INCOME SHARE AGREEMENTS AND STUDENT PREFERENCES

by

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ABSTRACT

NIRAV VORA. Income Share Agreements and Student Preferences. (Under the direction of DR. ARTIE ZILLANTE)

Income share agreements are increasingly discussed as an alternative to student loans. This paper seeks to measure the level of interest among students for various income share agreement offers, and to explore the possibility of adverse selection. Using survey data, the paper's analysis focuses primarily on whether student forecasts of their own incomes, self-reported risk attitudes, and grades have any predictive effect on their likelihood of interest. If lower income forecasts or lower grades correlate with higher interest in the offers, adverse selection may be present. However, because income-share agreements could be thought of as providing to students insurance against poorer-than-expected outcomes, risk aversion could play a role in dampening adverse selection by attracting a broad cross-section of students. The analysis finds that a student's forecast of his or her income correlates significantly with interest in the offers. If one assumes that students have an information advantage concerning their future incomes, adverse selection is present. Academic performance, measured by grades, lacked a meaningful relationship with likelihood of interest in the offer. If grades are better predictors of future income than student guesses, the results suggest adverse selection may not be an obstacle to the sustainability of income share agreements. The risk attitude measure had surprising predictive effects, with high levels of risk aversion corresponding to lower likelihood of interest in the offer. This outcome suggests that one obstacle income share agreements may need to overcome is unfamiliarity, and that framing the offers as a form of insurance may attract more participants.

ACKNOWLEDGEMENTS

First, I would like to thank my advisor, Dr. Artie Zillante. His generosity with his time allowed for discussions that motivated my curiosity and educated me about the process of research.

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DEDICATION

For my family, who have always allowed me to think out loud and who remind me of what is important.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

It has been common in recent years to hear about a crisis in higher education stemming from excessive student loan balances. The $1.5 trillion in debt is viewed by politicians and much of the public as a painful overhang, preventing younger Americans from getting married, buying a home, or even leaving their parents' basements. Accounts in the media of individuals with six-figure loan balances and meager job prospects have become routine, and there seems to be a broad consensus that new policies are necessary to address a ballooning problem.

Lochner and Monge-Naranjo (2015) show that the main driver of the soaring debt amounts has been rising average returns to attending college in the labor market, resulting in higher demand and prices, each a trend that has persisted for decades. Even though the returns to higher education have remained strong. Schwartz (2017) shows that while, on average, college remains a net-positive-value investment, about a third of borrowers will experience a negative return. Concerns over the delinquency rate and burdensome loan balances for a portion of borrowers have directed attention of politicians and policymakers to improve or innovate tools for financing education.

If the cost of higher education is rising, but the returns on that investment are also continuing to rise, perhaps the problem is not the cost of education for society overall, but the outcomes for a subset of students whose incomes in the years after graduation fall into the lowest tiers of the income distribution. These individuals would benefit from being spared the full cost of increasingly expensive educations. With traditional student loans, the cost either remains with the individual or is transferred to the institution that forgives that held debt.

Income share agreements, which would obligate a graduate to pay an agreed-upon

percentage of income for a set term in exchange for an amount of funding, can be interpreted as a form of insurance against outcomes that result in lower-than-expected pay. Essentially, fixed loan payments due from a low- or no-income household would be burdensome for borrowers and with a lower likelihood of repayment. The purpose, then, of the share agreement is to relieve the individual of the risk of a fixed payment. The institutional investor in the share would presumably be insulated from some of the risk by pooling large numbers of shares, some of which would pay more and some of which would pay less than the expected return.

Dynarski and Clayton (2006), along with Boatman, Evans and Soliz (2014), demonstrate that the complexity of loan application and repayment has been shown to discourage borrowing, and complexity is likely to lead students and parents to make borrowing and repayment choices that are not optimal. An aversion to loans, even when they are clearly beneficial, is demonstrated empirically by Caetano, Palacios and Patrinos (2011). Researchers in the Netherlands (Booji et al. 2012), where subsidized loans are similarly favorable but appear to be underutilized, find that varying levels of information about the loans and their benefits do not significantly influence take-up rates. Palameta and Voyer (2010) find that even aid packages that bundle loans and grants are rejected by some students because of negative framing biases when it comes to borrowing, in particular anxiety about retaining a debt balance that would need to be paid off over many years.

Given the returns of higher education to society and the individual, addressing the bias against loan balances could prove helpful. Marx and Turner (2016) show that when students are nudged into borrowing as opposed to avoiding loans, they earn more credits and higher grade point averages than counterparts who are not. A reason for the outcome, the paper suggests, may be that many students paying out of pocket would find it necessary to work part-time, resulting in less time for coursework or delayed graduation. Income share agreements could address the bias against

loan balances, or could supplement loans in a manner that make better educational outcomes more attainable and at a pace sooner than would be the case if students attended only part time.

Many governments, including the U.S., have introduced income-based repayment programs for education in recent years. Individuals in these programs are required to pay no more than a percentage of their disposable income, while payments never exceed the level of a fixed payment due under a traditional loan structure. The lender in this case bears the risk of lower income from borrowers, but experiences none of the upside from higher-earning individuals. Holliday and Gide (2016) found that the shift to income-based repayment of loans in Australia led to large shortfalls. Income share agreements, by bringing added revenue from higher-earning individuals, could be more fiscally sustainable.

However for such a program to be sustainable from the standpoint of the investing institution (be it a lending company, a government body, a nonprofit organization or the educator itself), there needs to be some predictability and consistency in outcomes that allow repayment rates to be set prudently, without becoming unattractive to students.

Andreason (2016) describes how, to date, income share agreements have largely been used by nonprofits or state governments as an alternative model to loans. But one major advantage to income share agreements may be in their ability to attract private capital to education finance, potentially expanding college-going opportunities for more people. Such agreements may also be more suitable to paying for workforce-development programs than the federal student loan system, which currently ignores such smaller-scale education programs. Yu and Salyard (2008) question whether investors would be interested in such an unpredictable investment as a stake in future income, given that it does not lend itself well to existing pricing models. The contracts would lack the collateral of traditional loans. But a number of small startup

companies, such as Lumni and Pave, have begun offering the agreements, and in 2017 another startup, Vemo, teamed up with Purdue University in to get an income share agreement program started. Given that the returns of education investment to individuals' income streams remain attractive, investors may be drawn to the potential rewards of such agreements if sufficient protections and rules are put in place.

For income share agreements to attract new sources of capital to higher education finance or to ensure the fiscal stability of governments or institutions offering them, the biggest pitfall must be carefully considered. Adverse selection and moral hazard can create a harmful dynamic for the investors and ultimately for the program. The subset of students that choose to participate may earn wages that are significantly less than the amounts assumed by investors, due possibly to adverse selection or moral hazard. In the case of moral hazard, if higher paid work requires more expenditure or costs (such as longer hours, lengthier commutes or greater effort) than lower paid work, an individual may be more likely to pursue lower paid work when the share of their earned income that accrues to them is reduced by a share agreement. Buyers (investors) would ultimately back away from a market where sellers (students) have private information of their intentions and abilities, as illustrated by Akerlof (1970).

Madonia and Smith (2017) find some evidence of disincentive to effort (moral hazard), and possibly adverse selection, in staking practices for poker tournaments. Staking is the practice of an investor providing a competitor in a tournament the entrance fee in exchange for a share of the winnings. Although staking practices are a form of income share agreement, it is far from clear whether such results have external validity to a situation as different as that of graduates in the labor market. The incremental "tax" of carrying an income share agreement for an early portion of a lifetime of earnings may have effects on behavior that are small in magnitude compared with poker tournaments, given that career choices have a life-long effect and that the societal status conferred to well-paid jobs are an important additional incentive. Some

students under these agreements may pursue higher paid work than they otherwise would to ensure take-home pay remains above a comfortable threshold. Furthermore, if students with income share agreements choose lesser-paid, more idealistic work, such as social work or teaching for instance, perhaps government incentives that reduce loan balances for such individuals could be used to similarly compensate the holders of those shares.

Because of limited use of the agreements in higher education until very recently, there is very little published data on the post-graduation incomes of participants. Therefore, it could be useful to know whether student participation in such a program is correlated to any variables that predict income. This paper attempts to contribute some, albeit limited, information about the potential viability of income share agreements, given the gap in knowledge that currently exists.

