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STUDENT LOANS: LESSONS FROM BORROWERS

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Abstract

The study presents the results and the analysis of a survey of recent student loan borrowers. The fields of study that result in the highest disbalance between the amount borrowed and the generated earnings are identified. Additionally, the survey results shed light on the post-graduation spending behaviour of the borrowers. The results indicate that the present student loan crisis may, at least in part, be caused by the selection of the major area of study and by the post-graduation personal consumption over adjustment of individuals from several (less financially lucrative) fields of study.

Keywords: Student Loans, Higher Education, Personal Consumption

JEL Classification: D14, D31

1. Introduction

The subject of the high cost of higher education and the "student loan crisis" has been at the forefront of media coverage and political debate in the United States over the last decade. The student loan forgiveness programs and the ideas of free college education have been frequently referenced as the solutions to the student loan crisis and means of providing equal educational opportunities to people of all socio-economic groups. As such, during the week of May 30, 2022, the Biden administration announced billions of dollars in automatic student loan forgiveness for over half a million borrowers. The program was further expanded on August 24, 2022. While arguing that student loans put significant financial pressure on vulnerable households, further support for the concept of loan forgiveness has been grounded in the argument that the economic benefit of obtaining higher education has been diminishing over time (see Forbes, September 25, 2020). Since then, the topic has been so politicised that it made it all the way to the US Supreme Court in June 2023, with the Court deciding against forgiveness and the three-year freeze on student loan payments is expected to expire by the end of 2023, with millions of borrowers being forced into resuming their payments.

Most of the media and academic coverage of the student loan crisis centres on the present problem instead of looking at the issue's underlying causes. There appears to be a lack of focus on the individual borrower's decision-making at the time of the borrowing. Furthermore, the financial decisions such borrowers make upon completing their higher education journey have not been thoroughly examined. In the current study, we look at the behaviour of individual borrowers and attempt to identify some commonalities that may shed light on the underlying causes of the crisis.

We explore the following questions: (1) when does taking student loans constitute a "good" (value-creating) financial decision, and (2) what specific decisions with respect to higher education-related borrowing result in outcomes that are viewed as positive by the borrowers? Our contribution is

threefold. First, we identify additional factors that need to be incorporated into the student loan worthiness debate. As such, we find that two determinants primarily drive the *ex-post* perception toward student loans: (1) the choice of the field of study and (2) an increase in personal consumption upon Graduation. Second, we introduce the personal consumption adjustment element into the conversation. Despite its importance in the decision of when and how to take student loans, it is hardly mentioned in the literature and analysis on the topic. Finally, we offer the individual perspective rather than an aggregate view of the topic, which could further enhance the understanding of who and when should be taking on student loans.

According to the US government[1], students can borrow in different ways, ranging from $5,500 per year for Direct Subsidised Loans to $20,500 per year for Direct Unsubsidized graduate loans. Furthermore, according to the College Board, the total amount borrowed for post-secondary education was about 102 billion dollars in the 2019-2020 period. Despite what seems to be a very high number, it represents a decline in borrowing for the ninth consecutive year. The average number borrowed per student is around $28,800 based on the 2018–2019-year data, a relatively modest change from $26,600 in 2008-2009 (this level of change represents an 8 percent decline in borrowing on an inflation-adjusted basis). The trend report also points out that after reaching a peak in 2010-2011, the total borrowed amount has been declining. Additionally, the Board identifies that, as of March 2020, 55% of all borrowers with outstanding loans owed less than $20,000. On the other extreme, 45% of all outstanding debt was owed by 10% of borrowers who owed more than $80,000 each[2]. According to Forbes, the newest information on student loan borrowing puts the average borrower in 2023 at $28,950, with 55% of students attending a public and 57% of students attending a private nonprofit four-year institution with student loans[3].

Although average numbers are useful, it is hard to understand the specifics of the student loan issue by looking at the figures in the aggregate. Media reports about the rising cost of college continue building the impression that the problem is becoming larger. In 2019, student loan debt was second to mortgages, exceeding credit card and auto borrowing in aggregate dollars. About 15% of the US population had outstanding student loans. About 101.4 billion dollars of student loans were in default, a figure that represents about 11.4% of the total outstanding student loans. Major changes have been observed between 2020-2023 due to the student loan payment pause. As of 2022, the default rate dropped to 2.3%, its lowest in years[4]. Given the lengthy pause in payment expectations, the recent numbers are artificially deflated. With the Supreme Court decision in June 2023, the defaults are expected to spike again.

There appears to be a disconnect between the perception of how acute student loan borrowing is and the actual borrowing of a typical college graduate. As current and future students are faced with their own educational and education-related investment decisions, the tools and the information availability appear to be biased and skewed toward a specific group of borrowers, which paints a rather grim picture of student loans. In reality, however, a well-thought-through educational decision financed using student loans is more likely than not to be among the best investments an individual will make in his/her lifetime. Furthermore, the non-discriminatory access to student loans offers an excellent opportunity for underprivileged classes to reap the long-lasting rewards of having a higher education.

To shed light on the student loan issue and the origins thereof, we examine the ex-post perceptions toward student loans of individuals who utilised such loans in pursuit of their higher education. We conducted a survey of borrowers who graduated and are employed or seeking employment at the time of the survey. The individuals' pre- (education major choice, type, and the amount of student loan) and post-borrowing (personal consumption) behaviours and decisions that potentially impact

[1] https://studentaid.gov/understand-aid/types/loans
[2] https://research.collegeboard.org/trends/student-aid/highlights
[3] https://www.forbes.com/advisor/student-loans/average-student-loan-debt-statistics/
[4] https://www.bestcolleges.com/research/student-loan-default-rate-facts-statistics/

their ability to repay the student loans. We also ask the individuals questions that assess their perception of higher education and student loans.[5]

The purely economic factors of the choice of the field of study, measured by the financial compensation offered to graduates at the time of Graduation, significantly impact the respondents' perception of the "worthiness" of student loan borrowing. Given that the universities in the United States charge tuition based on a credit hour and, generally, do not adjust such charges based on the field of study and expected future financial returns from obtaining the degree, the student loan crisis phenomenon may be specifically attributable to the field of study choices made at the outset of the educational journey. We find empirical evidence in support of this hypothesis. Individuals who completed higher education in less financially lucrative fields experience higher loan-to-earnings ratios and exhibit lower levels of satisfaction with their field of study choices and education-related borrowing. Thus, based on our results, a greater focus on discussing financial outcomes in different fields of study may be warranted when the field of study choice is made. A reexamination of the conventional flat rate per credit tuition model presently employed by the universities may also be justified.

