Measuring Aversion to Debt:

An Experiment among Student Loan Candidates[*]

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Abstract

Debt aversion, an unwillingness to enter into a financial contract framed or labeled as debt, distorts household investment and financing decisions. We test through an experiment for the presence of debt aversion among a relevant population. Our tests allow us to identify two different sources of debt aversion: one due to framing effects and another due to labeling effects. Most of the debt aversion we identified was due to labeling effects. Labeling a contract as a "loan" decreases its probability of being chosen over a financially equivalent contract and increases its perceived cost.

Introduction

Household finance attempts to understand the motivations underlying the financial decisions households make. In understanding how households make those decisions, the starting point is often that of a rational, utility maximizing agent who is trying to make the best out of the opportunities available to her. Yet a large body of empirical evidence, some of it related to household finance, challenges the rational paradigm as an accurate description of the way agents behave. Thus, a central question for this research is, when do the deviations from the paradigm take place, and how much do they matter?

Deviations from the rational agent paradigm matter when the decisions individuals make have a large impact on their future wealth. Perhaps the largest such decision is the one to invest in education. Although fraught with econometric issues to ascertain its value, a simple comparison of wages of full-time employed college and high school graduates in the United States reveals college graduates earned 107% more than high school graduates in 2010. The difference is often larger elsewhere in the world. Assuming the difference is due to education, and that the growth and riskiness of the earnings for both groups is similar, the value of human capital for a 25 year old college graduate is 107% larger than that of a 25 year old high school graduate.[1] The wage difference in 2010 was $38,522, which is about 19% of the home's average value for households who own a house, townhouse or apartment in the United States or 21% of the average total financial and business assets for all households. The difference in wages *per year* is greater than the average total financial and business assets for households under 40.[2] Based on this data one can conclude that human capital

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[1] Data from the 2011 annual Current Population Survey, based on 2010 earnings.

[2] The weighted average of a homeowner's property, excluding farms, ranches, and mobile homes, was $204,344 in 2007. The weighted average of all financial and business assets was $182,298 in 2007. Author's calculations based on the 2007 Survey of Consumer Finances.

is plausibly the largest asset for those under 40, and therefore the investment in education has first-order long-term consequences on their well-being. Furthermore, most students need financing for their education, so it is important to look at deviations from the paradigm in education investment decisions.

The literature started by Kahneman and Tversky's (1979) work, and the pervasive presence of marketing campaigns of financial products highlighting characteristics of the product unrelated to cash flows, suggests that agent's investment decisions are not just a function of a product's future flows. Related work has studied biases when making investment decisions (for instance, Choi, Laibson and Madrian, 2011). But, rather than focusing on agent's savings, we ask what happens when agents are choosing a financing mechanism. Are they subject to similar biases that affect their decision? Our research design, focused on student financial aid, allows us to address this question directly. If a bias does exist, its consequences reach much further than education investments because if households use characteristics unrelated to cash flows in deciding one of their most important investment decisions–education–they will plausibly use those other characteristics in many other settings. The bias results in welfare costs for themselves and potentially affects the prices of assets in the economy.

A prominent example of a potentially important bias is "debt aversion".[3] A common definition does not exist, but the term is loosely defined as borrowers suffering, for some reason, a subjective cost when taking on debt. We explore debt aversion in two novel ways. First, we narrow the definition of debt aversion to focus on aspects of the agent's financing decision unrelated to cash flows. We achieve this by varying characteristics of a financial instrument while maintaining the instrument's cash flows constant. Second, recognizing that an agent's aversion could stem from the framing of the contracts or from a negative

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[3]The term is used in the economics of education literature. See Rasmussen (2006) and Eckel et. al. (2007).

perception associated with the words "debt" or "loan", we separate debt aversion into two distinct concepts, one stemming from framing effects and the other from labeling effects. Our definition of debt aversion, including its two distinct sources, allow us to design an experiment where we can test for its presence and measure how important each source is.

Investments in education are a natural place to look for debt aversion. Labor economists have studied for decades (at least since Mincer (1974)) the value and return of investing in education. A robust result stemming from this literature is that the internal rate of return of the investment is high (on the order of 10% in the United States) when compared with other available financial investments, which leads to a puzzle: why do people not invest more in their education?[4] One potential answer is that the instruments available for financing education appear expensive relative to their true cost, expensive enough to make the investment not worthwhile.[5] Concretely, this argument points out that potential borrowers display "debt aversion", leading them to pass on a good investment. In this setting, debt aversion acts like a self-imposed borrowing constraint.

Our experiment consisted on a survey with two distinct parts, one aimed at measuring a preference for contracts that are not framed or labeled as debt, and the second one aimed at measuring the cost of debt aversion, if present. The survey was conducted in three Latin American countries: Chile, Colombia and México. 1422 persons answered the survey, of which 767 responded the questions most relevant to this study. The 1422 respondents were randomly assigned to a treatment and a control group.[6] A strength of our design is the

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[4]For example, Card (1999), Psacharopoulos and Patrinos (2004), and Palacios-Huerta (2003).

[5]Other possible answers which are not related to this paper are that once one adjusts for risk the returns to education are not that large, that once one appropriately accounts for selection biases the returns are smaller, that young high school graduates are misinformed about the returns to additional education, and that market imperfections lead providers of capital to ration it constraining students as a result.

[6]Table 1 shows that not only the sample of respondents, but most importantly the sample of people who responded the relevant questions are on average very similar across treatment status.

diversity of the population who took the survey, combined with the fact that, having been recent student loan applicants, the questions in their survey reflected a situation they had experienced recently.

In the first part of our experiment subjects were asked to choose between contracts that were framed as debt or as an income-contingent contract.[7] Following Palacios (2004), who shows that paying a percentage of income up to a cap (a "capped" Human Capital Contract, or HCC) is financially equivalent to an income-contingent loan, we framed financially equivalent contracts as "loans" or "HCCs" and asked respondents which one they would prefer. Debt aversion would manifest as a preference towards HCCs over loans. To identify labeling debt aversion, the treatment group had each contract clearly labeled as a "loan" or as a "HCC", whereas the control group had no label attached to either contract. With the exception of the label, the differences in the wording in the explanation of the HCC and loan contracts were exactly the same for both groups. This design allows us to control for framing effects, and to identify labeling debt aversion as the excess of preference for the HCC in the treatment group with respect to the control group, analogously to a difference-in-differences design.

In the second part of our experiment we attempted to measure the monetary value of labeling debt aversion. We asked respondents to provide the fixed monthly payment that would make them indifferent between that contract and a capped contract. The treatment group's question labeled the fixed payment contract as "debt", whereas the control group's

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[7]The population consisted of persons who had applied for financial aid through Lumni Inc. Lumni is a for-profit student-financing company, operating in Chile, Colombia, Mexico and the United States. Distinctively, Lumni does not offer loans to students, but instead offers variations of Human Capital Contracts, contracts in which students agree to pay a percentage of their income during a fixed period of time. As of February 2012, Lumni had financed approximately 2,500 students and had twice as many applications in the four countries mentioned above. One of the authors of this study is a co-founder and the second largest shareholder in Lumni Inc.

question labeled the fixed payment contract as a "different contract". We then investigate whether students in the treatment group are willing to pay the same monthly amount as students in the control group. Students in the treatment group willing to pay on average less than students in the control group would be evidence of labeling debt aversion.

