education Attainment Rate (between 25-34 years old)	25%
Education Equity Index	40%
Gender Parity Index	10%
Total	100%

2.2. Description of Data

This section describes the data for estimating affordability and accessibility indicators. We have resorted to several types of information: household survey data including data on expenditures and several kinds of administrative data.[15]

2.2.1. Affordability

To estimate affordability, we rely on cost information in the following prioritized sequence: (i) household surveys with data on expenditures (Table 4), (ii) administrative data from government sources, (iii) data-collection from the websites of educational institutions, and (iv) academic papers. Estimating affordability was the most difficult task in producing this paper due to the data limitation.

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[15] The data sources for the high-income countries can be found at Usher and Cervenan, 2005. Expansion factors are applied for household and expenditure surveys for the weighted estimation of affordability and accessibility. The annex provides further detail on data sources.

Table 4 Household Surveys

Country	Survey	Year
Brazil	Pesquisa Nacional por Amostra de Domicílios (PNAD)	2004
Colombia	Encuesta de Calidad de Vida (ECV)	2003
Mexico	Encuesta Nacional Sobre Niveles de Vida de los Hogares (MxFLS)	2002
Peru	Encuesta Nacional de Hogares (ENAHO)	2004

Estimating Education Costs

In Mexico, tuition fee is estimated using weighted aggregate data from the household expenditure survey. The sample size is about 600 on tuition for tertiary education, which lends credibility to the estimate of tuition in both public and non-governmental institutions. For the other countries, the household and expenditure surveys contain few and spurious information. In Colombia, the tertiary education institutions are by law required to report the tuition fee to the Ministry of Education for every authorized degree program. For this study, we use the average tuition level of higher education programs in public and non-governmental from 2003. Ideally, this should be weighted by the number of students in each program, but this information was not available. This may introduce a bias in the estimate if there is a systematic difference in the tuition level of small programs compared to large programs. For both Brazil and Peru, we equally searched for government databases, but did not find any available source. We therefore, had to resort to primary data collection. We searched the websites of all tertiary education institutions listed in Wikipedia in Brazil (123 institutions) and Peru (64). We obtained tuition information for non-governmental institutions for 20 institutions in Brazil, and 6 in Peru. Further, we surveyed by telephone another 12 Peruvian institutions.[16] Hence, the tuition estimate for Peru is the average of the tuition fee in those 18 (non-governmental) institutions.

The varying data sources and types of data to estimate education cost of the non-governmental institutions constitute the study's main weakness. In particular, for Brazil and Peru, we advice against drawing any conclusion based on the affordability indicators, because of the low level of representativeness of the information for the education cost of the non-governmental sector.[17]

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[16] The information on tuition is either: (i) overall average of all disciplines offered, or (ii) the average of a low-cost degree, most often a degree in education, and a high-cost degree, most often engineering or medical. When tuition differed upon the income level of the student, we computed the average of the tuition across the income groups, hence tantamount to the assumption of an equal distribution of students. For the telephone survey, we rely on admission officers' response.

[17] For both countries, the estimates involve only a set of the many tertiary education institutions existing in each country. The findings for these countries are therefore preliminary. Further research is required to establish a reliable and representative estimate on the affordability of tertiary education in these two countries. Nevertheless, we felt it important to report these preliminary estimates for two reasons: (i) they highlight the lack of information regarding the household costs of attending tertiary education, and (ii) the preliminary estimates add to the findings for Colombia and Mexico.

The cost of education is calculated separately for public and for non-governmental institutions. The average cost is weighted according to the share of the student population in each segment in 2003 (Table 5).

Table 5 Participation Rate by Public and Non-governmental Institutions

Country	Public (%)	Non-governmental (%)	Total Enrollment
Brazil	29	71	3,887,000
Colombia	42	58	1,045,000
Mexico	67	33	2,239,000
Peru	59	41	849,000

Source: Instituto Internacional de la UNESCO para la Educación Superior en América Latina y el Caribe (IESALC) for Brazil, Colombia and Mexico. ANR (2005) Estadisticas Universitarias, Lima: Asamblea Nacional de Rectores for Peru.

Average costs of books for students in tertiary education are available from household surveys in Colombia, Mexico and Peru. In Brazil, the expenditures on books are available as a part of costs of study materials. Instead, we rely on information from previous cost studies on the International Comparative Higher Education Finance and Accessibility Project at the State University of New York at Buffalo. We obtained average cost information on books for public and non-governmental institutions for the academic year of 2000 to 2001.

Table 6 Data Sources and Estimated Education Costs (US$2003 PPP)

Country	Source	Public	Non-governmental	Average
	Tuition			
Brazil	University Websites	0	4,912	3,478
Colombia	Information System for Tertiary Education at the Ministry of Education	573	2,386	1,661
Mexico	Household Survey	109	2,380	783
Peru	Telephone survey and University websites	0	5,276	2,581
	Other Study Costs (Books and Study Materials)			
Brazil	ICHEFAP-Region-Latin America- Brazil	220	220	220
Colombia	Household Survey	NA	NA	289
Mexico	Household Survey	273	778	418
Peru	Household Survey	455	509	531

Estimating Student Assistance

Reliable data on grants and loans were unavailable in all surveys. Thus, grant and loan expenditures are obtained from the relevant government sources in each country, see Table 7. The total grants dispersed to beneficiaries or students are divided by the total number of tertiary students in each country to estimate the average amount per student.

Table 7 List of Student Assistance Institutions

Country	Program and Source	Type of assistance	Amount (US$ Mil. PPP)
Brazil	Fundo de Financiamento ao Estudante do Ensino Superior (FIES)	Loans	212.0
Colombia	Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior (ICETEX)	Scholarships	414.9
		Loans	1199.9
Mexico	Programa Nacional de Becas y Financiacion para la Educación Superior (PRONABES)	Scholarships	146.7
	Instituto de Financiamiento e Información para la Educación (EDUCAFIN)	Scholarships	9.3
		Loans	10.2
	Instituto de Crédito Educativo del Estado de Tamaulipas (ICEET)	Scholarships	6.4
		Loans	5.3
	La Sociedad de Fomento a la Educación Superior (SOFES)	Loans	60.4
	Instituto de Crédito Educativo del Estado de Sonora (ICEES)	Loans	30.7
Peru		Scholarships	16.7
	Instituto Nacional de Becas y Créditos Educativos (INABEC)	Loans	31.7

Note: Amount in PPP US$ 2003 prices.

2.2.2. Accessibility

To estimate the four accessibility indicators, we use data from the education and demographic sections of the national household surveys. The education section provides data on school participation, the highest level of education completed, father's educational level, and current level of education. The demographic section of the surveys describes age, gender, relationship of interviewee to household head, and parent-children relationships.

3. FINDINGS

This section presents the findings of affordability and accessibility among the four LAC countries and the high-income countries. We present each indicator of affordability and accessibility as a percentage of GDP per capita at PPP. The detailed results are in the annex (Table 8 – 21).

3.1. Affordability

For our analysis, it is helpful to define five groups of countries:
- *Latin America*: Brazil, Colombia, Mexico and Peru
- *Japan*
- *Anglo-Saxon countries*: Australia, Canada, New Zealand, United Kingdom, and United States
- *Continental Europe*: Austria, Belgium, France, German, Ireland, and Italy
- *Northern Europe*: Finland, Netherlands, and Sweden

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As will become evident, each country group follows a distinct model of tertiary education finance.

Education Costs for the four LAC and high-income countries are shown in Figure 1. The smaller the percentage, the lower are the private costs of education.

Figure 1. Education Cost
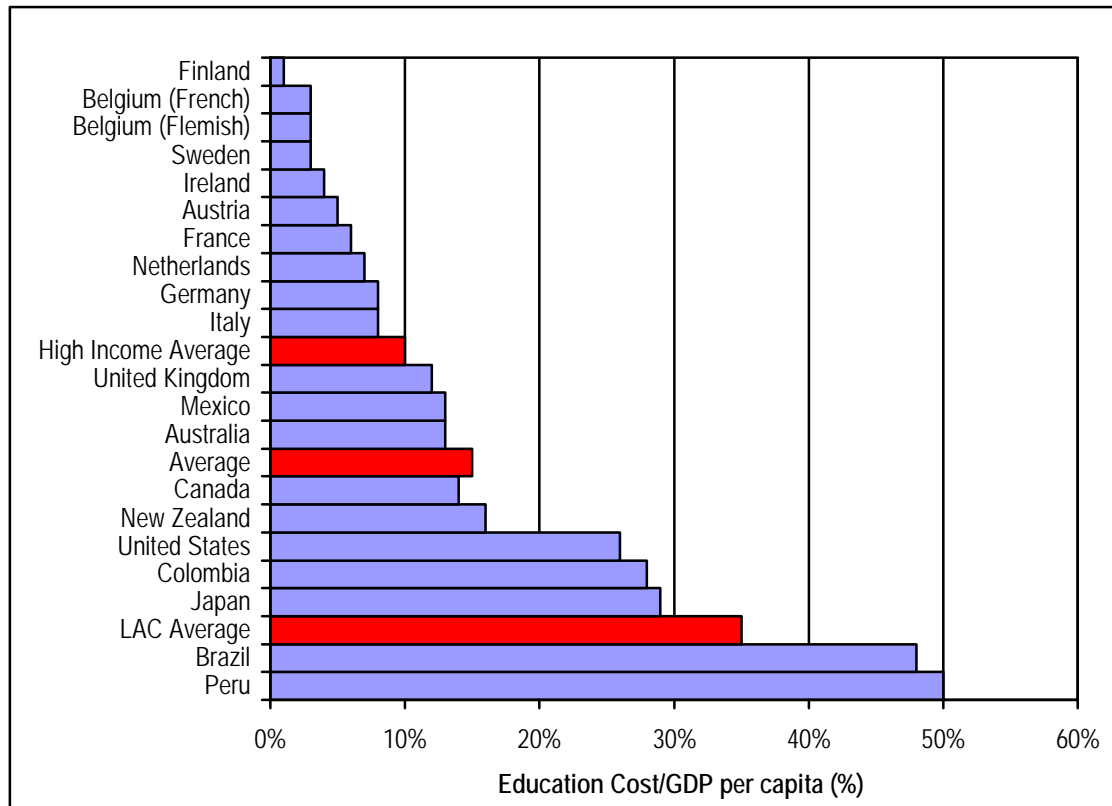
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries
Note: Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary.

Education costs in the four selected LAC countries represent a high proportion of GDP per capita, 35 percent, compared to high-income countries, 10 percent. All four LAC countries have higher than average costs. It is important to keep in mind that the reliability of data for tuition in Brazil and Peru stem from a small sample of universities (20 and 18, respectively). This estimate could overestimate the national average tuition level, since availability of university tuition information on the web implies large scale and/or modern institutions which tend to be among the expensive non-governmental institutions. This remains a major shortcoming for the study. As such the Brazil and Peru estimates are likely to reflect the cost of a high-cost non-governmental education.

The level of GDP per capita is also an important factor to understand the above figure. While the absolute costs of tertiary education to the household (as measured in PPP $) in Latin America is similar in the high-income countries (US$2,400 for LAC compared to

US$2,900 for high-income), the difference in income level implies that tertiary education becomes much more affordable in high-income countries than in LAC countries.