Additionally, we document an admitted lack of fiscal responsibility on the part of the student loan borrowers. On average, borrowers exhibit a sharp increase in personal consumption upon Graduation. Such an increase in consumption has an adverse effect on the ability of individuals to repay student loans, thus amplifying the problem. Our results provide some evidence that suggests that a more rational educational choice and better cashflow management upon commencement of post-graduation employment could result in a significantly better financial outcome on an individual level as well as a reduction in the overall burden of student loans on the economy.

2. Literature Review and Hypotheses

Several theories have been used to explain the decision to use student loans to pay educational expenses. The Human Capital theory (Becker, 1993; Becker & Tomes, 1979; Mincer, 1962; Schultz, 1960) suggests that individuals will make a cost-benefit decision and take on student debt if the benefits of making this decision are higher than the costs associated with it. In a literature review on the topic of student loans, Cho, Kiss and Xu (2015) conclude that research supports the view that education is an investment which normally results in an increase in lifetime earnings. This view is also supported by the empirical evidence documented in Timmerman and Volkov (2020). Interestingly, the higher education system does not appear to recognise the cost-benefit analysis that a prospective student goes through, as the per-credit tuition does not generally vary between courses and degrees that may offer vastly different expected earnings.[6]

Generally, the economic benefit of college education has been shown to be held in multiple scenarios. Early on, Morgan and David (1963) concluded that increased investment in education has several economic benefits, among which the most directly observed is the increased earning capacity. In addition to overall higher earnings, more education also translates into steadier and more secure jobs.[7][8] Additionally, Skoog, Ciecka, and Krueger (2019) document a consistent and significant

[5] Our data was collected prior to the widespread student loan forgiveness programs. Thus, the reported responses are not affected by the ongoing uncertainty as to the need to repay existing loans due to the increased probability of forgiveness of such loans.

[6] The exception to this statement, in some instances, may be medical and law schools.

[7] Based on the College Board newest trend reports for 2020-2021, the average price of higher education continues to go up year over year, from 0.9% for the public four-year out of state institution to 2.1% for a private nonprofit four-year college. The price averages from $3,770 for a two-year institution, to $10,560 and $27,020 respectively for a public four year in and out of state college and to $37, 560 for a private school.

[8] Based on the data provided by the Bureau of Labor and Statistics (www.bls.gov), there is a consistent inverse relation between the level of education and the unemployment rates in the United States. This inverse relation spans back for decades.

increase in the duration of labour force participation for individuals with higher levels of education. For example, a 25-year-old male with a high school diploma is expected to be active in the labour force for 32.6 years; a 25-year-old male with a bachelor's degree is expected to be active for 38.03 years, while a 25-year-old male with a master's degrees is expected to be in the labour force for an additional 38.66 years. This result again speaks to the positive relation between the level of education and the level of lifetime earnings.

Over time, the education-driven pay gap may have somewhat narrowed, and arguments in favour of education shifted slightly, but the central theme remains the same: on average, more education translates into more lifetime earnings. While it is easy to identify outliers who, despite the lack of a higher degree, became financially successful, our goal is to study average individuals and the education and career choices they made. Brown, Fang, and Gomes. (2012) estimated that the average return on a college education over high school is $300,000. However, the degree, the choice of college and the occupation choice add significant variability to this figure.

The benefits of going to college extend beyond just finances. Flint (1997) points out the sociological implications of attaining a college degree in an early paper. Among them are mentioned status attainment in terms of social mobility and social integration. Oreopoulos and Salvanes (2011) link more schooling with a lower probability of being unemployed and with a higher probability of being married, being healthier, having more successful children and being more civically engaged. At the same time, while getting a college degree results in overall positive outcomes, financing the degree with student loans is not as straightforward. Having higher student loans may influence the quality of life and other financial decisions of an individual. This is evident by the present high rates of default on student loans. Brown et al. (2014) document a negative association between higher student loan debt and home purchases, access to credit and ability to pay other debt. Anderson (2013) and Shao (2014), among others, argue that people who have student loans are less likely to be married or have children. Dugan and Kafka (2014) studied individuals who had more than $50,000 in student debt and showed that such individuals were less likely to do well in the areas of finances, well-being, and health. Interestingly, the above studies did not take a deeper look at the fields of study of the borrowers. Such generalised results are useful but may potentially lead to unnecessarily broad conclusions and result in suboptimal policy decisions.

Elliot and Nam (2013) use the Survey of Consumer Finances to find that, in 2009, a household that had student loan debt also had about $40,000 less in assets as compared to a household without student loan debt.[9] Hiltonsmith (2013) calculated the average student loan debt burden of a family to be $53,000, which results in a lifetime asset loss of $208,000, most of it coming from lower retirement accumulations. While these findings may be useful and reliable, they fail to examine the asset levels of similar individuals who made the decision not to take on student loans and, thus, not to obtain higher education. Given the documented positive relation between higher education and lifetime earnings, one would expect that the (long-term) financial worth of individuals who had student loans may be below those who received higher education without taking on student loans. However, such individuals' wealth likely exceeds the wealth of those who did not take on student loans and did not receive higher education. This, of course, is an argument that would support the use of financing for higher education.

Avery and Turner (2012) conclude that the earnings premium increased by more than the college tuition over a long period of time, which means that borrowing for college is not only optimal but also that the cost of it has been dropping in relation to the growth of the long-term earnings that is gained through higher education. Nevertheless, the authors point out that even though borrowing for college might make sense, a debt (risk) adverse student may decide against it, bypassing higher potential

[9] Note that the lower assets level may not be solely driven by the presence of student loans, rather it could also stem from the lower initial wealth level of the household.

earnings. In a theoretical setting, Cigno and Luporini (2019) show that student loans improve job matching and bring educational investment closer to efficiency. Cho, Xu, and Kiss (2015) point out that in order "to solve the life cycle utility maximisation problem, a student is believed to weigh the cost of student loan debt against the probability of college graduation and expected future earnings" (page 234). There are no simple tools to accurately assess both the probability of successful Graduation and the exact future earnings.