We find evidence consistent with debt aversion and label debt aversion, even with the small sample size of the study, suggesting that it affects the choices students make when considering an investment on education. When confronted with contracts with identical financial payoffs, a larger fraction of respondents prefer the HCC contract compared to the debt contract (some are indifferent). Furthermore, most of this difference seems to be due to the labeling debt aversion. Labeling a contract a "loan" decreases the probability that a respondent will choose it by more than 8%.

Moreover, based on the results from the second part of the survey, we estimate that participants place a premium to avoid contracts labeled as debt. The premium is about 4% of the financed value, and is statistically significant. Our results suggest that students disfavor contracts labeled as debt, and therefore the way financing alternatives are presented to them may have a significant impact on their choices.

The results in this study imply that, at least in terms of human capital investment, debt aversion exists and may potentially distort investments. The results have implications for policymakers promoting access to higher education and providers of student financing. The label of the financial mechanism seems to matter to achieve their goals. More broadly, this finding suggests that debt aversion may act as a self-imposed borrowing constraint affecting agents' portfolio decisions and, indirectly, asset prices.

The next section revisits the previous literature on the topic. Section II explains in more detail the survey methodology and the identification strategy. Section III presents and

discusses the results, section IV provides additional discussion, and section V concludes.

I   Literature Review

This paper fits into the literature that attempts to understand the investment, savings and portfolio allocation decisions that households make. Several authors point out that agents forego what is effectively "free cash" (Choi, Laibson and Madrian, 2011), and that their asset allocation and trading decisions are not driven by rational decisions or better information (Odean, Beshears et. al., 2008, and many others). We complement this literature by studying agent's preferences for different financing options in light of a large investment opportunity.

Credit frictions have also been studied in different settings to understand how optimal choices are affected by their presence as well as to explain asset pricing anomalies (e.g., Constantinides et. al. (2002) and Guiso et. al. (1996)). These frictions are typically associated with asymmetric information or a compatibility constraint given by bankruptcy laws (Zhang (1997)). In this paper we explore debt aversion as a potential source of a credit friction, particularly in education financing.

Ever since Becker (1964) and Mincer (1974) started measuring the returns to education, the estimates found are abnormally high around the world (e.g., see Patrinos and Psacharopoulos (2004)) for a survey). The ratio between the wages of higher education graduates and high school graduates varies across time and countries, but is typically 150% or higher.[8] Further, when comparing developing and developed countries, although the former countries have generally higher returns to education, they also have lower levels of education on average (Patrinos and Psacharopoulos (2004)). This suggests that people may

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[8]Ability bias may be a concern in biasing the estimates. Nevertheless, the literature that estimates the return to education with quasi-experimental designs (e.g., Angrist and Krueger (1991), Ashenfelter and Krueger (1994)) also find high estimates. See also Card (1999) and Card (2001).

be underinvesting in education, particularly in developing countries.[9] One plausible reason for this underinvestment is the presence of frictions that prevent an efficient match between capital and education investments.

Barr (2001) suggests that information asymmetry is an important source of such friction. On the one hand, students do not have good information about the value of education. On the other hand, potential investors cannot force graduates to work to obtain a return on their investment, and cannot get a tangible asset as collateral. As a result, valuable investment opportunities go unfunded.

Another source of friction is aversion to risk. While worthwhile on average, education is a risky investment. Debt, which is by far the most widespread credit instrument to finance education, does not transfer much risk away from the student, so students with loans take a substantial amount of risk. As a result, risk-averse individuals will be less likely to take loans. Friedman (1955) proposed an alternative to debt, analogous to the equity investments capitalists make in risky projects. Palacios (2004) analyzes this alternative, which he calls Human Capital Contracts (HCCs). During the last 25 years an increasing amount of income contingent loans, which are equivalent to a HCC with a cap in the payments students make, have been made available by governments and in some few instances, by the market. These instruments transfer risk away from students and thus partially alleviate the problem that students financing their education with loans face.

Debt aversion may be another source of friction in the higher education financing market. If students dislike debt, they might simply not invest as much in their education as they would have if the contract was framed differently. This underinvestment of education will imply lower wages over the rest of their career. Evidence supporting the existence of debt

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[9]There is also ample evidence of underinvestment on education because of credit constraints in developed countries (e.g., Carneiro and Heckman (2002)).

aversion stems from surveys that suggest certain demographic groups are unwilling to finance their education using debt (see Rasmussen (2006) and references therein). Experimental data offers contradictory evidence: Eckel et. al. (2007) find no evidence of debt aversion among Canadian citizens while Field (2009) provides empirical evidence from a field experiment that contracts framed as loans are less attractive for students than a convertible grant (a grant that converts into a loan) even though the financial payoffs are identical. The study of borrowing constraints from the perspective of debt aversion is, to our knowledge, only present in the labor economics literature.

Our work is similar in spirit to that of Eckel et. al. (2007) and Field (2009). In the case of Field (2009) the choices are made in a real transaction, while in Eckel et. al. (2007) the choices are made in a survey under which respondents enter a lottery whose payoffs are related to their answers. We offer equivalent options to students, and observe their choices in a survey, contributing to the literature in two directions. First, our design allows us to disentangle framing effects and labeling effects, which sheds new lights into the nature of debt aversion. Second, our studied population comprises of individuals who typically apply for financial aid to continue their studies in developing countries, where the underinvestment in education is of particular importance.

II Survey Description

This section describes the survey and the population in detail, emphasizing the research design used to identify framing and labeling debt aversion.

We designed the survey to refine our understanding of the sources of debt aversion in students. In particular, our design allows us to disentangle debt aversion due to the descrip-

tion of the contract (i.e., framing effect) from labeling debt aversion, that is, aversion due to the labeling of the contract. Previous work has not disentangled these two effects, and therefore their results reflect the combined effect of framing and labeling effects.

We conducted the survey by contacting via email over 3,000 people in Chile, Colombia and Mexico. This population had applied to get education financing, and about 1,800 of them had received financing. Out of these people, 1422 of them responded to the survey. The students who responded the survey were automatically assigned to either the treatment or the control group through a random algorithm.

After filling a form with demographic and current status information, the survey followed with 15 questions. The order of the questions was the same for all participants. The key questions for the purpose of this survey were questions 1 through 8.[10] Out of the 1422 respondents, only 767 responded the eight relevant questions, and throughout the paper we focus on the sample that answered each question.[11]

The appendix contains the translated text of the survey's most relevant questions. Respondents in each country answered slightly different surveys that reflected the relative costs of education in each country. The amounts were translated into local currencies, and the size of hypothetical loans and payments were adjusted to reflect realistic contracts given each country's own reality. Whereas students in Colombia typically need US$3,000 to finance a year of education, a Chilean needs US$6,700 and a Mexican US$4,150. The surveys for each country reflected these differences. The parameters used for each country can be found in table I. The survey was conducted in Spanish and the original text is available upon request.

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[10]The order of the questions in the survey did not follow the order in which we present them here. The survey asked the questions that presumably required higher effort at the beginning.

[11]We provide evidence in the next section that the subsample that answered all the relevant questions is reasonably balanced with respect to observables across treatment status. This is expected, as the difference in the questions for treatment and control groups are not likely to imply any difference in the costs of responding to the survey.

