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Student Loans and Borrower Outcomes

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Abstract

This review surveys the literature on student lending, emphasizing empirical studies of default, credit outcomes, and earnings. Student loans exist to alleviate credit constraints and, in theory, may have different effects on outcomes through multiple channels. There is significant heterogeneity in outcomes across types of borrowers, with many adverse outcomes driven by a subset of primarily for-profit institutions. We conclude by exploring policy options such as student loan forgiveness, income-driven repayment, income-share agreements, and penalizing schools for adverse borrower outcomes. These policies lead to possible equity and efficiency trade-offs.

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1. INTRODUCTION

Education is the single highest-return investment that most individuals will make, and an educated population has important positive externalities such as increased innovation and a better-functioning political system. A well-functioning system of higher education finance is fundamental for both households and the broader macroeconomy to ensure that human capital investment reaches efficient levels. Student loans exist to alleviate credit constraints so that individuals can make potentially high-return investments in human capital. Due to differences from other credit markets, student lending is overwhelmingly done by the government. Unlike other consumer credit markets, student loans are not secured by any underlying collateral that can be used as a screening or incentive mechanism. These challenges pertaining to adverse selection and moral hazard can lead to inefficiently low investment in education.

Student loan balances have grown rapidly in recent decades. This growth in student loan debt has fueled concerns that high debt levels are holding back economic growth, homeownership, and family formation; fueling tuition hikes; and costing taxpayers directly through defaulted loans. There is significant evidence that student lending fuels tuition increases, in turn leading to more borrowing. High levels of student debt could have ambiguous effects on many of these outcomes. For example, debt may lead to credit constraints, depressing homeownership or preventing borrowers from moving to locations with high-paying jobs. In contrast, access to liquidity early in life through loans might aid student borrowers in making down payments, and high debt levels might encourage students to work more hours to make payments. This review surveys the empirical literature on the impacts of student loans on borrower outcomes and explores policy options for improving student lending markets.

Student loans have increasingly received attention both in the media and among policy makers. Two key reasons are the size of the student loan market and its rapid growth. In 2022, student loan balances stand at US$1.7 trillion and are the second-largest source of household debt in the USA, following mortgages. To put that in perspective, outstanding US student loan balances are larger than the 2020 GDP of either Brazil or Russia. Much of this increase in balances may feed into itself.

Figure 1 shows growth in debt levels using Federal Reserve Bank of New York data. The figure shows outstanding loan volumes for various types of nonmortgage household debt as well as a rapid and continuous rise in student loan balances since the early 2000s. Since 2010, student loans have been the largest source of nonmortgage household debt. This increase has happened at a much faster rate relative to other forms of household debt.

Student loans are relatively understudied in economics and finance relative to other, in many cases smaller, credit and financial markets. For example, only 14 papers that mention student loans as a keyword appear in the top three finance and the top five economics journals.[1] There are more than three times as many papers on credit cards, even though $1.7 trillion in outstanding student loans balances is outstanding in comparison to $0.8 trillion for credit card debt (Cent. Microecon. Data 2022).

Empirical evidence suggests heterogeneous effects; there are several channels through which student borrowing may affect outcomes, and they often have countervailing effects. The most direct way in which student lending affects borrower outcomes is through relaxing credit constraints, which both allows borrowers to invest in human capital, potentially increasing their

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[1]The top three finance journals are defined as the *Journal of Financial Economics*, *Journal of Finance*, and *Review of Financial Studies*. The top five economics journals are defined as the *Journal of Political Economy*, *American Economic Review*, *Quarterly Journal of Economics*, *Review of Economic Studies*, and *Econometrica*. We focus on the years 2000–2021.
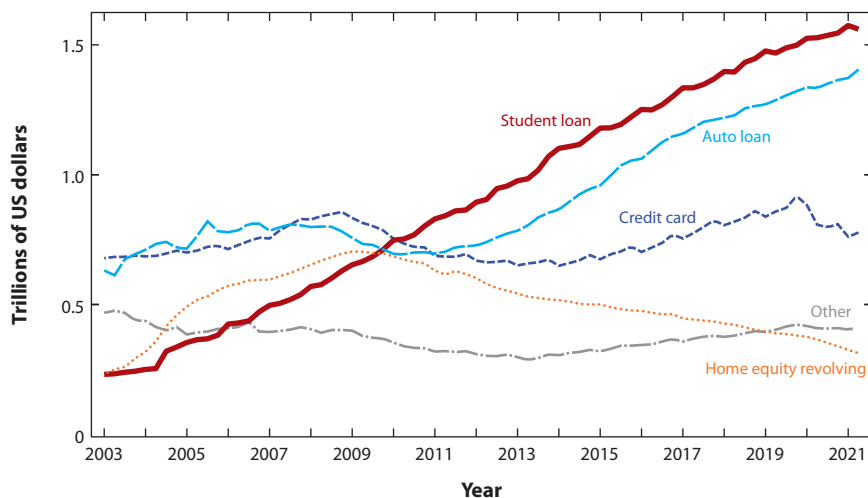
Figure 1

