

ONLINE APPENDIX

Understanding the Income Gradient in College Attendance in Mexico: The Role of Heterogeneity in Expected Returns

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1 Background Information on College Enrollment and on Costs and Financing of College Attendance in Mexico

In 2004 around 22% of adolescents of the relevant age group (18 to 24 years) were attending college in Mexico to receive an undergraduate degree (“licenciatura”) (ANUIES, annual statistics 2004). This attendance rate is significantly lower than in many other Latin American countries (see Table 1). Mexico is characterized by large inequalities in access to college education for different income groups. In comparison to other Latin American countries, such as Colombia, Argentina and Chile, only Brazil has a smaller fraction of poor students attending college (see Table 1). Figure 1 displays college attendance rates of 18 to 24 year old high school graduates for different parental income quartiles.¹ High school graduates are already a selective group, for example for urban Mexico about 75% of the relevant age group attain a high school degree. The attendance rate of high school graduates in the lowest parental income quartile is around 22% compared to 67% for the highest parental income quartile. The “Jovenes con Oportunidades” sample (2005) used in this paper consists of high school graduates from Oportunidades families and is thus only representative of about the poorest third of the high school graduate population. The positive correlation between parental income and college attendance rate can also be found for this sample, but differences between poorest quartile (17%) and richest quartile (35%) are smaller, as every individual in the sample is relatively poor (see figure 2, Jovenes con Oportunidades 2005).

College attendance costs in Mexico pocket a large fraction of parental income for relatively poor families. Costs consist of enrollment and tuition fees, fees for (entrance) exams and other bureaucratic costs, costs for transport and/or room and board, health insurance (mandatory for some universities), costs for schooling materials such as books. Administrative data on tuition and enrollment fees per year from the National Association of Universities and Institutes of Higher Education (ANUIES) reveals a large degree of heterogeneity: Yearly tuition and enrollment costs vary between 50 pesos (“Universidad Autónoma de Guerrero”, Guerrero) and 120,000 pesos (“Tecnológico de Monterrey”, I.T.E.S.M. - Campus Puebla), which is equivalent to approximately 5 and 12,000 US\$. The tuition cost measure that I use in my analysis is the minimum yearly tuition/enrollment fee of universities in the closest locality with at least one university. Fifty percent

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¹Parental income is measured in the last year before the college attendance decision.

of the high school graduates face (minimum) tuition costs of over 750 pesos, which is equivalent to about 15% of median yearly per capita parental income. The other important cost factor depends on whether the adolescent has to move to a different city and pay room and board or whether she can live with her family during college. I therefore construct a measure of distance to the closest university for each individual.

In Mexico funding for higher-education fellowships and student loan programs is very limited and only about 5% of the undergraduate student population receive fellowships, while 2% receive student loans, which is low even compared to other Latin American countries (see Table 1). The national scholarship program PRONABES was created in 2001 with the goal of more equal access to higher education at the undergraduate level. In 2005 funding of PRONABES amounted to 850 million pesos (equal to 40 US\$ per student per year) and 5% of the undergraduate student population received a fellowship (“beca”) in 2005 compared to 2% in 2001/02 (see Department of Public Education (SEP)), 2005). Eligibility for a fellowship is subject to three conditions: first, a maximum level of family income, where priority is given to families with less than two times the minimum monthly salary, while in special cases people are still eligible with less than four times the minimum monthly salary. Second, students need a minimum GPA (80) and third, they have to have been accepted at a public university or technical institute. After each year, the student has to prove that economic eligibility criteria are still met and that she is in good academic standing. In 2004/05 the fellowship consisted of a monthly stipend of 750 pesos –slightly more than half the minimum wage per month– in the first year of studies, and increased to 1000 pesos in the fourth year of studies. Student loan programs are also of minor importance in Mexico. Only about 2% of the national student population benefit from a student loan, which is low even compared to poorer Latin American countries, such as Colombia (9%) and Brazil (6%). In Mexico there are four different programs that offer student loans. The largest program, SOFES, offers loans to 1.5% of students and was implemented by a collaboration of private universities. It is need-and-merit based, but students with collateral are preferred. The other three are very small state programs, ICEES in Sonora state, ICEET in Tamaulipas, and Educafin in Guanajuato, which are not part of my sample.

Figure 1: College enrollment rates of 18 to 24 year old high school completers by parental income quartile (Mexican Family Life Survey, 2003).

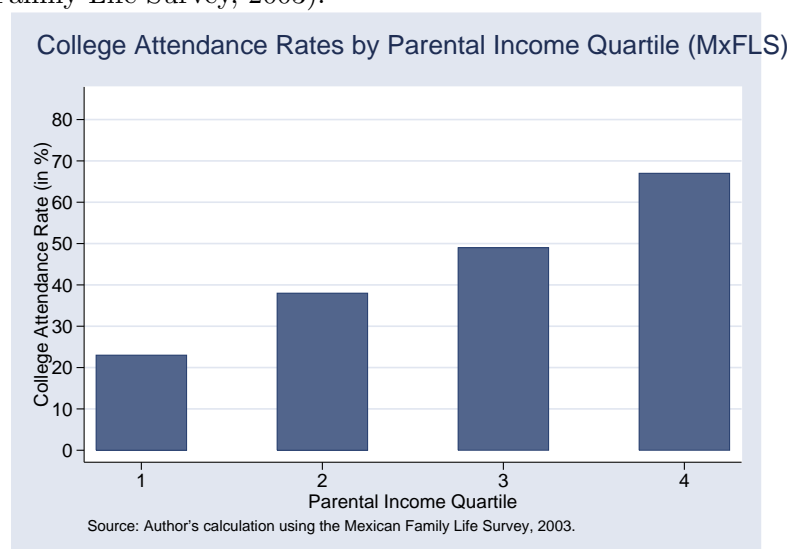


Figure 2: College enrollment rates of 18 to 24 year old high school completers by parental income quartile (Jovenes con Oportunidades Survey, 2005).