A Survey Questions and Identification Strategy

A.1 Questions 1–3: Choices between contracts

To explore the presence of debt aversion due to the description of the contract, we presented respondents with financially equivalent contracts framed differently in question 1. The contract framed as a loan states that every month a fixed payment has to be made, with the exception of low-income months, in which only a percentage of income has to be paid. The contract framed as a Human Capital Contract (HCC) states that every month a percentage of income has to be paid, with the exception of high-income months, in which a fixed payment has to be made. The parameters of the contracts are specified so that the financial payments every month, regardless of the level of income, is the same across contracts. Debt aversion due to framing effect manifests here as respondents avoiding the contract framed as debt.

To explore the presence of labeling debt aversion - aversion due to the labeling of the contract - we randomly assigned respondents to two groups, the treatment or the control group. People in the treatment and control groups had exactly the same descriptions of the debt and the HCC contract, with one exception: the treatment group observed the labels "loan" and "HCC", while the control group did not. Debt aversion due to framing and labeling effects manifests here as respondents in the treatment group avoiding the contract framed and labeled as debt, and labeling debt aversion would manifest here as respondents in the treatment group avoiding the loan contract even more frequently than respondents in the control group. This identification strategy is analogous to the differences-in-differences strategy widely seen in empirical work.

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We asked the same question changing the parameters so that the loan contract is better than the HCC contract in question 2 and the loan contract is worse than the HCC contract in question 3.[12] We expect that more people would accept the better contract in each question. However, the fact that this is expected to happen the same way for both the treatment and control groups allows us to still identify labeling debt aversion in this context: in each question, it will manifest as respondents in the treatment group avoiding the loan contract even more than respondents in the control group.

A.2 Question 4: A choice after being told contracts are financially equivalent in Question 1

As a follow up to questions 1 through 3, we perform a second type of test about the existence of debt aversion. Participants were told that in question 1 the two contracts are equivalent and then were asked to state their preference about question 1 again.[13]

In this question we test whether debt aversion exists in an environment in which subjects are aware of the financial equivalence between the two contracts they are choosing from. Evidence of debt aversion in this setting is even stronger than before, as we can control for the possibility that respondents do not understand the payoffs of the different contracts when manifesting a preference.

A.3 Questions 5–8: Value of Debt Aversion

The previous questions allowed us to test for the presence of debt aversion and labeling debt aversion among those answering the survey. We further tested for labeling debt aversion

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[12]A contract A is better than a contract B in the sense that the payments in contract A are lower than in contract B for some future income levels, and never higher no matter the future income level. More formally, contract A first-order stochastically dominates contract B.

[13]Survey participants could not go back in question 1 and check what they originally answered.

by attempting to quantify the premium people would be willing to pay to avoid a contract labeled as debt.

If labeling debt aversion exists, then the amount a borrower would be willing to pay in a contract labeled as debt would be lower than the payment she would be willing to make in a financially equivalent contract not labeled as debt. Thus, in question 5 through 8 we offered people two contracts: in a capped contract, one pays monthly an amount that cannot be more than $200 and depending of the future income can be less than that.[14] In the second contract, a fixed monthly payment of $X is made. The person taking the survey is then asked what is the value X that would make him or her indifferent between the two contracts. The numbers reported in the next section are normalized to be a proportion of the maximum value $200 of the capped contract. Because a contract with fixed payment of $X = 200$ can never be better than a contract with maximum payment of $200, we expect the reported values to be lower or equal to one. We asked four questions, depending on whether the person would enter the workforce (1 or 2 years), and depending on the framing of the first contract (HCC or flexible debt). In all four questions, the only difference between the question for the treatment and the question for the control group is that in the treatment group the second contract was labeled "debt", while in the control group the second contract was labeled "a different contract". Again, the difference-in-differences design allows us to identify the premium to avoid a contract labeled as debt even though the contracts are not financially equivalent. A premium to avoid a contract labeled as debt would manifest as respondents in the treatment group reporting a lower X than respondents in the control group.

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[14]The number $200 changes across countries as discussed before.

B   Econometric Analysis

In this section we explain the analysis we perform on the survey answers taking more than one question at a time, in order to get more precise estimates. The identification strategy still relies on the random assignment to the treatment and control groups as previously stated.

B.1   Questions 1–4

We test for the preference between a loan and a HCC using questions 1, 2 and 3 altogether, according to the following panel regression:

$$Loan_{i,j} = \alpha_1 + T_i\phi + LoanBetter_j\alpha_2 + HCCBetter_j\alpha_3 + \epsilon_{i,j}, \tag{1}$$

where $Loan_{i,j}$ takes the value of 1 if i chose debt in question j, 0 if i chose indifferent in question j, and -1 if i chose HCC in question j, $j = 1, 2, 3$. $LoanBetter_j$ is an indicator variable for whether $j = 2$ and $HCCBetter_j$ is an indicator variable for whether $j = 3$; T_i equals one if respondent i is assigned to the treatment group and zero otherwise (i.e., i assigned to the control group). Since we are including multiple answers for each individual in our regressions, we cluster at the individual level.

In equation (1), α_1 identifies debt aversion due to the framing effect, and ϕ identifies the labeling debt aversion. The measure of debt aversion commonly used in the literature is $\alpha_1 + \phi$. α_2 is naturally expected to be positive and α_3 to be negative.

We also report two additional specifications by augmenting specification (1) by observed demographic variables to improve the precision of the estimates. Additionally, we report estimates using a multinomial logit specification, to relax the assumption of linearity in

equation (1).

To end this section, we repeat an identical analysis for respondents of question 4 only to study the results when respondents have been told that the two contracts have identical payoffs.

B.2   Questions 5–8

We also estimate the premium to avoid a contract labeled as debt using questions 4, 5, 6 and 7 altogether, according to the following panel regression:

$$X_{i,j} = \alpha_4 + T_i\beta + Q5_j\alpha_5 + Q6_j\alpha_6 + Q7_j\alpha_7 + \eta_{i,j} \tag{2}$$

where Ql_j is an indicator variable equals to 1 for $j = l$, $j, l = 5, 6, 7$, T_i equals one if i is assigned to the treatment group and zero otherwise (i.e., i is assigned to the control group), and $X_{i,j}$ is the answer to question j by person i. The parameter β is identified to be the premium to avoid a contract labeled as debt. We also report two additional specifications by augmenting specification (2) by observed demographic variables to improve the precision of the estimates.

III   Data and Results

Table II shows demographic characteristics of people based on their treatment status. People are on average 23 years of age, and very few of them (under 10%) have children or are married. About two thirds of the respondents are still students, and about half of them are males. Finally, most of the data come from respondents from Colombia and Mexico. The table

also shows that the people are very similar on average in terms of observed demographic characteristics across treatment status. As discussed in the previous section, this is expected due to the random assignment of the 1422 respondents and due to the fact that the difference in the questions across groups is likely to not have generated further selection problems.

INSERT TABLE II NEAR HERE

A   Testing for the existence of debt aversion

We begin with an analysis of respondents' choices between financially equivalent contracts framed or labeled differently. Table III shows the raw data from respondents' answer to questions 1 through 3. When confronted with financially equivalent contracts (i.e., question 1), one framed and labeled as debt and the other framed and labeled as a Human Capital Contract (HCC), 37% of the respondents in the treatment group chose debt and 50% chose HCC. This difference (i.e., 13%), also seen in the panel A of Table IV, is our first evidence of the presence of debt aversion. It encompasses both framing and labeling effects, and therefore is similar in nature to the coefficients reported in the previous literature (for example, Field 2009). The difference of 2% in the control group suggests that the debt aversion due to framing effects is small. The difference-in-differences estimate, 11%, suggests that most of the debt aversion is due to labeling effects.