Aggregate balance of different types of nonmortgage household debt in the USA, by quarter, from 2004 to 2021. Data are from the Federal Reserve Bank of New York (Cent. Microecon. Data 2022).

earnings, and provides liquidity to borrowers, which can be used to increase consumption and make other investments, for example, in real estate or stocks. In contrast, higher debt burdens may also distort borrower incentives. Furthermore, debt overhang can reduce labor supply, and credit constraints resulting from higher debt levels may reduce home purchases and consumption.

Many adverse outcomes are driven by a small share of institutions and borrowers. A small number of high-default schools, which tend to be for-profit organizations, primarily drive loan defaults (Looney & Yannelis 2015). Because the vast majority of student loans are disbursed or guaranteed by the federal government, and there is effectively no underwriting, these schools can charge tuition regardless of borrowers' ability to repay loans. Most of the time-series variation in loan defaults is driven by the entry, exit, and expansion of these institutions, which in turn are driven by government policies expanding and contracting the supply of credit to high-default schools (Looney & Yannelis 2022). There is also evidence that institutions capture increases in federal borrowing limits by increasing tuition (Lucca, Nadauld & Shen 2019; Kargar & Mann 2022). Eliminating credit access to a relatively small number of programs can significantly reduce aggregate nonrepayment.

There is less consensus on the impact of student loans on credit and labor market outcomes, which is consistent with different theoretical mechanisms. Some studies find negative effects of student debt on homeownership (Bleemer et al. 2021, Mezza et al. 2020), while others find positive effects (Goodman, Isen & Yannelis 2021; Mazzone & Folch 2021). Similarly, various studies find a positive (Rothstein & Rouse 2011), a negative (DiMaggio, Kalda & Yao 2019; Black et al. 2020), or no (Britton & Gruber 2019; Goodman, Isen & Yannelis 2021) effect on earnings. These results suggest that multiple countervailing channels dominate for different subgroups of borrowers and at different points in the life cycle.

This review also discusses some policy options to address soaring student debt burdens. On one hand, loan forgiveness has been proposed. However, this policy would disproportionately benefit high-income borrowers (Catherine & Yannelis 2020). On the other hand, income-driven repayment (IDR) plans that link borrowers' payments to their incomes would offer more forgiveness

to lower-income borrowers, but at a potential cost of exacerbating information asymmetries (Karamcheva, Perry & Yannelis 2020; Herbst 2021). Administrative barriers have been a significant barrier to the take-up of these plans (Mueller & Yannelis 2022). Income share agreements, which offer equity rather than debt, might also provide relief to low-income borrowers, though there are similar concerns stemming from asymmetric information (Hendren & Herbst 2021; Herbst, Palacios & Yannelis 2021). Directly incentivizing schools by fining them for adverse outcomes such as loan defaults and dropouts is also a potential method of solving incentive problems (Barahona et al. 2021).

This review highlights the trade-offs implicit in various policy options and heterogeneity in the effects of student debt on some outcomes, suggesting fruitful avenues for future research. The review complements earlier summaries that concentrated on theoretical research and focuses on more recent empirical literature. Lochner & Monge-Naranjo (2012, 2016) and Amromin & Eberly (2016) provide a review of earlier theoretical and empirical research on student loans. Avery & Turner (2012) provide a basic overview of student loans and human capital investment for less specialized readers.

The remainder of this review is organized as follows. Section 2 discusses institutional details. Section 3 explains the incentive problem that lies at the heart of the US student loan market. Section 4 discusses loan defaults and the role of for-profit institutions in rising student loan defaults. Section 5 explores research on student loans and credit market outcomes, such as homeownership, and Section 6 discusses studies on the impact of student loans on earnings. Section 7 discusses policy options, and Section 8 concludes and presents avenues for future research.