1.1 A Closer Look at an Income Share Agreement

Purdue University currently offers an income share agreement option for eligible students. Although the Purdue Research Foundation, which implements the offers, states that its terms can vary, the general agreement carries a repayment term of 10 years that begins 6 months after graduation. Entering graduate school at any time during the repayment period would pause the clock on it, as would voluntarily leaving the work force. Dropping out of school or shifting to below half-time enrollment status would force the repayment period to begin following a standard 6-month grace period. Purdue's arrangement stipulates a maximum repayment of 2.5 times the amount borrowed. If a participant prefers early repayment, they would owe 2.5 times the amount borrowed. Purdue's program offers differing repayment rates based on choice of major and states that it does not steer students to particular jobs. There are no academic or grade requirements after the contract is signed. The general amount offered per semester is $5,000, and it can supplement other forms of student loans or aid. The program tries to keep the total amounts provided at a level that results in

students paying no more than 15 percent of their expected post-graduation income. Once students graduate, those earning $20,000 or less will not be required to pay anything. Income levels are verified through tax returns, and failure to pay or to provide accurate information could constitute a default. The amounts, including late fees and interest, would be pursued through court ("Income Share Agreements").

CHAPTER 2: RESEARCH QUESTIONS

For an idea like income share agreements to be sustainable, they need to be popular enough to attract a wide cross-section of participants, and not a subset of students with poorer income prospects.

(Q1) What is the level of student interest in income share agreements?

If most students perceive their prospects as being above average, giving up a share of their incomes may not be palatable. Pay-as-you-earn modifications to traditional loans may cause some students to question the value of an income share agreement. However because of a widely perceived hunger for dramatically simpler alternatives that alleviate individuals of income risk, the researcher expects more respondents will be interested in the income share agreement offers than uninterested.

(Q2) Does interest correlate with self-reported expectations of future income? More to the point, do students exhibit evidence of making rational choices, and do they appear to be risk-neutral, risk-averse, or risk-seeking? Do income forecasts and risk attitudes together explain preference for income share agreements? Under a traditional loan paradigm, payment is fixed and income will vary, resulting in variance in the payment-to-income ratio. With income-based payments, payment and income both vary but have a linear relationship, resulting in a fixed payment-to-income ratio.

Hypothetical students who lack unique information about their future prospects would share the same probability distribution of their post-graduate income streams, centered on an expected value. Suppose some of these students are risk neutral and some of them are risk averse. Whether under a fixed-payments or variable-payments contract, the expected value of the take-home income stream (after loan or income-share payments) would be identical. However the variance of the take-home income

stream would be higher for the fixed-payment option relative to the income share agreement. For a risk-neutral student, the expected utility under either of these scenarios would also be identical. However for the risk-averse student, expected utility would be lower under fixed payments, relative to income-based payments.

The simplest way to illustrate the effect of this risk aversion is through a concave utility function: Assume take home pay (THP) has diminishing marginal utility and assume equal probabilities for high, middle and low after-tax income.

$$U''(THP) < 0$$

Table 2.1: Take home pay under three income scenarios with fixed debt payments

After tax income	Fixed debt payment	Take home pay
45,000	-2,400	42,600
30,000	-2,400	27,600
15,000	-2,400	12,600

Table 2.2: Take home pay under three income scenarios with income based payments

After tax income	Income based payment	Take home pay
45,000	-3,600	41,400
30,000	-2,400	27,600
15,000	-1,200	13,800

The difference in take home pay between the higher income scenarios, $42,600 - 41,400 = 1,200$, is equivalent to the difference in take home pay for the lower income scenario, 13,800 minus 12,600 = 1,200. However, due to the concavity of the utility function:

$$U(42,600) - U(41,400) < U(13,800) - U(12,600)$$

This results in higher expected utility under the income-based plan relative to the fixed payment plan.

(Q3) Does interest correlate with self-reported grade point averages? In essence, does a more objective measure of student performance correlate to an individual's likelihood to be interested in a share agreement?

Several papers, examining results in various years and locales, suggest that grade point average correlates meaningfully with starting salaries after graduation. This correlation is typically attributed to the fact that employers hiring undergraduate students with little work experience have few if any criteria on which to judge the recent performance of candidates (Rumberger 1997; Chia and Miller 2008; Oehrlein 2009).

(Q4) How do varying offer terms (adjusting agreement amounts, repayment rates, and repayment time horizon) affect interest?

Marketing research has existed for decades on consumer sensitivity to prices and price increases. While there is evidence for some conclusions, such as consumer affinity to prices ending in 9, there are few clear conclusions that extend to a wider context. But it seems to be well-understood that, determined by context, consumers do have thresholds for prices or price increases that they are willing to accept (Monroe 1973; Sirvanci 1993). Then, one would expect there to be a higher likelihood of participation for share agreements that require smaller repayment percentages, because that is the prominent aspect of the "price" in these offers, even though the offers are economically equivalent. In research pertaining to automobile loans, survey respondents seemed to prefer moderately low interest rates over a moderate repayment period when offered a menu of choices, with relative aversion to offers with long repayment terms and low rates or short repayment terms and high rates (Wonder et al, 2008).

CHAPTER 3: METHODOLOGY

The data comes from a survey distributed to the undergraduate listserv of a business college within a large, public university. The survey, which can be reviewed in Appendix A, asked students to approach the questions as if they were themselves, but at the stage just prior to entering their freshman year, weighing different options for financing their educations. Participants were randomly assigned to one of four treatments, each of which represented a different hypothetical income share agreement offer, varying in agreement amounts and in repayment terms, but basically equivalent in the sense that the repayment rates (ranging from 1.1% to 5.7% of income) were calculated to return to the investor zero expected profit based on an average-level income post-graduation. The treatments consisted of: $30,000 in exchange for 5.7% of income for 12 years; $30,000 in exchange for 3.4% if income for 20 years; $10,000 in exchange for 1.9% of income for 12 years; and $10,000 in exchange for 1.1% of income for 20 years. Students could interpret the offers as a primary source of funding or a supplement to other sources of funding.

Subjects were asked to select among five levels of interest in the offer. Subjects were then given a detailed explanation of the offer, including calculations showing that, at the mean, the repayment terms they were offered could be considered fair and not engineered to produce profits for the issuer. Subjects would then revisit the offer, allowing them to rate it again. Subsequently, subjects were asked to provide information about their majors, grades, likelihood of graduating and income expectations.[1] Subjects would then once more revisit their interest in the hypothetical offer and rate it a third and final time. Subjects were given an opportunity to indicate

[1] These questions will be sometimes referred to as the consideration phase.

whether they felt the offer was cheaper or more expensive than traditional options, as well as simpler or more complex. They could also indicate if incorporating G.P.A. or choice of major into the repayment rate would make the offers more appealing. Then came questions meant to quantify the subjects' risk attitudes, financial literacy, demographic information, and history with loans and financial aid.

The survey, designed in Qualtrics, was distributed to 3,840 students by e-mail and was open February 7 to February 21, 2017. Subjects were promised the possibility of winning one of two $100 Amazon.com gift cards in a random drawing, and were told the time needed to complete the survey was an estimated 15-20 minutes. The duration of survey participation, as measured by Qualtrics, ranged 3 minutes to 105 hours. Participants were allowed to open and begin the survey and then return to it at a later time over the two week period, which explains hours-long durations among a subset of participants.

CHAPTER 4: SURVEY RESULTS

The survey's characteristics introduce limitations to the external validity of the results. The most significant limitation is that participants were affiliated with the business college of a large public research university and overwhelmingly had declared majors that represent a relatively small subset of the majors available. Accounting, Finance, Business Administration, Marketing, Management Information Systems, Economics, Operations Management and International Business comprised nearly all of the respondents who had declared a major. In one way, this relative homogeneity in majors was an advantage. It made the assessment of a subject's income prospects more likely to be similar, when other traits such as grades were held fixed, than comparisons of students across widely differing skill areas (such as, say, computer science compared to film studies). Furthermore, the heterogeneity in the other variables, such as grades and income forecasts, was adequate for the research questions being posed.

Of the 501-student sample, the mean age was 21.8.