Table III and panel A of table IV show also the results for questions 2 and 3. When the loan contract is better than the HCC contract, some people in both the treatment and control groups switch from indifferent to preferring the loan contract, and vice-versa, which suggest some internal consistency in the results. The labeling debt aversion is still high and statistically significant for these questions, although the estimates are relatively imprecise, ranging from 7% for question 3 to 18% for question 2.

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To exploit the information offered by the first three questions simultaneously, and to attempt to estimate more precise estimates, we proceed to estimate simultaneously equation (1) for questions 1–3. Panel B of Table IV summarizes the results for this model.

The first column of Table IV shows the results of equation (1) when we do not use any additional control variables. Two coefficients are of interest. First, "Constant" identifies debt aversion due to framing effects. Although not significant, the estimated value is -.0202, which is consistent with the value seen in panel A. The second coefficient of interest, "Treatment", identifies labeling debt aversion. Its estimate is equal to -0.118 and is significant at the 5% level. This coefficient means that a respondent who sees the contracts labeled as "loan" and "HCC" is more likely to prefer the HCC than a respondent who had no labels associated with the contracts but had exactly the same wording. Thus, table IV provides further evidence of the existence of labeling debt aversion. Our estimate of debt aversion under this specification is the sum of Treatment and Constant, which is -.138, implies that survey participants were more likely to prefer an HCC over an income-contingent loan, even though these two contracts are financially equivalent.

The coefficient of "Loan Better" (0.101) has the expected sign as more people should choose the loan when it is cheaper, and is significant at 1% level. The "HCC better" coefficient (-0.0954) also has the expected sign and is significant at the 1% level.

The second and third specifications of Table IV estimate the same model augmented by control variables. Specification 2 includes indicator variables for the country, while specification 3 also include variables such as age, gender, study completion status and presence of children. The estimated coefficient for "Treatment" does not change, providing further evidence of the random assignment.

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A potential issue with the results shown in Table IV is that the three potential outcomes make the coefficients difficult to interpret, whereas in a binary choice the coefficient can be interpreted as the marginal increase in the probability of making a particular choice. To deal with this issue we present the results of equation (1) by running regressions where the outcomes are "debt" or "not debt", where "not debt" include choosing an HCC or being indifferent. Similarly, we run regressions where the outcomes are "HCC" or "no HCC", where "no HCC" include choosing debt or being indifferent. The results are presented in tables V and VI.

Table V does not provide enough information about framing effects, since the constant includes indifference as well as choosing debt. However, the results do allow us to comment on labeling effects. In this case they are consistent with previous results, providing evidence of labeling effects against debt, though the magnitude (-.0421) is not significant. The probability of choosing the debt contract increases by about 7% when the loan contract is better, and decreases by about 2%, though not significant, when HCC is the better contract. These results are consistent for different specifications.

Table VI delivers similar but opposite effects when the choice is taking the HCC. In this case the coefficient for preferring HCCs in the treatment group is .0755, significant at the .001 level. Under this specification, labeling contracts increases the probability of choosing a HCC by about 7.5% accross different specifications. Taken together, the results in Tables V and VI are consistent with the presence of labeling effects against debt.

We repeat the previous analysis relaxing the linearity assumption of equation (1) by running a multinomial logit regression, where the choices are a preference for the HCC, indifference, or a preference for the loan. Table VII reports the results for the marginal effect on the probability of choosing a given option, where the options are given in each column. The evidence of labeling debt aversion is still high and statistically significant, but under this specification it is much more precise. 7.6% people choose HCC because of labeling debt aversion. If the options did not have the label debt, then about 41% of these 7.6% students (3.14%) would have chosen indifference and the other 60% (4.48%) would have chosen the loan. Moreover, the sign of the coefficients of "Loan Better" and of "HCC Better" are consistent although they are not always significant.

INSERT TABLE VII NEAR HERE

A similar analysis can be ran using an ordered probit regression, given that there is a clear ordering between loan preferred, indifference, and HCC preferred. Table VIII reports the results for the maginal eefect on the probability of choosing a given option. The evidence of labeling debt aversion is consistent with the one found through the multinomial logit regression (Table VII). 6.1% of the sample chooses HCC because of labeling debt aversion. If the options did not have the labels, then most of the respondents (97% of that 6.1%, or 5.9%) who preferred HCCs would have chosen the loan. The ordered probit highlights that most of the label effect comes from switching between contracts, rather than becoming indifferent between them.

INSERT TABLE VIII NEAR HERE

The results found in question 4, where participants are told the contracts are financially equivalent, are consistent with the findings discussed so far. Table IX reports the average

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treatment effect when participants have been told that both contracts are equivalent. The constant is negative but not significant in two of the specifications (-.02 and -.01), suggesting the presence of a small but insignificant framing effect. In the third specification we obtain a very large but statistically insignificant result, reflecting what appear to be large differences in the answers of different demographic groups. We do not attempt to explain these differences as none of them, with the exception of gender, appear to be significant.

INSERT TABLE IX NEAR HERE

A multinomial logit analysis confirms the result that subjects in the treatment group are more likely to avoid the debt contract. The treatment coefficient in Table IX does not change across different specifications and is significant at the 1% level. At -.18 it provides evidence that participants who did not see any label where more likely to prefer a HCC. Table X corroborates this result. Subjects in the treatment are 5.5% less likely of preferring the loan and 7.4% less likely of being indifferent. Conversely, subjects in the treatment group were 13% more likely to prefer a HCC. This last result is significant at the 1% level.

INSERT TABLE X NEAR HERE

Given the above analysis, we conclude that there is evidence of debt aversion, particularly due to labeling effects, among a population similar to the one that routinely applies for education financial aid. The results are particularly strong in light of answers to question 4, since respondents are told that contracts are financially equivalent. Lack of awareness about the payoffs do not seem to be driving the results.

B   Measuring the value of debt aversion

The evidence supporting the influence of labeling debt aversion in questions 1–4 leads to an attempt to measure the monetary value it might have. We report in this section the results of asking survey participants to choose between a fixed payment and an income contingent contract. In this case, the only difference between the treatment and control groups is the label of the contract. The treatment group saw the fixed payment contract labeled as "debt" whereas the control group saw the fixed payment contract labeled as a "different contract". We test whether the average fixed payment each group is willing to make differs between groups.

The contingent contract states a maximum that the person will have to pay monthly. We report the results as a proportion of these monthly maximum. Panel A of Table XI shows the average payment for the total sample, and differentiated by treatment and control groups for the four related questions (i.e., questions 5–8). This table provides evidence that some respondents did not understand the question, since the reported average monthly payment is over 100% of the maximum in the contingent contract. The fact that the average reported values in the first question asked are substantially larger than in the other questions bring even more evidence that some people did not understand the questions properly.[15]

Panel B of table XI shows the average payment when we restrict the sample to students who answer values lower or equal to 100%. The restricted sample excludes, depending on the question, 16 to 29% of the full sample.[16] The third column shows that students place some premium to avoid contracts labeled as debt, although the estimated values are only statistically significant for questions 7 and 8.

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[15]People were not allowed to revise their decisions in the previous question after they moved on to the next question.

[16]These results are available upon request.

