Measuring Aversion to Debt

An Experiment among Student Loan Candidates

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July 2011

Abstract

This paper reports the results of an experiment designed to test for the presence of debt aversion. The population who participated in the experiment were recent financial aid candidates and the experiment focused on student loans. The goal is to shed new light on different aspects of the perceptions with respect to debt. These perceptions can prevent agents from choosing an optimal portfolio or from undertaking attractive investment opportunities, such as in education. The study design disentangles two types of debt aversion: one that is studied in the previous 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. Labeling a contract as a “loan” decreases its probability of being chosen over a financially equivalent contract by more than 8 percent. The analysis also provides evidence that students are willing to pay a premium of about 4 percent of the financed value to avoid a contract labeled as debt.

This paper is a product of the Education Team, Human Development Network. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at hpatrinos@worldbank.org.

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Measuring Aversion to Debt: An Experiment among Student Loan Candidates*

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JEL codes: *I22, J24, G11*

Keywords: *debt aversion, educational finance, human capital, investment decisions, student loans*

*We thank Juan David Herreño for valuable research assistance, the World Bank for providing funding for this project, and Lumni Inc. for conducting the surveys. We are grateful to seminar participants at the Australian National University, the University of Naples Federico II, the Darden School (University of Virginia), the University of Leicester and the World Bank for valuable suggestions and comments.

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1 Introduction

Borrowing constraints may have a large impact on an individual’s investment—in tradeable assets and, notably, in education and in other forms of human capital. On the aggregate, borrowing constraints may also have a large impact on asset prices. Several explanations have been given for why borrowing constraints exist, ranging from asymmetric information to legal barriers (for example, Zhang (1997)). In this paper we investigate a different source of borrowing constraints: a psychological aversion to debt on the part of potential borrowers. We define debt aversion as the unwillingness to enter into a financial contract framed as debt relative to a financially equivalent contract framed as an income contingent contract. Such unwillingness is a violation of rational behavior (the agent should be indifferent) and implies that agents could be taking a suboptimal amount of debt.

Investments in education are a natural place to look for debt aversion. Pursuing a higher education degree is one of the largest investment decisions that most individuals face. The investment appears to offer large risk-adjusted returns (Card (1999), Psacharopoulos and Patrinos (2004), and Palacios-Huerta (2003)), so missing the opportunity to pursue a higher education degree can potentially have large welfare consequences. Students also typically need to finance their education, so that borrowing constraints are likely to affect their investment decision. Thus, our analysis focuses on a population where the presence of debt aversion is particularly relevant.

This study takes previous research one step further by taking a finer look at the sources of debt aversion. A student’s aversion could stem from the characteristics of the contract, the framing of the contracts offered to them, or from a negative perception associated with the words “debt” or “loan”. Whereas we do not address an aversion due to the characteristics of the contract, we focus on aversion due to the framing of the contract and due to a negative perception associated with these words. We suggest two measures of debt aversion, one comparable to the previous literature, which encompasses both framing and labeling effects, and another that only captures labeling effects. We denote the latter *labeling debt aversion*. We report these measures of debt aversion among a diverse population of students who are seeking ways to finance their education. To our knowledge, this is the first study to measure debt aversion among a non-U.S. student and recent graduate population and the first one to disentangle the sources of debt aversion into framing and labeling effects.

We conducted surveys in three Latin American countries: Chile, Colombia and Mexico. People were asked to choose between contracts that were framed as debt or as an income-contingent contract.¹ 1422 persons answered the survey, of which 767 responded

¹The population consisted of students and alumni who had applied for financial aid through Lumni

to the questions most relevant to this study. We randomly assigned the 1422 respondents to a treatment or a control group.² 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 HCC and loan 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 HCC in the treatment group with respect to the control group, analogously to a difference-in-differences design.

Next, we attempt 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 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, on a finer test of the debt aversion hypothesis, 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

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 2011, Lumni had financed approximately 1,800 students and had twice as many applications in the four countries mentioned above. Palacios, one of the authors of this study, is a co-founder and the second largest shareholder in Lumni Inc.

²Table 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.

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 3 explains in more detail the survey methodology and the identification strategy. Section 4 presents and discusses the results, and section 5 concludes.

2 Literature Review

Credit frictions have 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 (1993) 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 50% or higher.³ 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 be underinvesting in education, particularly in developing countries.⁴ 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

³Ability 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).

⁴There is also ample evidence of underinvestment on education because of credit constraints in developed countries (e.g., Carneiro and Heckman (2002))

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 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 of education is of particular importance.

3 Survey Description

This section describes the survey and the population in detail, emphasizing the research design used to identify and label 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 description 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 7.⁵ Out of the 1422 respondents, only 767 responded the eight relevant questions, and throughout the paper we focus on this sample.⁶

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 9. The survey was conducted in Spanish and the original text is available upon request.