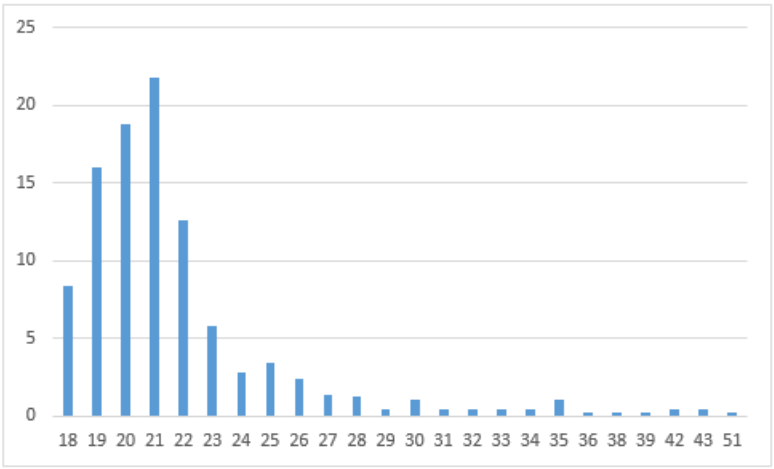

Figure 4.1: Age Distribution of Respondents by Percentage

What is notable about the age distribution of the sample is that there are higher concentrations of older students than would have been expected. About 83% of participants are 18-23 years old, with 17% older than 23. The University does not publish age data for students of the business college, so it is unclear whether this represents sample error or is a roughly accurate representation of students.

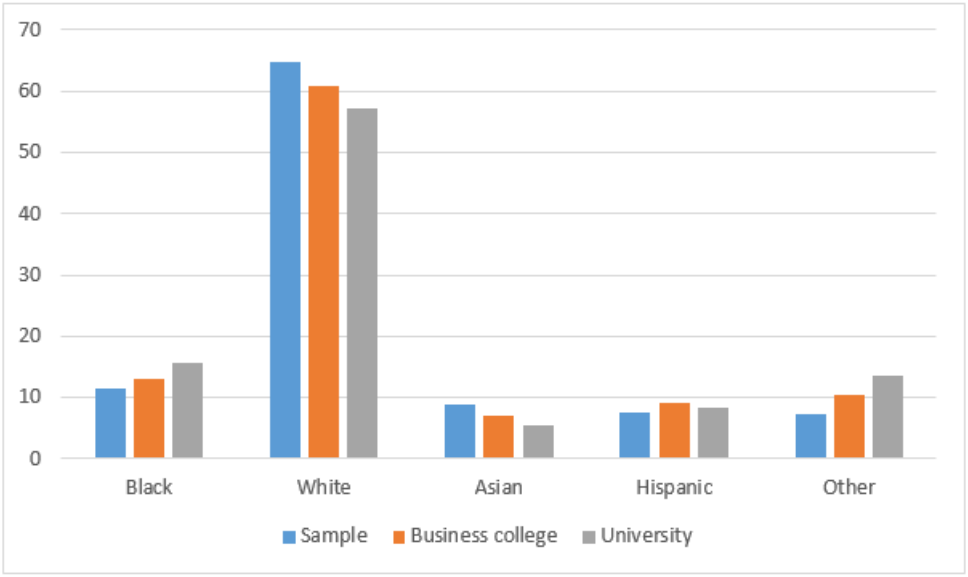

Figure 4.2: Race/Ethnicity Distribution by Percentage

The distribution of race/ethnicity in the sample is similar to that of the business college, and to that of the university overall.

Table 4.1: Distribution of Gender in Sample, University and Business College

Gender	Sample	University	Business college
Male	47.3	51.1	60.4
Female	52.7	48.9	39.6

A slight majority of survey respondents were female. Female students represent a slight minority of the university student body, and an even smaller proportion of students at the business college.

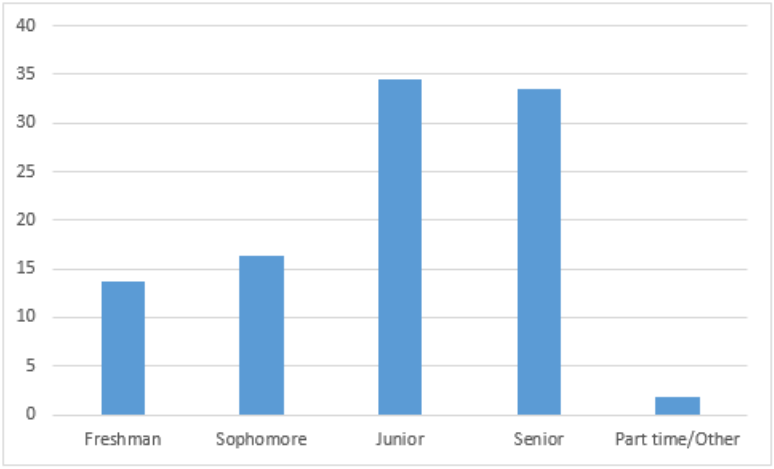

Figure 4.3: Year in College of Respondents Distribution by Percentage

Participation appears to be skewed to upperclassmen. The skew is to be expected because the business college would comprise mostly of students with selected majors and fewer undecided students. Although the distribution listserv did contain students listed as Pre-Business or Undecided, affiliation with the business college commonly occurs in the third year.

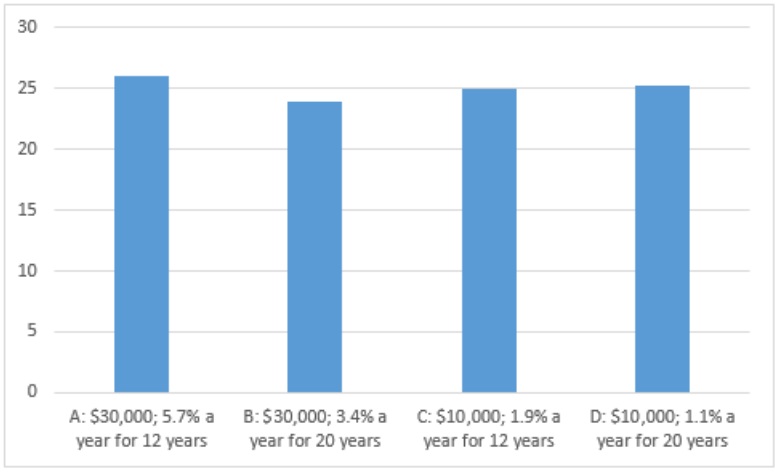

Figure 4.4: Treatment Distribution by Percentage

Participants were randomly, evenly assigned to treatments by Qualtrics. The slight deviations from perfect evenness in the treatment counts is likely attributable to different amounts of attrition among individuals who began surveys.

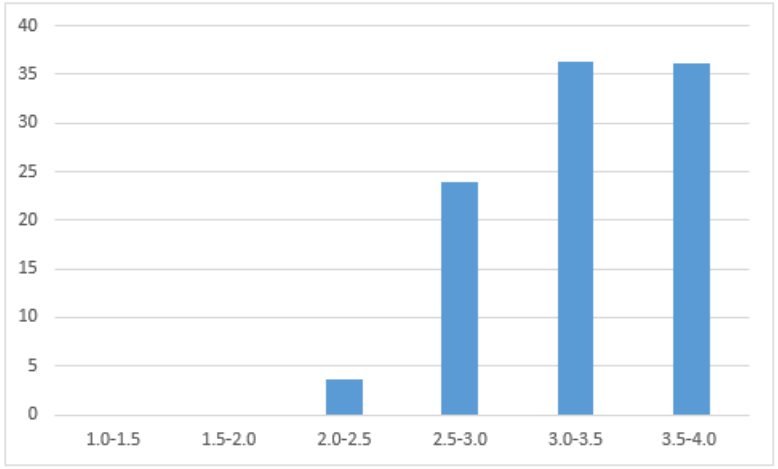

Figure 4.5: College G.P.A. Distribution of Respondents by Percentage

Grade measures were self-reported. The responses resulting from the six options were collapsed into three possible values (below 3.0, 3.0-3.5 and above 3.5) to result in categories with meaningful sizes. Undergraduates must have a 2.0 grade point average to graduate from the university. Students of the business college must have

a 2.5 G.P.A. to declare a major, although it can drop after the declaration as low as 2.0 for the student to still graduate. The school's rule helps to explain the lack of responses for the first two of the original category choices. Responses on high school G.P.A. were also collected and the responses were handled similarly.