Table XII pools all the data from the four questions to estimate the premium to avoid a contract labeled as debt, as in equation (2). Three different specifications of the model are used, depending on the controls added in the regression. Specification 1 summarizes the findings for the model stated in equation (2). We find that respondents in the treatment group were, on average willing to pay 3.97% less per month than people in the control group, significant at the 5% level. Again, we find that the treatment coefficient is relatively precise and very stable around 4%, and significant at the 5% level. The result for the best specification implies that people are willing to pay 4.5% more per month to avoid a contract labeled as debt.

The estimates of the premium to avoid a contract labeled as debt are positive and statistically significant. Taking the results altogether, there is evidence of debt aversion, mainly due to labeling effects. Given these results, further attempts to estimate a monetary value of the impact of debt aversion becomes relevant in order to draw welfare and policy implications.

IV   Discussion of results

The results presented in this paper support the hypothesis that debt aversion affects financing decisions when considering a large investment. When financing their higher education, respondents shy away from a debt contract, particularly because of the label. In this section we discuss some potential drawbacks of our experimental approach, and suggest future research related to our findings.

A potential problem with our specification is the different wording used to describe debt. In English they correspond to "debt" and "loan". Informally, when one talks about types of financing, ones talks about debt, whereas the actual contract is a loan. Our survey reflected these differences. When asked to choose between financially equivalent contracts, the actual label was "loan", whereas the questions that referred to the fixed payment included the word "debt". An alternative hypothesis is that loan aversion is different from debt aversion. Further study allowing for this difference would shed light on this question.

One practical constraint experienced in this study was its small sample size. The experiment was designed with this restriction in mind. For instance, our goal of identifying differences in the preference for one type of contract over another led us to ask questions in the same order across respondents. However, the order of the questions may be an important determinant of students' answers. If so, then our estimates would be biased. With a larger sample size, randomizing the order of the questions would allow us to control for this issue.

Moreover, before asking students for their preference we could have asked them whether they understand that the contracts they are asked to choose from are financially equivalent. On the one hand, including such question will shed more light on the reason students are observed to have debt aversion. On the other hand, the inclusion of such question will be artificial in the sense that in the real world setting students make decisions without the financial implications being spelled-out for them.

An important shortcoming of this experimental design is that it is a survey, so students are not actually choosing a financial instrument in a real transaction. Research in this direction could provide evidence on the extent to which the findings of this paper hold in a real financial transaction.

Another avenue of future research is to measure the consequences of the debt aversion be-

havior found in this paper. Not only students may decide to not invest in education because of such debt aversion, but also, conditional on accepting a loan, they may change other behaviors due to their debt aversion, which may lead to unanticipated long-term consequences.

Finally, more broadly, it would be useful to see if the findings of this paper are also prevalent in other investment decisions agents make.

V Conclusion

Standard utility theory predicts that investment and financing decisions depend only on the characteristics of the payoffs of the investment. In particular, the label or framing of a particular financing vehicle should not affect its value. We test whether the labeling and framing of "debt" among a population for whom the financing decision was recent and important affects its perceived value. We find that both labeling and framing impact the attractiveness of a financial contract. Labeling a contract as a "loan" decreases its probability of being chosen over a financially equivalent contract by more than 8%. We also provide evidence that students are willing to pay a premium of about 4% of the financed value to avoid a contract labeled as debt.

Our analysis sheds new light on different aspects of perceptions with respect to debt since our design disentangles two types of debt aversion: one that has been studied before in the literature, which encompasses both framing and labeling effects, and another that controls for framing effects and identifies only what we denote labeling debt aversion. The results suggest that participants in the experiment exhibit debt aversion, and most of the debt aversion is due to labeling effects.

These perceptions can prevent agents from choosing an optimal portfolio or from un-

dertaking attractive investment opportunities, such as in education. More generally, these perceptions act as self-imposed borrowing constraints, reducing agent's welfare and potentially affecting asset-prices. They can explain why apparently profitable investments like higher education are not pursued more widely, or why most investors do not participate actively in markets for risky assets. Ultimately, a better understanding of the perceptions agents have about financial assets should lead to better understanding of the drivers of household investment, borrowing, and indirectly, asset prices.

References

Angrist, Joshua D., and Alan B. Krueger, 1991, Does compulsory school attendance affect schooling and earnings?, *The Quarterly Journal of Economics* 106, 979–1014.

Ashenfelter, Orley, and Alan Krueger, 1994, Estimates of the economic return to schooling from a new sample of twins, *The American Economic Review* 84, 1157–1173.

Barr, Nicholas, 2001, *The welfare state as piggy bank: information, risk, uncertainty, and the role of the state* (Oxford University Press, USA).

Becker, Gary S., 1964, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education, by Gary S. Becker,...* (London).

Beshears, John, James J. Choi, David Laibson, and Brigitte C. Madrian, 2008, The importance of default options for retirement saving outcomes: Evidence from the usa, *Lessons from Pension Reform in the Americas* p. 59.

Card, David, 1999, The causal effect of education on earnings, *Handbook of labor economics* 3, 1801–1863.

——— , 2001, Estimating the returns to schooling: progress on some persistent econometric problems, *Econometrica* 69, 1127–1160.

Carneiro, Pedro, and James J. Heckman, 2002, The evidence on credit constraints in post-secondary schooling*, *The Economic Journal* 112, 705–734.

Choi, James J., David Laibson, and Brigitte C. Madrian, 2011, $100 bills on the sidewalk: Suboptimal investment in 401 (k) plans, *The Review of Economics and Statistics* 93, 748–763.

Constantinides, George M., John B. Donaldson, and Rajnish Mehra, ????, Junior can't borrow: A new perspective on the equity premium puzzle, .

Eckel, Catherine C., Cathleen Johnson, Claude Montmarquette, and Christian Rojas, 2007, Debt aversion and the demand for loans for postsecondary education, *Public Finance Review* 35, 233–262.

Field, Erica, 2009, Educational debt burden and career choice: Evidence from a financial aid experiment at NYU Law School, *American Economic Journal: Applied Economics* 1, 1–21.

Friedman, Milton, 1955, The role of government in public education, *Economics and the public interest* pp. 123–153.

Guiso, Luigi, Tullio Jappelli, and Danielle Terlizzese, 1996, Income risk, borrowing constraints, and portfolio choice, *The American Economic Review* 86, 158–172.

Kahneman, Daniel, and Amos Tversky, 1979, Prospect theory: An analysis of decision under risk, *Econometrica* pp. 263–291.

Mincer, Jacob, 1974, *Schooling, Experience, and Earnings. Human Behavior & Social Institutions No. 2.* (National Bureau of Economic Research, Inc., 261 Madison Ave., New York, New York 010016).

Odean, Terrance, 1998, Are investors reluctant to realize their losses?, *Journal of Finance* 53, 1775–1798.

Palacios, Miguel, 2004, *Investing in human capital: a capital markets approach to higher education funding* (Cambridge: Cambridge University Press).

Palacios-Huerta, Ignacio, 2003, An empirical analysis of the risk properties of human capital returns, *American Economic Review* 93, 948–964.

Patrinos, Harry A., and George Psacharopoulos, 2004, Returns to investment in education: a further update, *Education economics* 12, 111–134.

Rasmussen, Christopher J., 2006, Effective cost-sharing models in higher education: insights from low-income students in Australian universities, *Higher Education* 51, 1–25.