The life cycle theory (Modigliani, 1986) predicts that the choice of major should not be affected by the debt a student chooses to undertake, as the debt repayments should represent only a small component of one's earned income over the duration of the repayment period. In other words, taking on student loans and the amount taken should not influence the selection of the major field of study and the type of job chosen. Furthermore, the theory predicts that individual financial decisions should not be affected by the amount of student loans. Empirically, this may not hold.

The reality is that life decisions are affected by the amount of student loans taken. For example, Rothstein and Rouse (2011) devised an experiment in which they have shown that debt is related to choosing higher-paid private jobs rather than lower-paid public jobs. Kuzma, Kuzma and Thiewes (2010) show that the choice of the major drive's students' confidence in how well they can repay their debt. Gicheva (2011) examines the relationship between student loans and the timing of the marriage, concluding that the amount of student loans is negatively related to the decision to marry.

Alternatively, the human capital theory (see Becker, 1993) predicts that the amount of student loans taken is an optimisation problem that is invariably linked to the choice of the major. In the current paper, we explore the alternative theories and the student's perception of student loans post-graduation. Dearden (2019) argues that to design student loan systems, it is imperative to predict students' earnings and income potential in the future. This is important for assessing the burden of any taxpayer costs and the repayment estimated and the hardships associated with it for the individual borrower. Despite the lack of tools and the complexity of the decisions, students make rational choices when it comes to taking on student loans. While universities may not necessarily follow market forces, students (consumers) appear to do so. They appear to be aware of the economic implications of selecting a particular major and the income that comes with it and adjust accordingly. This is evidenced by the recent increased enrollments in STEM-related majors and business schools and the drops in enrollments in the liberal arts fields and other areas of study that presently offer lower economic rewards upon Graduation. In our empirical setting, we explore the idea that people are rational in that the ratio of loans to post-graduation pay is influenced by the choice of the field of study and that the individuals who are studying in the more financially lucrative fields are more likely to take on greater student loan balances.

If the above hypothesis holds that there exists a relation between the future expected earnings and the amount of the student loans, this could imply that the ability to repay the loans stays somewhat consistent across the different areas of study. This finding would further put in question the origin and the causes of the "student loan crisis". One of the less studied potential explanations of the origin of the student loan crisis is the consumption behaviour or the changes in the consumption behaviour of individuals upon securing post-graduation earnings (gaining post-graduation employment in the labour market). We argue that the disproportional consumption to income changes that do not account for the need to repay student loans may be a major driver of the present student loan problem. Johnson and Li (2007) studied the link between higher household debt and consumption smoothing. They find evidence that a high household debt service ratio does not mean a higher sensitivity of consumption to changes in income. Thus, it is possible that individuals who have high student loans over-adjust their consumption upward upon securing post-graduation employment. Such overadjustment would then result in diminished ability to repay student loans. We study how the perceptions about student loans are influenced by the loan-to-pay ratio and by the personal consumption adjustment after Graduation.

The lifecycle theory predicts that the accumulation of student loans should have little (if any) effect on consumption. Because the income is seen as permanent, individuals with student loans should not

behave any differently than those who do not take on loans. This, however, could reduce their ability to pay on the loans and thus may be one of the major causes of the high delinquency and default rates on the loans. Flint (1997) identifies lower disposable income as one of the main factors leading to loan default.

If one subscribes to the lifecycle theory, then we would not expect a relationship between consumption and income to student loan balance ratios after Graduation. On the one hand, if there is a regard for one's post-graduation overall financial position and the need to repay student loans, we would not expect to see an upward adjustment in consumption upon Graduation. On the other hand, graduates could be rational, and their consumption behaviour after Graduation would coincide with their debt/income obligations. Borrowers may not sufficiently consider their debt obligations when making consumption decisions; they may end up with a consumption increase that hinders their ability to repay loans, and this, in turn, can influence their perception of the usefulness of the education they obtained and student loans as an instrument to finance the education. Our second goal is to examine the impact of the loan-to-pay ratio on the perceptions of students toward higher education and student loans after Graduation. We argue that higher satisfaction with and the major of study selection and positive perception toward student loans is related to the loans-to-pay ratio post-graduation.

3. Data Analysis and Results

Using social media distribution channels, we conducted a survey of recent higher education graduates during the spring of 2020.[10] We collected 587 responses, with 65 respondents, or 11.07%, enrolled at a higher education institution at the time of the survey. The rest of the respondents, 88.93%, had either graduated or dropped out of a higher education program prior to responding to the survey. Specifically, 4.26% of the respondents attended higher education institutions but have not graduated/dropped out, 4.60% have attained an associate degree, 34.07% secured a bachelor's degree, while 37.48% had a master's degree, and 19.59% had a terminal degree. The distribution of the sample may not be representative of the education levels of the overall population of the United States. We were intentionally targeting participants who completed bachelor's and advanced degrees and thus can self-assess the worthiness of their education and the contribution of student loans as a mechanism of obtaining higher education.

The survey included 36 questions, split into categories on demographics, education, student loans, earnings, changes in personal consumption, self-assessment of the worthiness of education, and self-assessment of the worthiness of student loans.

First, we present univariate results. One of the main objectives of our study is to understand self-perceived attitudes towards student loans as related to majors of studies, universities attended, and income post-graduation. Thus, there is great value in looking at univariate data. However, we proceed to multivariate analysis, specifically OLS regression, to make any conclusions and implications. The data is checked for distribution (normally distributed) and heteroskedasticity. As the dependent variables are a series of categories (4 or 5), we first recode the data to create new variables to make meaningful comparisons. We check the coefficients between variables (correlation coefficients and VIFs within normal range) and the correlations between the independent variables and the error terms in the regression model for endogeneity.

[10] The survey was conducted prior to the discussion and implementation of the student loan forgiveness programs implemented by the Biden Administration in 2022.

3.1 General Data Overview

Table 1A presents the distribution of the student loan balances by the education level of the survey respondents. Some notable observations from Table 1A are that 33% of the participants who dropped out did not take on any student loans. The same is true of Professional or PhD degrees. By comparison, 13% of the respondents who dropped out accumulated between $40k-$50k in student loans, while 46% of respondents with terminal or PhD degrees accumulated more than $100k in student loans. Some key takeaways from this data distribution are that 20% do not borrow anything to go to college or obtain higher degrees. Of particular concern is that 67% of the respondents who dropped out took out between $5k and 50k in student loans; most students who obtain an Associate's, a bachelor's or a master's degree borrow between $10-40k; and almost 50% of those who have a terminal or professional degree take on more than $100k in loans (this result is driven by majors such as law and medicine).