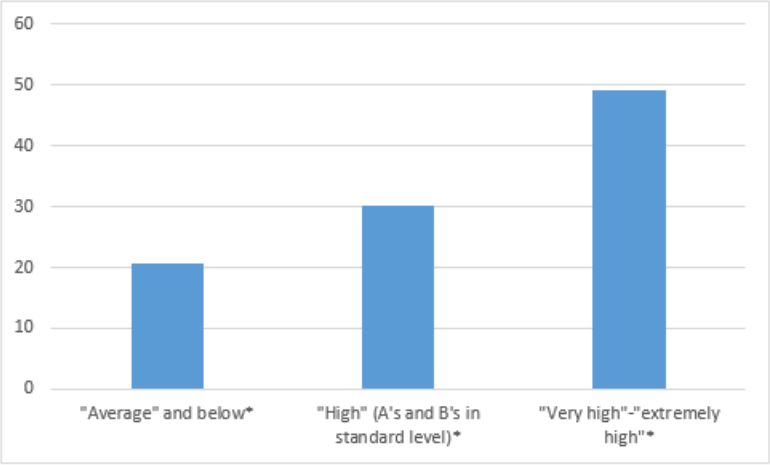

Figure 4.6: High School Performance Distribution of Respondents by Percentage

4.1 Subjects' estimations of future income

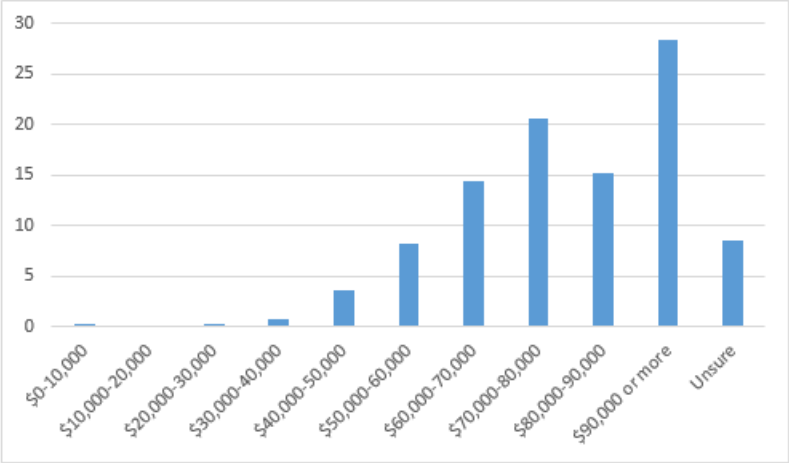

Figure 4.7: 10-Year Income Forecast Distribution of Respondents by Percentage

Subjects were asked to forecast their income 10 years after graduating and were allowed to choose from 10 ranges of income, or to select "Too hard to predict."

For several ranges in the lower half of the possible choices, there were few or zero responses. As a result, some of these responses were collapsed into new groupings that encompassed multiple of the original ranges. As a result the bottom five groups were collapsed into one.

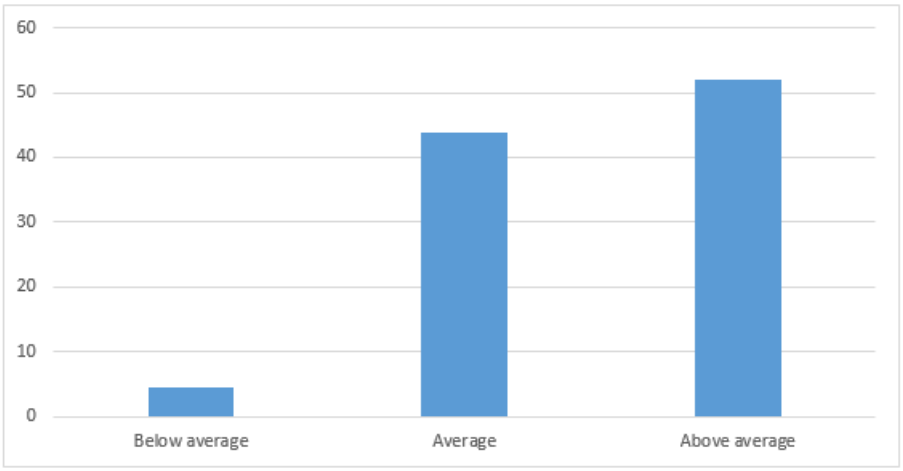

Figure 4.8: Distribution of Forecasted Relative Income by Percentage

Subjects were also asked whether they expect to earn an average salary, a below average salary, or an above average salary upon graduation, relative to fellow graduates. Though the survey question left some ambiguity as to whether the subject would make the comparison with the average of business college graduates or more broadly, the question did provide an estimate of $44,000 per year as a reference for the average.

4.2 Risk attitudes

Survey question 15 (see Appendix A) was intended to measure risk attitudes, but it was poorly worded and most likely led to widespread misunderstanding. The question asked "Suppose there is a lottery ticket offering you a 50% chance of winning $500 and a 50% chance of winning a $1,000. What is the most you would be willing to pay for this ticket?" A very high proportion of responses were in the $0 to $20 dollar range and likely anchored by pre-conceived expectations about the general cost of lottery

tickets (which have high probability of zero payout). A large majority of responses were well below $500. Any response below $500 implies not high risk aversion but a misunderstanding of the question (and likely a faulty assumption of nonzero probability of a zero payout). The fact that many participants invested time in a survey with low probability of winning a $100 gift card might imply the subject pool is risk seeking or that they do not view time cost as a monetary cost. Subjects were also asked to provide a self-assessment of their risk preferences in financial matters. As a result of the confusion over question 15, only the self-assessment of risk attitude was used in the analysis.

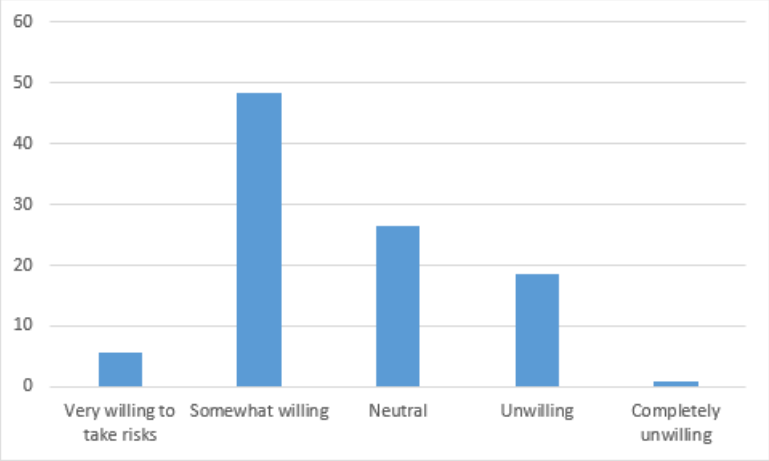

Figure 4.9: Risk Attitude Distribution of Respondents by Percentage

4.3 Loans and Financial Aid

Table 4.2: Proportion of students receiving loans/financial aid

Percentage now receiving loans	53.89%
Percentage ever receiving loans	57.88
Percentage now receiving financial aid broadly	62.28
Percentage ever receiving financial aid broadly	68.86
Percentage now or ever having received loans or aid	74.85

Though figures vary depending on the categorizations of types of aid, the proportions above are moderately below national averages for the proportion of students

receiving loans, or financial aid broadly.

4.4 Financial Literacy

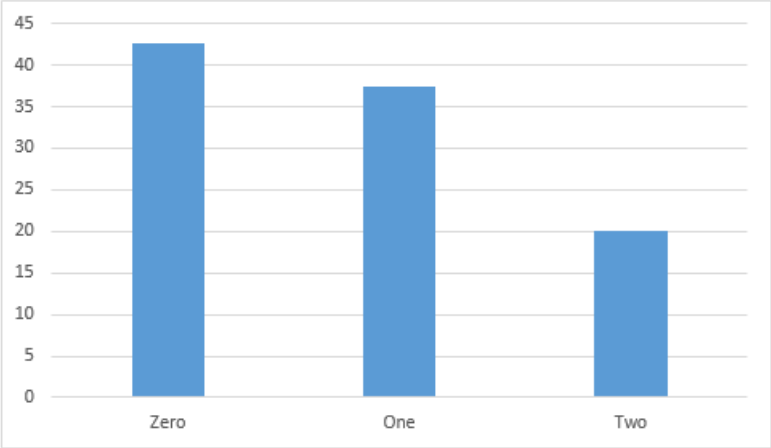

Figure 4.10: Financial Literacy Score Distribution of Respondents by Percentage

Subjects were given two questions, No. 16 and 17 (see Appendix A), to measure their ability to do some mildly difficult financial math. The variable measures the total number of correct answers and could thus be 0, 1, or 2.

4.5 Response variable

The original income share agreement was offered three times (see Appendix A). The specific terms of the offer, determined by which of the four treatment categories the subject was randomly assigned, was kept consistent per individual over the survey.

