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Public university in Argentina: subsidizing the rich?

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Abstract

We analyze some characteristics of the higher education system in Argentina regarding equity and efficiency. Individuals attending the university belong to the top deciles of the income distribution and to relatively highly educated families. Almost 90% of the students in tuition-free public universities have higher than median per capita family income and almost 50% attended tuition-financed private high schools. We compare these students with those who attend non tuition-free private colleges. Although students in private universities seem to have higher per capita family income, this difference is not large enough to distinguish the two groups after controlling for other variables. These facts imply that there is an implicit transfer to the richest individuals in the society. We argue that equity and efficiency of the system can be improved by charging tuition fees. Complementary, selective scholarships and loans could be offered to attract the most talented students from poor families.

JEL classification: I2; H52

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1. Introduction

In Argentina, like in most Latin American countries, the government heavily subsidizes higher education. The subsidy comes in the form of the central government financing tuition-free public universities and it is enjoyed by all students regardless of their economic and academic background. Enrollment in those universities is open to all individuals with the only requirement of having a high school degree. In 1998, almost 83% of the more than one million undergraduates in the country were students at public universities (Secretaría de Políticas Universitarias, 1999). During the last decade, this figure has been increasing at an average annual rate of approximately 3.6%. One of the most important implications of this is the overpopulation in public institutions with an associated decrease in the quality of education.

The current organization of the provision of public higher education presents several other problems. Among them, the most obvious is the availability of public funds for a growing number of students given the severe fiscal restrictions of the country. This increasing scarcity of public funds is not only due to macroeconomic conditions but also due to the competition for these funds from other public needs such as basic education, health care, poverty reduction programs, public infrastructure, etc.

The system has also distributional consequences. Standard models of public provision of college education, for example, tend to imply a transfer from the rich to the poor, however, empirical studies (Psacharopoulos, Tan, & Jimenez, 1986) and new theoretical work (Fernandez & Rogerson, 1995) show that free higher education implies a transfer from lower income groups to higher income groups.

Other problems related to the tuition-free system are

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the low rate of graduation among students and the excessive number of years they take to complete their college studies. Official figures show that, on average, in 1995 for each 100 new students that enrolled in public universities, only 19 students graduated.[1] In general, students spend many more years to finish their college education than they should. On average, students take 60% more time to complete their university studies than the theoretical duration indicates. Both numbers clearly indicate a waste of resources that would be likely to be reduced by increasing academic performance requirements and the pecuniary cost of being a public university student.

Students attending public universities defend, of course, the status quo. They are active, organized, and very vocal. The defense of the tuition-free university is made on the grounds of equal opportunity and access to higher education for all. Other arguments in favor of the current public financing of the higher education system are that it contributes to economic growth and it also produces positive externalities. Recent developments in the theory of economic growth identify investment in education as a key element of economic growth.[2]

Sometimes the justification for subsidizing higher education is that it produces positive externalities. The externality argument suggests that social returns are larger than the wage differentials. This might be the case, at least for some individuals in some professions. However, it does not justify subsidizing every student at exactly the same rate (see Rosen, 1995, ch. 6). The existence of positive externalities would imply that investment in higher education is below the social optimum. If this is the case, we should use subsidies to encourage investment by those individuals that otherwise would not attend college.

In this paper we analyze the socioeconomic characteristics of individuals attending and not attending university in the Buenos Aires metropolitan area using a new dataset. The main contribution of this paper is to identify the beneficiaries of public university education and, on these grounds, assess the distributional consequences of the current public university system. To the best of our knowledge, this is the first study that addresses these issues for Argentina. The rest of the paper is organized as follows.

Section 2 describes the current higher education system in Argentina focusing mainly on its financing, its admission policies, and the distribution of students between public and private institutions. In Section 3, we describe the data we use and we analyze the characteristics of university students. We compare individuals enrolled in universities with those that, while being in the relevant age group, do not attend college. We find that the majority of college students belong to the very top of the income distribution. Section 4 analyzes more deeply these characteristics by looking at the determinants of university — public or private — attendance, and estimating the probability of attending college. We found that families' socioeconomic background is an important determinant of college attendance, after controlling for the individual's demographic characteristics. However, we do not find significant differences in family background and income between students in public and private institutions. Section 5 is devoted to the analysis of higher education returns and unemployment among university graduates. Conclusions are found in Section 6.