Table 1 Panel A: Student Loans and Degree Completion
Panel B: Student Loans and the Types of Loans
Panel C: Student Loans and the Type of College Attended

Panel A Total Student Loans at Graduation

Highest Education	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,001	Overall
Dropped out	33%	0%	21%	13%	8%	8%	13%	0%	0%	0%	0%	4%	0%	4.44%
Associate's	35%	0%	4%	15%	12%	4%	8%	12%	0%	4%	4%	4%	0%	4.81%
Bachelor's	23%	5%	7%	14%	18%	9%	9%	3%	5%	2%	2%	1%	3%	35.12%
Master's	17%	1%	5%	10%	10%	11%	7%	12%	4%	6%	3%	6%	8%	40.11%
Professional and PhD.	12%	0%	1%	2%	5%	2%	4%	4%	6%	4%	6%	8%	46%	15.53%
Overall	20%	2%	6%	11%	12%	9%	8%	7%	4%	4%	3%	4%	11%	-

Panel B Total by Type of Loan

Loan Type	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,001	Overall
Federal Subsidized	4%	20%	38%	16%	4%	12%	2%	0%	2%	0%	0%	2%	11.63%
Federal Unsubsidized	9%	21%	15%	18%	12%	0%	9%	9%	0%	0%	0%	6%	7.67%
Combination of S and U	2%	5%	13%	17%	13%	8%	8%	5%	6%	2%	7%	13%	50%
Private	17%	25%	0%	33%	0%	8%	8%	0%	0%	8%	0%	0%	2.79%
Combination and F and P	0%	2%	3%	9%	10%	13%	12%	8%	5%	7%	8%	25%	27.91%
Overall	3%	7%	13%	15%	10%	9%	9%	5%	5%	3%	6%	14%	-

Panel C Total by School Type

School Type	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,0001	Overall
In state public	23%	3%	7%	12%	13%	10%	8%	7%	3%	3%	3%	3%	5%	53.83%
Out-of-state public	13%	0%	3%	5%	13%	5%	5%	5%	10%	7%	2%	7%	25%	11.21%
Private	18%	1%	3%	11%	12%	7%	7%	8%	5%	4%	2%	5%	18%	34.95%
Overall	20%	2%	5%	11%	12%	8%	7%	7%	4%	4%	3%	4%	12%	-

Table 1B breaks down the information by the type of student loan obtained. Respondents self-report the student loans by the federal subsidised, federal unsubsidised, a combination of the two types of federal loans, private loans, and a combination of private and federal loans. We find that most loans are issued through federal programs, and the need to use private loans in addition to federal loans drives the higher outstanding balance of respondents. This makes logical sense for high loan balances (for example, paying for law school), but it does not for respondents with relatively low loan balances upon Graduation. Finally, in Table 1C, we link the amount of student loans taken with the type of school attended. The most balanced are accumulated by respondents who choose to attend an out-of-state public school and pay the out-of-state tuition. Those balances exceed the ones reported by respondents who attended private schools. This result is interesting and somewhat alerting in that the decision to attend a public institution out of state may contribute to the lower ability to repay student loans.

In order to understand the decision to finance education through student loans, we also collect and report the data by graduating/current GPA and by the field of study. Tables 2A, 2B, and 2C present this information. As expected, individuals with higher GPAs are less likely to borrow. We speculate that the decision is driven by a higher probability of obtaining financial assistance in the form of scholarships and grants. Nevertheless, when it comes to very large borrowed amounts of over $100K, the amount does not seem to be an artefact of the GPA, with graduates who have a 2.5-3.0 GPA being as likely to accumulate $100k in student loans as respondents with a 3.5-4.0 GPA.

Table 2 Panel A: Student Loans and GPA
Panel B: Student Loans and Degree
Panel C: Student Loans and Starting Pay

Panel A	**Total Student Loans at GPA**													
GPA	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,0001	Overall
2.01- 2.5 GPA	33%	0%	0%	17%	33%	17%	0%	0%	0%	0%	0%	0%	0%	1.23%
2.51- 3.0 GPA	18%	5%	0%	8%	13%	13%	8%	8%	3%	5%	5%	5%	13%	8.20%
3.01- 3.5 GPA	11%	5%	5%	11%	15%	4%	12%	6%	6%	4%	5%	4%	13%	25.41%
3.51- 4.0%	23%	1%	6%	10%	12%	10%	5%	7%	5%	3%	2%	4%	12%	65.16%
Overall	19%	2%	5%	10%	13%	9%	7%	7%	5%	4%	3%	4%	12%	-
Panel B	**Total Student Loans by Field of Study**													
Field of Study	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,001	Overall
Agricultural and life sciences	29%	6%	12%	12%	18%	6%	12%	6%	0%	0%	0%	0%	0%	3.43%
Art's	30%	4%	4%	13%	13%	4%	4%	0%	0%	4%	0%	9%	13%	4.65%
Business	26%	2%	4%	10%	15%	8%	5%	9%	6%	4%	2%	5%	3%	34.34%
Engineering	31%	0%	13%	13%	6%	0%	19%	6%	6%	0%	0%	0%	6%	3.23%
Education	18%	1%	7%	13%	14%	13%	13%	6%	2%	2%	1%	2%	5%	16.77%
Health Science and Public Health	13%	0%	4%	4%	4%	13%	2%	4%	9%	4%	9%	9%	24%	9.29%
Humanities	10%	7%	14%	10%	10%	0%	0%	7%	7%	10%	0%	14%	10%	5.86%
Journalism and Communication	6%	13%	13%	13%	6%	13%	6%	6%	13%	0%	6%	0%	6%	3.23%
Medical / Dental / Pharmacy / Veterinary	9%	0%	13%	16%	13%	3%	3%	6%	0%	0%	6%	0%	31%	6.46%
Law	6%	0%	0%	9%	6%	6%	9%	3%	3%	3%	6%	3%	47%	6.87%
Liberal Arts	24%	0%	0%	7%	7%	7%	10%	17%	3%	14%	0%	3%	7%	5.86%
Overall	20%	2%	6%	11%	12%	8%	7%	7%	5%	4%	3%	5%	11%	-