The share of non-governmental education is an important factor behind the cost differences. Countries with a higher share of students in non-governmental universities evidently tend to have a higher education costs than countries with a higher share of students in public universities. The extent of cost-recovery in public institutions also plays a role for the cost difference.

Living costs for accommodation and food for the academic year vary significantly between the countries in this study (
Figure 2).

Figure 2. Living Costs
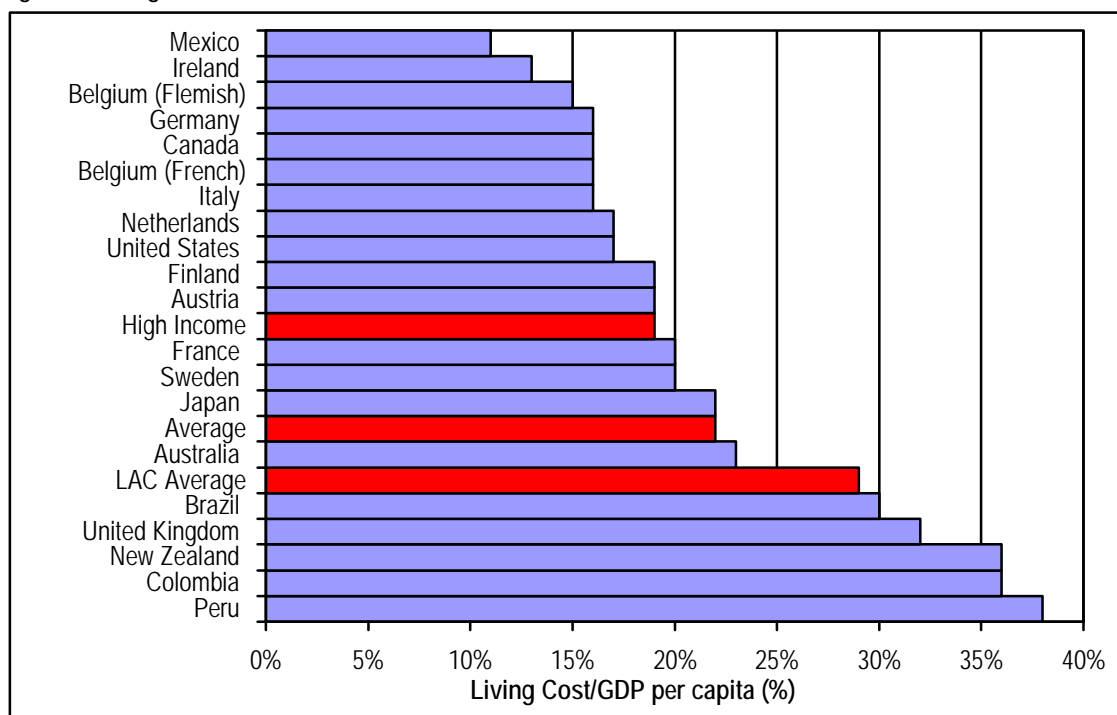
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

Students in LAC countries have to pay a comparatively large share of income on living costs, 29 percent as a share of GDP per capita, compared to peers in high-income countries, 19 percent.[18] Brazil, Colombia and Peru are found to have considerably higher living costs relative to their GDP per capita. Mexico is the only LAC country that shows a lower percentage, 11 percent.

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[18] The difference in living in Peru could possibly originate from the difference in available information. As explained, the Peru household survey collects information regarding actual accommodation costs of students, while this is estimated in a conservative manner in the case of the other LAC countries. Also, the living costs in a number of continental European countries are lower because of subsidized accommodation. This subsidization policy is absent on a significant scale in the other countries considered in this study, include the LAC countries.

The high living costs in LAC is primarily caused by the difference in GDP per capita. The absolute living costs in LAC (US$2,000) are smaller than costs in the high-income countries (US$ 5,600) (Table 17 of the Annex).

The results indicate living costs are a substantial part of the costs of tertiary education in particular in Latin America (29 percent) as compared to high-income countries (19 percent). Hence, even with free (public) university education, living costs will amount to a substantial financial burden for students from low-income families.

Total Costs is the sum of education and living costs (Figure 3).

Figure 3. Total Costs
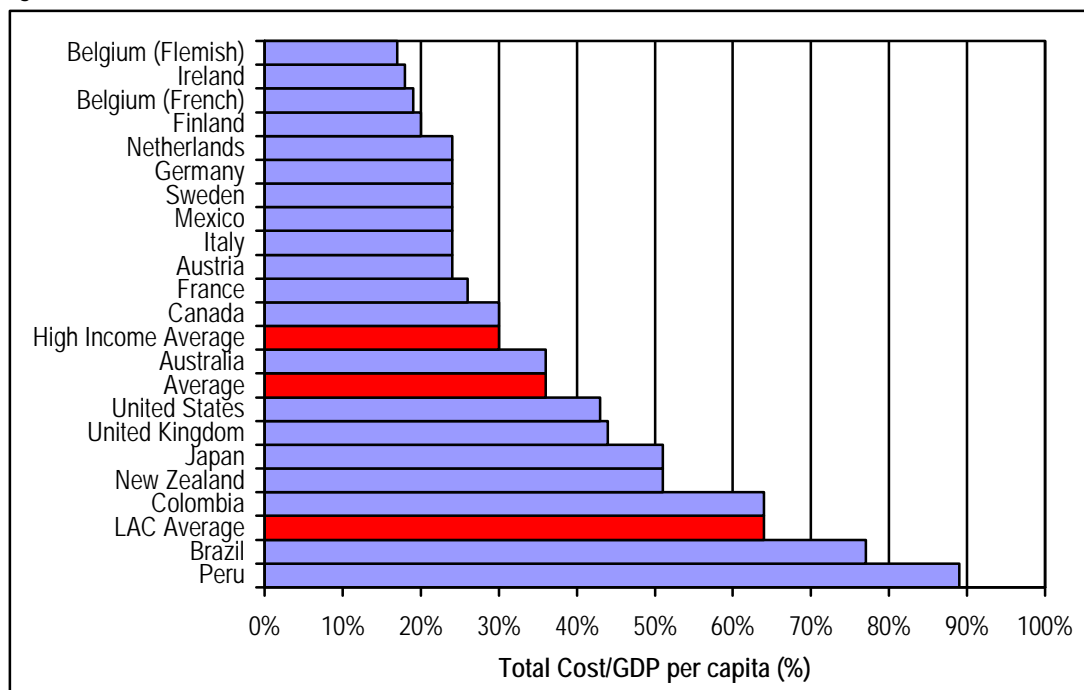
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries
Note: Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary.

The average total cost of tertiary education for the selected LAC countries is 64 percent compared to 30 percent for high-income countries. These averages hide some important differences. In LAC, especially Brazil, Colombia and Peru tend to have the least affordable total costs. The Anglo-Saxon countries (Australia, Canada, New Zealand, UK, and US) and Japan have high total costs, 40 percent and 51 percent, respectively. Continental and Northern Europe have more affordable total costs of tertiary education, 23 percent and 22 percent, respectively.

Grants is measured by the average amount of grant a student receives per year from public programs relative to a country's GDP per capita (Figure 4) These grants can cover, at least partially, tuition, housing or food expenditures.

Figure 4. Grants

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

Grants are available in the selected LAC countries, but not wide-spread. The typical LAC student receives a grant equally to two percent of GDP per capita. This is approximately half of the average grant to students in high-income countries. Anglo-Saxon and Northern Europe stand out as two country groups with significant grant programs (6 percent for Anglo-Saxon countries and 10 percent for Northern Europe).

Within LAC countries, Colombia stands out with a scholarship program amounting to six percent. Further, several federal and state programs in Mexico offer grants that in total amounts to one percent of GDP per capita per student. In 2003, the base year for this study, Brazil and Peru did not have any large scale grant programs available for tertiary students.[19] For example, Peru offered US$8 (PPP value) of grants per student. The highest among the LAC countries is Colombia with US$380 (PPP value) per student.

Net Cost is total education costs net of grants (Figure 5).

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[19] In Brazil, the PROUNI program was initiated in 2005. It finances free access to low-income students in non-governmental institutions that in turn are compensated by tax-deductions. Although this program is expected to impact tertiary education affordability, it is not reflected in the analysis because the base year of our study is 2003.

Figure 5. Net Costs after Tax
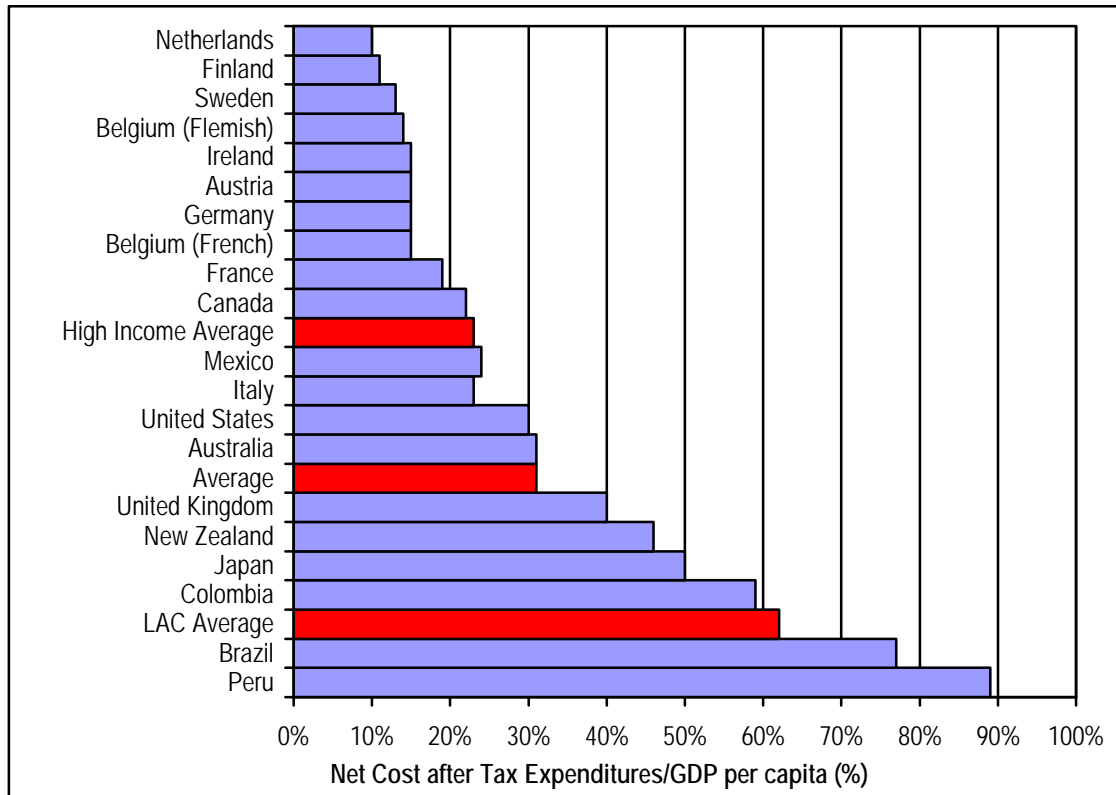
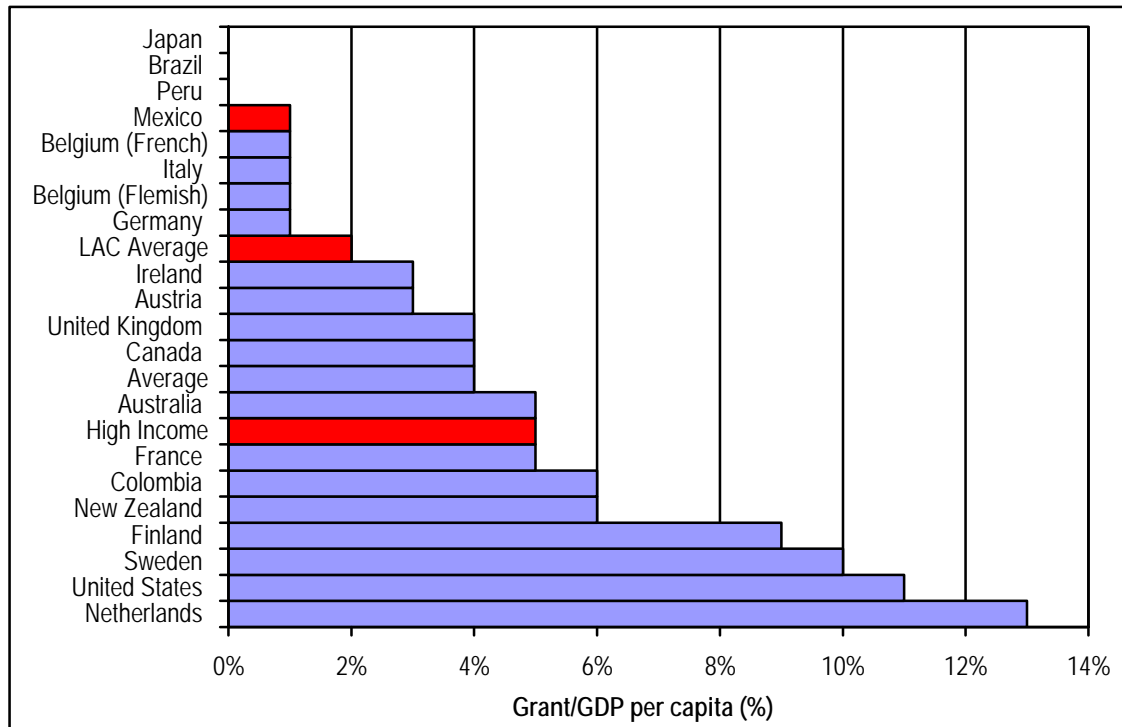Net Cost after Tax Expenditures/GDP per capita (%)