3.1 Survey Questions and Identification Strategy

3.1.1 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 (i.e., question 1). The

⁵The 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.

⁶We provide evidence in the next section that this subsample 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.

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.

We also asked a similar question when the loan contract is better than the HCC contract (i.e., question 2) and when the loan contract is worse than the HCC contract (i.e., question 3).⁷ 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.

3.1.2 Questions 4–7: 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 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 questions 4 through 7 we offered people two contracts: in a capped contract, one pays monthly an

⁷A 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.

amount that cannot be more than \$200 and depending of the future income can be less than that.⁸ 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 lower X than respondents in the control group.

3.2 Panel Regressions

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 treatment and control group as previously stated.

3.2.1 Questions 1–3

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

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

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).

In equation (1), α_1 identifies debt aversion due to the framing effect, and ϕ identifies

⁸The number \$200 changes across countries as discussed above.

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).

3.2.2 Questions 4–7

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:

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

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.

4 Data and Results

Table 1 shows demographic characteristics of people based on their treatment status. People are on average 24 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 1022 respondents and due to the fact that the difference in the questions across groups is likely to not have generated further selection problems.

4.1 Testing for the Existence of Debt Aversion

We begin with an analysis of respondents' choices between financially equivalent contracts framed or labeled differently. Table 2 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 3 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 suggest that the debt aversion due to framing effects is small. The difference-in-differences estimate, 11%, suggest that most of the debt aversion is due to labeling effects.

Table 2 and the first panel of Table 3 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.

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 3 summarizes the results for this model.

The first column of Table 3 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 $-.032$, 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 -0.131 and is significant at the 5% level. This coefficient means that a respondent who sees the contracts labeled as “loan” and “HCC” is 13.1 percent 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 3 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 $-.163$, implies that survey participants were 16% more likely to prefer an HCC over an income-contingent loan, even though these two contracts are financially equivalent.

The coefficient of “Loan Better” (0.120) 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 (-0.076) also has the expected sign and is significant at the 1% level.

The second and third specifications of Table 3 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.

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 4 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. 8% people choose HCC because of labeling debt aversion. If the options did not have the label debt, then about 50% of these 8% students (4.19%) would have chosen indifference and the other 50% (4.73%) would have chosen the loan. Moreover, the sign of the coefficients of “Loan Better” and of “HCC Better” are consistent.

The previous results might be a function of respondents not realizing that the contracts they were choosing from were financially equivalent. To better understand what drives debt aversion, we make explicit to respondents that the contracts they are choosing from are equivalent, and ask again for their preference. Tables 5 and 6 analyze the results. We repeat the analysis of questions 1 through 3, both the linear regression and the multinomial logit model, but this time only using the information from question 4, where the students know that both the “HCC” and the “Loan” options are equivalent. Table 5 reports the results on the linear regression where $Loan_{i,4}$ is the dependent variable, and the right-side variables are the treatment effects and additional control variables.

In 5 we find that the treatment coefficient is equal to -0.18 and is significant at the 1% level. This coefficient means that a respondent who sees the contracts labeled as “loan” and “HCC” is 18 percentage points more likely to prefer the HCC than a respondent who had no labels associated with the contracts but had exactly the same wording even though the respondent has been told that the contracts are equivalent. Among the additional control variables only the gender of the respondent is significant at a 10% level.

Table 6 reports the marginal effects on the probability of choosing one of the three alternatives presented. We find that a person who sees the contracts labeled as “Loan” and “HCC” is 12.99 percentage points more likely to prefer the “HCC”, 7.42 percentage points less likely to be indifferent between the alternatives and 5.57 percentage points less likely to prefer the “Loan”. These results are significant at the 1% level, except preference for the “Loan”, which is not significant.

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.

4.2 Measuring the Value of Debt Aversion

The evidence supporting the influence of labeling debt aversion in questions 1–3 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 7 shows the average payment for the total sample, and differentiated by treatment and control groups for the four related questions (i.e., questions 4–7). 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 people did not understand the questions properly.⁹

Panel B of Table 7 shows the average payment when we restrict the sample to students who answer values lower or equal to 100%. The sample was reduced substantially, from 50% to about 80% of the full sample, depending on the question, although the treatment and control groups remain balanced.¹⁰ 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 6 and 7.

Table 8 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 monthly 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 monthly to avoid a contract labeled as debt.

The estimates of the premium to avoid a contract labeled as debt are positive and

⁹People were not allowed to revise their decisions in the previous question after they moved on to the next question.

¹⁰These results are available upon request.

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.

5 Conclusion

The results presented in this paper support the hypothesis that debt aversion affects investment decisions with respect to education. When financing their higher education, students 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

behavior 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.