Zhang, Harold H., 1997, Endogenous borrowing constraints with incomplete markets, *Journal of Finance* 52, 2187–2209.

VI   Appendix: Survey Questions

Below are the relevant questions that respondents answered in the survey. Other questions referring to respondents demographics, education, family background, and future income and employment expectations are not shown below (but available upon request). We highlight a few words below to emphasize differences between the control and treatment surveys. The original surveys were not highlighted. We also give a title to each question for the reader's convenience; the original survey questions did not have a title.

Question 1: Choosing between two financially equivalent contracts

Suppose you need $10,000 to finance a one year program. In one year you will join the workforce. How do you prefer to finance your education?

Control	Treatment
60 monthly payments of **$200**. If in any month your income is below **$2,000**, then you only have to pay 10% of your income in that month.	**Loan:** 60 monthly payments of **$200**. If in any month your income is below **$2,000**, then you only have to pay 10% of your income in that month.
60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.	**Human Capital Contract:** 60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.
Indifferent	**Indifferent**

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Question 2: Choosing between a Human Capital Contract and a loan with flexible payments

The Human Capital Contract is financially worse than the flexible loan.

Suppose you need $10,000 to finance a one year program. In one year you will join the workforce. How do you prefer to finance your education?

Control	Treatment
60 monthly payments of **$180**. If in any month your income is below **$1,800**, then you only have to pay 10% of your income in that month.	**Loan:** 60 monthly payments of **$180**. If in any month your income is below **$1,800**, then you only have to pay 10% of your income in that month.
60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.	**Human Capital Contract:** 60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.
Indifferent	**Indifferent**

Question 3: Choosing between a Human Capital Contract and a loan with flexible payments

The Human Capital Contract is financially better than the flexible loan.

Suppose you need $10,000 to finance a one year program. In one year you will join the workforce. How do you prefer to finance your education?

Control	Treatment
60 monthly payments of **$220**. If in any month your income is below **$2,200**, then you only have to pay 10% of your income in that month.	**Loan:** 60 monthly payments of **$220**. If in any month your income is below **$2,200**, then you only have to pay 10% of your income in that month.
60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.	**Human Capital Contract:** 60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 in that month.
Indifferent	Indifferent

Question 4: Identical to question 1, asked after respondents were made aware that the two contracts had the same payoffs

Question 5: Fixed payments versus a Human Capital Contract
1-year financing

Suppose you need $10,000 to finance a 1-year program. In 1-year you will join the workforce.

To finance the $10,000, Lumni has offered you a human capital contract. The contract states that you will make 60 monthly payments equal to 10% of your income. If in any month your income is larger than $2,000, then you only have to pay $200 that month.

Control	Treatment
Besides the human capital contract, another entity offered you a **different** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **alternative** contract?	Besides the human capital contract, another entity offered you a **debt** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **debt** contract?

Question 6: Fixed payments versus a loan with flexible payments
1-year financing

Suppose you need $10,000 to finance a 1-year program. In 1-year you will join the workforce. To finance the $10,000, a financial institution has offered you a flexible debt. The debt states that you will make 60 monthly payments of $200. If in any month your income is less than $2,000, then you only need to pay 10% of your income that month.

Control	Treatment
Besides the flexible debt, another entity offered you a **different** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the flexible debt and the **alternative** contract?	Besides the flexible debt, another entity offered you a **debt** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **debt** contract?

Question 7: Fixed payments versus a Human Capital Contract
2-year financing

Suppose you need $20,000 to finance a 2-year program. In two years you will join the workforce.

To finance the $20,000, Lumni has offered you a Human Capital Contract. The contract states that you will make 60 monthly payments equal to 15% of your income. If in any month your income is larger than $3,000, then you only have to pay $450 that month.

Control	Treatment
Besides the human capital contract, another entity offered you a **different** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **alternative** contract?	Besides the human capital contract, another entity offered you a **debt** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **debt** contract?

Question 8: Fixed payments versus a loan with flexible payments
2-year financing

Suppose you need $20,000 to finance a 2-year program. In two years you will join the workforce.

To finance the $20,000, a financial institution has offered you a flexible debt. The debt states you will make 60 monthly payments of $450. If in any month your income is less than $3,000, then you will only have to pay 15% of your income.

Control	Treatment
Besides the flexible debt, another entity offered you a **different** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the flexible debt and the **alternative** contract?	Besides the flexible debt, another entity offered you a **debt** contract. The contract states that you will make 60 monthly payments of $X dollars. What value of X would make you indifferent between the human capital contract and the **debt** contract?

Table I
Loan Parameters used in the Questions

This table shows the parameters used for all the questions across countries. The values are different across countries to reflect the fact that the education costs in these countries are different. Panel A shows the amounts in local currency and Panel B shows the amounts in U.S. dollars.

Panel A: Amounts in Local Currency

Variable	Colombia	Chile	Mexico
Financed Amount - 1 year	$6,000,000.00	$3,500,000.00	$52,000.00
Cap - 1 year	$1,200,000.00	$700,000.00	$10,400.00
Monthly Payment with Cap - 1 year	$120,000.00	$70,000.00	$1,040.00
Financed Amount in Local Currency - 2 years	$12,000,000.00	$7,000,000.00	$104,000.00
Cap - 2 years	$1,800,000.00	$1,050,000.00	$15,600.00
Monthly Payment with cap- 2 years	$270,000.00	$157,500.00	$2,340.00

Panel B: Amounts in U.S. Dollars

Variable	Colombia	Chile	Mexico
Financed Amount - 1 year	$3,024.94	$6,693.18	$4,146.73
Cap - 1 year	$604.99	$1,338.64	$829.35
Monthly Payment with Cap - 1 year	$60.50	$133.86	$82.93
Financed Amount in Local Currency - 2 years	$6,049.88	$13,386.36	$8,293.46
Cap - 2 years	$907.48	$2,007.95	$1,244.02
Monthly Payment with cap- 2 years	$136.12	$301.19	$186.60

Table II
Summary Statistics

This table shows the descriptive statistics for the subsample that answered the study's relevant questions (questions 1 – 8). We show results differentiated by treatment and control groups in columns 1 and 2, and the difference between groups in column 3.

The variables used are: age, male indicator, student status indicator, country, indicator for the presence of children, married indicator, an indicator for whether the mother of the respondent has an education degree equal or higher than high school, an indicator for whether the father of the respondent has an education degree equal or higher than high school.

	Treatment N=378		Control N=389		Difference N=767	
	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Age	23.4418	0.2625	23.5039	0.2705	-0.0621	0.3772
Male	0.5423	0.0257	0.5476	0.0253	-0.0052	0.0360
Student	0.6931	0.0238	0.7172	0.0229	-0.0241	0.0330
Colombia	0.6058	0.0252	0.5861	0.0250	0.0197	0.0355
Mexico	0.2884	0.0233	0.2828	0.0229	0.0056	0.0327
Chile	0.1058	0.0158	0.1311	0.0171	-0.0253	0.0234
Children	0.0794	0.0139	0.0951	0.0149	-0.0158	0.0204
Married	0.0688	0.0130	0.0643	0.0124	0.0045	0.0180
Mother Education	0.7037	0.0235	0.7018	0.0232	0.0338	0.0252
Father Education	0.6667	0.0242	0.6427	0.0243	0.024	0.0343

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table III
Questions 1–3: Responses

Respondents were asked to state whether they preferred a loan, an HCC, or whether they were indifferent. This table reports the proportion of students who chose each alternative in the questions that compared equivalent contracts, two contracts in which the loan dominates the HCC, and two contracts in which the HCC dominates the loan (questions 1, 2 and 3, respectively). For each question we include in the sample all the respondents who answered that question.