2. Higher education institutions in Argentina

In Argentina, universities are located throughout the country, however most of them can be found in main urban areas. Universities are divided into private and public institutions. Public universities are financed by the central government and they are tuition-free. In contrast, private institutions are financed by charging tuition to their students and by contributions of private firms (see Trombetta, 1998; Balan & Fanelli, 1994). Annual tuition to attend private universities depends on the particular institution and field of study. Fees range from around US$2000 to more than US$10,000 annually, and they are usually paid in 10 installments during the academic year. In private universities the admission policies range from very open to very selective. While some institutions admit any candidate with a high school degree, others follow an admission procedure very similar to American universities. They select their students based on SAT or GMAT equivalent test scores, interviews, essays, high-school grades, etc. Most private universities require prospective students to take an introductory course and pass an exam. In contrast, most public universities have a policy of open enrollment to all high-school graduates with no admission exams.

In the mid-nineties, more than half of the 79 universities in the country were private. However, 83% of the more than one million students were attending public institutions. More than 50% of university students were concentrated in the Buenos Aires metropolitan area. The largest university is Universidad Nacional de Buenos Aires, which is a public institution, and in 1998 it had 206,941 undergraduate students. In contrast, the largest private university has less than 17,000 students.

Given the high concentration of college students in the Buenos Aires area and the availability of data, we perform the rest of our analysis focusing on this region.

[1] Unfortunately, we do not have data on the number of graduates by entry cohort. However, the figure shown illustrates how large is the dropout ratio given the current enrollment growth rate.

[2] For a survey on this topic see Barro and Sala-i-Martin (1995).

Table 1
Descriptive statistics[a]

	Attending university		Not attending university	
	All	Living with parent/s[b]	All	Living with parent/s
% Female	52.2	52.5	49.2	42.2
Mean per capita family income (US$)	615	572	269	268
Median per capita family income (US$)	500	467	192	200
Father's education (years)		12.2		7.2
Father's education				
University complete (%)		29.4		2.1
University incomplete (%)		9.2		1.7
Secondary complete (%)		24.3		8.8
Secondary incomplete (%)		17.8		15.0
Primary complete (%)		18.2		47.3
Primary incomplete (%)		1.0		25.1
Mother's education (years)		11.7		7.1
Mother's education				
University complete (%)		23.9		2.2
University incomplete (%)		9.1		1.9
Secondary complete (%)		30.4		10.5
Secondary incomplete (%)		12.4		12.9
Primary complete (%)		20.7		44.2
Primary incomplete (%)		3.5		28.4
Father's hourly wage (US$)		8.7		4.2
Mother's hourly wage (US$)		7.4		3.9

[a] Including those between 17 and 34 years old who are not university graduates.
[b] Including those living with at least one parent or guardian.

3. Data and basic characteristics of the population under study

In this section we attempt to characterize university students and we compare them to their counterparts who are not attending college. We analyze micro data from the May 1998 Permanent Household Survey (EPH). These data, which cover the city of Buenos Aires and the Greater Buenos Aires region, was collected by the National Statistical Institute (INDEC). In addition to basic demographic and employment information, the May 1998 survey contains a supplement on education that was administered to all individuals between 5 and 60 years of age. The supplemental survey is organized in three different questionnaires directed to people currently attending school, those who do not attend anymore, and those who never attended. It collects detailed information on the educational history of each person in the household and includes questions that allow us to distinguish between those in public and those in private institutions.

Table 1 presents basic statistics for those attending the university and those who are not. We focus on the group of people between 17 and 34 years old without a college degree.[3] Approximately 18% of them are enrolled in the university. The rest have finished or abandoned their formal schooling. We observe that women are a majority among university students. The most striking difference between those who attend college and those who do not is per capita household income. The average per capita family income for those who do not attend college is US$269 a month. This figure is more than 100% higher for university students, reaching US$615 per month.