Panel C	Total Student Loans by Starting Pay													
Starting Pay	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,001	Overall
$10,001-$20,000	26%	4%	7%	11%	11%	13%	9%	2%	7%	7%	0%	0%	4%	9.18%
$20,001-$30,000	17%	4%	15%	13%	15%	7%	7%	3%	0%	4%	7%	4%	3%	14.17%
$30,001-$40,000	17%	4%	5%	14%	11%	9%	12%	8%	4%	4%	2%	3%	7%	23.75%
$40,001-$50,000	16%	0%	5%	8%	16%	12%	4%	8%	5%	4%	1%	4%	18%	15.37%
$50,001-$60,000	24%	0%	1%	15%	10%	9%	7%	4%	4%	1%	4%	6%	13%	13.57%
$60,001-$70,000	9%	0%	3%	6%	6%	9%	6%	9%	12%	9%	6%	15%	12%	6.79%
$70,001-$80,000	8%	0%	0%	8%	15%	4%	4%	15%	8%	4%	4%	8%	23%	5.19%
$80,001-$90,000-	30%	0%	0%	0%	10%	10%	0%	20%	0%	0%	0%	10%	20%	2.00%
$90,001-$100,000	31%	0%	8%	8%	8%	0%	8%	8%	0%	8%	0%	0%	23%	2.59%
$100,001-$125,000	25%	0%	6%	0%	19%	13%	0%	13%	6%	0%	0%	6%	13%	3.19%
$125,001-$150,000	22%	0%	0%	0%	22%	11%	0%	22%	11%	0%	0%	0%	11%	1.80%
>$150,001	25%	0%	0%	0%	8%	0%	8%	0%	0%	0%	0%	8%	50%	2.40%
Overall	19%	2%	6%	10%	12%	9%	7%	7%	5%	4%	3%	5%	12%	-

Panel B breaks down the loans by the field of study. Our sample consists of 34.34% of respondents with degrees in a business-related major, 16.77% in education, 9.29% in public health and science, 6.87% in law, 6.46% in medical/dental pharmacy/veterinarian field, 5.86% in liberal arts and humanities. The rest of the sample, with less than 5%, consists of responses from individuals with degrees in agricultural sciences, arts, engineering, and journalism/communications. Consistent with rational choice theory, respondents in high-paying fields have higher amounts of student loans. Based on the entry-level salaries and expected lifetime earnings, we would expect a medical student to have more student loans than a humanities student. The first look at the data by profession points to signs that students in certain majors, like education and liberal arts, appear to be overleveraged. This is further explored in the multivariate analysis that follows the present section.

Next, in Panel C, we present the analysis using the sorting of the data by the amount of student loans and the post-graduation earnings. Of special interest are the numbers highlighted in green (where the ratio of student loans to starting pay is low) and red (where the ratio of student loans to starting pay is higher than one). As we have previously pointed out, looking at the student loan "problem" on a global scale may result in misleading findings. In the present study, we attempt to address the problem by looking at more specific scenarios (combinations of education choices and level of acceptable borrowing) of when it is economically feasible to finance a specific degree with an appropriate level of student loans. As such, it is of concern when, for example, 15% of respondents report a starting pay of $60-70k and student loans of $90-100k. By comparison, someone whose starting pay is $150k+ and who has the same student loans of $90-100k at Graduation is likely to be able to enjoy a higher standard of living while effectively paying on their student loans in the years following Graduation.

The next part of the survey focused on the respondents' self-perception regarding the student loans taken. Table 3 presents the data by major and a scale of agreement that ranges from strongly agree to strongly disagree when answering the question of whether the selected major improved the respondent's standard of living and whether the student loans accumulated during the degree acquisition were worth it to the respondent.

The summary of the responses provided in Panel A suggests that the highest dissatisfaction with the major selection is experienced in the fields of Arts, Journalism and Communication, and Liberal Arts, while the highest level of satisfaction is observed in Business, Engineering, Medical and Legal fields. The most neutral responses appear in the areas of Agricultural and Life Science and Humanities.

Table 3 Panel A: Student Loans and Standard of Living
Panel B: Worthiness of Loans
Panel C: Satisfaction with the Major Selection

Panel A	**Did Major Selection Improved Financial Standard of Living?**											
Agree/ Disagree	Agricultural and life sciences	Arts	Business	Engineering	Education	Health Science and Public Health	Humanities	Journalism and Communication	Medical/Dental/ Pharmacy/Veterinary	Law	Liberal Arts	Overall
Strongly Agree	7%	10%	53%	63%	21%	25%	4%	13%	52%	53%	11%	34.59%
Somewhat Agree	40%	20%	29%	13%	44%	36%	33%	25%	31%	28%	27%	31.87%
Neither Agree nor Disagree	33%	20%	10%	6%	14%	23%	26%	13%	0%	9%	24%	14.26%
Somewhat Disagree	7%	15%	6%	6%	15%	2%	22%	19%	7%	3%	16%	9.43%
Strongly Disagree	13%	35%	2%	13%	6%	14%	15%	31%	10%	6%	22%	9.85%
Panel B	**Loans Were Worth It?**											
Agree/ Disagree	Agricultural and life sciences	Arts	Business	Engineering	Education	Health Science and Public Health	Humanities	Journalism and Communication	Medical/Dental/ Pharmacy/Veterinary	Law	Liberal Arts	Overall
Strongly Agree	20%	5%	35%	44%	16%	12%	25%	13%	32%	24%	11%	24.11%
Somewhat Agree	20%	15%	23%	6%	33%	23%	11%	25%	35%	41%	17%	24.53%
Neither Agree nor Disagree	33%	30%	25%	25%	21%	28%	18%	13%	6%	6%	23%	21.38%
Somewhat Disagree	13%	20%	12%	19%	15%	23%	25%	13%	10%	12%	20%	15.30%
Strongly Disagree	13%	30%	6%	6%	15%	14%	21%	38%	16%	18%	29%	14.68%
Panel C	**Happy with Higher Education and Major**											
Agree/ Disagree	Agricultural and life sciences	Arts	Business	Engineering	Education	Health Science and Public Health	Humanities	Journalism and Communication	Medical/Dental/ Pharmacy/Veterinary	Law	Liberal Arts	Overall
Happy	40%	50%	81%	81%	69%	57%	61%	38%	79%	81%	49%	68.76%
Happy but Wrong Major	47%	40%	13%	13%	22%	34%	29%	44%	14%	13%	38%	22.64%
Not Happy	13%	10%	6%	6%	9%	9%	11%	19%	7%	6%	14%	8.60%

The main takeaways from the data are reported in Table 3. Panel B shows that students majoring in business, engineering, education, medicine, and law overall think that it is worthwhile to take on student loans to obtain their degrees. Students majoring in arts, humanities, journalism, and liberal arts overall think that the accumulated student loans were not worth the while. For example, 49% of the respondents with degrees in liberal arts disagree or strongly disagree that the loans were worth it. By comparison, 58% of business graduates agree or strongly agree that the loans were worth it. To further understand if the answer was driven by the student loan amount or the selection of the major, in Panel B, we ask the participants to reflect on how happy they are with the major chosen in college.