Table 4.3: Distribution of Interest Level of Respondents by Percentage

Interest Level	Offer1	Offer2	Offer3
Strongly uninterested	9.98	6.39	10.38
Uninterested	24.75	14.97	23.95
Neutral	16.17	17.37	15.17
Interested	38.12	37.92	35.73
Very interested	10.98	23.35	14.77

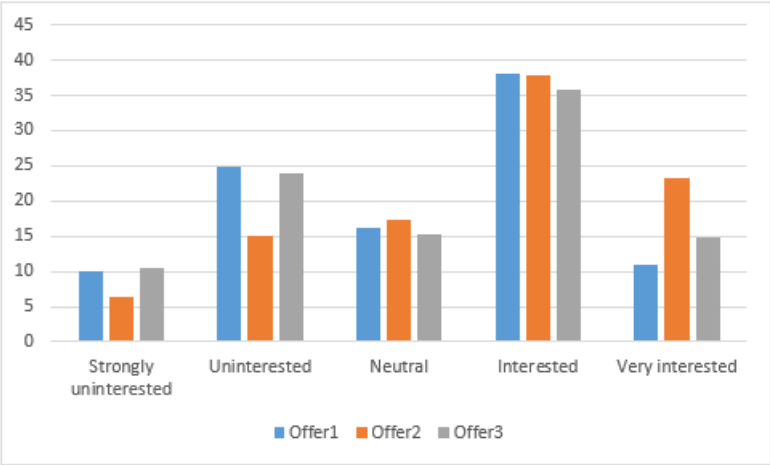

Figure 4.11: Distribution of Interest Level of Respondents by Percentage

The results above answer the first of the research questions (Q1), with students consistently more likely to be interested in the offer than uninterested at each of the three instances the offer was made. At Offer 1 about 50 percent are interested (as opposed to neutral or uninterested), rising at Offer 2 to about 60 percent, and falling at Offer 3 to about 50 percent.

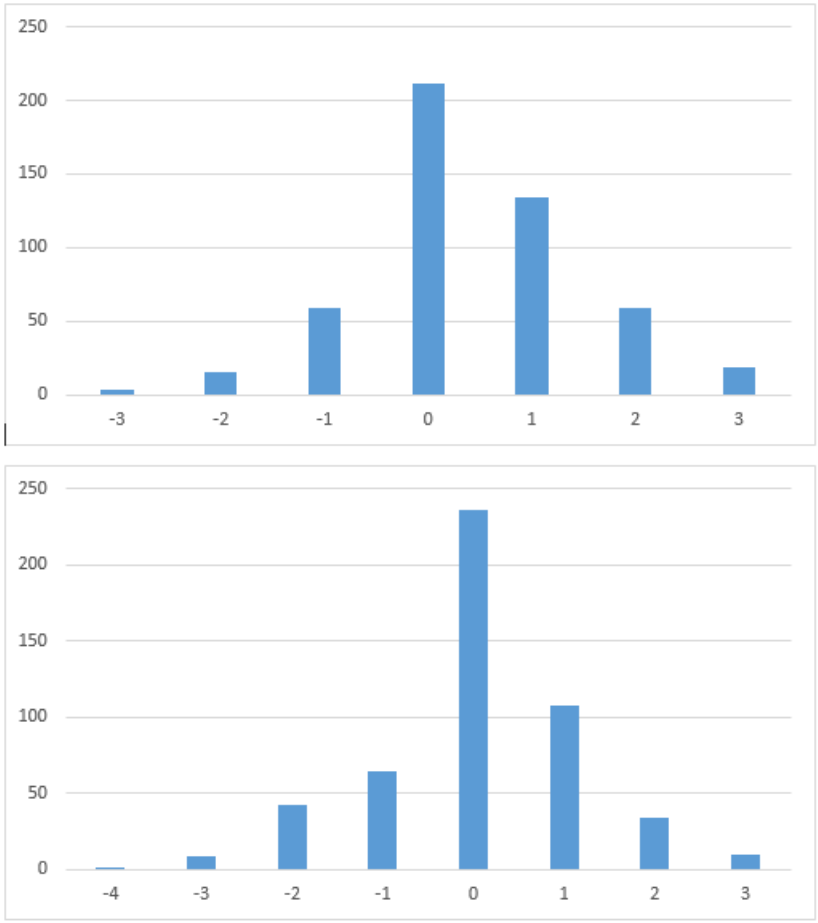

Figure 4.12: Count of Change in Interest From Offer 1 to 2 (top) and Offer 2 to 3 (bottom)

It appears that while a plurality of subjects did not change their minds, the tendency was for interest in the offer to rise (as opposed to fall) among those who did change their minds during the process of familiarizing themselves with the offer and with their estimates of grades and income.

CHAPTER 5: MODEL

A binary variable was also created from the final offer variable, where a "1" value corresponds to "Interested" or "Very interested" and "0" corresponds to "Neutral", "Not interested", or "Strongly uninterested." The expanded (more detailed) interest variable was also analyzed, using an ordered logistic regression. However, due primarily to the number of covariates and the degree-of-freedom difficulties imposed by them, the ordered logistic regression generally suffered from overlapping confidence intervals on cutoffs, making the usefulness of the parameters questionable. The only ordered logistic regression to avoid this problem regressed the individual's response to the final offer solely on the 10-year income forecast variable set, but without any control variables.[1]

To address Q2 and Q3, the regressions estimated were all variations on two main ideas: would income forecast and risk atittude predict probability of interest in the offer and/or would G.P.A. predict probability of interest in the offer. Q4, concerning treatment effects, was addressed by the inclusion of the treatment dummy variables in each of the regressions estimated). The two core regressions (Appendix B, Table 1, columns 1 and 2, respectively) were each estimated with many variations (columns 3-14). Most regressions using the income forecast as an independent variable included the risk attitude variable, while one excluded them (column 3), to explore the results using income forecast alone. Another variation (column 4) performed a similar analysis, but using relative income forecast in place of the 10-year absolute income forecast. In regressions using G.P.A., college grades were mainly used, but one regression (column 5) used high school grades to explore any differences. Among

[1] These results can be viewed in Appendix B Table 2.

the selections for control variables, all of the regressions used race, gender, age, and loan/aid participation as control variables. In columns 6 and 7, an additional control variable, financial literacy score, was included to explore its effect. Financial literacy score was excluded as a control variable in prior regressions because of the possibility that financial literacy may correlate with intellectual ability in a similar manner as grades. Regressions were estimated using survey duration as a control variable (columns 8 and 9), and in addition the two main regressions were estimated on a subset of the data that excluded participants in the lowest and highest deciles of survey duration (columns 10 and 11). Duration range for this reduced sample was 4.5 minutes to 19 minutes. Finally the two main regressions were also performed on the subset of the sample that answered yes to ever having received student loans or financial aid (columns 12 and 13).

CHAPTER 6: DISCUSSION OF RESULTS

6.1 Income Forecasts and Risk Attitudes

If subjects incorporated their expectations of the future stream of costs into their preferences, their interest in the income share offer should be sensitive to their forecast of post-graduation income. Column 1 (as well as 3, 4, 6, 8, 10 and 12) suggests that subjects do incorporate their forecast of income, with lower forecast of income corresponding to a higher likelihood of being interested in the offer. The strong statistical significance of the forecasted income coefficients suggests the results were not due to chance and that students considered the economic consequences of their choice. Therefore, a form of adverse selection appears to be present, although the explanatory effect of the income forecasts on interest level may be mild, judging by the pseudo-R-squared values.

A proposed model combining the income forecast variable with risk attitude yields surprising results. In theory, a subject expecting to earn a high income who is risk-averse should be more inclined to take an offer than one who is not risk-averse. The presence of apprehension toward a high balance, high payment, low income scenario, should give a risk attitude variable explanatory power when included with the income forecast variable. As the regression in column 1 (as well as 6 and 8) shows, it does indeed. But the coefficients tell a less coherent story. Individuals who describe themselves as willing to take financial risks appear less inclined to the offer, as we might expect, although the result is not statistically significant.

However, those who describe themselves as risk-averse are also less inclined to take the offer. The differences are statistically significant relative to the base case, suggesting that risk-averse individuals (although they are theoretically well-served

by an arrangement that relieves them of financial risk), are responding negatively to the offer because it is unfamiliar and thus risky in an altogether different way. As measured by Akaike Information Criterion, the inclusion of risk attitude as an independent variable added meaningful explanatory power to regressions in which it was included.