Question	Alternative	Treatment	Control	N
Equivalent	Loan	0.3708	0.4060	
	HCC	0.5064	0.4286	790
	Indifferent	0.1228	0.1654	
Loan dominates	Loan	0.4212	0.4962	
	HCC	0.4884	0.3836	778
	Indifferent	0.0904	0.1202	
HCC dominates	Loan	0.3532	0.3795	
	HCC	0.5636	0.5128	775
	Indifferent	0.0831	0.1077	

Table IV
Questions 1–3: Cross-Section and Panel Regressions

Panel A estimates framing and labeling debt aversion when choosing between two different contracts (questions 1–3) for each question separately. Panel B combines answers from questions 1–3 using a panel, as in equation (1). The dependent variable in both panels is the variable $Loan_{i,j}$, where $Loan_{i,j} = 1$ if student i chooses the Debt in question j, $Loan_{i,j} = -1$ if the HCC is chosen instead, and $Loan_{i,j} = 0$ if the option "indifferent" is chosen.

Panel A: Cross-Sectional Regression

	Equivalent Alternatives N=790		Loan better N=778		HCC better N=775	
	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Treatment	-0.1355***	(0.0469)	-0.0672	(0.0484)	-0.2104***	(0.0477)
Control	-0.0226	(0.0458)	0.1125***	(0.0472)	-0.1333**	(0.0474)
Difference	-0.1130*	(0.0655)	-0.1797***	(0.0676)	-0.0771	(0.0672)

Panel B: Panel Regression

	Specification 1		Specification 2		Specification 3	
			N=2343			
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**-0.118****	**0.0545**	**-0.115****	**0.0544**	**-0.114****	**0.0544**
Constant	**-0.0202**	**0.0422**	**-0.0217**	**0.0472**	**-0.128**	**0.1780**
Loan Better	0.101***	0.0333	0.101***	0.0333	0.101***	0.0333
HCC Better	-0.0954***	0.0329	-0.0954***	0.0329	-0.0956***	0.0330
Mexico			-0.0441	0.0632	-0.0233	0.0873
Chile			0.108	0.0850	0.128	0.0943
Age					0.00586	0.0072
Male					-0.0441	0.0549
Student					0.0818	0.0651
Children					-0.142	0.1110
Married					0.0585	0.1280
Mother Education					0.00463	0.0744
Father Education					-0.105	0.0732

* 10% Significance Level
** 5% Significance Level
*** 1% Significance Level

Table VII
Choosing between two contracts (questions 1–3):
Multinomial Logit Regression

This table reports the marginal effects of a multinomial logit regression. The dependent variable is the variable $Loan_{i,j}$, where $Loan_{i,j} = 1$ if student i chooses the Debt in question j, $Loan_{i,j} = -1$ if the HCC is chosen instead, and $Loan_{i,j} = 0$ if the option "indifferent" is chosen. The coefficients should be interpreted as the marginal effect on the probability of choosing the alternative labeled in the column.

	HCC		Indifferent		Loan	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**0.0762*****	**(0.0208)**	**-0.0314****	**(0.0129)**	**-0.0448****	**(0.0205)**
Loan Better	-0.0349	(0.0255)	-0.0337**	(0.0139)	0.0686***	(0.0252)
HCC Better	0.0689***	(0.0255)	-0.0436***	(0.0138)	-0.0253	(0.0251)
Mexico	0.00303	(0.0325)	0.0184	(0.0206)	-0.0214	(0.0318)
Chile	-0.0512	(0.0360)	-0.0268	(0.0202)	0.0780**	(0.0362)
Age	-0.00391	(0.00278)	0.00149	(0.00168)	0.00242	(0.00272)
Male	0.0122	(0.0211)	0.0221*	(0.0129)	-0.0342*	(0.0208)
Student	-0.0330	(0.0246)	-0.0169	(0.0154)	0.0499**	(0.0239)
Children	0.0690	(0.0429)	0.00315	(0.0273)	-0.0722*	(0.0403)
Married	-0.0176	(0.0475)	-0.0229	(0.0243)	0.0404	(0.0477)
Mother Education	-0.0229	(0.0280)	0.0444***	(0.0154)	-0.0215	(0.0275)
Father Education	0.0643**	(0.0274)	-0.0248	(0.0181)	-0.0396	(0.0272)
Observations	2,343		2,343		2,343	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table V
Choosing between two contracts (questions 1–3):
Binary Panel Regression

Panel Regression - $Loan_{i,j} = 1$ if student i chooses $Debt$ in question j. The variable takes 0 otherwise.

	Specification 1		Specification 2		Specification 3	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**-0.0421**	**(0.0285)**	**-0.0408**	**(0.0285)**	**-0.0401**	**(0.0284)**
Loan Better	0.0699***	(0.0181)	0.0699***	(0.0181)	0.0697***	(0.0181)
HCC Better	-0.0232	(0.0171)	-0.0232	(0.0171)	-0.0233	(0.0172)
Mexico			-0.0402	(0.0328)	-0.0215	(0.0450)
Chile			0.0634	(0.0453)	0.0782	(0.0499)
Age					0.00226	(0.00371)
Male					-0.0333	(0.0287)
Student					0.0498	(0.0337)
Children					-0.0750	(0.0581)
Married					0.0426	(0.0660)
Mother Education					-0.0185	(0.0388)
Father Education					-0.0423	(0.0387)
Constant	0.409***	(0.0227)	0.413***	(0.0254)	0.380***	(0.0914)
Observations	2,343		2,343		2,343	
Number of id	790		790		790	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table VI
Choosing between two contracts (questions 1–3):
Panel Regression

Panel Regression - $Loan_{i,j} = 1$ if student i chooses HCC in question j. The variable takes 0 otherwise.

	Specification 1		Specification 2		Specification 3	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**0.0755***	**(0.0292)**	**0.0746**	**(0.0291)**	**0.0735**	**(0.0291)**
Loan Better	-0.0312*	(0.0169)	-0.0311*	(0.0169)	-0.0310*	(0.0169)
HCC Better	0.0722***	(0.0179)	0.0722***	(0.0179)	0.0723***	(0.0179)
Mexico			0.00389	(0.0341)	0.00180	(0.0474)
Chile			-0.0444	(0.0445)	-0.0500	(0.0498)
Age					-0.00360	(0.00401)
Male					0.0108	(0.0293)
Student					-0.0320	(0.0350)
Children					0.0665	(0.0601)
Married					-0.0160	(0.0689)
Mother Education					-0.0231	(0.0395)
Father Education					0.0624	(0.0386)
Constant	0.430***	(0.0227)	0.434***	(0.0254)	0.508***	(0.0981)
Observations	2,343		2,343		2,343	
Number of id	790		790		790	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table VIII
Measuring the Cost of Debt Aversion (Questions 1–3): Ordered Probit Regression

This table reports the marginal effects of an ordered probit regression. The dependent variable is the variable $Loan_{i,j}$, where $Loan_{i,j} = 1$ if student i chooses the Debt in question j, $Loan_{i,j} = -1$ if the HCC is chosen instead, and $Loan_{i,j} = 0$ if the option "indifferent" is chosen. The coefficients should be interpreted as the marginal effect on the probability of choosing the alternative labeled in the column.