Information about their parents is only available if the two generations are still living in the same household. Approximately 80% of university students live with at least one parent, but this percentage is only 43 for those who are not in college.[4] We are aware that this fact might introduce some bias in the results, due perhaps to different household characteristics, so when comparing the family background of the two groups we also present information for the whole population as a reference. The distribution of education among parents is very different between groups. Almost 40% of university students have fathers who attended college. In contrast, less than 20% of men, with ages in the same range as the ages of the

[3] The election of this age range responds to the age distribution of college students in our sample. The results however are not sensitive to changes in the age range we consider.

[4] In Argentina it is not uncommon for young adults to live with their parents while they are single.

fathers of college students, in the total population have some tertiary education. Among those who do not attend college less than 4% have a father with education beyond high school. We find a similar pattern among mothers. While around 14% of women in the total population, with ages in the same range as the ages of the mothers of college students, have some college education, this figure reaches 33% among mothers of college students.

It is clear from Table 1 that a very small proportion of those who have access to college education come from families with low human capital. Less than 20% of college students have fathers with primary or lower education. The relationship between parents' schooling and children's education is a well-established fact in the literature and it has many dimensions (Schultz, 1988). We can think about parental education as a direct input in the production function of children's education. We can relate it to characteristics of communities and neighborhoods where families locate, which can affect the children's education too. Clearly, parents' education can also be seen as related to income, particularly as a proxy for permanent income.

Table 2 shows university attendance by income deciles. The majority of university students — almost 70% — belong to the richest 30% of the population. Moreover, only 11% belong to the bottom half of the income distribution. The results are very similar when we analyze those living with one or both parents. It is possible that this was not always the situation. Using comparable data from 1974 we find that the probability of attending the university was much higher for those at the bottom half of the income distribution. Fig. 1 depicts this fact very clearly. While only 11% of university students in 1998 belonged to the bottom 50% of the income distribution, this figure was almost 30% in 1974.

This simple descriptive analysis shows an important difference between the socioeconomic background of those enrolled in the university and those who are not. In Argentina, those who attend college come from families located at the top of the income distribution and with high human capital background when compared with those who do not attend college.

Table 2
Distribution of students attending university by income decile

Per capita family income decile	All (%)	Living with at least one parent (%)
1	1.38	1.75
2	0.69	0.87
3	1.61	1.75
4	3.23	3.50
5	4.15	4.66
6	9.91	10.20
7	10.60	11.66
8	16.82	17.49
9	26.04	25.36
10	25.58	22.74

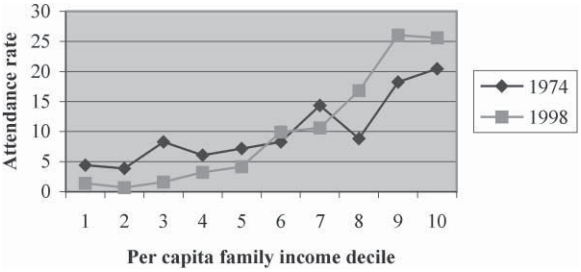

Fig. 1. University attendance by income decile.

4. Empirical results

In this section we further analyze the characteristics of the two groups mentioned in Section 3 by looking at the determinants of university attendance in general, and then by studying the differences between those attending private institutions and those who attend public ones. The strategy we use is as follows. First, we estimate a probit model for university attendance and show which are the principal factors that affect the decision to attend college. Next, we divide those who attend college into two groups: those attending a private university and those who attend a public one. We study their family background and analyze if there are differences in the determinants of attending private or public universities.