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries
Note: Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary. Tax breaks only included for high-income countries

Net education cost in LAC is about 60 percent while in high-income countries net education costs only reach slightly above 20 percent. There is a considerable difference between the most affordable to least affordable country. The most affordable is the Northern European countries, followed by Continental European countries, and thereafter Anglo-Saxon countries, Japan and LAC.

Student loan is another major policy tool for improving affordability of tertiary education (Figure 6).

Figure 6. Loans

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries
Note: Brazil, Mexico, and Peru have loan programs in operation. However, the loan amount offered to the average student is less than 1 percent of GDP per capita.

Availability of student loans in the selected four Latin America countries is limited, with the exception of Colombia. The four studied Latin American countries all have loan programs. However, for Brazil, Mexico and Peru, the average offered amounts to less than 1 percent of GDP per capita. In Colombia, the average student receives a loan equivalent to eight percent of GDP per capita. The average student in the four countries receives a loan equivalent to two percent of GDP per capita. This compares to five percent for the average student in a high-income countries. In particular, Anglo-Saxon countries have invested in large student loan programs to finance tertiary education. Student loans reduce the financial outlays by 11 percent. Loan programs in Northern European countries equally cover a substantial part of the costs (equivalent to seven percent of GDP per capita).

Out-of-Pocket Costs refer to the total education costs (education and living costs) net of student assistance (grants and student loans).[20] The out-of-pocket costs represent what the family has to pay during the studies (Figure 7).

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[20] Further, it is net of any tax breaks offered by high-income countries.
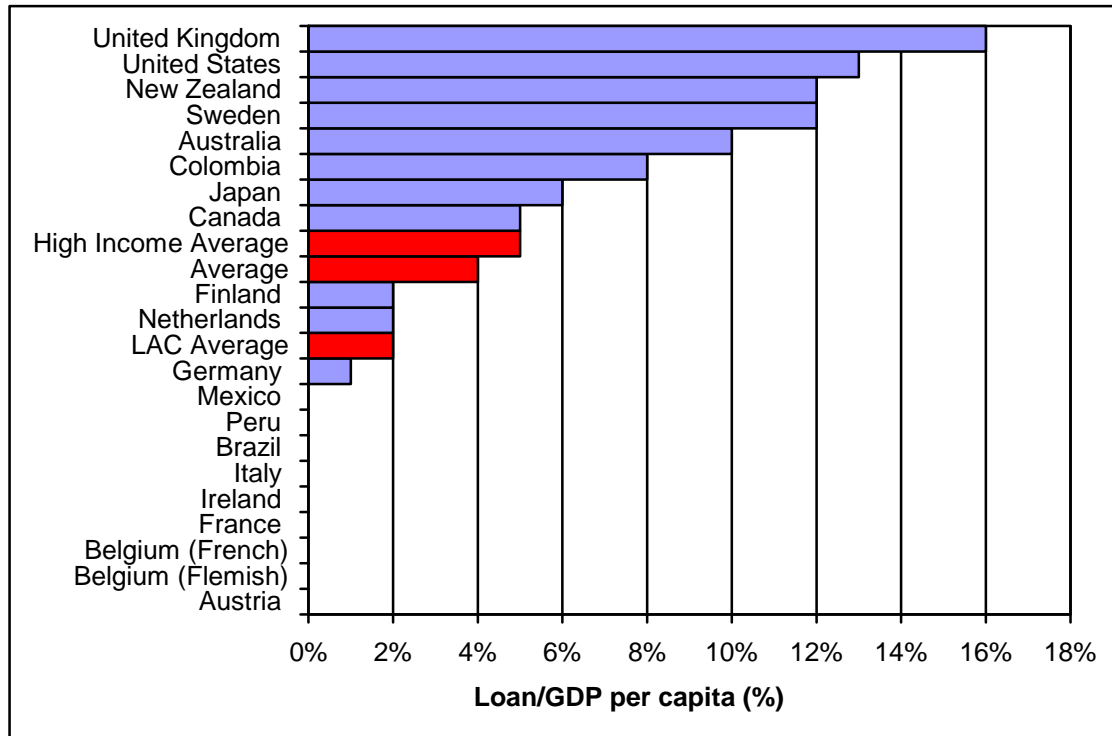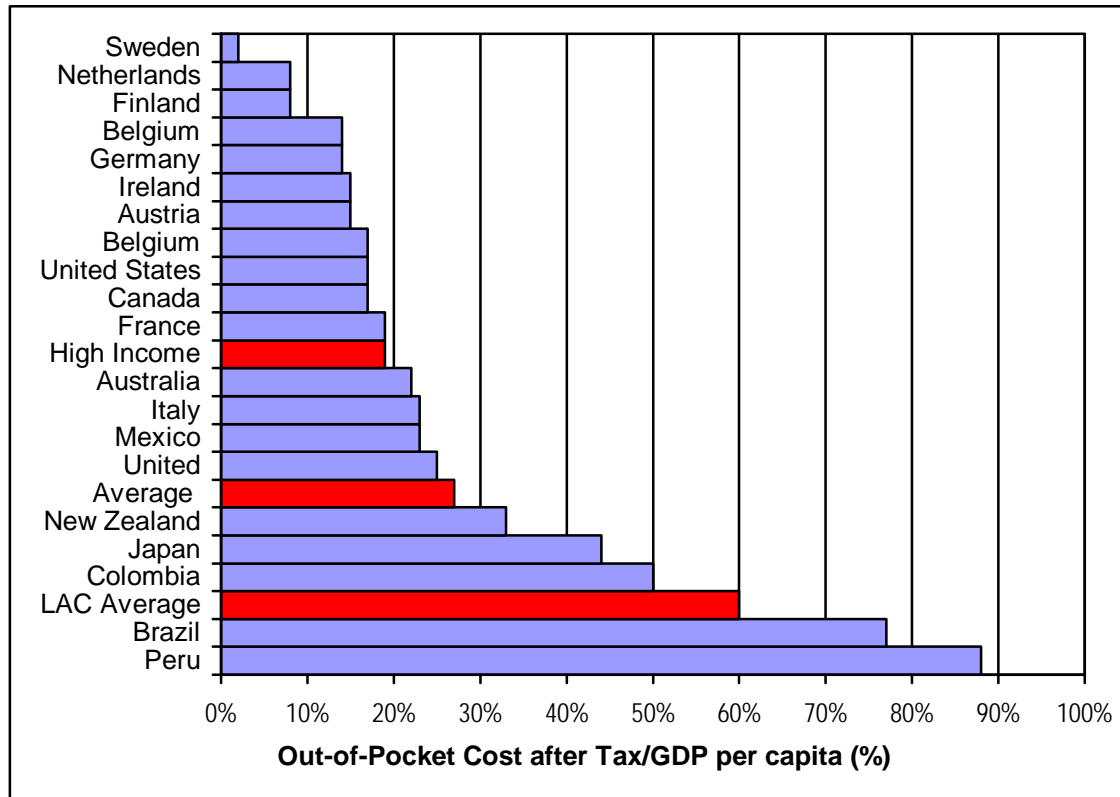
Figure 7. Out-of-Pocket Costs after Tax

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries.
Note: Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary.

Average out-of-pocket cost of tertiary education in Latin America, 60 percent, is significantly higher compared to high-income, 19 percent.

Colombia is the only LAC country where student assistance implies a significant improvement in the affordability of tertiary reduction. Education and living costs reach 64 percent of GDP per capita, but grants and loans reduces the costs to 50 percent, a 14 percent reduction. Student assistance in Mexico improves affordability by 1 percent of GDP per capita. In Brazil, out-of pocket costs amount to 77 percent. Similarly, Peru's out-of-pocket costs remain similar to total costs, which can be attributed to its low availability of grants and loans for tertiary education. Although availability of student assistance in Latin America is comparatively low, the impact can still be significant in segments of the population in particular if the student assistance is well targeted.

The inclusion of student assistance (grants and loans) in the equation also introduces a dramatic change to affordability in Anglo-Saxon countries (22 percent) and Northern European countries (15 percent). Actually, the high level of student assistance in Anglo-Saxon countries equals the large difference in total education costs that exist between Continental Europe and Anglo-Saxon countries. The out-of-pocket cost that the families from these two country groups have to shoulder during studies becomes more or less similar.