There are additional explanations for the unexpected directional effects of the risk attitude variables. As discussed, risk averse individuals might be more likely to reject something new and unproven. In addition, the current novelty of income share agreements may require especially careful attention to framing and choice architecture, which decades of behavioral research has shown to play a meaningful role. Risk averse individuals may fear overpaying for college by choosing the agreements. It may be important to emphasize the built-in insurance aspect of the offers, while simultaneously highlighting the risks of traditional fixed-payment loans. Income share agreements may often be used, as they are currently at Purdue, to supplement federal loans, and thus provide an alternative to higher-interest, nonsubsidized traditional loans. Given the risks involved in traditional loans, a side-by-side comparison of the risks of each option may result in risk averse individuals choosing differently than they did in this survey.

It is possible that some risk averse individuals are not interested in owing money, whether a fixed or variable payment. As will be discussed further in section 6.3, this bias may be similar to loan aversion, which has been shown to cause students to reject unequivocally beneficial offers (Cadena and Keys, 2013). Thoroughly informing loan-averse or contract-averse individuals about their menu of options may result in different outcomes than those observed in this survey and in past research.

Table 6.1: Average Marginal Effects for 10-Year Forecast and Risk Attitude Variables (Regression 1)

10-Year Income Forecast (Base case: $90,000+)	dy/dx	p-value
Zero to $50,000	0.399348	0.00
$50,000-$60,000	0.317758	0.00
$60,000-$70,000	0.308158	0.00
$70,000-$80,000	0.255999	0.00
$80,000-$90,000	0.176155	0.01
Uncertain	0.141423	0.09
Risk Aversion (Base case: Somewhat willing to take financial risks)		
Very willing	-0.12125	0.216
Neutral	0.016085	0.753
Unwilling	-0.13508	0.019
Completely Unwilling	-0.40067	0.002

By assessing the results using the average marginal effect measurements above, it is possible to see the jump or decline in probability of interest (relative to the base case) for the income forecast and risk attitude variables. The highest share of respondents to the 10-year forecast question responded with the highest income range among the options provided. Because the highest income category was the appropriate base case, each alternative case represents a lower forecast of expected income. The regression shows positive marginal effects on probability of interest for respondents that chose any of the lower income ranges. In the most dramatic contrast, Individuals who estimated they would earn $50,000 or less had a roughly 40-percentage-point higher likelihood of being interested in the income share agreement than someone who forecasted earnings of more than $90,000. Forecast incomes in the middle of the two extremes followed a predictable laddering of probability differences from the base case. A similarly dramatic effect could be found in the risk attitude variable, with individuals describing themselves as completely unwilling to take risks having a 40-percentage-point lower likelihood of being interested relative to someone describing themselves as "somewhat willing to take risks."

6.2 Academic Performance

There is a strong tendency in the subjects to expect higher-than-average salaries upon graduation, evident in the distribution of responses to question 10 in the survey. If academic performance is a better, more objective measure of an individual's performance, then the regression in column 2 (as well as 5, 7, 9, and 11) tells a different story. We consistently fail to reject the null hypothesis concerning the grade point average variables. In essence, there is insufficient evidence that academic performance can predict the probability of interest in an offered income share contract. The result holds true for college as well as high school grades. Further analysis shows that the mean of grade point average responses for individuals who were interested in their offered contract differed by only a minuscule amount from the mean G.P.A. response of the uninterested subset.

The observation suggests the possibility of inconsistency between students' performance and their expectations of income. When considering the viability of income share agreements and the need to have participants that represent a full distribution of future incomes and not just a lower-earning subset, the inconsistency could be viewed as a positive support.

To take a closer look at this inconsistency, the following table may prove helpful:

Table 6.2: Grade point averages of respondents by expected income upon graduation

	Grade point averages		
Income expected upon graduating	High	Middle	Low
High	65.19	47.8	39.86
Middle	30.94	47.25	55.8
Low	3.87	4.95	4.35

The inconsistency appears to be driven by a pronounced tendency among those with lower G.P.A.'s to overestimate their prospects relative to their counterparts. While it may be helpful to the underwriter of an income share agreement that some

poorly performing students overestimate their incomes and avoid share agreements, one implication of the result is that adding income share agreements to the menu of financing options may not necessarily steer individuals to financially sustainable outcomes.

6.3 Treatment Effects, Control Variables and Feedback Question

When evaluating the treatment effect of the structurally different, economically equivalent offers, the null hypothesis that the treatments have no meaningful effect on interest cannot be rejected. In essence, there is insufficient evidence that different contract terms affected participant interest. On one hand, the result is not surprising because the offers are economically equivalent when taking the expectations of cost and benefits over a period of time at the mean outcome. However, one might expect to see different responses to offers with varying terms if assuming that individuals are not effective economic calculators and may be subject to biases to larger or smaller repayment plans. The lack of clear preferences among equivalent but differently framed offers represents a departure from some of the cited research, although the preferences cited in past research could be due to specific norms of traditional borrowing programs, such as loans for homes, automobiles, or consumer purchases.

Among the control variables, age and gender seem to have no effect on interest level. As for race, there is greater inclination among black students relative to white students toward the offer, and this difference is statistically significant across regressions. If we compare the results to literature on take up of student loans, there are parallels. Jackson and Reynolds (2013) include a similar logit model, but with student loan participation as the dependent variable. Statistical significance is found in the race category only for African Americans (with the coefficient showing the group is more likely to have loans) and no significant coefficient in the gender variable. Table 3 in Appendix B is a logit model using our survey data that assesses the likelihood of participating in student loans, using race and gender as independent variables. The

regression indicates black students are likelier than white students to be participating in loans, and that female students are likelier to have loans than males. If black students relative to white students, then, are likelier to fund their educations without loans, one could also infer why black students would be more interested in a student-loan alternative like income share agreements than white students.

Similarly, there is statistical significance for the coefficient applied to the binary variable of having ever received loans or financial aid. Past or current experience with loans or aid made subjects more likely to be interested in the offer across the regressions attempted. The result could be interpreted in multiple ways. Perhaps most commonly it would be assumed that some subjects whose families have high incomes forego loans and do not qualify for aid. These subjects, as a result, may be less interested in share agreements if they are simply uninterested in any kind of outside funding for their education. Perhaps, in addition, individuals that forego loans or aid and come from families with higher wealth expect to earn higher incomes upon graduation. Alternatively, it might be that individuals familiar with student loans and aid are more open to consider funding arrangements of various kinds than students who are not, even when the arrangement could be of benefit. Caetano et al (2011), Marx and Turner (2016), and Cadena and Keys (2013) discuss that loan aversion is a phenomenon present even among lower income students. It is possible that income share agreements may engender similar responses, either because they are not different enough in concept from loans or because they are not framed distinctly enough.

When survey duration was used as a control variable, it lacked statistical significance. Furthermore, the results of the reduced sample (top and bottom deciles of survey duration removed) revealed no meaningful departures from the analysis of the participating total. The financial literacy variable also appears to have little or no effect. Also of note, high school grades were no better a predictor of interest in

the offer than college grades. The relative income forecast measure was significantly weaker in explanatory power than the 10-year forecast variable. Finally, the two main regressions, performed on the subset of participants who had received loans or aid, did not depart meaningfully from the results of the total subject pool. When we consider how the degree of interest changes over the consideration period (in which grades and income forecast are considered by the subject), we see no meaningful relationship to the income forecast rendered, nor to grades, nor to risk attitude or any control variables.

Regardless of regression, and even in cases with statistically significant coefficients, the amount of variation that is explained by the chosen variables never exceeds 0.11, as estimated by McFadden's pseudo-R-squared value, and typically stays well beneath that.[1] Still, it seems that while several of the independent variables may have marginal effects on hypothetical interest, there is considerable homogeneity between the group of interested subjects and the neutral/uninterested subjects.

The offer feedback question (the results of which can be viewed in Appendix C) demonstrate some interesting tendencies among interested and uninterested participants. Overall, responders to these questions were likelier to be neutral among the choices on whether the offer was a bargain, neutral or expensive. Interested participants overwhelmingly found the offers fair, while uninterested participants overwhelmingly found the offer expensive. Overall, respondents overwhelmingly found the offers simpler than traditional student loans, and interested students were especially drawn to this trait. Uninterested students were more muted on whether the offers represented a simpler option, but it was clear nearly none of them found the offer more complex. Nearly half the subjects responded that incorporating G.P.A. based incentives to the repayment rate would make the offer more appealing.

[1] We must use caution when using McFadden's pseudo-R-square because, though it attempts to calculate the explained proportion of the data's variance, it does so using ratios of maximized likelihood parameters and results in values that tend to be small.