4.1. University attendance

First, we analyze the factors affecting the decision to attend college by estimating a probit model, that is, we model the probability of attending university by including two sets of explanatory variables. The first set tries to capture personal characteristics such as sex and age. These variables are introduced as dummy variables adopting the value of one when the individual is a woman, between the ages of 17 and 24, or aged 25–29. A positive sign in the sex variable would imply that women are more likely to attend college. We would expect a higher coefficient for the 17–24 age variable than for the 25–29 age variable, reflecting the fact that those younger are more likely to attend college. The second set of variables tries to describe the family's socioeconomic background. These variables are: per capita family income, dummy variables for educational level of the head of household (HH), number of siblings living in the parents' home, and a dummy indicating whether the last educational institution attended was public or

private. Given the findings in the previous section we would expect a positive sign associated with the income variable, and a negative one in the number of siblings variable. The greater the education of the head of household, the greater the coefficient we would expect. The variable indicating if the last educational institution was public would discriminate the two groups according to the educational background of the student.

Table 3 shows these results. Column 1 includes all current university students, column 2 excludes those individuals that are head of household, and the last column, 3, shows the sub-sample of those living with at least one parent. In general, sex does not appear to be a significant determinant of university attendance. As suggested in Table 1, we do not find a sex gap in educational attainment. Being young seems to increase the probability of attending the university when we use any of the samples. After restricting the sample to those living with their parents — a younger group on average — the age coefficient of the dummy variable for people 25–29 years old is not statistically significant.

Families' socioeconomic background seems to be an important determinant of college attendance. Our estimates show that the coefficient on per capita family income is positive and significant for all three samples, meaning that individuals coming from families with higher income have a greater probability of attending college, after controlling for other socio-demographic characteristics. Since some individuals in the sample may be working while they are studying, income may be endogenous. In order to check for possible endogeneity of per capita family income we also ran regressions using log of per capita family income but excluding the student's income. We obtained similar results with both variables suggesting endogeneity is not a problem, so we show the first set of results in Table 3. Further, we performed the Hausman specification test (see Hausman, 1978) and confirmed that log of per capita family income is an exogenous variable.

We also included two dummy variables that indicate whether the head of household has a high-school degree or a college degree, respectively. Both variables enter the equation positively and significantly and the coefficient of the college degree dummy variable is significantly greater than the coefficient on the high-school degree variable, in agreement with our expectations. As we mentioned before, these variables may be acting as proxies for permanent income and/or may indicate taste or ability towards education. Having attended a private school increases the chances of attending the university too. This finding may reflect differences between public and private institutions that affect the demand for additional education. For those living with their parents we were able to include the effect of having siblings. The probability of attending college is smaller for those with more siblings.

Our results clearly imply that per capita family income is an important determinant of college attendance. To measure its impact on the probability of college attendance, Table 4 shows the change in the predicted probability of university attendance when a change in per capita family income would allocate an average individual in the next decile of the income distribution. For example, when evaluating at the means, a change in per capita family income that moved a person from the seventh to the tenth income decile would more than double the probability of college attendance. It can be seen that the effect of income on the probability of attending the

Table 3
Dependent variable: university attendance[a]

	(1)	(2)	(3)
Constant	−5.343 (0.531)	−4.360 (0.483)	−3.288 (0.506)
Female	0.083 (0.072)	−0.041 (0.084)	0.229 (0.094)
Age 17–24	1.204 (0.113)	1.221 (0.164)	0.882 (0.237)
Age 25–29	0.414 (0.129)	0.441 (0.180)	0.183 (0.258)
Log per capita family income	0.720 (0.080)	0.478 (0.075)	0.383 (0.077)
Last educational institution was public	−0.770 (0.087)	−0.713 (0.091)	−0.655 (0.104)
HH has secondary education		0.582 (0.094)	0.719 (0.105)
HH has tertiary education		1.069 (0.135)	1.361 (0.157)
Number of siblings			−0.213 (0.040)
Observations	2505	1986	1234
Pseudo R^2	0.315	0.349	0.361

[a] Figures in parentheses are standard deviations. In all regressions we used as the independent variable the log of per capita family income including the income of the university student. To check for the possible endogeneity of this variable we ran the same regressions but using as independent variable the log of per capita family income excluding the income of the university student. We got similar results with both variables, so we show in the tables the first set of regressions. Further, the Hausman test confirmed that the log of per capita family income is exogenous.