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Figure 8 Student Assistance (Grants and Loans)

Overall Affordability. There are multiple perspectives of affordability. Using the somewhat subjective methodology presented in the earlier section, one can weigh the above affordability indicators to create an overall affordability of tertiary education indicator (Figure 9). The Figure displays the level of affordability of tertiary education compared to other countries.
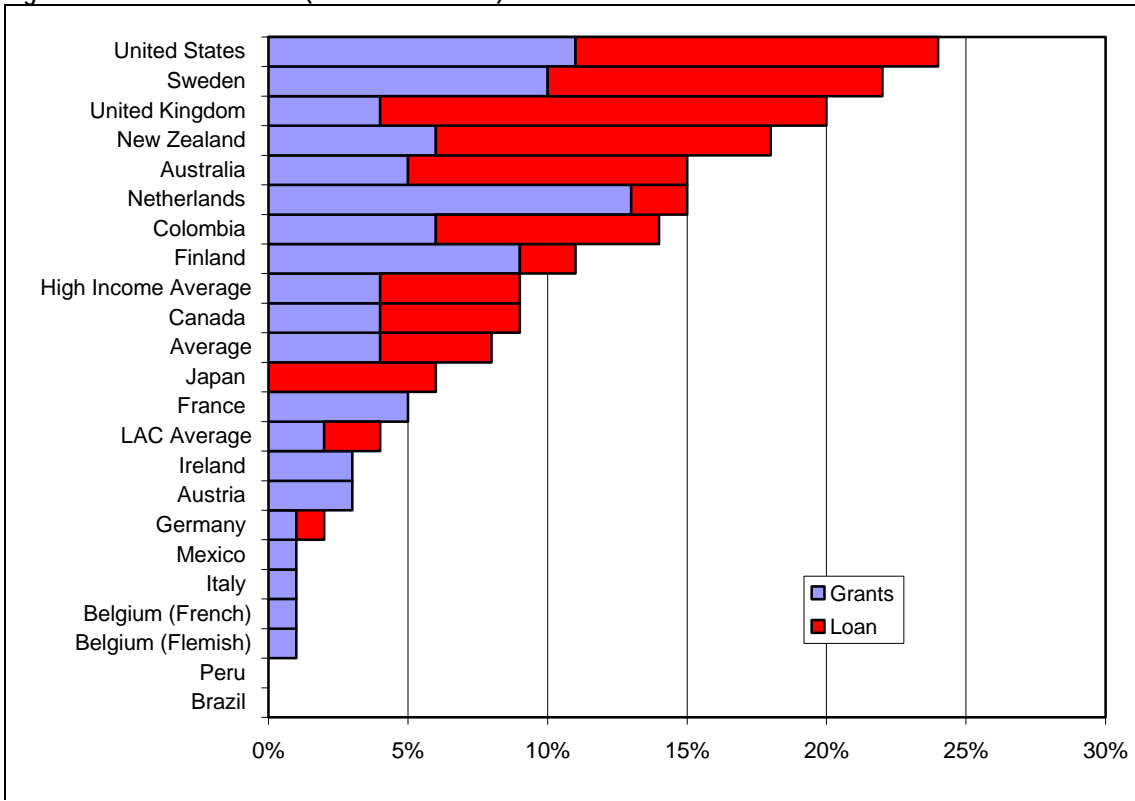
Figure 9. Overall Affordability
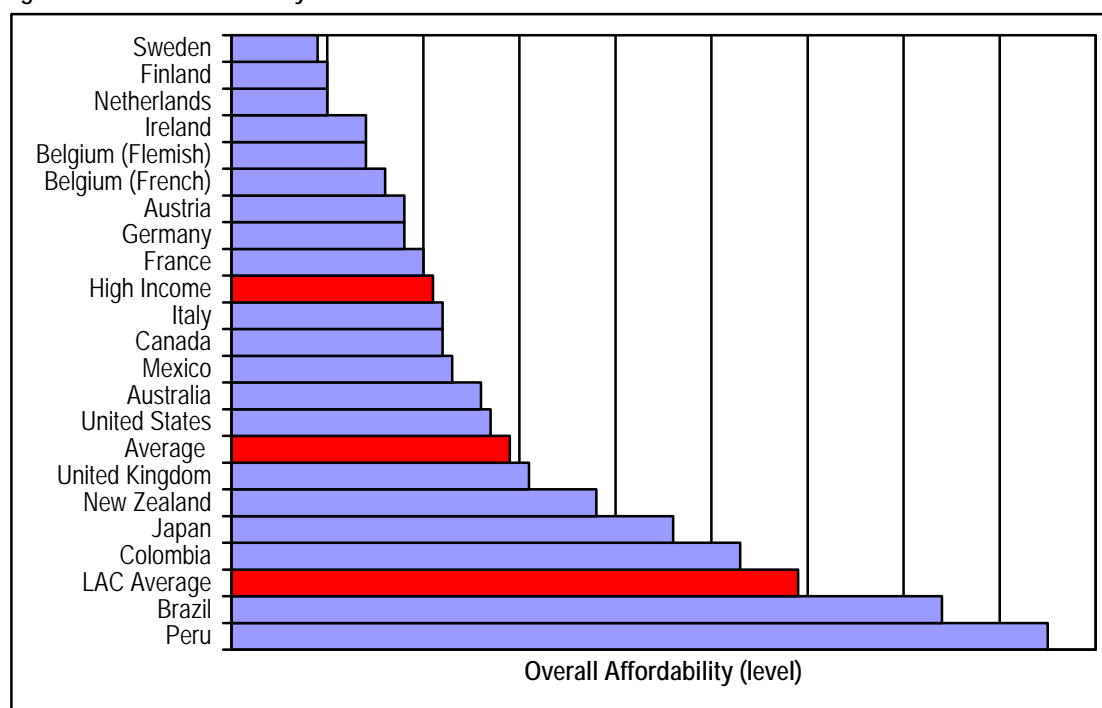
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries.
Note: The graph displays the level of affordability of tertiary education compared to other countries. Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary.

Tertiary education in the selected four LAC countries is less affordable than in the high-income countries. The previous analysis suggests three mean reasons for this finding: (i) a relatively larger share of non-governmental education; (ii) a relatively lower GDP per capita, and (iii) a low level of student assistance.

3.2. Accessibility Findings

This section presents at the findings on accessibility of tertiary education in LAC compared to accessibility of tertiary education in high-income countries. As described earlier, the accessibility indicators attempt to capture the accessibility of tertiary education in terms of two broad concepts: first, how many people get to participate and attain tertiary education (quantity), and second, who gets to access tertiary education (composition).[21]

Participation Rates for the selected LAC and high-income countries are presented in Figure 10 with participation rates on the horizontal axis and the countries on vertical axis in order of decreasing prevalence.

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[21] As reported by Usher and Cervenan, 2005, data was unavailable for Japan on the participation indicator, while data was unavailable for New Zealand on the Educational Equity Index. In contrast to the affordability section where data for Belgium was presented separately for two linguistic communities, accessibility indicators for Belgium are not divided into communities, but presented on a national basis.

Figure 10. Participation Rates in Tertiary Education (Highest Four-Year Participation Rate)
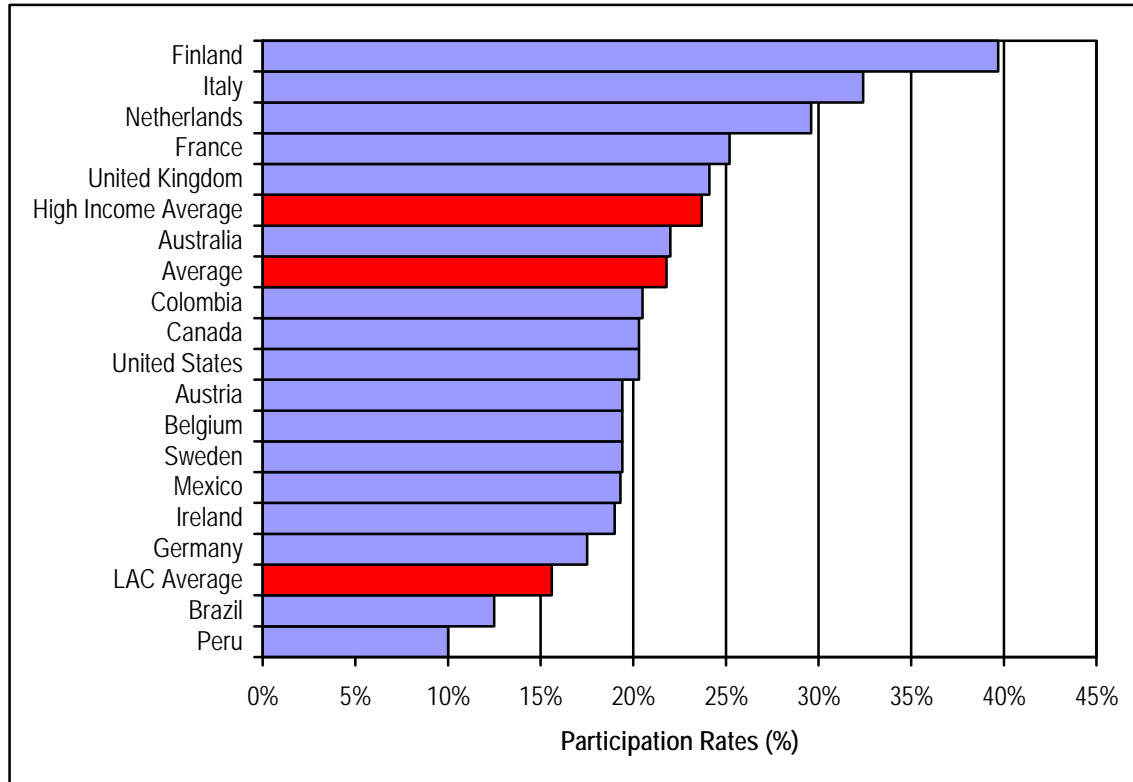
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries
Note: The shown participation rate is calculated as the participation rate of the four year age-group with the highest average participation rate.

As is well-known, the four selected LAC countries have lower participation rates than the high-income countries, 16 percent compared to 24 percent, respectively. The majority of countries' participation rates are around 20 percent. Among the four LAC countries, Colombia has the highest participation rate in tertiary education in this study with 21 percent. Mexico follows next with 19 percent participation rate. Brazil has 12 percent participation rate and Peru has 10 percent participation. Importantly, this indicator measures participation in a different way than the more traditionally reported gross enrollment rate, which includes students in all ages and all types of tertiary education. Hence, the shown participation rate is lower than gross enrollment.

The limitation of this indicator is that the highest four year participation rate does not reflect the participation of other age groups into tertiary education than the four year age-group with the highest participation rate. For example, the participation rate of the United States is below the average participation rate. This is because the participation rate only captures the access for the four-year age group with the highest participation. The age distribution of the US student population is broader than other high-income and LAC countries. That is, the second moment of the age distribution of the student population is higher in the US than in other countries. It is the opposite case for the four selected LAC

countries. Their student population consists of a fairly narrow age group. The next indicator, education attainment rate, captures such differences in access to education.

Education Attainment Rate gauges the educational attainment of the population aged 25-34 (Figure 11).