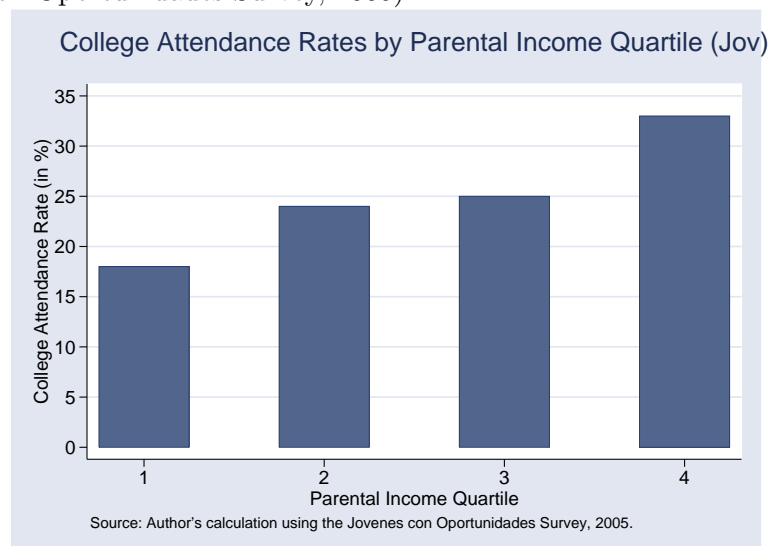


Table 1: Comparison of enrollment rates, fraction of poorest 40% in percent of the student population, fraction of GDP spend on higher education, fraction of expenditures on higher education on fellowships and student loans: Mexico, other Latin American countries, OECD and USA.

Countries Ranked by Per Cap GDP	Enrollment in Higher Education in % of 18-24 Year Old	Fraction of Poorest 40% of 18-24 Year Old as % of Student Body	Expenditures on Higher Education in % of GDP	Spending on Fellowships and Loans in % of Exp. on Higher Educ	Beneficiaries of Student Loans in % of students
Brazil	16%	4%	1.5%	11.2%	6%
Colombia	23%	14%	1.7%	.	9%
Peru	29%
Mexico	20%	8%	1.1%	6.2%	2%
Chile	39%	16%	2.2%	34.8%	.
Argentina	37%	16%	1.1%	.	.
OECD	56%	.	.	17.5%	.
USA	54%	20%	.	.	35%

Sources: World Bank (2005) for Enrollment and Fraction of Poorest 40%, OECD Indicators (2007) for Expenditures on Higher Education and on Spending on Fellowships and Loans. CIA World Factbook (2006) and IMF Country Ranking for Ranking of Per Capita GDP (PPP). For Beneficiaries of Student Loans: Ministry of Education, Brazil (2005); ICETEX, Colombia (2005); SOFES (2005), ICEES (2006), ICCET (2007) and Educafin (2007) in Mexico; US Office of Post-Secondary Education Website, 2006. Information not available indicated as “.”.

2 Brief Introduction to the Local Instrumental Variable Methodology

To introduce the “Local Instrumental Variable (LIV)” methodology (see Heckman and Vytlacil (2005), Carneiro, Heckman, and Vytlacil (2011) and Carneiro, Heckman, and Vytlacil (2010)), the framework of the “Generalized Roy Model” is a useful starting point (compare Section 2 of the paper):²

$$\begin{aligned}\ln Y_0 &= \alpha + U_0 \\ \ln Y_1 &= \alpha + \bar{\rho} + U_1 \\ S^* &= \mu(Z) - U_S \\ S = 1 &\Leftrightarrow S^* \geq 0.\end{aligned}$$

In the context of this framework, if U_S is independent of U_0, U_1 , the average treatment effect can be calculated as the simple difference between the outcome of the “treated” ($\ln Y_1$) and the “untreated” ($\ln Y_0$). If on the other hand U_S is correlated with U_0, U_1 , that is people self-select into treatment based on U_S which is correlated with the potential outcomes, then the simple difference will be a biased estimate of the average treatment effect. The problem is that one compares “treated” and “untreated” individuals who differ in their unobserved costs, U_S , and these unobserved costs are correlated with the potential outcomes.

The LIV methodology addresses this endogeneity problem as follows: Imagine U_S was observable and one could thus condition on U_S when computing the simple difference. In other words, one could use as counterfactual outcomes for people who were treated those individuals with the same U_S who were not treated. This approach would solve the usual endogeneity problem. This is exactly the key idea of the “Marginal Treatment Effect” (*MTE*), which is defined as follows:

$$\Delta^{MTE}(u_S) = E(\ln Y_1 - \ln Y_0 | U_S = u_S) = E(\rho | U_S = u_S). \quad (1)$$

The obvious question is how one can condition on U_S that is unobserved. Even though U_S is generally unobserved, it is known for individuals who are exactly indifferent between selecting into or out of treatment (“on the margin”), as can be seen from the selection equation: $S^* = 0 \Leftrightarrow \mu(Z) = U_S$. One can compute U_S for those individuals who are indifferent, by estimating the selection equation and calculating the propensity score $P(Z) \equiv P(S = 1 | Z = z)$, which is the probability of selecting into treatment conditional on observable characteristics Z . The “Marginal Treatment Effect” can then be estimated for those individuals who are indifferent and characterized by $U_S = \mu(Z) = P(Z)$. For example in my context, the *MTE* represents the average gross gain to college for individuals who are indifferent between attending college or not and who have unobservable costs of $U_S = u_S$.