	HCC		Indifferent		Loan	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Loan						
Treatment	**0.0608*****	**(0.0197)**	**-0.00172****	**(0.000720)**	**-0.0591*****	**(0.0191)**
Loan Better	-0.0508**	(0.0239)	0.00112**	(0.000528)	0.0497**	(0.0235)
HCC Better	0.0495**	(0.0241)	-0.00169	(0.00104)	-0.0478**	(0.0232)
Mexic	0.00910	(0.0307)	-0.000270	(0.000957)	-0.00883	(0.0297)
Chile	-0.0654*	(0.0339)	0.000656	(0.000557)	0.0647*	(0.0342)
Age	-0.00312	(0.00261)	8.81e-05	(7.73e-05)	0.00303	(0.00254)
Male	0.0228	(0.0200)	-0.000626	(0.000558)	-0.0222	(0.0194)
Student	-0.0410*	(0.0233)	0.00141	(0.000990)	0.0395*	(0.0224)
Student	0.0726*	(0.0408)	-0.00359	(0.00292)	-0.0691*	(0.0380)
Married	-0.0271	(0.0448)	0.000535	(0.000534)	0.0266	(0.0443)
Mother Education	-0.000272	(0.0264)	7.68e-06	(0.000749)	0.000264	(0.0257)
Father Education	0.0525**	(0.0260)	-0.00117**	(0.000576)	-0.0513**	(0.0255)
Observations	2,343		2,343		2,343	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table IX
Results after knowledge of financial equivalence of contracts (question 4):
Cross Section Regression

This table estimates the framing and labeling debt aversion after respondents are told that alternatives in the first question were financially equivalent. The dependent variable is the $Loan_{i,4}$, where $Loan_{i,4} = 1$ if student i chooses the Debt in question 4, $Loan_{i,4} = -1$ if the HCC is chosen instead, and $Loan_{i,4} = 0$ if the option "indifferent" is chosen.

	Specification 1		Specification 2		Specification 3	
			N=767			
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**-0.189***	**0.0667**	**-0.185***	**0.0667**	**-0.183***	**0.0669**
Constant	**-0.0231**	**0.0464**	**-0.0100**	**0.0548**	**0.2600**	**0.2190**
Mexico			-0.0941	0.0743	0.0423	0.0995
Chile			0.1020	0.1070	0.1770	0.1150
Age					-0.0101	0.0088
Male					-0.132*	0.0673
Student					0.115	0.0773
Children					-0.0290	0.1440
Married					-0.1340	0.1510
Mother Education					-0.1340	0.0912
Father Education					0.0018	0.0897

* 10% Significance Level
** 5% Significance Level
*** 1% Significance Level

Table X
Results after knowledge of financial equivalence of contracts (question 4): Multinomial Logit Regression

This table reports the marginal effects of a multinomial logit regression based on the results of question 4, where respondents are told that the two alternatives are financially equivalent. The dependent variable is $Loan_{i,4}$, where $Loan_{i,4} = 1$ if the student i chooses the Debt in question 4, $Loan_{i,4} = -1$ if the HCC is chosen instead, and $Loan_{i,4} = 0$ if the option "indifferent" is chosen. The coefficients should be interpreted as the marginal effect on the probability of choosing the alternative labeled in the column.

	HCC		Indifferent		Loan	
	N=767					
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**0.1299***	**0.0361**	**-0.0742***	**0.0233**	**-0.0557**	**0.0354**
Mexico	-0.0412	0.0571	0.0449	0.0404	-0.0037	0.0562
Chile	-0.0945	0.0632	0.0080	0.0425	0.0865	0.0640
Age	0.0048	0.0049	0.0005	0.0033	-0.0053	0.0048
Male	0.0502	0.0370	0.0348	0.0229	-0.0850***	0.0360
Student	-0.0620	0.0428	0.0035	0.0260	0.0585	0.0413
Children	0.0494	0.0762	-0.0695**	0.0333	0.0200	0.0752
Married	-0.0545	0.0826	0.0558	0.0627	-0.0012	0.0835
Mother Education	0.0474	0.0490	0.0416	0.0286	-0.0890*	0.0482
Father Education	0.0057	0.0484	-0.0112	0.0319	0.0055	0.0465

* 10% Significance Level
** 5% Significance Level
*** 1% Significance Level

Table XI
Measuring the Cost of Debt Aversion (Questions 5–8): Responses

This table reports the answers for questions in which respondents were asked the value of a fixed payment that would make them indifferent between the fixed payment and a given income-contingent contract (questions 5 through 8). The value is measured as a proportion of the maximum monthly payment of the income-contingent contract in each question. A choice of $X > 1$ is not "rational" in the sense that it implies the respondent prefers to pay X for sure instead of a random amount which is always less than X. Thus, Panel A shows the results for all sample, and panel B shows the results for students who responded $X \leq 1$ only.

Panel A: Respondents of Questions 5-8

Question	N	Treatment Mean	Treatment Std. Error	N	Control Mean	Control Std. Error	Difference Mean	Difference Std. Error
Question 5	378	24.237	22.043	389	2.412***	0.801	21.816	21.74
Question 6	378	1.988***	0.377	389	1.729***	0.339	0.258	0.508
Question 7	378	1.863***	0.361	389	1.546***	0.244	0.316	0.434
Question 8	378	1.627***	0.324	389	2.025***	0.7196	-0.397	0.797

Panel B: Only Respondents with $X \leq 1$

Question	N	Treatment Mean	Treatment Std. Error	N	Control Mean	Control Std. Error	Difference Mean	Difference Std. Error
Question 5	268	0.742***	0.018	285	0.776***	0.016	-0.034	0.024
Question 6	298	0.656***	0.020	323	0.665***	0.020	-0.008	0.028
Question 7	292	0.678***	0.017	300	0.729***	0.016	-0.0502**	0.023
Question 8	310	0.674***	0.016	328	0.735***	0.015	-0.060***	0.022

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table XII
Measuring the Cost of Debt Aversion (Questions 5–8): Panel Regression

This table shows the panel regression results of the fixed payment that would make respondents indifferent between the fixed payment and a given income-contingent contract (questions 5 through 8), following equation (2). The dependent variable is X as a proportion of the monthly fixed payment that will make the respondent indifferent in each question.

	Specification 1		Specification 2		Specification 3	
			N=2404			
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	**-0.0397****	**0.0189**	**-0.0431****	**0.0184**	**-0.0448*****	**0.0183**
Question 5	0.782***	0.0147	0.786***	0.0163	0.621***	0.0649
Question 6	-0.0976***	0.0139	-0.0959***	0.0139	-0.0960***	0.0139
Question 7	-0.0554***	0.0111	-0.0553***	0.0111	-0.0555***	0.0112
Question 8	-0.0578***	0.0111	-0.0577***	0.0111	-0.0576***	0.0111
Mexico			0.0607***	0.0231	0.0124	0.0290
Chile			-0.153***	0.0210	-0.195***	0.0251
Age					0.00602**	0.0026
Male					0.0014	0.0182
Student					0.0173	0.0224
Children					-0.0642	0.0465
Married					-0.0851	0.0569
Mother Education					0.0251	0.0253
Father Education					0.0361	0.0244

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level