Figure 11 Education Attainments Rates
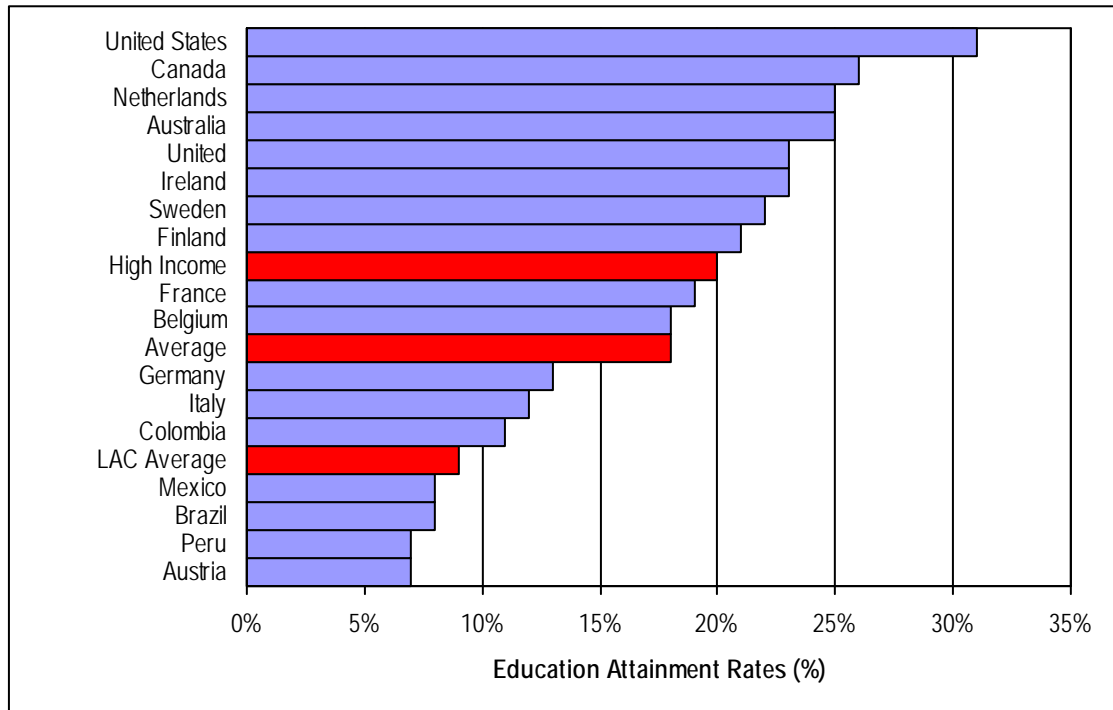
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

As expected, attainment rate of high-income countries exceed those of the four LAC countries. The four LAC countries and Austria have the lowest attainment rates. Generally speaking, the predominantly-Anglophone countries have a higher educational attainment (26 percent) compared to LAC countries (8 percent) and Continental Europe (16 percent). Educational attainment differ only marginally among the four LAC countries, Colombia has the highest attainment rate in this study with 11 percent among students aged 25-34 at tertiary education. Mexico and Brazil follow with eight percent of attainment. The last country is Peru with 7 percent.

Although the participation rates of the four countries differ by a considerable distance, the attainment rates are found to be in the same range. The difference between participation and attainment could be explained by three factors: (i) a difference in participation in tertiary education of persons outside the age-range captured by the participation rate in this study; (ii) higher internal efficiency of a tertiary education system leading to lower drop out and higher attainment rates through remedial education, student financing and the like; and (iii) a recent increase in participation rates will take at least 4 years to start impacting the attainment rate.

Education Equity Index (EEI) seeks to measure the socio-economic status (SES) of students with access to tertiary education. The indicator is the ratio of the percentage of university students whose fathers' have a tertiary education degree, which measures the SES of the student population, and the percentage of men aged 45-64 who have a tertiary education degree, which measures the SES of the general population. The horizontal axis indicates the EEI score. A high EEI indicates more equal access to tertiary education. A lower EEI refers to less equity (Figure 12).
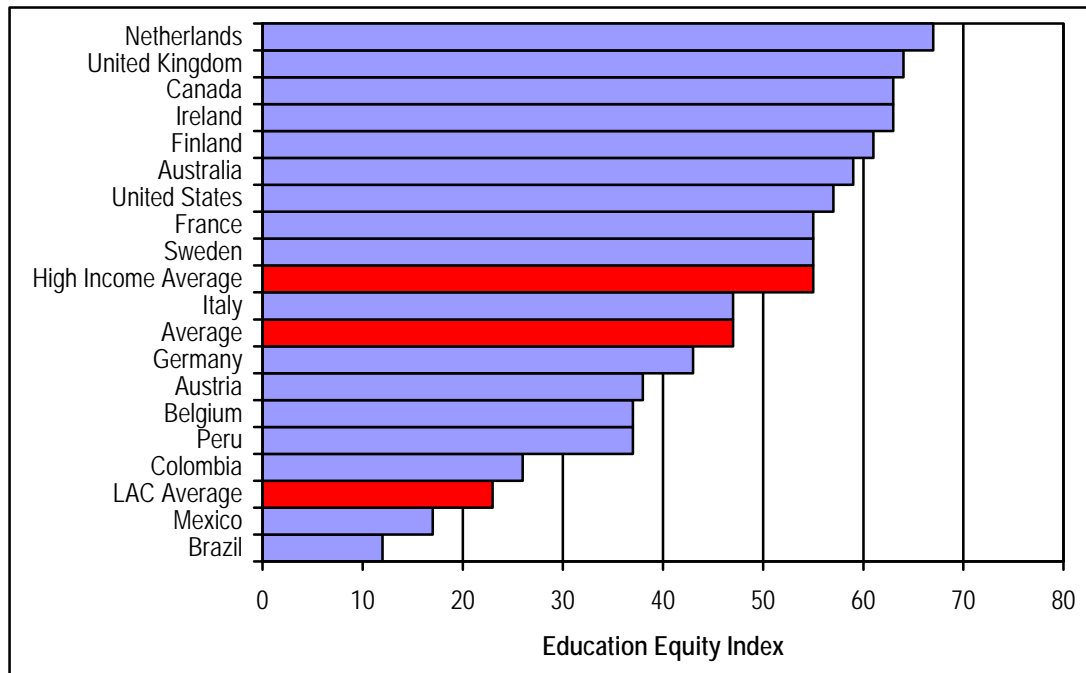
Figure 12. Education Equity Index

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

Overall, the average EEI score of the LAC countries is the lowest among the countries in this study. This is expected given the high level of overall inequality in Latin America. Anglo-Saxon and Northern European countries offer more equal access to tertiary education, while the majority of Continental European countries fall below the average.[22] Within Latin America, there are differences. For example, Peru seems to have less inequality than Brazil.

The differences in equity in access are likely to stem from a combination of at least seven factors: (i) a country's overall inequality, (ii) inequality in graduation of secondary education, (iii) affordability of tertiary education, (iv) government and institutional policies favoring access to low-income students, (v) efficiency of a tertiary education system, (vi) the composition of tertiary education supply and learning paths available, and (vii) participation rate. For example, a larger supply of short term tertiary education

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[22] As explained in the methodology section, this indicator reflects composition only, and not access. For example, Peru's high EEI (38) is equal to that of Belgium, although the participation rate in Belgium is twice the level of Peru's.

combined with a culture of credit transfer agreement between institutions is expected to improve equity. However, relatively little research has been conducted into cross-country differences in inequality of tertiary education. It is therefore difficult to quantify the importance of each factor.

Gender Parity Index (GPI) measures the equality of access across the two genders (Figure 13). The horizontal axis shows the distance from gender parity (parity as zero) and vertical axis shows the countries on the basis of distance from parity. In terms of scoring the gender parity index, one must not compare based on the highest or lowest GPI scores, but rather based on the distance from the parity score. A positive parity reflects a higher share of females in tertiary education as compared to the share of males in tertiary education.

Figure 13. Gender Parity Index
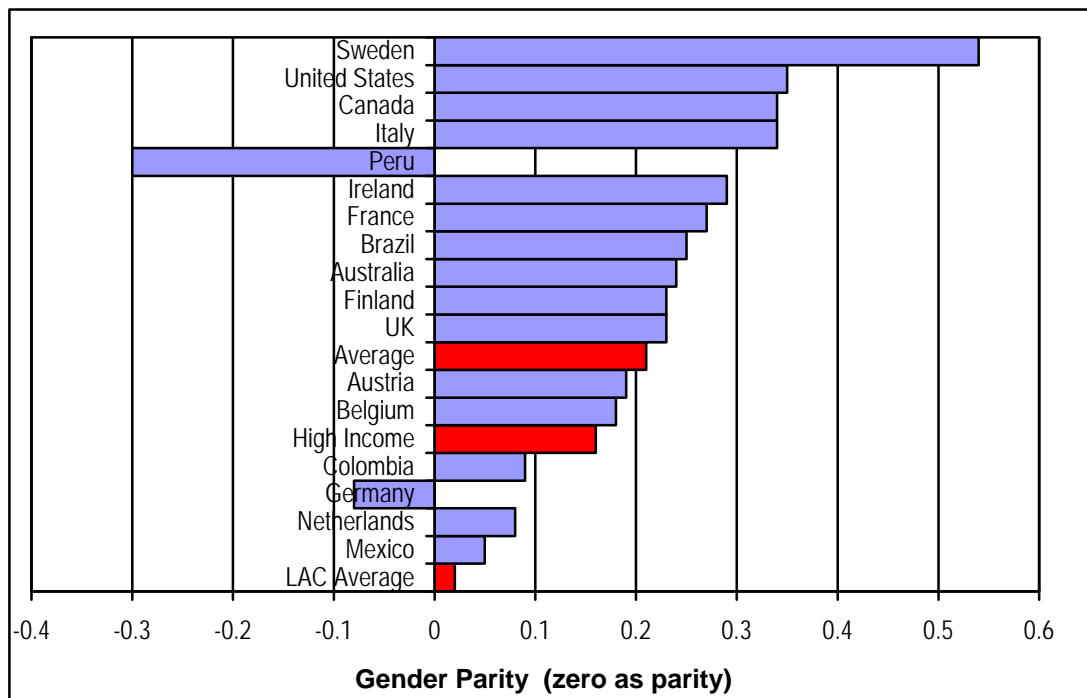
Gender Parity (zero as parity)

Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

The LAC countries are shown to provide relatively equal access to both genders. Gender parity scores are all positive except for Peru among the LAC countries and Germany among the high-income countries. The two countries have males outnumbering females in tertiary education. Interestingly, the LAC average is close to parity (0.02) compared to high-income countries (0.16). Most high-income countries have gender balances in the range between 1.18 and 1.35, implying that females make up between about 55 and 60 percent of the student body. The finding confirms previous findings for tertiary education in Latin America, IESALC (2005).

Overall Accessibility. Just as the previous section showed that different measures of affordability may lead to different conclusions about which countries are affordable, this

section has shown that different indicators of accessibility provide different insights as to which countries are "high access" countries. Still, one can attempt to make one (subjective) indicator of access. Figure 14 shows such a combined accessibility indicators once the different access indicators have been scored according to the methodology described earlier.