In a second step, policy experiments can be performed using the estimated *MTE* in the following way (see Heckman and Vytlacil (2001)): The “Policy Relevant Treatment Effect” (*PRTE*) is a weighted average of the marginal treatment effects (*MTE*), where the weights depend on who changes participation in response to the policy of interest. One important assumption underlying this analysis is that the selection equation continues to hold under hypothetical interventions. The

² $\ln Y_1$ and $\ln Y_0$ denote log earnings with and without college ($S = 1, 0$), α denotes average earnings without college, $\bar{\rho}$ average returns to college and U_1 and U_0 the error terms in the earnings equations. For notational simplicity, I omit conditioning on observable characteristics X . The latent variable S^* depends on observable characteristics Z , which contain at least one element that is not in X and the error term U_S . Individuals choose college if and only if the value of the latent variable S^* is larger than zero.

$P RTE$ can be written as:

$$P RTE = \int_0^1 MTE(u)\omega(u)du, \quad \text{where} \quad \omega(u) = \frac{F_P(u) - F_{P^*}(u)}{E(P^*) - E(P)}. \quad (2)$$

P is the baseline probability of $S = 1$ with cumulative distribution function F_P , while P^* is defined as the probability produced under an alternative policy regime with cumulative distribution function F_{P^*} . The intuition for the $P RTE$ is as follows: Given a certain level of unobservable costs, u , those individuals with $P(Z) > u$ will attend college, which is equivalent to a fraction $1 - F_P(u)$. A reduction, for example, in direct costs, Z , will lead to a new larger probability of attending, $P(Z^*)$. Thus for a given u , there are now more people deciding to attend college, $1 - F_{P^*}(u)$, and the change can be expressed as $F_P(u) - F_{P^*}(u)$. The weight is normalized by the change in the proportion of people induced into the program, $E(P^*) - E(P)$, to express the impact of the policy on a per-person basis.³

³The intuition is even more straightforward in the following special case: Suppose that $S^* = Z'\gamma + V$. Consider a policy that shifts Z_k (the k th element of Z) to $Z_k + \varepsilon$. For example, Z_k might be the tuition faced by an individual and the policy change might be to provide an incremental tuition subsidy of ε dollars. The resulting $P RTE_\varepsilon$ is the average return among individuals who are induced into university by the incremental subsidy, $P RTE_\varepsilon = E(\rho_i | Z'\gamma \leq V \leq Z'\gamma + \varepsilon\gamma_k)$.

3 Complementary Material and Robustness Checks

3.1 Complementary Material

Figure 3: The Cumulative Distribution Function of Costs with 95% Confidence Intervals.

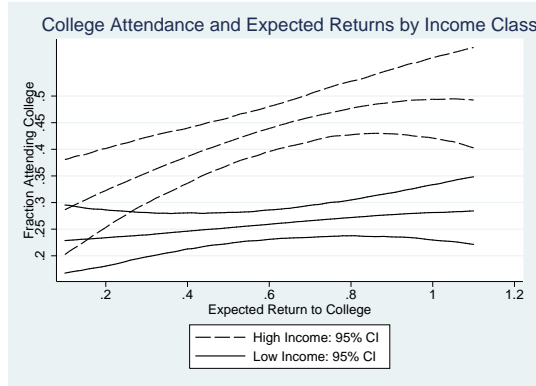


Figure 4: The Predicted Probability of Attending College.

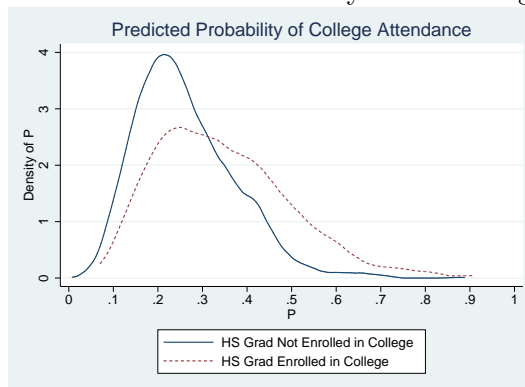


Figure 5: The Marginal Return to College for Different Levels of Unobserved Costs.

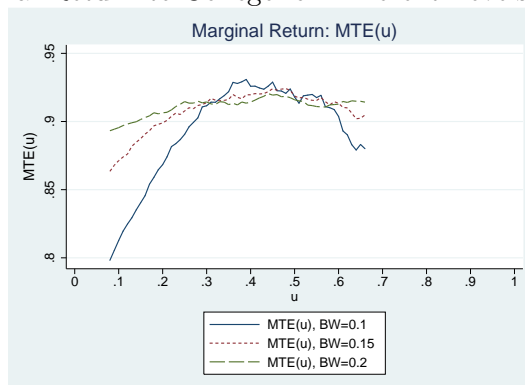


Figure 6: The Marginal Return to College with 95% Confidence Interval Bands.

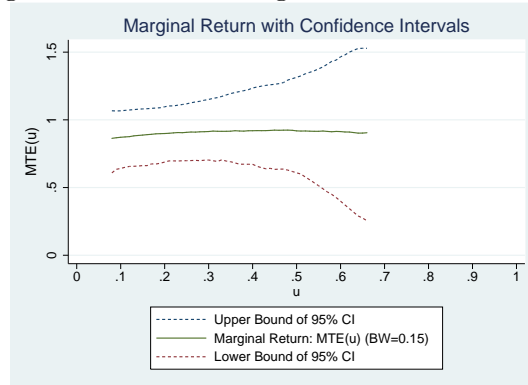


Table 2: Rationalization of Choices

	P-Val of KS-Test
Exp Log Earnings	
- Senior HS	0.417
- College	0.677
Exp Return	
- College	0.188
Prob of Work	
- Senior HS	0.236
- College	0.349
Observations	
(Sen HS Grads/Grade 12)	1612/469

Notes: Table displays the p-values of Kolmogorov-Smirnov tests of equality of distributions. The null hypothesis is that the cross-sectional distribution of -for example- expected returns is the same for the sample of senior high school graduates (whose schooling decision we are analyzing) and the sample of a cohort that is one year younger and just starting grade 12 (who have thus not decided yet about whether to enrol in college or not).