The results are consistent with the responses to the previous question, pointing out that the choice of the major cannot be separated from the pay upon Graduation and the decision to finance college education through student loans. Again, business, engineering, education, medical and law graduates are overall satisfied with their choice of profession, while agriculture, arts, humanities, journalism, and liberal arts graduates are not. For example, 81% of law school graduates are happy with their choice of major, while only 38% of journalism majors are. Interestingly, over 90 percent of the sample are satisfied with their decision to obtain higher education. This confirms that higher education is perceived as a value-adding proposition.

3.2 Consumption Data Overview

As noted in the introductory section of this paper, the personal consumption behaviour of graduates, and more specifically, the (over) adjustment of personal consumption of individuals upon Graduation, may be a cause of the present state where a large amount of student loans are in or at risk of default. To further contribute to the literature on the topic, we explore the changes in the personal consumption behaviour of our survey respondents.

This part of the study focuses on exploring how individuals see their own consumption, how fast and to what degree they adjust their consumption to the higher post-graduation income level and what impact they perceive such adjustment to have on their ability to repay student loans. Table 4 presents the distribution of responses to certain questions posed in the survey. Panels A and B present the responses by the amount of the student loans outstanding and by the area of study, respectively.

Table 4 Panel A: Perceptions of Spending and Student Loans
Panel B: Perceptions of Spending and Major
Panel C: Follow-Up

Panel A	**Spent too much on car, house, going out, vacations upon Graduation?**													
Total Borrowed	$0	<$5,000	$5,000-$10,000	$10,001-$20,000	$20,001-$30,000	$30,001-$40,000	$40,001-$50,000	$50,001-$60,000	$60,001-$70,000	$70,001-$80,000	$80,001-$90,000	$90,001-$100,000	>$100,0001	Overall
Yes	31%	36%	44%	44%	49%	46%	41%	51%	38%	38%	44%	54%	45%	42.52%
No	69%	64%	56%	56%	51%	54%	59%	49%	63%	62%	56%	46%	55%	57.48%

Panel B	**Spent too much on car, house, going out, vacations upon Graduation?**											
Field of Study	Agricultural and life sciences	Arts	Business	Engineering	Education	Health Science and Public Health	Humanities	Journalism and Communication	Medical/Dental/ Pharmacy /Veterinary	Law	Liberal Arts	Overall
Yes	47%	52%	39%	69%	51%	57%	31%	50%	38%	47%	50%	45.54%
No	53%	48%	61%	31%	49%	43%	69%	50%	63%	53%	50%	54.46%

Panel C	**Happy with Higher Education and Major**											
Agree/ Disagree	Agricultural and life sciences	Arts	Business	Engineering	Education	Health Science and Public Health	Humanities	Journalism and Communication	Medical/Dental/ Pharmacy/Veterinary	Law	Liberal Arts	Overall
Strongly Agree	0%	12%	12%	15%	10%	17%	15%	21%	13%	26%	18%	13.53%
Somewhat Agree	17%	35%	17%	21%	23%	24%	8%	29%	35%	22%	6%	20.30%
Neither Agree nor Disagree	33%	53%	44%	46%	31%	12%	46%	21%	26%	26%	29%	34.09%
Somewhat Disagree	25%	0%	14%	8%	18%	24%	15%	14%	13%	13%	24%	16.04%
Strongly Disagree	25%	0%	14%	8%	18%	24%	15%	14%	13%	13%	24%	16.04%

Overall, 42.5% of respondents identify having spent too much on consumption (in terms of spending too much on a new car, house, going out, and going on vacations) after Graduation. Notably, the

proportion of those who think that they overspent grows as the borrowed amount increases. This result points to the fact that individuals appear to recognise that their personal consumption actions affect their ability to repay student loans. However, this is an ex-post response, and thus, it suggests that the over-adjustment in consumption may contribute to the student loan crisis.

When the field of study dimension is examined, 69% of engineering and 57% of health science and public health graduates identify themselves as having spent too much, while 61% of business, 69% of humanities, and 63% of medical students do not believe they have overspent upon Graduation. Generally, we see the following trends: individuals who borrow little or do not borrow at all seem to be more fiscally conservative, while almost half of the sample identify themselves as overspenders. As a follow-up question (see Table 4C), we asked the respondents to evaluate whether they believe they should have paid more toward student loans than they did/presently do. We see a relatively even distribution of opinions on the topic of paying/not paying off the loans faster. Journalism and communication, medical, and law graduates appear to underpay on their loans upon Graduation (underpay refers to their perception as to how much they should have paid as opposed to actual loans being underpaid on). The implication we draw from the answers is that unless the money that would otherwise be used to pay off the student loans is invested in higher return assets, prior payments for educational expenses (i.e. student loans) should be considered as a sunk cost (the asset that was obtained using this money does not appreciate).[11] Thus, one should put effort into paying such loans off as soon as possible to reduce the burden on future cash flows. This may (should) be achieved through a more fiscally responsible management of personal consumption upon Graduation.

3.3 Multivariate Analysis

To further investigate the relations between student loans, employment-related outcomes, and perceptions of borrowers toward higher education and student loans, we perform multivariate analysis. First, we focus on the relationship between financial satisfaction with the chosen major and the loan-to-pay ratio. The results of the tests are presented in Table 5. We asked borrowers/former students to assess their own perceptions of whether their college major increased their standard of living post-graduation. The dependent variable is represented by the degree of agreement with the statement that the chosen major increased/will increase the standard of living after Graduation; the main independent variable is the loans to starting pay ratio. For robustness checks, we also include alternative measures for the dependent variable. Specifically, we use the log of student loans instead of the ratio and the student loans to median pay in the industry. These alternative measures address the issue of self-selection bias (only students who have little in loans and a high salary decide to answer the survey) and representativeness. Our results are consistent with the main findings and are available on request.