CHAPTER 7: CONCLUSION

The survey, being a hypothetical exercise for participants, can provide limited answers for the research questions. In the decade to come, efforts to include income share agreements among the menu of financing options at places like Purdue University could yield data that would be far more credible. More experiments like the one at Purdue would be still more helpful, and hypothetical exercises like this one could hopefully be a useful data point for anyone considering offering a program. For the time being, if we assume boldly that the responses to this survey are an accurate representation of the considered choices students would actually make, there are some interesting insights.

The survey found evidence of adverse selection among subjects, with income forecasts having a significant effect on offer interest. The merit of those income forecasts, however, relative to an objective measure such as academic performance, is a topic that bears more scrutiny. If grades predict actual incomes far better, then the presence of adverse selection mentioned above would have limited, if any, effect on the distribution of prospects for participating individuals, relative to all students.

The results appear to suggest that an obstacle income share agreements must overcome is their lack of familiarity. If precisely the risk-averse individuals who would benefit from the implicit insurance that these agreements provide are less inclined to use them, it suggests an aversion to the unfamiliar.

Other discussed explanations for the effects of risk attitude in this study may also be valid. A company or institution offering contracts would be well served to understand the roots of the surprising relationship, because it is the presence of risk aversion in individuals and the insurance aspect of these agreements that would make

their success possible. The framing of the offers almost surely plays an important role. Perhaps if the agreements were framed with an emphasis on their insurance aspect, it would attract a cross section of students and parents in much the same manner as health insurance attracts both individuals expecting to be healthy and those anticipating illness.

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APPENDIX A: SURVEY

A.1 Example of survey: Treatment A

Imagine yourself as an incoming freshman at UNCC who needs to pay for tuition and other expenses for the four years of education. (For these questions, please disregard grants, scholarships, assistance from parents, or other forms of special assistance that may be specific to your situation.)

You are offered $30,000 toward these expenses; in exchange, you would sign a contract that would deduct 5.7% of your income for 12 years after you graduate. This would not be a loan: you would owe nothing at the end of the 12 year period, no matter how much or how little your income based payments add up to. How interested would you be in the offer?

◯ Very interested (1)

◯ Interested (2)

◯ Neutral (3)

◯ Not interested (4)

◯ Strongly Uninterested (5)

A2 You were just asked to consider what is called an income share agreement. It is a method for paying for college that is an alternative to student loans. With student loans, after you graduate, if your payments are too small, your principal balance grows. With income share agreements, there is no principal balance. You would know ahead of time exactly what percentage of your income will be deducted for your entire repayment period. For example, if you are unemployed and have no income, you would owe nothing. Students who earn less, pay less. Students who earn more, pay more. After your repayment period is over, you're done and you would owe nothing

more. In this hypothetical example, the institution is not expecting to profit. To illustrate this, I will show you how your repayment rate was calculated on the next page.

A3 Let's break down the hypothetical offer you received earlier: An estimate for the average income of a UNCC student after graduation is $44,000. The $30,000 you would receive as a student, divided over a 12 year repayment period is equal to $2,500 per year. This amounts to 5.7% of the $44,000 estimated average income of a graduate. In other words, if your income after graduation is the average, and you paid 5.7% of that income over the 12 years, you would pay back about exactly $30,000, the same amount that you got. Given what you have learned: How interested would you be in the offer?

◯ Very interested (1)

◯ Interested (2)

◯ Neutral (3)

◯ Not interested (4)

◯ Strongly Uninterested (5)

A4 We'd like to see what factors might make someone more likely to be interested (or uninterested) in the income share agreement idea. Are you a ?

◯ Freshman (1)

◯ Sophomore (2)

◯ Junior (3)

◯ Senior (4)

◯ Part time/Other (5)

A5 What is your major or your expected major? (If Undecided, you can type that)

A6 How would you describe your likelihood of graduating?

◯ Highly likely (1)

◯ Likely (2)

◯ Unsure (3)

◯ Unlikely (4)

◯ Very unlikely (5)

A7 Do you have plans to attend graduate school after getting your bachelor's degree?

◯ No (1)

◯ Yes - Medical school (2)

◯ Yes - Other Health-related Program (3)

◯ Yes- Law school (4)

◯ Yes- In a Science and Technology Field (5)

◯ Yes- In a Liberal Arts field (6)

◯ Yes - Other (7)

◯ Maybe/Not sure what area (8)

A8 What would you rate your high school GPA?

◯ Extremely high: many college level courses and straight A's (1)

◯ Very high: Straight A's in standard level courses; or A's and B's in college level courses. (2)

◯ High: A's and B's in standard level courses (3)

◯ Average: A's, B's and C's in standard level courses (4)

◯ Below Average: mostly B's, C's and D's (5)

◯ Well Below Average: C's, D's and F's (6)

A9 What is your college GPA?

◯ 3.5-4.0 (1)

◯ 3.0-3.5 (2)

◯ 2.5-3.0 (3)

◯ 2.0-2.5 (4)

◯ 1.5-2.0 (5)

◯ 1.0-1.5 (6)

A10 If you had to guess, what do you estimate your income will be after graduating relative to those who will be graduating at the same time as you?

◯ Above average (1)

◯ Average (estimated at $44,000) (2)

◯ Below average (3)

A11 Roughly, what do you expect to earn 10 years from now?

◯ 0-$10,000 a year (1)

◯ 10,000-20,000 (2)

◯ 20,000-30,000 (3)

◯ 30,000-40,000 (4)

◯ 40,000-50,000 (5)

◯ 50,000-60,000 (6)

◯ 60,000-70,000 (7)

◯ 70,000-80,000 (8)

◯ 80,000-90,000 (9)

◯ 90,000+ (10)

◯ It's too hard to predict. (11)

A12 Reflecting on these questions, we'd like to make the original hypothetical offer one last time: If you don't remember it: You are offered $30,000; in exchange, you would sign a contract that would deduct 5.7% of your income for 12 years after you graduate. How interested would you be in the offer?

◯ Very interested (1)

◯ Interested (2)

◯ Neutral (3)

◯ Not interested (4)

◯ Very uninterested (5)

A13 Here's a chance for you to critique the offer you were given. Please check any boxes that reflect your view:

☐ The 5.7% payment rate for 12 years is a bargain to you. (1)

☐ The 5.7% payment rate seems fair. (2)

☐ The 5.7% payment rate seems high. (3)

☐ Income share agreements seem simpler than student loans (4)

☐ Income share agreements seem equally complex relative to student loans (5)

☐ Income share agreements seem more complex than student loans (6)

☐ I would be more interested if a graduating with a higher GPA meant I would pay a rate lower than 5.7% (7)

☐ I would be more interested if by choosing a more in-demand major, I would pay a rate lower than 5.7% (8)

A14 Suppose there is a lottery ticket offering you a 50% chance of winning $500 and a 50% chance of winning a $1,000. What is the most you would be willing to pay for this ticket?

A15 How willing do you feel you are to take risks in financial matters?

◯ Very willing (1)

◯ Somewhat willing (2)

◯ Neutral (3)

◯ Unwilling (4)

◯ Not at all willing to take risks (5)

A16 The following couple questions are just to get a rough sense of your familiarity with finances: Suppose you owe $1,000 on your credit card bill with a 20% annual interest rate, compounded annually. About how long would it take for the amount you owe to double?

◯ Less than 2 years (1)

◯ 2 to 4 years (2)

◯ 5 to 7 years (3)

◯ 7 to 10 years (4)

◯ 10 years or more (5)

◯ Not sure (6)

A17 Suppose you owe $3,000 on your credit card with a 12% annual interest rate (or 1% a month), and you intend to make a $30 payment each month toward that debt. How long would it take you to pay it off?

◯ 6 months-1 year (1)

◯ 1 to 3 years (2)

◯ 3 to 5 years (3)

◯ 5 to 7 years (4)

◯ 7 to 9 years (5)

◯ more than 9 years (6)

◯ Never (you will remain in debt) (7)

◯ Not sure (8)

A18 What is your age?

A19 With which race do you identify?

◯ Black (1)

◯ White (2)

◯ Asian/Pacific Islander (3)

◯ Hispanic (4)

◯ Native American (5)

◯ Other (6)

A20 With which gender do you identify?

◯ Male (1)

◯ Female (2)

A21 Do you currently receive financial aid?

◯ Yes (1)

◯ No (2)

A22 Have you ever received financial aid?