Table 3: Summary statistics of important variables of the two groups of respondents.

Respondent	Adolescent Mean (Std. Dev.)	Mother Mean (Std. Dev.)	P-Val of Diff
Expected Return	0.6670 (0.3820)	0.6550 (0.3592)	0.347
Expected Log High School Earnings	7.5778 (0.5004)	7.6477 (0.4338)	0.000
Var of Log High School Earnings	0.0054 (0.0079)	0.0046 (0.0062)	0.003
Var of Log College Earnings	0.0039 (0.0061)	0.0034 (0.0054)	0.022
Prob of Work High School	0.6657 (0.1817)	0.6505 (0.1780)	0.015
Prob of Work College	0.8250 (0.1601)	0.8142 (0.1544)	0.046
College Attendance Rate	0.2308 (0.4215)	0.3636 (0.4812)	0.000
Female	0.5813 (0.4935)	0.4954 (0.5001)	0.000
GPA (Scale 0 to 100)	82.19 (7.16)	82.27 (10.34)	0.783
Father's Yrs of Schooling	5.33 (2.96)	5.34 (3.03)	0.902
Mother's Yrs of Schooling	5.03 (2.77)	5.06 (2.76)	0.794
Per Capital Parental Income (Pesos)	7519.54 (8010.08)	7925.42 (13638.29)	0.371
Distance to University (km)	24.2312 (22.8159)	26.4647 (22.8688)	0.005
Tuition Costs (Pesos)	608.8104 (634.5729)	503.4896 (338.1346)	0.000

Table 4: Correlation between Earnings Expectations and Individual and Family-Background Characteristics.

Dependent Variable	Expected Earnings	
	High School	College
Female	-0.116*** (0.026)	-0.069*** (0.026)
GPA of Junior HS (0-100)	0.001 (0.002)	0.004** (0.002)
Mother's Educ - Jr HS	-0.056 (0.036)	-0.046 (0.035)
Mother's Educ - Sr HS	-0.021 (0.089)	0.013 (0.087)
Mother's Educ - Univ	0.092 (0.194)	0.234 (0.189)
Father's Educ - Jr HS	-0.023 (0.039)	0.004 (0.038)
Father's Educ - Sr HS	0.060 (0.071)	0.114 (0.069)
Father's Educ - Univ	0.164 (0.167)	0.121 (0.163)
Per cap Income - 5 to 10k	0.015 (0.029)	0.015 (0.028)
Per cap Income - more than 10k	0.050 (0.033)	0.044 (0.032)
Observations	3342	3342
Cens. obs.	1730	1730
Chi-Square	211.983	157.746
Inverse Mills Ratio	0.096	0.046
S.E. of Inv Mills	0.076	0.075

Notes: Table displays coefficients and standard errors in brackets. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Excl. categories: not obese, father in household, father's and mother's education primary or less, lowest per capita parental income category, father's occupation unskilled worker, size of locality of residence less than 15k.

Table 5: Correlation between Expected Returns and Direct Costs of Schooling.

Dep Var: Expected Return	Coeff./ (S.E.)	Coeff./ (S.E.)
Mother's Educ - Jr HS	-0.009 (0.034)	0.011 (0.030)
Mother's Educ - Sr HS	0.048 (0.076)	0.036 (0.073)
Mother's Educ - Univ	0.168 (0.192)	0.115 (0.158)
Father's Educ - Jr HS	0.001 (0.035)	0.027 (0.032)
Father's Educ - Sr HS	0.066 (0.061)	0.054 (0.058)
Father's Educ - Univ	-0.186 (0.144)	-0.054 (0.136)
Per cap Income - 5 to 10k	0.022 (0.028)	-0.002 (0.023)
Per cap Income - more than 10k	-0.007 (0.031)	-0.007 (0.027)
GPA - second tercile	0.004 (0.027)	0.026 (0.023)
GPA - top tercile	0.042 (0.028)	0.053** (0.024)
Distance to University	0.002 (0.002)	
Distance Squared	-0.000 (0.000)	
Tuition Costs	0.000 (0.000)	
Tuition Squared	0.000 (0.000)	
Tuition Above 750 Pesos		0.046 (0.031)
Dist to Univ 20 to 40km		0.013 (0.023)
Dist to Univ above 40km		0.043 (0.028)
Observations	2327	3342
Censored Observations	1156	1730
Lambda	-0.086	-0.070
S.E. of Lambda	0.063	0.064

Notes: * p<0.1 ** p<0.05 *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, per capita income less than 5000 pesos.

3.2 Robustness Checks

Figure 7: The Cumulative Distribution Function of Costs for Different Income Classes.

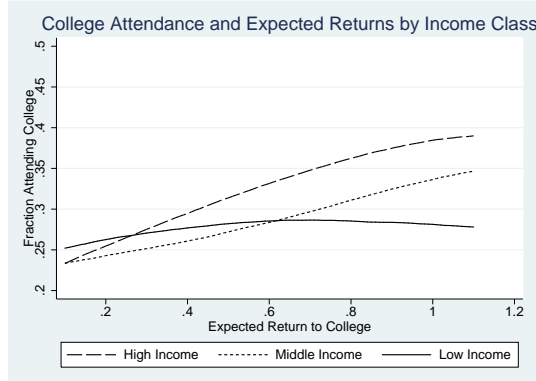


Figure 8: The Cumulative Distribution Function of Costs with 95% Confidence Intervals.