Table 4
Change in predicted attendance probability as income increases by decile[a]

Per capita family income decile	(%)	Cumulative (%)
2	11.75	11.75
3	8.37	20.12
4	9.54	29.67
5	9.07	38.74
6	11.18	49.92
7	17.53	67.45
8	24.07	91.52
9	41.70	133.22
10	164.85	298.07

[a] Estimates using the complete sample and evaluated at the means.

university is larger at the top of the income distribution. For example, doubling per capita income from US$50 to 100 will only increase the chance of attending university by around 14%. However, increasing per capita income from US$250 to 500 will imply an increase of 71%, and going from US$500 to 1000 will raise the probability 128%.

Finally, when evaluating at the means, the probability of attending the university is more than 100% higher — other things being equal — for those who went to private high schools.

4.2. Public and private university students: is there any difference?

We have shown that most university students belong to the most affluent sectors of society. In this section we turn to analyze the characteristics of those attending private institutions and those enrolled in public universities. In our sample, 22% of the students attend private universities. Table 5 shows some basic statistics for both groups. The two groups appear to be similar in many dimensions. The education of students' parents is not statistically different between the two groups. On average, fathers have approximately 13 years of schooling while mothers have around 12 years. Although more students in private universities have parents with a college degree, it is also true that both groups have similar proportions of parents that did not finish high school. Among students in private universities, 69% attended private secondary schools. This figure is not low among those in public institutions, almost half of them — 46% — come from private high schools, while this figure is only 13% among the relevant age group not attending the university. It should be noted that private high schools are not tuition-free and, in some cases, they charge a higher fee than private universities.

Mean per capita family income of students in public institutions is 72% of that of their counterparts in private universities when the whole sample is considered. This figure is slightly larger — 80% — among students living with their parents. However for both groups, the standard deviation of per capita family income is too large to allow us to draw any strong conclusion about this evidence. Fig. 2 shows the whole income distribution using kernel density estimates of log per capita family income for three different groups: those who do not attend college, those in public universities, and those enrolled in private institutions. At first sight it looks as if those who attend the university, in private or public institutions, have higher income than those who do not. Also, while more similar, it seems that income is higher for students in private universities than for students in public ones. To see this more formally, we use the Kolmogorov–Smirnov test to determine differences in the distribution of income for these three groups. We find that per capita family income for those not enrolled in the university is smaller than for those attending college. When comparing students in public and private universities, we also reject the hypothesis that the densities are the same. The test indicates that individuals in private institutions have higher per capita family income than those in public universities. To complete the analysis, Table 6 presents enrollment in public and private universities by per capita family income deciles. As we mentioned before, there are very few students that belong to the bottom 50% of the distribution. Less than 12% of the students in public or private universities belong to the bottom half of the distribution. Most students, in either public or private universities, belong to the top 30% of the income distribution.

This preliminary analysis might lead us to conclude that those students coming from wealthier families go to private colleges. However, we did not control for any other characteristics of the population under study. To do so, we estimate a probit model to see how different variables affect the probability of studying in a public institution. Table 7 shows the estimation results. Column 1 includes all available observations; this is including all current university students. As in our previous estimates, the next column uses a sub-sample that excludes individuals that are head of household and the last column displays results for the sub-sample of those living at their parents' home. Following our analysis of university attendance, the explanatory variables are sex, group age dummies, per capita family income, dummy variables for educational level of the head of household, number of siblings living in the household, and a dummy indicating whether the student attended a private or public high school.