Figure 14. Overall Accessibility
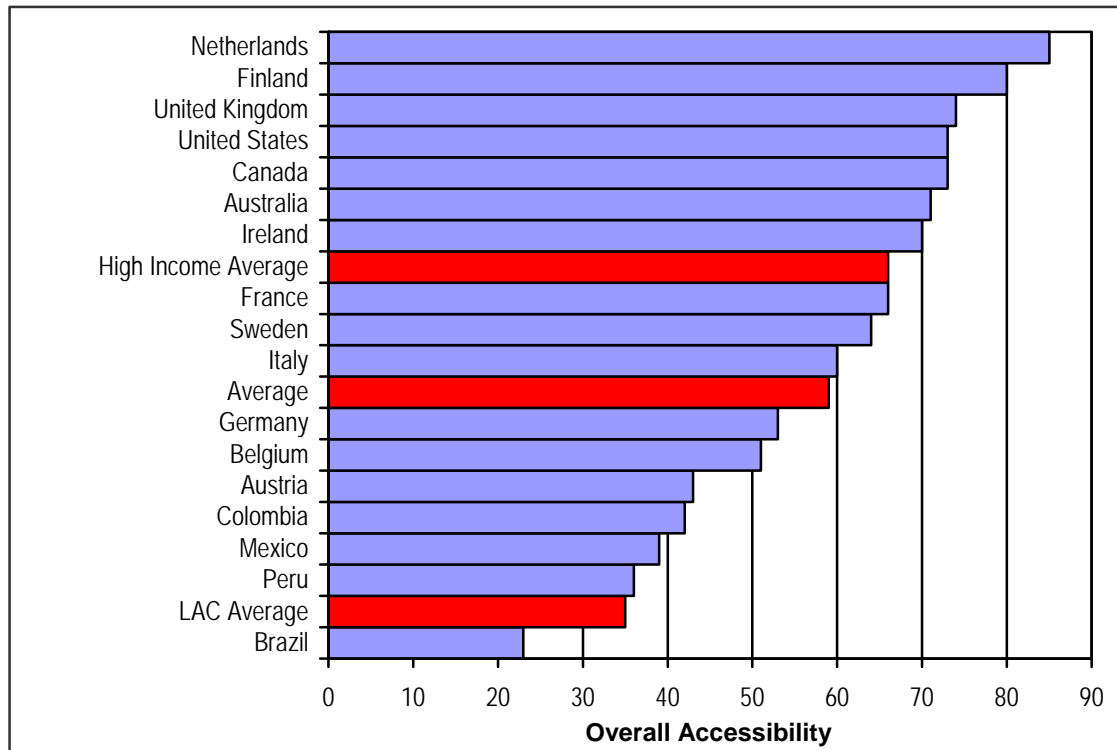
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

The overall accessibility indicator suggests that accessibility of tertiary education in the selected four LAC countries is relatively low compared to high-income countries. Some countries gain a higher score owing to a high participation rate, while some countries receive a high overall score because of its educational equity and gender parity score.

Colombia has the highest overall accessibility among the LAC countries. Peru is the second most accessible among the four, followed by Brazil and Mexico. In a case of Colombia, it achieves the highest participation rate, attainment rate and gender equity index among the LAC countries. Comparing to Peru, Mexico has a higher participation rate, higher attainment rate, and more equal gender index. Nonetheless, the lower EEI score shifts the overall score lower than Peru. The last LAC country, Brazil, has less favorable results for all four indicators resulting in the least accessible tertiary education system.

According to this (subjective) weighing of access indicators, the Northern European countries have the highest level of access, followed by Anglo-Saxon countries and Continental European countries, then follows LAC.

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3.3. Discussion of affordability and accessibility

The preceding pages have examined in some detail the issues of affordability and accessibility of tertiary education in Latin America.

The financing of tertiary education in Latin America is unique. The model features low affordability of tertiary education with low education costs of public education and high costs of non-governmental education. This is combined with limited student assistance. It is a unique product of the past political and educational evolution of the region. The current situation seems to be a result of a financing model similar to Continental Europe in the past, where the majority of tertiary education was publicly funded. This characteristic has in recent years—last two to three decades—been combined with a significant growth of non-governmental education charging high tuition, similar to Anglo Saxon countries. However, public policies have not been fully adjusted to the growth of the non-governmental sector, and therefore, student assistance remain relatively scarce.

The analysis is not broken down into affordability for students in public and non-governmental education institutions. The necessary dis-aggregation of data for public and non-governmental was not included in the Usher and Cervenan, 2005 study. Further, data on student assistance in Latin America separated into assistance to students in public institutions and students in non-governmental institutions is unavailable. For education costs, a separation is possible, Figure 15. The education costs show a marked difference between education costs in the public and in the non-governmental sector. Consequently, the national averages hide a large difference between costs and affordability of public tertiary education and non-governmental tertiary education. The difference in costs is likely to be mainly driven by subsidies to public education institutions that keep tuition low. The large difference in affordability between public and non-governmental tertiary education raises a policy question whether the vast majority of public resources into tertiary education should continued to almost exclusively benefit students in the public institutions or should needy students in non-governmental institutions equally benefit, for example through student assistance?

Figure 15 Tuition Costs in the Public and Non-governmental Sub-sectors
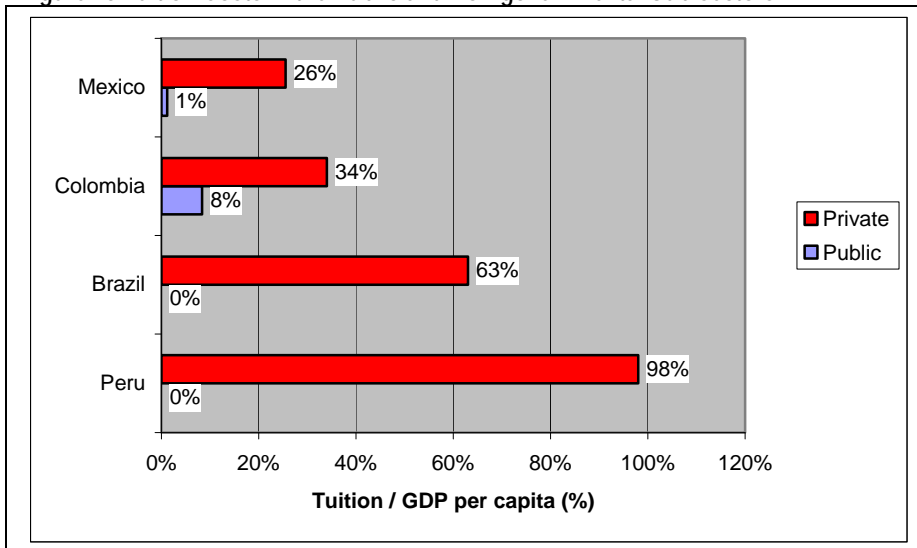
Sources: Authors' calculation
Note: Findings for Brazil and Peru are based upon tuition fees of a relatively small sample of higher education institutions. The findings for these countries should therefore be considered preliminary.

These findings do not examine affordability of tertiary education for low-income families. The analysis is based on the average GDP per capita. This is important for Latin America, since it suffers from a high level of inequality. To estimate affordability of tertiary education for a low-income family, the education costs and student assistance would have to be expressed as a share of income of a low-income family.[23] In many cases, poor families in Latin America would not be able to find sufficient funds to cover living costs, estimated to an average of $1,950 for the four Latin American countries. On the other hand, one could find high-income families where affordability is high in particular if the student was enrolled in a tuition-free public institution.

The high-income countries provide two relatively successful financing models for affordability and accessibility: the Northern Europe and the Anglo-Saxon models. The Anglo Saxon model is successful through its combination of a medium to high education cost and a highly extensive student assistance system, in particular with high availability of student loans. A second successful model is the Northern European, which provides the most accessible and affordable education to all students. They have large student bodies, high attainment rates, and the student bodies are reasonably similar to the country's socio-economic composition. This comes from tuition free or almost tuition-free tertiary education combined with extensive student assistance programs. However, this model relies on a large public investment into tertiary education financed by very high tax contribution of its citizens.[24]

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[23] A related issue is the regional differences within each country. Generally, all countries show large variations in education costs, living costs and income between urban and rural areas.

[24] Japan offers a third way. It features the least affordable tertiary education among the high-income country. However, tertiary education is not beyond the means of most Japanese families as household savings rates (not shown) and parental contribution for children's tertiary education in Japan are extremely high.

We can not find a simple link between affordability and accessibility. Figure 16 presents the scatter-graphs of affordability and accessibility of tertiary education. The LAC countries are clustered in the upper-left corner of the graph, reflecting low access and low affordability, while the high-income countries cluster in bottom left and right of the graph indicating high affordability and a range of accessibility scores from low to high. At first glance, there appears to be a correlation between affordability and accessibility. Low affordability—indicated by a high Un-affordability score—is associated with a low accessibility score. The simple correlation coefficient is between overall affordability and affordability is - 0.68 (R^2 = 0.46). However, the relationship is primarily driven by the difference between the group of LAC countries compared to the group of the high-income countries. There is no correlation between affordability and accessibility among the high-income countries. The correlation coefficient is - 0.003 (R^2 = 0.000). The correlation between affordability and accessibility among LAC countries is weak (R^2=0.26). Consequently, the preliminary data is not conclusive. Further research is required to investigate the link between affordability and accessibility.

Figure 16. Correlation between Accessibility (Overall Score) and Affordability (Overall Score)
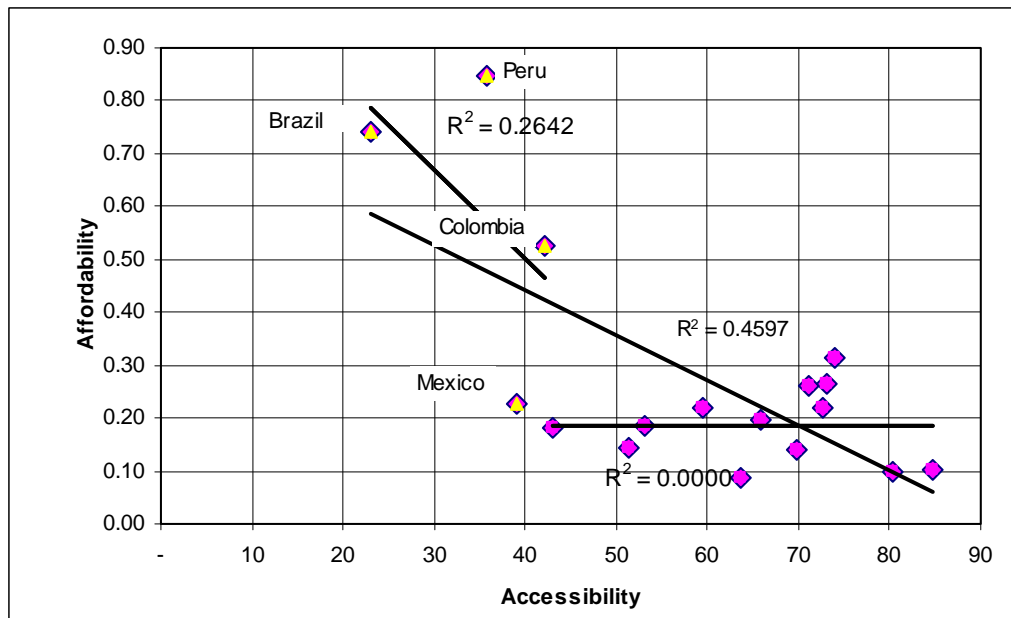
Sources: Authors' calculation for the LAC countries and (Usher and Cervenan, 2005) for high-income countries

There may not necessarily be a strong correlation between affordability and accessibility. This is an important message for policy making. High affordability, for example through tuition free public education, does not automatically lead to high access, because somebody has to foot the bill for higher education. If the families are not contributing, then investments, supply of seat and accessibility may decrease. In some countries, the government can further subsidize higher education, but in most countries governments have severe spending constraints and many competing priorities. In the context of severe spending constraints, governments could consider more nuanced ways of financing of higher education than a simple across the board subsidy to all students regardless of their

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ability to pay. In these countries, it is important to consider affordability of higher education, including student assistance, for different kinds of households. Therefore, the public debate on financing of higher education could be more nuanced and discuss more than just for or against tuition in public universities. The discussion could among other things take into account affordability for low-income families, affordability and ability to pay of high-income families, affordability of private education, and distribution of public subsidies.