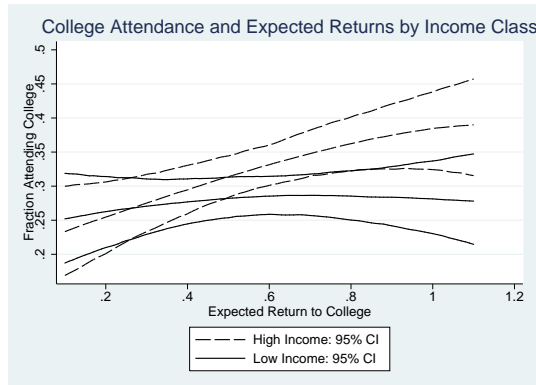


Table 6: Determinants of College Attendance: Total Household Income.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Expected Return to College	0.092*** (0.033)	0.078** (0.034)	0.076** (0.034)
Prob of Work - Sr HS	0.032 (0.087)	0.013 (0.085)	0.012 (0.077)
Prob of Work - College	-0.008 (0.101)	-0.001 (0.099)	0.023 (0.089)
Var of Log Earn - Sr HS	-2.625 (1.919)	-3.016 (2.008)	-2.701 (1.900)
Var of Log Earn - College	-0.310 (2.351)	0.036 (2.291)	0.029 (2.092)
Female (d)	-0.055* (0.029)	-0.059* (0.033)	-0.044 (0.032)
GPA - second tercile (d)		0.055* (0.031)	0.057* (0.030)
GPA - top tercile (d)		0.187*** (0.038)	0.170*** (0.047)
Father's Educ - Jr HS (d)		0.099** (0.042)	0.078* (0.042)
Father's Educ - Sr HS (d)		0.151* (0.078)	0.109 (0.074)
Father's Educ - Univ (d)		0.547*** (0.120)	0.569*** (0.142)
Mother's Educ - Jr HS (d)		0.100** (0.040)	0.076* (0.039)
Mother's Educ - Sr HS (d)		0.203** (0.099)	0.172* (0.101)
Mother's Educ - Univ (d)		0.196 (0.209)	0.234 (0.208)
Total Fam Income - T2 (d)			0.025 (0.028)
Total Fam Income -T3 (d)			0.060* (0.032)
Dist to Univ 20 to 40km (d)			-0.076*** (0.028)
Dist to Univ above 40km (d)			-0.105*** (0.030)
Tuition Above 750 Pesos (d)			-0.078** (0.038)
Observations	3342	3342	3342
Censored Obs	1730	1730	1730
Log Likelihood	-3041.971	-2990.349	-2975.200
Sample Sel: Corr betw Err	-0.487	-0.282	-0.061
Sample Sel: P-Val	0.055	0.314	0.835

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1 ** p<0.05 *** p<0.01. Excl. categories: male, lowest GPA tercile, father's and mother's education primary or less, lowest family income tercile, distance to university less than 20 km and tuition less than 750 pesos.

Table 7: Excess Responsiveness of the Poor to Changes in Direct Costs (Distance to College): Per Capital Income and Wealth.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Univ 20 - 40km * Par Inc/Wealth Q1	-0.123** (0.054)	-0.124** (0.053)	-0.145* (0.075)
Univ 20 - 40km * Par Inc/Wealth Q1 * High Exp Ret			0.023 (0.148)
Univ 20 - 40km * Par Inc/Wealth Q2	-0.009 (0.073)	-0.006 (0.073)	0.014 (0.109)
Univ 20 - 40km * Par Inc/Wealth Q2 * High Exp Ret			-0.042 (0.136)
Univ 20 - 40km * Par Inc/Wealth Q3	-0.078 (0.062)	-0.081 (0.060)	-0.064 (0.095)
Univ 20 - 40km * Par Inc/Wealth Q3 * High Exp Ret			-0.018 (0.141)
Univ 20 - 40km * Par Inc/Wealth Q4	0.074 (0.073)	0.071 (0.072)	0.116 (0.109)
Univ 20 - 40km * Par Inc/Wealth Q4 * High Exp Ret			-0.065 (0.115)
Univ > 40km * Par Inc/Wealth Q1	-0.064 (0.053)	-0.064 (0.052)	-0.020 (0.078)
Univ > 40km * Par Inc/Wealth Q1 * High Exp Ret			-0.127 (0.096)
Univ > 40km * Par Inc/Wealth Q2	-0.030 (0.072)	-0.030 (0.071)	-0.029 (0.102)
Univ > 40km * Par Inc/Wealth Q2 * High Exp Ret			-0.006 (0.147)
Univ > 40km * Par Inc/Wealth Q3	-0.178*** (0.058)	-0.177*** (0.057)	-0.214** (0.085)
Univ > 40km * Par Inc/Wealth Q3 * High Exp Ret			0.106 (0.235)
Univ > 40km * Par Inc/Wealth Q4	-0.088 (0.064)	-0.087 (0.063)	-0.177** (0.076)
Univ > 40km * Par Inc/Wealth Q4 * High Exp Ret			0.266 (0.188)
Interaction of Par Inc/Wealth Quartiles and High Ret	Yes	Yes	Yes
Controls: Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Par Inc/Wealth and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Uncensored Obs	1612	1612	1612
Log Likelihood	-2981.146	-2978.124	-2968.895
Sample Sel: Corr betw Err	-0.208	-0.177	-0.209
Sample Sel: P-Val	0.488	0.565	0.504

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, lowest parental income/wealth quartile, interactions of distance to university less than 20km with parental income/wealth and low expected return interacted with parental income/wealth quartiles.