The sex and age dummies do not appear significantly different from zero. The coefficient on per capita family income is negative but is not statistically significant. This

Table 5
Descriptive statistics[a]

	Attending private university		Attending public university	
	All	Living with parent/s[b]	All	Living with parent/s
% Female	51.5	49.3	52.5	53.3
Mean per capita family income (US$)	789	681	567	547
Std. deviation per capita family income (US$)	544	470	423	411
Median per capita family income (US$)	665	589	450	438
% Attended private high school	69	74	46	49
Father's education (years)		12.9		12.3
Father's education				
University complete (%)		36.7		27.6
University incomplete (%)		6.7		9.9
Secondary complete (%)		26.7		23.7
Secondary incomplete (%)		11.7		19.4
Primary complete (%)		16.7		18.5
Primary incomplete (%)		1.7		0.9
Mother's education (years)		12.6		11.8
Mother's education				
University complete (%)		27.5		23.0
University incomplete (%)		10.2		8.9
Secondary complete (%)		27.5		31.1
Secondary incomplete (%)		15.9		11.5
Primary complete (%)		15.9		21.8
Primary incomplete (%)		2.9		3.7
Father's hourly wage (US$)		9.5		8.6
Mother's hourly wage (US$)		9.7		6.8

[a] Including those between 17 and 34 years old who are not university graduates.
[b] Including those living with at least one parent or guardian.

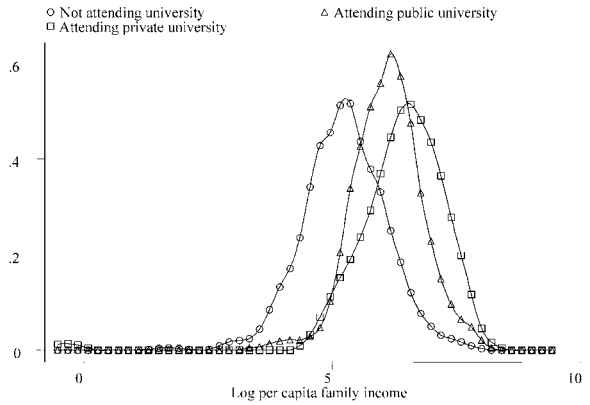

Fig. 2. University attendance: Kernel density estimates.

Table 6
Distribution of students attending public and private universities by income decile

Per capita family income decile	Public (%)	Private (%)
1	1.47	1.06
2	0.88	0.00
3	1.47	2.13
4	2.94	4.26
5	4.41	3.19
6	11.76	3.19
7	11.47	7.45
8	18.53	10.64
9	26.18	25.53
10	20.88	42.55

finding is very important because it is saying that per capita family income has no effect on the probability of attending a public institution, after controlling for socio-demographic variables. The education of the head of household is not significant either. The coefficient on the number of siblings is negative but not significantly different from zero. Whether the student has attended a public high school has a positive effect on the probability of attending a public college. In brief, none of these variables related to personal characteristics, income, and family background appear to distinguish attendance of students at private or public universities. To investigate the possibility that the income variable is collinear with

Table 7
Dependent variable: public university attendance[a]

	(1)	(2)	(3)
Constant	1.553 (0.952)	0.724 (0.893)	1.246 (1.028)
Female	0.031 (0.138)	0.044 (0.152)	0.094 (0.159)
Age 17–24	0.224 (0.262)	0.500 (0.358)	−0.166 (0.583)
Age 25–29	0.021 (0.300)	0.265 (0.399)	−0.404 (0.621)
Log family income per capita	−0.188 (0.135)	−0.071 (0.131)	−0.039 (0.138)
Secondary education at public institution	0.483 (0.146)	0.590 (0.162)	0.569 (0.176)
HH has secondary education		−0.149 (0.220)	−0.066 (0.226)
HH has tertiary education		−0.214 (0.239)	−0.061 (0.253)
Number of siblings			−0.124 (0.084)
Observations	433	385	343
Pseudo R^2	0.046	0.055	0.053
VIF	1.05	1.22	1.22
TOL	0.95	0.82	0.82

[a] Figures in parentheses are standard deviations. In all regressions we used as the independent variable the log of per capita family income including the income of the university student. To check for the possible endogeneity of this variable we ran the same regressions but using as the independent variable the log of per capita family income excluding the income of the university student. We got similar results with both variables, so we show in the tables the first set of regressions. Further, the Hausman test confirmed that the log of per capita family income is exogenous.