Several control variables, such as gender and GPA, are included in the models based on prior findings. Yankovich et al. (2019) find that gender significantly impacts student loan borrowing and the perceived impact of debt on academic performance. Additionally, we include the consumption adjustment variable as it relates to the satisfaction with the choice of the major. After presenting the overall data (Model 1), we split the sample into two subsamples (results reported in Models 2 and 3) based on the labour force demand/marketability and starting pay in the respective groups of major fields of study. As such, category one (Model 2) is comprised of students who majored in arts, humanities, journalism, liberal arts, agriculture/life sciences and education-related majors. The second category (Model 3) consists of responses from business, engineering, health-related degrees, law and medicine majors.

[11] This is in contrast to, for example, having a mortgage on a home.

Table 5

Variable	Model 1	Model 2	Model 3
Loans/Pay	-.0991 (0.072)*	-.2595 (0.000)***	-.0637 (0.211)
DegreeCategory	.8979 (0.000)***		
GPA	.0932 (0.552)	.1700 (0.587)	.0327 (0.843)
Gender	.3175 (0.011)**	-.0976 (0.713)	.4620 (0.001)***
ConsumptionScore	.0696 (0.006)***	.0530 (0.211)	.0736 (0.013)**
Constant (p-value)	2.753 (0.000)***	2.7461 (0.020)**	3.7609 (0.000)***
F model (p-value)	22.17 (0.000)***	5.12 (0.0006)***	4.74 (0.0010)***
R-squared	0.1945	0.0771	0.0818
Fixed Effects	Yes	No	No
N	449	192	257

Note: The dependent variable is coded as a scale from 1 to 5, representing the degree of agreement with the statement: "I feel like the major I chose has increased/will increase my financial standard of living after graduation". It is represented by a scale from 1-5, where 1 is strongly disagree and 5 is strongly agree. Independent variables are as follows: Loans/Pay is the log of the midrange of loans at current time/Graduation to starting pay, DegreeCategory is a dummy variable equal to 1 if the respondent was a business, engineering, health administration, law or medicine major and 0 otherwise, GPA midrange and gender (equals 1 if the respondent identifies as male and 0 otherwise), ConsumptionScore is the calculated number based on answers to four different questions about increases in the individual's standard of living after Graduation. Model 1 presents the overall data. It includes major fixed effects, and Models 2 and 3 present the data by category, where Model 2 is comprised of students who majored in arts, humanities, journalism or liberal arts, agriculture/life sciences and education and Model 3 of former students in business, engineering, health, law, and medicine.

Model 1 (the combined model) shows that there is an inverse relationship between financial satisfaction with one's major choice and the loan-to-pay ratio, an expected result that implies that the satisfaction is reduced when the loan balance (as percent of pay) is greater. The positive relationship between satisfaction with the major selection and consumption upon Graduation leads us to infer that the way borrowers perceive their chosen major is directly related to the amount of money they have available after Graduation and to the improvement in the standard of living. The relationship between the money-making ability that the selection of the major provides and the satisfaction with the selection is further emphasised by the positive relationship between the level of satisfaction and the educational major category (proxied by the DegreeCategory variable). Majors that are more marketable, i.e. have a high potential to produce greater income, lead to higher financial satisfaction with the major selection decision. This finding supports the idea that students should analyse the post-graduation job market when deciding on both what majors to choose and how much student loans to incur during their educational journey. We also used the individual consumption adjustment answer rather than the aggregate score for robustness checks. The results were similar and consistent with the overall model.

It is possible that the above results of an inverse relation between the student loan-to-pay ratio and the level of satisfaction stem from individuals over-adjusting their personal consumption upon Graduation, which results in a diminished ability to repay student loans. This may lead to a perception that the initial choice of the field of study was not the correct one.

When we break the sample up by subcategories based on the labour market demand and expected earnings (DegreeCategory variable), the relation between the satisfaction from the major selection and the loan-to-pay ratio emphasised for both, the high (Model 3) and low (Model 2) expected earnings major graduates, however, the negative relationship is only highly statistically significant for the lower earnings group (Model 2). The group in Model 3 is comprised of students who majored in business, engineering, health-related fields, law, and medicine – the majors that generally result in higher expected earnings. While present, the negative relationship between the loans-to-pay ratio and satisfaction in this educational category is not statistically significant. This may be explained by

the fact that graduates in this educational group may experience similar starting pay to those included in Model 2; however, their expected earnings growth rate may be significantly higher, which in turn results in less fear of higher loan-to-pay ratios. A medical student, for example, can make the determination that, even though she is incurring a large amount of student loans, ultimately, her pay and potential for a job will be sufficient to justify such an expense. We find that, while the negative relationship between financial satisfaction and loans/pay ratio is present, so is a positive relationship between increased levels of consumption and satisfaction (in the overall sample reported in Model 1). In Model 2, which reports the results for former students who majored in arts, humanities, journalism, liberal arts, agriculture/life sciences and education-related majors, we find the relation to hold for the loans to pay ratio, but not the consumption score. In other words, the former students from this category are less likely to be satisfied with the financial outcomes of their major selection when they have greater loan-to-pay ratios and this effect is not offset by the increased satisfaction from the ability to increase personal consumption upon Graduation. This result may indicate that the educational choice of students in this category does not sufficiently contribute to a higher standard of living upon Graduation. Overall, we conclude that a higher loan/pay ratio post-graduation leads to lower financial satisfaction with the chosen major regardless of the major. Individuals who have high student loans compared to their starting pay are more likely to regret their choice of major regardless of what that major was. The consumption adjustment relationship is not as clear. In order to try to understand it better, we focus on the degree to which consumption increases post-graduation.

To further test the application of rational choice theory when it comes to education and career choices, we look at the relationship between the consumption score and the loan-to-pay ratio. The results are reported in Table 6. We build the dependent variable, ConsumptionScore, by combining the self-perceived increase in spending along four variables: increase in expense for transportation (buying a new/better car after Graduation), increases in the living conditions (renting a better/more expensive place), increases in vacation spending, and increases in entertainment spending. We build the aggregate score based on the answers provided by the respondents. Someone who did not increase/adjust their spending in any of the categories is assigned a score of 0, while someone who reported an increase in all four spending categories is given a score of 4.