Table 8: Excess Responsiveness of the Poor to Changes in Direct Costs (Distance to College): Total Household Income.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Univ 20 - 40km * Fam Income Tercile 1 (d)	-0.107** (0.042)	-0.108** (0.042)	-0.085 (0.057)
Univ 20 - 40km * Fam Inc 1 * High Exp Ret (d)			-0.058 (0.081)
Univ 20 - 40km * Fam Income Tercile 2 (d)	-0.019 (0.051)	-0.022 (0.050)	-0.034 (0.075)
Univ 20 - 40km * Fam Inc 2 * High Exp Ret (d)			0.020 (0.112)
Univ 20 - 40km * Fam Income Tercile 3 (d)	0.102 (0.066)	0.095 (0.065)	0.115 (0.093)
Univ 20 - 40km * Fam Inc 3 * High Exp Ret (d)			-0.038 (0.106)
Univ > 40km * Fam Income Tercile 1 (d)	-0.066* (0.040)	-0.068* (0.039)	-0.053 (0.058)
Univ > 40km * Fam Inc 1 * High Exp Ret (d)			-0.039 (0.082)
Univ > 40km * Fam Income Tercile 2 (d)	-0.108** (0.050)	-0.115** (0.047)	-0.160** (0.070)
Univ > 40km * Fam Inc 2 * High Exp Ret (d)			0.115 (0.158)
Univ > 40km * Fam Income Tercile 3 (d)	0.002 (0.072)	-0.001 (0.071)	-0.127 (0.083)
Univ > 40km * Fam Inc 3 * High Exp Ret (d)			0.323* (0.185)
Fam Inc 1 * High Exp Ret (d)			-0.111** (0.048)
Fam Inc 2 * High Exp Ret (d)			0.028 (0.055)
Fam Inc 3 * High Exp Ret (d)			0.007 (0.053)
Controls for Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Fam Income and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Censored Obs	1730	1730	1730
Log Likelihood	-2985.843	-2981.618	-2960.931
Sample Sel: Corr betw Err	-0.133	-0.096	-0.144
Sample Sel: P-Val	0.648	0.748	0.623

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, lowest family income tercile, interactions of distance to university of less than 20km with family income and low expected return interacted with family income.

Table 9: Excess Responsiveness of the Poor to Changes in Direct Costs (Distance to College): Total Household Income and Wealth.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Univ 20 - 40km * Fam Inc/Wealth Q1 (d)	-0.098** (0.042)	-0.097** (0.041)	-0.093** (0.042)
Univ 20 - 40km * Fam Inc/Wealth Q1 * High Exp Ret (d)			-0.078 (0.069)
Univ 20 - 40km * Fam Inc/Wealth Q2 (d)	-0.071 (0.045)	-0.075* (0.044)	-0.056 (0.052)
Univ 20 - 40km * Fam Inc/Wealth Q2 * High Exp Ret (d)			0.010 (0.093)
Univ 20 - 40km * Fam Inc/Wealth Q3 (d)	-0.050 (0.047)	-0.049 (0.046)	-0.070 (0.049)
Univ 20 - 40km * Fam Inc/Wealth Q3 * High Exp Ret (d)			0.041 (0.100)
Univ 20 - 40km * Fam Inc/Wealth Q4 (d)	-0.066 (0.043)	-0.064 (0.043)	-0.081* (0.045)
Univ 20 - 40km * Fam Inc/Wealth Q4 * High Exp Ret (d)			0.171 (0.109)
Univ > 40km * Fam Inc/Wealth Q1 (d)	-0.112*** (0.042)	-0.114*** (0.040)	-0.110*** (0.042)
Univ > 40km * Fam Inc/Wealth Q1 * High Exp Ret (d)			-0.073 (0.072)
Univ > 40km * Fam Inc/Wealth Q2 (d)	-0.081* (0.044)	-0.081* (0.043)	-0.061 (0.050)
Univ > 40km * Fam Inc/Wealth Q2 * High Exp Ret (d)			0.005 (0.095)
Univ > 40km * Fam Inc/Wealth Q3 (d)	-0.085* (0.049)	-0.087* (0.048)	-0.100* (0.051)
Univ > 40km * Fam Inc/Wealth Q3 * High Exp Ret (d)			-0.047 (0.094)
Univ > 40km * Fam Inc/Wealth Q4 (d)	-0.060 (0.049)	-0.058 (0.048)	-0.061 (0.048)
Univ > 40km * Fam Inc/Wealth Q4 * High Exp Ret (d)			0.155 (0.121)
Interaction of Fam Inc/Wealth Quartiles and High Ret	Yes	Yes	Yes
Controls: Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Fam Inc/Wealth and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Censored Obs	1730	1730	1730
Log Likelihood	-2982.507	-2979.743	-2974.615
Sample Sel: Corr betw Err	-0.130	-0.097	-0.030
Sample Sel: P-Val	0.657	0.747	0.923

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, lowest family income/wealth quartile, interactions of distance to university less than 20km with family income/wealth and low expected return interacted with family income/wealth quartiles.

Table 10: Excess Responsiveness of the Poor to Changes in Direct Costs (Tuition Costs): Per Capital Income and Wealth.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Tuition > 750 * Par Inc/Wealth Q1	-0.064 (0.048)	-0.067 (0.047)	-0.000 (0.071)
Tuition > 750 * Par Inc/Wealth Q1 * High Exp Ret			-0.148* (0.084)
Tuition > 750 * Par Inc/Wealth Q2	-0.037 (0.065)	-0.037 (0.064)	-0.006 (0.095)
Tuition > 750 * Par Inc/Wealth Q2 * High Exp Ret			-0.055 (0.118)
Tuition > 750 * Par Inc/Wealth Q3	-0.051 (0.062)	-0.055 (0.061)	-0.087 (0.094)
Tuition > 750 * Par Inc/Wealth Q3 * High Exp Ret			0.038 (0.137)
Tuition > 750 * Par Inc/Wealth Q4	0.069 (0.070)	0.066 (0.070)	0.117 (0.104)
Tuition > 750 * Par Inc/Wealth Q4 * High Exp Ret			-0.106 (0.101)
Interaction of Par Inc/Wealth Quartiles and High Ret	Yes	Yes	Yes
Controls: Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Par Inc/Wealth and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Uncensored Obs	1612	1612	1612
Log Likelihood	-2987.524	-2984.668	-2972.787
Sample Sel: Corr betw Err	-0.329	-0.309	-0.326
Sample Sel: P-Val	0.236	0.275	0.247

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, lowest parental income/wealth quartile, interactions of tuition costs less than 750 pesos with parental income/wealth and low expected return interacted with parental income/wealth quartiles.