4. MAIN FINDINGDS AND POLICY IMPLICATIONS

This paper explored affordability and accessibility of tertiary education in four selected countries in Latin America – Brazil, Colombia, Mexico, and Peru – within a global context. We relied on information from household surveys, expenditure surveys, administrative data, and institutional data through primary data collection.

We learned that the available information is far from perfect. We therefore urge caution when interpreting the results. In particular, the estimates of education costs for Peru and Brazil are not necessarily representative of the true national average. However, it is to our knowledge, the best available estimates. We believe the paper brings value-added by estimating accessibility and, in particular, affordability. The analysis can contribute to improved policymaking and stimulate public debate based on real quantifiable trade-offs as opposed to the occasionally ideologically driven debate in Latin America.

Main Findings
Affordability of tertiary education in LAC is low compared to high-income countries. We examine education costs and living costs expressed as a share of GDP per capita, a measure of ability to pay. We find that the average family in Latin America pays the equivalent of 60 percent of GDP per capita for tertiary education in LAC. This is the out-of-pocket costs. It compares to 19 percent for families in high-income countries. This is explained by the difference in GDP per capita, comparatively higher education costs due to a higher share of non-governmental education in Latin America, and a low level of student assistance.

Living costs are a significant cost of tertiary education. We estimate that the cost of living amounts to 29 percent of GDP per capita for the typical Latin American family. This compares to 19 percent for high-income countries.

There is a relatively low level of student assistance in Latin America. In the four examined Latin American countries, Brazil, Colombia, Mexico and Peru, student assistance—loans and scholarships—amounted to four percent of GDP per capita, divided into two percent for loans and two percent for grants. This compares to nine percent for high-income countries (and 22 percent for Anglo-Saxon countries and 15 percent for Northern Europe).

There is relatively low access to tertiary education. Our estimation confirms existing evidence of a relatively low accessibility to tertiary education in Latin America,

measured by both quantity (participation rates and attainment rates) and equity (socio-economic). However, Latin America is the best region when it comes to equal access for females and males.

There is not necessarily a simple relationship between affordability of tertiary education and accessibility. Hence, high affordability to the families does not necessarily lead to high access. This is likely to be the case for low-income families, where even living costs presents a barrier to access. However, this may not be the case for middle and high-income families. This is explained by the fact that if the families do not contribute to the part of the costs, the government has to shoulder the full costs, and this tends to limit available supply of higher education.

The findings presented in this paper could be improved and extended in at least three ways: (i) the data on tuition levels and other education costs could be improved, in particular for Brazil and Peru, (ii) the analysis could be expanded to other Latin American countries, and (iii) the affordability and to a certain extent accessibility analysis could be undertaken separately for students in public and non-governmental institutions, and also separately for students from low-income families compared to students from high-income families. That would provide highly relevant research that could inform policies for admission, potential cost-recovery and student assistance.

Policy Implications

The above findings show that the examined Latin American countries finance tertiary education in a different and unique way compared to high-income countries. Further, the study shows that there are important differences within Latin America. Policies therefore have to be tailored to each country. The differences and the lack of reliable information also highlight the need to undertake more data collection and research before designing policies.

The first implication that we draw from the analysis is a requirement to take a comprehensive approach to tertiary education financing. Education and living costs, public financing of tertiary education, student assistance and other financing policies should be examined together. Tertiary education finance is more than only the issue of cost-recovery of public universities. Further, it is should be well-known that high affordability does not necessary lead to high access, because if the families are not contributing to the investment in tertiary education, the government has to foot the entire bill. However, without a high level of tax contributions, government financing is insufficient to finance a broad section of the qualified students, and is inequitable in many cases.

The second policy implication is that governments in Latin America have an opportunity to improve affordability of tertiary education through increased student assistance. By doing so, the governments would help families finance the relatively high costs of tertiary education and thereby increase enrollment and equity. This could be done by:
- Expand availability of student loans. Student loans allow students to postpone the costs of tertiary education, so that costs—the loan repayments—coincide

with the benefits of tertiary education—employment and higher salary. Student loans hold a large promise in Latin America, because the costs of education are relatively large and prohibit many families from accessing tertiary education. Loans help low, middle, and high-income families finance tertiary education. Further, loans facilitate student-contributions to investments in tertiary education, and thereby contribute to higher investment in tertiary education.

- <u>Expand availability of grants (or income-contingent loans) to students from poor families to cover living costs.</u> For many low-income families, free education is not enough of a subsidy to finance access to tertiary education. Living costs need to be covered. Most Latin American countries have large, targeted grant programs, in particular Mexico and Colombia. An income-contingent loan program would be the most cost-efficient way of assisting low-income families gain access to tertiary education.

Following public debate, a successful scaling up of student assistance programs and a comprehensive review of tertiary education financing policies would enable government and families in Latin America to increase access to tertiary education for many more students. This would enhance the productivity, creativity, innovativeness, and technological capacity of the national labor force, and thereby boost economic growth, national competitiveness, and poverty reduction.

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ANNEX

Participation Rate $PR^t_{h,a,\max} = \dfrac{E^t_{h,a}}{P^t_{h,a}} * 100$

Where $PR^t_{h,a,\max}$ is Participation Rate at maximum when selecting four year age group a at the
level of education h in school year t,

$E^t_{h,a}$ is the number of enrollment in age group a at the level of education h in school year
t, and

$P^t_{h,a}$ is total population in age group a at the level of education h in school year t.

Educational Attainment Rate: $\% P^t_{25-34,h} = \dfrac{P^t_{25-34,h}}{P^t_{25-34}} * 100$

Where $\% P^t_{25-34,h}$ is a percentage of population aged 25-34 that attained educational level h in year
t,

$P^t_{25-34,h}$ is population aged 25-34 that attained educational level h in year t, and

P^t_{25-34} is total population aged 25-34 in year t.

Educational Equity Index: $EEI^t_{h,m} = \dfrac{\% P^{\,t}_{45-65,m,h}}{PR^t_{h,a,\max,f}} * 100$

Where $EEI^t_{h,m}$ is Education Equity Index at level of education h in school year t among gender m,

$\% P^{\,t}_{45-65,m,h}$ is a percentage of population with gender m and age 45-65 that attended
educational level h in year t,

$PR^t_{h,a,\max,f}$ is Participation Rate at level of education h in school year t among gender m
and whose father has a higher degree f,

Gender Parity Index: $GPI^t_h = \dfrac{GER_{female\ h,a}^{\,t}}{GER_{male\ h,a}^{\,t}}$

Where $GER_{female\ h}^{\,t}$ is Gross Enrollment Ratio for female students in age group a at level of
education h in school year t and

$GER_{male\ h}^{\,t}$ is Gross Enrollment Ratio for male students in age group a at the level of
education h in school year t.[25]

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[25] Gross Enrollment Ratio at level of education h in school year t is calculated as $GER^t_h = \dfrac{E^t_h}{P^t_{h,a}} * 100$

where

E^t_h is enrollment at the level of education h in school year t, and

$P^t_{h,a}$ is population in age group a at the level of education h in school year t.

Table 8. Education Costs (% of GDP per capita)

Level	Country	% of GDP per capita
1	Finland	1%
2	Belgium (Flemish)	3%
2	Belgium (French)	3%
2	Sweden	3%
5	Ireland	4%
6	Austria	5%
7	France	6%
8	Netherlands	7%
9	Germany	8%
9	Italy	8%
11	United Kingdom	12%
12	Australia	13%
12	Mexico	13%
14	Canada	14%
15	New Zealand	16%
16	United States	26%
17	Colombia	28%
18	Japan	29%
19	Brazil	48%
20	Peru	50%
	Average	15%
	LAC Average	35%
	High Income Average	10%

Table 10. Total Costs (% of GDP per capita)

Level	Country	% of GDP per capita
1	Belgium (Flemish)	17%
2	Ireland	18%
3	Belgium (French)	19%
4	Finland	20%
5	Netherlands	24%
5	Germany	24%
5	Sweden	24%
5	Mexico	24%
5	Italy	24%
5	Austria	24%
11	France	26%
12	Canada	30%
13	Australia	36%
14	United States	43%
15	United Kingdom	44%
16	Japan	51%
17	New Zealand	51%
18	Colombia	64%
19	Brazil	77%
20	Peru	89%
	Average	36%
	LAC Average	64%
	High Income Average	30%

Table 9. Living Costs (% of GDP per capita)

Level	Country	% of GDP per capita
1	Mexico	11%
2	Ireland	13%
3	Belgium (Flemish)	15%
4	Germany	16%
4	Canada	16%
4	Belgium (French)	16%
4	Italy	16%
8	Netherlands	17%
8	United States	17%
10	Finland	19%
10	Austria	19%
12	France	20%
12	Sweden	20%
14	Japan	22%
15	Australia	23%
16	Brazil	30%
17	United Kingdom	32%
18	New Zealand	36%
18	Colombia	36%
20	Peru	38%
	Average	22%
	LAC Average	29%
	High Income Average	19%

Table 11. Grants (% of GDP per capita)

Level	Country	% of GDP per capita
1	Netherlands	13%
2	United States	11%
3	Sweden	10%
4	Finland	9%
5	New Zealand	6%
5	Colombia	6%
7	France	5%
7	Australia	5%
9	Canada	4%
9	United Kingdom	4%
11	Austria	3%
11	Ireland	3%
13	Germany	1%
13	Belgium (Flemish)	1%
13	Italy	1%
13	Belgium (French)	1%
13	Mexico	1%
18	Peru	0%
19	Japan	0%
18	Brazil	0%
	Average	4%
	LAC Average	2%
	High Income Average	5%

Table 12. Net Costs (% of GDP per capita)

Level	Country	% of GDP per capita
1	Netherlands	10%
2	Finland	11%
3	Sweden	13%
4	Belgium (Flemish)	14%
5	Ireland	15%
5	Austria	15%
5	Germany	15%
5	Belgium (French)	15%
9	France	19%
10	Canada	22%
11	Italy	23%
11	Mexico	24%
13	United States	30%
14	Australia	31%
15	United Kingdom	40%
16	New Zealand	46%
17	Japan	50%
18	Colombia	59%
19	Brazil	77%
20	Peru	89%
	Average	31%
	LAC Average	62%
	High Income Average	23%