◯ Yes (1)

◯ No (2)

A23 Do you currently receive student loans?

◯ Yes (1)

◯ No (2)

A24 Have you ever received student loans?

◯ Yes (1)

◯ No (2)

A.2 Offers Made in Treatments B, C, and D

Treatment B offer:

B1 You are offered $30,000 toward these expenses; in exchange, you would sign a contract that would deduct 3.4% of your income for 20 years after you graduate. This would not be a loan: you would owe nothing at the end of the 20 year period, no matter how much or how little your income based payments add up to. How interested would you be in the offer?

Treatment C offer:

C1 You are offered $10,000 toward these expenses; in exchange, you would sign a contract that would deduct 1.9% of your income for 12 years after you graduate. This would not be a loan: you would owe nothing at the end of the 12 year period, no matter how much or how little your income based payments add up to. How interested would you be in the offer?

Treatment D offer:

D1 You are offered $10,000 toward these expenses; in exchange, you would sign a contract that would deduct 1.1% of your income for 20 years after you graduate. This would not be a loan: you would owe nothing at the end of the 20 year period, no matter how much or how little your income based payments add up to. How interested would you be in the offer?

APPENDIX B: TABLES

B.1 Logistic Regressions

Table B.1: Logistic Regressions 1-7: Estimates of Variable Effect on Interest

Independent Variable\Regression	1	2	3	4	5	6	7
10-Year Income Forecast (Base case:$90,000+)							
Zero to $50,000	1.824**		1.698**			1.816**	
$50,000-$60,000	1.419**		1.406**			1.405**	
$60,000-$70,000	1.374**		1.320**			1.361**	
$70,000-$80,000	1.139**		1.114**			1.135**	
$80,000-$90,000	0.791**		0.822**			0.775**	
Uncertain	0.641		0.717			0.615	
Risk Aversion (base case: somewhat willing to take financial risks)							
Very willing	-0.553					-0.572	
Neutral	0.074					0.065	
Unwilling	-0.617*					-0.617*	
Completely Unwilling	-2.201					-2.196	
College GPA (base case: 3.0-3.5)							
Below 3.0		0.172					0.163
Above 3.5		0.194					0.218
High school GPA (base case: Very high-extremely high)							
Average (A's B's and C's in standard level) and below					0.374		
High (A's and B's in standard level)					0.133		
Relative Income (base case: above average)							
Below average				0.653			
Average				0.748**			
Treatments (base case(A): $30,000/5.7%/12 years)							
(B)$30,000/3.4%/20 years	-0.468	-0.407	-0.387	-0.442	-0.404	-0.476	-0.418
(C)$10,000/1.9%/12 years	0.208	0.204	0.296	0.231	0.215	0.201	0.194
(D)$10,000/1.1%/20 years	0.175	0.195	0.286	0.275	0.192	0.179	0.199
Received Student Loan or Aid	0.552*	0.592**	0.521*	0.584**	0.573**	0.547*	0.585**
Age	0.008	-0.003	0.003	0.004	-0.009	0.009	-0.001
Gender Female	-0.045	0.092	-0.107	-0.004	0.135	-0.082	0.041
Race (base case: White)							
Black	0.787*	0.680*	0.786*	0.687*	0.682*	0.757*	0.645*
Asian	-0.142	-0.287	-0.154	-0.338	-0.298	-0.166	-0.326
Hispanic	-0.047	0.012	-0.027	-0.064	-0.057	-0.060	-0.008
Other	0.300	0.295	0.294	0.380	0.297	0.283	0.271
Financial literacy score						-0.102	-0.144
Survey duration (in minutes)							
Constant	-1.284*	-0.609	-1.325*	-0.943	-0.471	-1.180	-0.501
Pseudo-Rsquare	0.100	0.038	0.083	0.058	0.039	0.101	0.039
Prob > chi2 (Wald)	0.000	0.011	0.000	0.000	0.007	0.000	0.011
AIC	666.812	694.475	670.634	680.156	693.131	668.229	695.202
BIC	755.361	749.291	742.317	734.972	747.947	760.994	754.234
* indicates significance at 5% level ** indicates significance at 1% level							

Table B.2: Logistic Regressions 8-13: Estimates of Variable Effect on Interest

Independent Variable\Regression	8	9	10	11	12	13
10-Year Income Forecast (Base case:$90,000+)						
Zero to $50,000	1.856**		1.667**		1.654**	
$50,000-$60,000	1.447**		1.050*		1.318**	
$60,000-$70,000	1.404**		1.378**		1.251**	
$70,000-$80,000	1.131**		1.031**		1.310**	
$80,000-$90,000	0.835**		0.799*		0.900**	
Uncertain	0.665		0.600		0.517	
Risk Aversion (base case: somewhat willing to take financial risks)						
Very willing	-0.546		-0.573		-0.665	
Neutral	0.065		0.078		-0.114	
Unwilling	-0.604*		-0.673		-0.554	
Completely Unwilling	-2.133		-2.011		-2.247	
College GPA (base case: 3.0-3.5)						
Below 3.0		0.180		0.034		0.334
Above 3.5		0.191		0.042		0.132
(B)$30,000/3.4%/20 years	-0.472	-0.416	-0.297	-0.258	-0.271	-0.192
(C)$10,000/1.9%/12 years	0.210	0.186	0.195	0.154	0.285	0.309
(D)$10,000/1.1%/20 years	0.179	0.192	0.224	0.209	0.035	0.121
Received Student Loan or Aid	0.549*	0.584**	0.449	0.537*	-	-
Age	0.016	-0.002	0.002	-0.008	0.020	0.012
Gender Female	-0.049	0.082	0.018	0.146	-0.181	-0.060
Race (base case: White)						
Black	0.792*	0.692*	0.487	0.425	0.835*	0.678*
	0.019	0.028	0.184	0.214	0.019	0.042
Asian	-0.137	-0.280	-0.307	-0.412	0.083	-0.148
	0.689	0.394	0.425	0.265	0.834	0.695
Hispanic	-0.051	0.002	0.134	0.160	-0.158	-0.154
	0.890	0.996	0.743	0.684	0.696	0.690
Other	0.296	0.288	-0.214	-0.075	0.729	0.480
	0.429	0.422	0.626	0.859	0.110	0.259
Financial literacy score						
Survey duration (in minutes)	0.000	0.000				
Constant	-1.282*	-0.614	-1.076	-0.412	-0.961	-0.340
Pseudo-Rsquare	0.101	0.038	0.083	0.025	0.085	0.024
Prob > chi2 (Wald)	0.000	0.014	0.001	0.307	0.001	0.354
AIC	668.664	695.881	553.168	569.300	512.873	528.464
BIC	761.430	754.914	637.094	621.253	591.412	575.587

Regressions 10 and 11 were on subset of sample excluding top and bottom decile of duration (observations 402).

Regressions 12 and 13were on subset of sample where loan/aid had been received (observations: 375)

Table B.3: Ordered Logistic Regression

Dependent. Variable: Level of Interest in Offer (nonbinary)		
10-Year Income Forecast (Base case:$90,000+)	Coefficient	P-value
Zero to $50,000	1.41	0.000
$50,000-$60,000	1.20	0.000
$60,000-$70,000	1.47	0.000
$70,000-$80,000	1.03	0.000
$80,000-$90,000	0.71	0.006
Uncertain	0.79	0.011
Pseudo r-squared	0.03	

Table B.4: Logistic Regression Estimates of Variable Effect on Loan Take-Up

	Dependent Variable: Have Received Student Loans	
Indep Var.	Coefficient	P-value
Gender Female	0.50	0.01
Race (base case: White)		
Black	1.43	0.00
Asian	-0.47	0.15
Hispanic	0.14	0.69
Other	0.36	0.32
Constant	-0.02	0.87
Wald Test	0.00	
Pseudo-Rsquared	0.04	

B.2 Subject Feedback on Offer

Table B.5: Count of response selections describing income share agreement offers

	Subject Viewpoints to Income Share Agreement Offer:		
Offer Is:	Bargain	Neutral	Expensive
Interested	41	141	23
Not Interested	7	34	110
Total	48	175	133

	Subject Viewpoints to Income Share Agreement Offer:		
Offer Is:	Simpler	Equally Complex	More complex
Interested	133	19	22
Not Interested	56	50	4
Total	189	69	26

	Subject Viewpoints to Income Share Agreement Offer:	
Offer Is:	Interested in GPA Factor	Interested in Major Factor
Interested	130	63
Not Interested	114	53
Total	244	116