Table 11: Excess Responsiveness of the Poor to Changes in Direct Costs (Tuition Costs): Total Household Income.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Tuition > 750 * Fam Income T1 (d)	-0.070 (0.049)	-0.078 (0.049)	-0.038 (0.067)
Tuition > 750 * Fam Income T1 * High Exp Ret (d)			-0.084 (0.076)
Tuition > 750 * Fam Income T2 (d)	-0.043 (0.050)	-0.045 (0.050)	-0.024 (0.071)
Tuition > 750 * Fam Income T2 * High Exp Ret (d)			-0.048 (0.086)
Tuition > 750 * Fam Income T3 (d)	-0.044 (0.052)	-0.050 (0.052)	-0.087 (0.069)
Tuition > 750 * Fam Income T3 * High Exp Ret (d)			0.058 (0.100)
Fam Inc 1 * High Exp Ret (d)			-0.090 (0.061)
Fam Inc 2 * High Exp Ret (d)			0.060 (0.069)
Fam Inc 3 * High Exp Ret (d)			0.003 (0.062)
Controls for Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Fam Income and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Censored Obs	1730	1730	1730
Log Likelihood	-2991.555	-2987.575	-2978.676
Sample Sel: Corr betw Err	-0.321	-0.318	-0.315
Sample Sel: P-Val	0.295	0.310	0.264

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, family income lowest tercile, interactions of tuition costs less than 750 pesos with family income and low expected return interacted with family income.

Table 12: Excess Responsiveness of the Poor to Changes in Direct Costs (Tuition Costs): Total Household Income and Wealth.

Dependent Variable	College Attendance		
	(1) Marg Eff (SE)	(2) Marg Eff (SE)	(3) Marg Eff (SE)
Tuition > 750 * Fam Inc/Wealth Q1 (d)	-0.060 (0.059)	-0.063 (0.059)	0.028 (0.088)
Tuition > 750 * Fam Inc/Wealth Q1 * High Exp Ret (d)			-0.141* (0.080)
Tuition > 750 * Fam Inc/Wealth Q2 (d)	-0.093* (0.053)	-0.097* (0.053)	-0.066 (0.073)
Tuition > 750 * Fam Inc/Wealth Q2 * High Exp Ret (d)			-0.062 (0.093)
Tuition > 750 * Fam Inc/Wealth Q3 (d)	-0.017 (0.058)	-0.016 (0.058)	0.017 (0.081)
Tuition > 750 * Fam Inc/Wealth Q3 * High Exp Ret (d)			-0.067 (0.093)
Tuition > 750 * Fam Inc/Wealth Q4 (d)	-0.031 (0.054)	-0.035 (0.054)	-0.095 (0.070)
Tuition > 750 * Fam Inc/Wealth Q4 * High Exp Ret (d)			0.123 (0.108)
Fam Inc/Wealth Q1 * High Exp Ret (d)			0.008 (0.081)
Fam Inc/Wealth Q2 * High Exp Ret (d)			-0.049 (0.072)
Fam Inc/Wealth Q3 * High Exp Ret (d)			0.069 (0.078)
Fam Inc/Wealth Q4 * High Exp Ret (d)			-0.032 (0.060)
Controls for Expected Return, Exp Log Earn, Prob of Work and Var of Log Earn	No	Yes	Yes
Controls: GPA, Fam Income and Educ, Sex, State FE	Yes	Yes	Yes
Observations	3342	3342	3342
Censored Obs	1730	1730	1730
Log Likelihood	-2995.767	-2993.140	-2982.624
Sample Sel: Corr betw Err	-0.318	-0.313	-0.282
Sample Sel: P-Val	0.250	0.264	0.311

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1, ** p<0.05, *** p<0.01. Excl. categories: male, lowest GPA tercile, parents' education primary or less, lowest family income/wealth quartile, interactions of tuition costs less than 750 pesos with family income/wealth and low expected return interacted with family income/wealth quartiles.

Table 13: Time Preference of Different Per Capita Income Categories: Total Household Income.

	Total Family Income Category				
	Tercile 1 (low)	Tercile 2	Tercile 3	Compare	
	(1)	(2)	(3)	(1)-(2)	(1)-(3)
	Mean	Mean	Mean	Diff	Diff
	(SD)	(SD)	(SD)	(P-Val)	(P-Val)
Intertemp Behavior: Health					
Smoke	0.03	0.02	0.03	0.01	0.00
	(0.18)	(0.16)	(0.18)	(0.450)	(0.946)
Drink Alcohol					
Yes	0.12	0.11	0.15	0.01	-0.03
	(0.33)	(0.31)	(0.36)	(0.511)	(0.111)
≥ 2 /week	0.04	0.04	0.05	-0.00	-0.01
	(0.19)	(0.19)	(0.21)	(0.837)	(0.416)
How Use 3000 Pesos?					
Immediate Consumption	0.16	0.19	0.21	-0.03	-0.05
(Alternative: Save/Invest)	(0.36)	(0.39)	(0.41)	(0.136)	(0.024)
Observations	585	523	504		

Notes: Columns 1 to 3 display means and standard deviations in brackets. Columns 4 and 5 display the difference of (1)-(2) and (1)-(3), respectively, and the p-value of the difference in brackets.

Table 14: Counterfactual Policy Experiments: Total Household Income.

Policy Change	Individuals Changing College Attendance Decision Change in Overall Attendance Rate in pp (in %) (p-value)	Marginal Expected Return (MTE)	Individuals Attending College Average Expected Return (TTE)	Diff MTE-TTE (p-value)
Decrease Dist by 20km for all	1pp (4%) (p-val 0.04)	0.89	0.71	0.18 (0.17)
	0.4pp (2%) (p-val 0.12)	0.88	0.71	0.16 (0.29)
	0.2pp (1%) (p-val 0.09)	0.90	0.71	0.19 (0.18)
Decrease Tuition by 10% for all	0.3pp (1.5%) (p-val 0.49)	0.85	0.71	0.14 (0.27)
	0.3pp (1.5%) (p-val 0.28)	0.79	0.71	0.08 (0.40)
	0.3pp (1.5%) (p-val 0.29)	0.81	0.71	0.10 (0.36)

Table 15: Determinants of College Attendance: Including Ability-Return Interactions.