Table 14. Out-of-Pocket Costs (% of GDP per capita)

Level	Country	% of GDP per capita
1	Sweden	2%
2	Netherlands	8%
3	Finland	8%
4	Belgium (Flemish)	14%
5	Germany	14%
6	Ireland	15%
7	Austria	15%
8	Canada	17%
9	United States	17%
10	Belgium (French)	17%
11	France	19%
12	Australia	22%
13	Italy	23%
14	Mexico	23%
15	United Kingdom	25%
16	New Zealand	33%
17	Japan	44%
18	Colombia	50%
19	Brazil	77%
20	Peru	88%
	Average	27%
	LAC Average	60%
	High Income Average	19%

Table 13. Loans (as % of GDP per capita)

Level	Country	% of GDP per capita
1	United Kingdom	16%
1	United States	13%
1	New Zealand	12%
1	Sweden	12%
1	Australia	10%
1	Colombia	8%
1	Japan	6%
1	Canada	5%
1	Finland	2%
10	Netherlands	2%
11	Germany	1%
11	Mexico	0%
13	Peru	0%
14	Brazil	0%
15	Austria	0%
16	Belgium (Flemish)	0%
17	Belgium (French)	0%
17	France	0%
19	Ireland	0%
20	Italy	0%
	Average	4%
	LAC Average	2%
	High Income Average	5%

Table 15. Overall Affordability

Level	Country	% of GDP per capita
1	Sweden	9%
2	Finland	10%
3	Netherlands	10%
4	Ireland	14%
5	Belgium (Flemish)	14%
6	Belgium (French)	16%
7	Austria	18%
8	Germany	18%
9	France	20%
10	Italy	22%
11	Canada	22%
12	Mexico	23%
13	Australia	26%
14	United States	27%
15	United Kingdom	31%
16	New Zealand	38%
17	Japan	46%
18	Colombia	53%
19	Brazil	74%
20	Peru	85%
	Average	29%
	LAC Average	59%
	High Income Average	21%

Table 16 Cost Details for LAC and High-income Countries ($2003 PPP)

Region	Country	Institution	Tuition & Education Costs	Living Costs	Grants	Tax Breaks	Loans	GDP per capita
Region LAC	Country Brazil	Public	220					
		Non-governmental	5,132					
		Overall	3,698	2,285	0	-	16	7,745
	Colombia Colombia	Public	562					
		Non-governmental	2,339		1,722		3,392	
		Overall		2,492	380		575	6,879
	Mexico Mexico	Public	389					
		Non-governmental	3,217					
		Overall	1,223	1,030	49		32	9,313
	Peru Peru	Public	455	695				
		Non-governmental	5,697	1,701				
		Overall	2,659	2,018	8		16	5,275
High-income Countries	Australia		3,828	6,720	1,376	11	2,789	29,143
	Austria		1,478	5,821	849	1,914	-	29,972
	Belgium (Flemish)		821	4,145	275	820	-	28,396
	Belgium (French)		821	4,615	254	800	-	28,396
	Canada		4,149	4,909	1,114	1,238	1,468	30,463
	Finland		271	5,229	2,565	-	647	27,252
	France		1,738	5,401	1,350	618	-	27,327
	Germany		2,083	4,417	315	1,962	315	27,608
	Ireland		1,575	4,957	1,028	49	-	36,774
	Italy		2,135	4,421	254	-	-	27,049
	Japan		8,248	6,156	-	360	1,768	28,162
	Netherlands		1,990	4,924	3,969	-	652	29,411
	New Zealand		3,327	7,546	1,224	-	2,580	21,176
	Sweden		852	5,431	2,757	-	3,087	26,655
	United Kingdom		3,257	8,602	963	-	4,261	27,106
	United States		9,604	6,344	4,025	639	4,865	37,352

Table 17 Estimated Education Costs in US$2003 (not Purchasing power parity)

Country	Source (details in table 23)	Public	Non-governmental	Average
	Tuition			
Brazil	University Websites	0	1,795	1,271
Colombia	Information System for Tertiary Education at the Ministry of Education	151	628	437
Mexico	Household Survey	73	1597	525
Peru	Telephone survey University websites	0	2238	918
	Other Study Costs (Books and Study Materials)			
Brazil	ICHEFAP-Region-Latin America- Brazil	80	80	80
Colombia	Household Survey	NA	NA	76
Mexico	Household Survey	183	522	280
Peru	Household Survey	193	216	225

Table 18. Participation Rates

Level	Country	Highest Four-Year Participation Rate	Ages for Highest Four-Year Period
1	Finland	39.7%	21-24
2	Italy	32.4%	20-23
3	Netherlands	29.6%	19-22
4	France	25.2%	19-22
5	United Kingdom	24.1%	18-21
6	Australia	22.0%	18-21
7	Colombia	20.5%	19-22
8	United States	20.3%	18-21
8	Canada	20.3%	19-22
10	Sweden	19.4%	20-23
10	Belgium	19.4%	18-21
11	Austria	19.4%	21-24
11	Mexico	19.3%	18-21
14	Ireland	19.0%	18-21
15	Germany	17.5%	21-24
16	Brazil	12.5%	20-23
17	Peru	10.0%	19-22

Table 19. Education Attainment Rates (25-34 Years Old)

Level	Country	Attainment Rate
1	United States	31.0%
2	Canada	26.0%
3	Netherlands	25.0%
4	Australia	25.0%
5	United Kingdom	23.0%
6	Ireland	23.0%
7	Sweden	22.0%
8	Finland	21.0%
9	France	19.0%
10	Belgium	18.0%
11	Germany	13.0%
12	Italy	12.0%
13	Colombia	10.8%
14	Brazil	8.5%
15	Mexico	8.0%
16	Peru	7.4%
17	Austria	7.0%

Table 20. Education Equity Index

Level	County	% of males aged 45-64 with higher degree	% of tertiary student whose fathers have higher degree	EEI score
1	Netherlands	26%	39%	67
2	United Kingdom	19%	30%	64
3	Ireland	19%	30%	63
4	Canada	19%	31%	63
5	Finland	14%	23%	61
6	Australia	17%	29%	59
7	United States	29%	51%	57
9	Sweden	16%	29%	55
8	France	21%	38%	55
10	Italy	9%	19%	47
11	Germany	16%	37%	43
12	Austria	10%	26%	38
14	Peru	8%	21%	37
13	Belgium	19%	50%	37
15	Colombia	19%	73%	26
16	Mexico	11%	68%	17
17	Brazil	9%	80%	12

Table 21 Gender Parity

Level	Country	GPI	Distance from Parity
1	Mexico	1.05	0.05
2	Netherlands	1.08	0.08
3	Germany	0.92	-0.08
4	Colombia	1.09	0.09
5	Belgium	1.18	0.18
6	Austria	1.19	0.19
7	United Kingdom	1.23	0.23
8	Finland	1.23	0.23
9	Australia	1.24	0.24
10	Brazil	1.25	0.25
11	France	1.27	0.27
12	Ireland	1.29	0.29
13	Peru	0.70	-0.30
14	Italy	1.34	0.34
15	Canada	1.34	0.34
16	United States	1.35	0.35
17	Sweden	1.54	0.54

Table 22. Overall Accessibility

Level	Country	Score
1	Netherlands	84.7
2	Finland	80.4
3	United Kingdom	74.0
4	United States	73.2
5	Canada	72.7
6	Australia	71.2
7	Ireland	69.7
8	France	65.8
9	Sweden	63.7
10	Italy	59.5
11	Germany	53.0
12	Belgium	51.4
13	Austria	43.0
14	Colombia	42.2
15	Mexico	39.0
16	Peru	35.8
17	Brazil	23.1

Table 23 Data sources for Tuition

Country	Sources
Brazil	Faculdades Integradas do Instituto Ritter dos Reis
	Fundação Getulio Vargas
	Universidade Metodista de Piracicaba
	Universidade Metodista de São Paulo
	Universidade Presbiteriana Mackenzie
	Universidade de Taubatez
	Universidade de Sofocaba
	Universidade Salvador
	Universidade de Fortaleza
	Universidade Católica de brasilia
	Pontifícia Universidade Católica do Paraná
	Universidade Tuiuti do Paraná
	Universidade Católica de Pernambuco
	Pontifícia Universidade Católica do Rio de Janeiro
	Universidade Cândido Mendes
	Universidade Veiga de Almeida
	Faculdade de Natal
	Universidade Potiguar
	Universidade de Caxias do Sul
	Centro Universitário Feevale
Colombia	*Valor de la matrícula en educación superior por origen institucional y modalidad del programa académico de pregado* the semesters of 2005 from the *Información reportada por las IES al SNIES with Corte de datos: 3 ago/2006*
Mexico	2002 Mexican Family Life Survey/*Encuesta Nacional Sobre Niveles de Vida de los Hogares* (MxFLS).
Peru	Privada Universidad Católica del Perú
	Universidad Peruana Cayetano Heredia
	Universidad Católica Santa María
	Universidad del Pacífico
	Universidad de Lima
	Universidad de San Martin de Porres
	Universidad Femenina del Sagrado Corazón
	Universidad Inca Garcilaso de la Vega
	Universidad de Piura
	Universidad Andina del Cusco
	Universidad Privada San Pedro
	Universidad Privada Marcelino Champagnat
	Universidad Alas Peruanas
	Universidad Privada Norbert Wiener
	Universidad Tecnológica del Perú
	Universidad Científica del Sur
	Universidad Continental de Ciencia e Ingeniería
	Facultad de Teología Pontificia y Civil de Lima

Purchasing Power Parity (PPP), for all countries included in affordability and accessibility, is based on data from the OECD. (http:/www.oecd.org/std/ppp/)

Exchange Rates, PPP conversion factor rates, and GDP deflator rates from local currency to US dollars were taken from the World Development Indicators of 2003 and the lists are shown in Table 24 and 25. The formula for the deflation and inflation are shown below. Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency

Table 24. Official Exchange Rates and Purchasing Power Parity Conversion Factors

Country	Description	2003
	Official exchange rate (LCU per US$, period average)	3.08
Brazil	PPP conversion factor to official exchange rate ratio	0.37
	Official exchange rate (LCU per US$, period average)	2877.65
Colombia	PPP conversion factor to official exchange rate ratio	0.26
	Official exchange rate (LCU per US$, period average)	10.79
Mexico	PPP conversion factor to official exchange rate ratio	0.67
	Official exchange rate (LCU per US$, period average)	3.48
Peru	PPP conversion factor to official exchange rate ratio	0.42

Table 25. Inflation and GDP deflator

Country	1999	2000	2001	2002	2003	2004
Brazil			6.84	8.45	14.71	6.60
Colombia	10.88	9.22	7.97	6.35	7.13	5.90
Mexico			6.36	5.03	4.55	4.69
Peru			1.98	0.19	2.26	3.66

Gross Domestic Product (GDP) per Capita, for all countries included in the rankings, has been calculated by using the World Bank data on GDP (http://www.worldbank.org/data/databytopic/GDP.pdf) which has total 2003 GDP in US dollars, and by the World Bank's total national population data on each country (http://www.worldbank.org/data/databytopic/POP.pdf).