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6 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

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: 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 5: 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 6: 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 7: 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 1
Summary Statistics

This table shows the descriptive statistics for the subsample that answered 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		Control		Difference	
	N=378		N=389		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	0.024279	0.6427	0.024328	0.024	0.034378

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table 2
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 questions 1, 2 and 3.

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

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

Panel A estimates framing and labeling debt aversion in questions 1–3 for each question separately. Panel B estimates them for questions 1–3 altogether, 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		Loan better		HCC better	
	N=790		N=778		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=3110					
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	-0.1314**	0.0534	-0.1292**	0.0533	-0.1274**	0.0533
Constant	-0.0324	0.0391	-0.0298	0.0444	-0.0479	0.1724
Loan Better	0.1202***	0.0296	0.1201***	0.0296	0.1201***	0.0296
HCC Better	-0.0763***	0.0277	-0.0763***	0.0277	-0.0764***	0.0277
Mexico			-0.0581	0.0613	-0.0089	0.0836
Chile			0.1066	0.0852	0.1400	0.0937
Age					0.0021	0.0071
Male					-0.0646	0.0538
Student					0.0918	0.0627
Children					-0.1171	0.1094
Married					0.0592	0.1233
Mother Education					-0.0278	0.0728
Father Education					-0.0802	0.0718

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table 4
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	
	N=3110					
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Treatment	0.0893***	0.0180	-0.0419***	0.0113	-0.0473***	0.0177
Loan Better	-0.0478**	0.0221	-0.0275**	0.0124	0.0754***	0.0219
HCC Better	0.0563**	0.0221	-0.0374***	0.0123	-0.0188	0.0218
Mexico	-0.0079	0.0282	0.0251	0.0185	-0.0172	0.0276
Chile	-0.0617**	0.0312	-0.0180	0.0186	0.0797**	0.0315
Age	-0.0018	0.0024	0.0013	0.0015	0.0005	0.0024
Male	0.0213	0.0183	0.0255**	0.0113	-0.0468***	0.0180
Student	-0.0401*	0.0213	-0.0120	0.0133	0.0520**	0.0207
Children	0.0649	0.0373	-0.0153	0.0222	-0.0497	0.0356
Married	-0.0252	0.0411	-0.0064	0.0236	0.0316	0.0414
Mother Education	-0.0056	0.0242	0.0439***	0.0137	-0.0383	0.0238
Father Education	0.0499**	0.0238	-0.0217	0.0158	-0.0282	0.0234

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table 5
Question 4: Cross Section Regression

This table estimates the framing and labeling debt aversion in question 4. 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 6
Question 4: Multinomial Logit Regression

This table reports the marginal effects of a multinomial logit regression. 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.

N=767						
	HCC		Indifferent		Loan	
	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 7
Questions 4–7: Responses

This table reports the answers for questions 5 through 8. The value is measured as a proportion of the monthly payment of each question. A choice of $X > 1$ is considered to be from people who did not understand the question, as it suggest they would prefer to pay X for sure instead of something less than X some of the time only. 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: Full Sample								
Question	N	Treatment		N	Control		Difference	
		Mean	Std. Error		Mean	Std. Error	Mean	Std. Error
Question 4	519	20.247	16.133	558	2.543***	0.592	17.704	15.570
Question 5	476	2.283***	0.377	486	1.752***	0.300	0.531	0.481
Question 6	419	2.068***	0.381	432	1.752***	0.300	0.605	0.437
Question 7	394	1.609***	0.312	404	1.975***	0.693	-0.366	0.766

Panel B: Only Respondents with $X \leq 1$								
Question	N	Treatment		N	Control		Difference	
		Mean	Std. Error		Mean	Std. Error	Mean	Std. Error
Question 4	268	0.742***	0.018	285	0.776***	0.016	-0.034	0.024
Question 5	298	0.656***	0.020	323	0.665***	0.020	-0.008	0.028
Question 6	292	0.678***	0.017	300	0.729***	0.016	-0.0502**	0.023
Question 7	310	0.674***	0.016	328	0.735***	0.015	-0.060***	0.022

* 10% Significance Level

** 5% Significance Level

*** 1% Significance Level

Table 8
Questions 4–7: Panel Regression

This table shows the panel regression results with regard to questions 5 through 8, as in equation (2). The dependent variable is X , the proportion of the monthly 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 4	0.782***	0.0147	0.786***	0.0163	0.621***	0.0649
Question 5	-0.0976***	0.0139	-0.0959***	0.0139	-0.0960***	0.0139
Question 6	-0.0554***	0.0111	-0.0553***	0.0111	-0.0555***	0.0112
Question 7	-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

Table 9
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 dollar.

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 Dollar			
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