Dependent Variable	College Attendance	
	(1)	(2)
	Marg Eff (SE)	Marg Eff (SE)
Expected Return to College	0.118** (0.050)	0.116** (0.050)
Exp Return * GPA 2	-0.059 (0.074)	-0.061 (0.071)
Exp Return * GPA 3	-0.087 (0.074)	-0.081 (0.071)
Prob of Work - Sr HS	0.004 (0.081)	0.010 (0.078)
Prob of Work - College	0.034 (0.093)	0.025 (0.090)
Var of Log Earn - Sr HS	-3.063 (1.973)	-2.794 (1.916)
Var of Log Earn - College	0.212 (2.180)	0.033 (2.106)
Female (d)	-0.046 (0.032)	-0.044 (0.032)
GPA - second tercile (d)	0.097 (0.063)	0.102 (0.063)
GPA - top tercile (d)	0.241*** (0.074)	0.233*** (0.075)
Father's Educ - Jr HS (d)	0.074* (0.042)	0.079* (0.042)
Father's Educ - Sr HS (d)	0.096 (0.075)	0.105 (0.074)
Father's Educ - Univ (d)	0.570*** (0.132)	0.564*** (0.144)
Mother's Educ - Jr HS (d)	0.073* (0.039)	0.075* (0.039)
Mother's Educ - Sr HS (d)	0.176* (0.101)	0.175* (0.101)
Mother's Educ - Univ (d)	0.215 (0.206)	0.225 (0.207)
Dist to Univ 20 to 40km (d)	-0.076*** (0.029)	-0.076*** (0.028)
Dist to Univ above 40km (d)	-0.106*** (0.031)	-0.105*** (0.030)
Tuition Above 750 Pesos (d)	-0.083** (0.039)	-0.080** (0.038)
Per cap Income - 5 to 10k (d)	0.054* (0.031)	
Per cap Income - more than 10k (d)	0.120*** (0.037)	
Total Family Income T2 (d)		0.026 (0.028)
Total Family Income T3 (d)		0.061* (0.033)
Observations	3342	3342
Censored Obs	1730	1730
Log Likelihood	-2972.170	-2974.427
Sample Sel: Corr betw Err	-0.140	-0.069
Sample Sel: P-Val	0.634	0.816

Notes: Table displays marginal effects and standard errors in brackets. * p<0.1 ** p<0.05 *** p<0.01. Excl. categories: male, lowest GPA tercile, father's and mother's education primary or less, lowest household income tercile, distance to university less than 20 km and tuition less than 750 pesos.

Table 16: Time Preferences: Comparison between Per Cap Income $\leq 5k$ and $\geq 5k$ and $\leq 10k$.

Dependent Variable	Smoke (Yes/No)	Alcohol (Yes/No)	Alcohol (≥ 2 /week)	Immediate Consumption
Per cap Income - less than 5k	-0.001 (0.010)	0.014 (0.019)	0.012 (0.012)	0.002 (0.023)
Female	-0.050*** (0.009)	-0.061*** (0.017)	-0.027** (0.011)	-0.007 (0.021)
Age	0.013*** (0.004)	0.019** (0.008)	0.009** (0.005)	0.023** (0.009)
Chiapas	-0.020 (0.012)	-0.066*** (0.023)	-0.006 (0.014)	-0.170*** (0.027)
Guanajuato	-0.021 (0.065)	-0.102 (0.119)	-0.017 (0.075)	0.166 (0.144)
Guerrero	0.012 (0.016)	0.003 (0.029)	0.034* (0.018)	-0.095*** (0.035)
Michoacan	0.005 (0.017)	0.230*** (0.032)	0.058*** (0.020)	-0.013 (0.038)
Veracruz	0.015 (0.016)	-0.040 (0.030)	0.013 (0.019)	-0.055 (0.036)
Observations	1340	1340	1340	1340
R-squared	0.032	0.080	0.019	0.039

Notes: Table displays coefficients and standard errors in brackets. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Excl. category: male. All regressions contain state fixed effects.

Table 17: Time Preferences: Comparison between Per Cap Income $\leq 5k$ and $\leq 10k$.

Dependent Variable	Smoke (Yes/No)	Alcohol (Yes/No)	Alcohol (≥ 2 /week)	Immediate Consumption
Per cap Income - less than 5k	0.003 (0.012)	-0.035 (0.023)	0.012 (0.014)	-0.015 (0.027)
Female	-0.044*** (0.010)	-0.084*** (0.019)	-0.039*** (0.012)	-0.005 (0.022)
Age	0.012*** (0.004)	0.010 (0.009)	-0.000 (0.005)	0.007 (0.010)
Chiapas	-0.002 (0.013)	-0.037 (0.025)	0.003 (0.015)	-0.188*** (0.029)
Guanajuato	-0.006 (0.075)	0.097 (0.146)	-0.011 (0.089)	0.315* (0.171)
Guerrero	0.020 (0.016)	0.073** (0.031)	0.073*** (0.019)	-0.094** (0.037)
Michoacan	0.022 (0.018)	0.233*** (0.035)	0.052** (0.022)	-0.033 (0.041)
Veracruz	0.009 (0.017)	-0.026 (0.032)	0.004 (0.020)	-0.091** (0.038)
Observations	1224	1224	1224	1224
R-squared	0.027	0.075	0.028	0.044

Notes: Table displays coefficients and standard errors in brackets. * $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$. Excl. category: male. All regressions contain state fixed effects.

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