other personal characteristics, Table 7 presents the tolerance (TOL) and variance inflation factors (VIF) for that variable. As a rule of thumb, if the VIF of a variable exceeds 10, that variable is said to be highly collinear. As we can see in Table 7, the VIF of log per capita family income is around one, indicating that there is no collinearity between income and personal characteristic variables. Additionally, the TOL equals one if there is no collinearity and it approaches zero when there exists near perfect collinearity. Results in Table 7 confirm what we found using the VIF indicator, since for all regressions the TOL is near one. The only variable statistically significant in this analysis is the dummy variable indicating attendance to a public high school. As we mentioned in our previous analysis, this finding may reflect differences between public and private institutions, such as quality of education, that affects the demand for higher education.

Overall, the results of this section are evidence that in Argentina individuals attending college belong to the richest families. Almost 50% of the students in public universities belong to the top 20% of the income distribution. Moreover, 90% of the students in public universities have higher than median per capita family income and almost 50% attended private high schools. Since the public university is tuition-free, there is an implicit subsidy to the richest families. We also find that students in public and private universities look similar in many dimensions. This indicates that most of the students in public universities have the ability to pay some tuition. Private universities charge fees from around US$2000 to more than US$10,000 a year, the weighted average being over US$3300. Tuition fees would cover, at least, part of the public cost of providing higher education. Revenues would free up public funds that can be reallocated toward primary and secondary education, or could be partially used to improve the quality of the public universities. Furthermore, they could be used to develop or extend a system of selective scholarships targeting the most talented students from poor families who otherwise would be unable to attend the university.[5]

As we mentioned, students in public universities seem to have the ability to pay while they are completing their studies. However, this may not be the case for all of them all the time. One way to deal with this is to develop a small "need-based" program offering income-contingent loans for those attending higher education public institutions. Students could borrow money to pay tuition or living expenses while they are attending the university, to be repaid with future income. We are aware that student loans present several problems. In particular, they tend to have a low repayment rate due to poor record-keeping, geographic dispersion of borrowers, lack of loan collection incentives, and the difficulty of tracking many students.[6] However, one of our main empirical findings is that in Argentina the majority of the students in public universities can pay tuition fees. Therefore, a

[5] In our sample less than 1.4% of the students in public universities declared to be receiving a scholarship.

[6] For experiences on implementing student loan programs and other reforms in Latin America, see Carlson (1992) and Johnstone, Arora, & Experton (1998), among others.

loan program would be small enough to have a close contact between lender and borrower, improving record-keeping and easing the tracking of a few students, and in this way, increasing the repayment of loans. A more formal analysis of the design and implementation of this kind of program is beyond the scope of this study; however we imagine that, even in the case that a good loan program were impossible to be implemented, a system of tuition and scholarships would be better than the current situation.

In the next section, we will show that university graduates receive a large wage premium that would allow them to repay borrowed money with future income.[7]

5. Returns to higher education

In this section we analyze the returns to university education. University graduates earn substantially higher wages than those who do not have a college degree. Eighty percent of college graduates belong to the top 30% of the income distribution. Table 8 shows indices of average earnings by education level for both hourly wages and monthly salaries. Without controlling for any other characteristic, we see that university graduates earn much more than less-educated workers. We also estimate an earnings equation using as the dependent variable the logarithm of hourly wages in one specification, and the logarithm of monthly labor income in a second specification. The explanatory variables are sex, age and its square, and dummy variables reflecting if the individual has high-school education or university education. In some of the regressions we split this last variable into those who completed their college education and those who did not. Tables 9 and 10 show the estimates. In all specifications our hypothesis is confirmed. We can see that, on average, university graduates have returns more than three times higher than the returns of those with high-school education. The difference is obviously larger when we considered only those that completed their university education. Socio-demographic variables enter the equation as we expected. The earnings–age profile is concave and, other things being equal, women earn less than men do.

Table 8
Index of average labor earnings by education level

	Average hourly wage	Average monthly wage
Primary incomplete	100	100
Primary complete	111	138
Secondary incomplete	122	158
Secondary complete	164	219
University incomplete	193	236
University complete	407	494

University graduates also have a smaller probability of being unemployed. In May 1998, the unemployment rate for university graduates in the Buenos Aires metropolitan area was 5.7% while the average unemployment rate excluding them was 15.8%.