Table 6

Variable	Model 1	Model 2	Model 3
Loans/Pay	-.1653 (0.059)*	-.2937 (0.042)**	-.1288 (0.169)
DegreeCategory	.6005 (0.007)***		
GPA	-.5940 (0.078)*	-.9587 (0.100)	-.3848 (0.365)
Gender	-.4760 (0.090)*	-.8173 (0.142)	-.3477 (0.284)
Constant (p-value)	5.1007 (0.000)***	6.5800 (0.002_***	4.888 (0.001)***
F model (p-value)	4.06 (0.0030)**	3.00 (0.0316)**	1.14 (0.3331)
R-squared	0.0366	0.0429	0.0172
N	458	198	260
Variable	Model 1	Model 2	Model 3
Loans/Pay	-.1653 (0.059)*	-.2937 (0.042)**	-.1288 (0.169)

Note: The dependent variable is the consumption score, which ranges from 0 to 4, based on each of the categories of increased consumption post-graduation. Independent variables are as follows: Loans/Pay is the log of the amount of borrowed midrange amount from the highest degree and log of the midrange of starting pay, DegreeCategory is a dummy variable equal to 1 if the respondent was a business, engineering, health administration, law or medicine major and 0 otherwise, GPAmidrange and Gender (equals 1 if the respondent identifies as male and 0 otherwise). Model 1 presents the results for the overall sample. It includes major fixed effects. Models 2 and 3, present the data by category, where Model 2 is comprised of students who majored in arts, humanities, journalism or liberal arts, agriculture/life sciences and education and Model 3 former students in business, engineering, health, law and medicine.

We find a negative association between the loans-to-pay ratio and consumption after Graduation, a relation that persists in the overall sample and the lower starting pay degree category subsample (the relation is negative but statistically insignificant in the higher earnings educational group included in Model 3). The higher the loans/pay ratio at Graduation, the lower the increase in consumption. Three possible explanations for these relationships are: (1) reduced levels of disposable income due to student loan payments, (2) an elevated degree of caution in the expenditure decisions that are associated with the higher level of debt, and (3) inability of the individuals to access credit in order to increase their consumption/expenditure. On the one hand, individuals who have a high loan-to-pay ratio may not be willing to increase their standard of living after Graduation because of the impact of student loan payments on their disposable income. Interestingly, the relation described above is only statistically significant for the low-pay major categories (Model 2) but is not significant for the higher expected earnings majors (Model 3).

Regardless of whether the individual is in a high expected earnings major, like medicine, or on the opposite end of the scale, the concern for post-graduation loan payoff may be driving the restricted consumption behaviour. It is also possible that, even if the individuals wanted to increase their standard of living by getting a new car or going on a vacation, they may not be able to do so. Further work is needed to disentangle the effect. However, there is a relation between the post-graduation standard of living and the amount of loans one graduates with. This relation has an impact on post-graduation perception toward the major selection and individual's personal consumption. These findings should be taken into consideration when a decision to take on loans to finance higher education is made.

To further understand the relationship between financial satisfaction in the choice of major, post-graduation student loans to pay ratio and adjustment in consumption, we look at how an increase in the standard of living is related to the satisfaction in major choice. Overall, the test of perception of the major selection on consumption points to an increase in satisfaction when consumption increased only when the individual was able to afford that increase. Overall, there is a strong positive relationship between the perception that a major is responsible for the increased standard of living and the adjustment in personal consumption. The higher the adjustment in consumption, the higher the perception that the major was a positive choice in life that led to a higher standard of living. This result is consistent with the expected rational behaviour.

4. Implications, Limitations and Conclusion

Overall, we find indication that individuals are mostly exhibiting rational decision-making when it comes to career and education choices and to the decision to finance education with student loans. They generally appear to decide on student loans while considering prospective future earnings. This is consistent with rational expectations and human capital theory. We also find that there is a strong association between the perception that a major was worth obtaining and the marketability and the starting pay that jobs requiring specific degrees generally pay.

Extending the argument, we also conclude that the major selection indirectly impacts personal consumption adjustment post-graduation and, in turn, an increase in consumption is associated with a positive view of the chosen major. We find evidence of rational decision-making when it comes to borrowing, major selection and consumption adjustment regardless of the major chosen. Individuals who have a higher loan-to-pay ratio after Graduation adjust their consumption the least.

A shortcoming of the study and potential area to expand is incorporating financial literacy into the consumption and educational choice framework. Artavannis and Karra (2020), Lusardi et al. (2010), Lusardi and Tufano (2015) and Mahdavi and Horton (2014) link financial literacy to understatement of student loan debt, financial mistakes, and correlation with college majors. Extending the analysis along the financial literacy dimensions could shed light on the ex-ante decision-making process.

It is important to mention that this study focuses on the value of financial education from the perspective of the return on the investment. We acknowledge that there is a broader perspective beyond this paper's scope. This could be exacerbated based on current economic conditions and investor sentiment. Prasad et al. (2022) point out the impact of investor sentiment on various dimensions of economic decision-making. Including investor sentiment in the analysis may impact how valuable some majors are, and as a result, the worth of student loans is in the context of the selection of a major. This topic and the incorporation of investor sentiment need to be explored further.

The benefits of education go beyond the return on investment. In this paper, however, we focus on the narrow view of the benefits associated with monetary investment.

Another consideration that could be examined in future work is the availability of programs associated with public loan forgiveness. We have excluded it from this analysis due to its narrow scope and applicability. Despite the talk in the media, few people qualify for any kind of forgiveness. Additionally, forgiveness only applied to public loans. This is a consideration that could be included in future work, especially given the recent changes (and proposed changes) to the public loan forgiveness and, potentially, a new income-based repayment plan.

Our findings may have significant policy implications. It is unrealistic to expect an equal level of increase in the standard of living and consumption across all majors of study. There is an argument to be made for students being able to adjust to market forces and follow them, even when universities do not. A student who has very bleak job prospects should have both information and counselling on those prospects and, potentially, a way to minimise the amount borrowed. Individuals on the other side of this decision have expressed both regret and the desire to make a more educated and restrictive decision about the amount of loans they undertook based on their future job perspectives and potential pay. Society needs highly trained individuals in all fields of study, including those that are known to provide lower earnings. However, the current non-discriminatory tuition policies that charge the same amount to engineering and liberal arts students may, in part, cause student loan crises and, more generally, contribute to overall societal inequalities.

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