Just as an indication, we want to point out that according to official figures, during 1997 the annual cost of public universities was approximately US$2000 per student. This figure is just a little above the average monthly labor income of a college graduate (US$1943). These findings show that if some students were not able to afford tuition fees while in college, they would be able to postpone their payment until they graduate and begin working.

6. Conclusion

In this paper we have analyzed some characteristics of the higher education system in Argentina regarding equity and efficiency. We found that individuals attending the university belong to the top deciles of the income distribution and belong to relatively highly educated families. We did not find that socioeconomic variables are capable of differentiating between those who attend tuition-free public institutions and those attending private colleges. Both groups are very similar with respect to their income and family background. Furthermore, almost half of the students in public universities completed their secondary education in private high schools where they paid tuition. These facts imply that there is an implicit transfer to the richest individuals in society. In Argentina, only a privileged group is able to attend college. Our analysis indicated that poor students are excluded from higher education and they are not able to enjoy the subsidy. The fact that public universities in Argentina are tuition-free does not seem to particularly benefit them.

Equity and efficiency of the system can be improved by charging tuition fees. Complementary to this policy, selective scholarships and student loans could be offered in order to attract the most talented students from poor families. To that end we showed that expected income for college graduates is high and that loan repayment is possible. These policies could eliminate regressive transfers, introduce incentives toward a more efficient edu-

[7] Obviously, these are not the only possible measures one could take in order to solve the inequity of the current educational system in Argentina (see Psacharopoulos et al., 1986, for a description of several policy measures intended to improve equity and efficiency in education).

Table 9
Dependent variable: log hourly wage[a]

	(1)	(2)	(3) Male	(4) Female
Constant	−0.572 (0.094)	−0.443 (0.094)	−0.471 (0.111)	−0.535 (0.168)
Female	−0.122 (0.022)	−0.137 (0.021)		
Age	0.060 (0.005)	0.055 (0.005)	0.055 (0.005)	0.056 (0.008)
Age^2	−0.001 (0.000)	−0.000 (0.000)	−0.000 (0.000)	−0.000 (0.000)
Secondary education	0.296 (0.024)	0.288 (0.024)	0.305 (0.028)	0.249 (0.046)
College education	0.941 (0.027)			
Incomplete college education		0.720 (0.031)	0.714 (0.040)	0.704 (0.052)
Complete college education		1.154 (0.033)	1.279 (0.048)	1.029 (0.049)
Observations	3930	3930	2404	1526
Adj. R^2	0.301	0.322	0.346	0.294

[a] Figures in parentheses are standard deviations. We took into account the possible sample bias using Heckman's two-step procedure, but the sample bias correction term was not statistically significant. So, we present the results without using that term.

Table 10
Dependent variable: log monthly wage[a]

	(1)	(2)	(3) Male	(4) Female
Constant	4.077 (0.102)	4.216 (0.101)	4.070 (0.121)	3.941 (0.178)
Female	−0.483 (0.023)	−0.499 (0.023)		
Age	0.091 (0.005)	0.086 (0.005)	0.092 (0.006)	0.078 (0.009)
Age^2	−0.001 (0.000)	−0.001 (0.000)	−0.001 (0.000)	−0.000 (0.000)
Secondary education	0.388 (0.025)	0.380 (0.025)	0.384 (0.029)	0.364 (0.049)
College education	0.979 (0.029)			
Incomplete college education		0.743 (0.033)	0.675 (0.040)	0.801 (0.058)
Complete college education		1.209 (0.036)	1.323 (0.050)	1.101 (0.054)
Observations	4119	4119	2541	1578
Adj. R^2	0.328	0.348	0.358	0.273

[a] Figures in parentheses are standard deviations. We took into account the possible sample bias using Heckman's two-step procedure, but the sample bias correction term was not statistically significant. So, we present the results without using that term.

cational system, and even increase the number of university graduates.

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