2. INSTITUTIONAL DETAILS

2.1. Government Intervention in Credit Markets

In terms of economic efficiency, the ultimate goal is for education loans to be made in situations where the return exceeds the cost of funds.[2] In this context, this means that the increase in earnings coming from the investment in college should exceed the cost of the loan. Measuring the returns to education is a notoriously difficult task. Existing evidence suggests that, first, the returns to education are quite high and, second, there is significant heterogeneity across institution types (Hoxby 2020).

In the case of student loans, there is a clear economic rationale for federal support, which comes from the role that government can play in alleviating credit constraints. If lenders like banks cannot separate borrowers who will repay their loans from those who will not, then credit provision may be inefficiently low. The lender will offer only one price to all borrowers. Borrowers who are likely to repay will have to pay too much and may not borrow. This leaves only borrowers who are less likely to repay in the market. Therefore, the lender may charge an even higher price, driving out more borrowers who are likely to repay and perhaps even causing financial collapse. In a credit market with imperfect information, government intervention can help bring credit back to optimal levels. This can be done in the form of loan guarantees or interest rate subsidies (Stiglitz & Weiss 1981, Mankiw 1986).

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[2]There exist other reasons for government intervention in education stemming from externalities. For example, a more educated population may lead to more scientific breakthroughs that benefit all, or could lead to a better-functioning political system. However, these positive externalities should be primarily a justification for subsidies and grants (a Pigouvian subsidy) rather than loans, which primarily alleviate liquidity constraints. When earnings increase due to loan access, most of the benefits are internalized by the borrower, save the additional dollars paid in taxes and externalities stemming from overall higher levels of education.

The government may be better able to provide insurance programs to borrowers. For example, private IDR systems might collapse due to adverse selection or moral hazard. Government subsidies might allow income-linked repayment systems to survive even in the face of adverse selection. The government might also be better suited to deal with moral hazard, for example, by withholding tax refunds or forcing employers to garnish wages. Thus, while there is a clear justification for government intervention in the student loan market, it is less clear what the magnitude should be and how it should be administered.

Why finance higher education through private payments and loans, and not solely through grants? Why not have taxpayer-financed higher education like in much of continental Europe? A key reason is equity. People who go to college earn more than those who do not, and people who spend more years in college, like lawyers or doctors, earn more than those who spend fewer years, like dropouts or holders of associate's degrees. Giving transfers to people who earn more over the life cycle is regressive. Thus, the systems of higher education finance in countries like the USA, Canada, and the United Kingdom are much more progressive than fully taxpayer-funded systems like those in continental Europe, which give significant transfers to people earning high amounts over the life cycle.

2.2. The Federal Student Loan Program

Student loans can be divided into loans issued by the federal government and private loans. They are unlike any other consumer loan market in the USA, chiefly because the vast majority of student loans—more than 90%—are either directly disbursed or guaranteed by the federal government.[3] Also, unlike other consumer loans, student loans are almost entirely nondischargeable in bankruptcy (Looney & Yannelis 2015).

The US Government first started a student loan program of some variety in 1958, under the National Defense Education Act, passed in response to the Soviet Union's accomplishments in technology and the launching of *Sputnik*. In 1965, the government began the Federal Family Education Loan program with the Higher Education Act, giving government guarantees to privately originated student loans. Most federal student loans today, however, were originated through the Federal Direct Loan (FDL) program, created by the 1992 Higher Education Amendments. The critical difference is that the US Department of Education now directly disburses loans and then contracts out servicing to a handful of private institutions. Since the 2010–2011 award year, all federal loans have been disbursed through the FDL program. Lucas & Moore (2010) study trade-offs between direct and guaranteed lending and find that the guarantee program was more costly to the government.

Federal loans may be further divided into subsidized, unsubsidized, PLUS, and consolidated loans.[4] Subsidized loans are given to undergraduate students who meet a financial need requirement, are under a certain borrowing limit, and are dependents. Meanwhile, PLUS loans are available to dependent students attending any institution of higher education. Independent students can take out only unsubsidized loans. A key difference between subsidized loans and unsubsidized loans is that, while subsidized loans do not accrue interest while the recipient is in school or during the 6-month postgraduation grace period, other loans immediately begin to accumulate interest.

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[3]There are at least two potential reasons why the volume of private student lending is so low. First, information asymmetries may lead to financial collapse. Second, generous government loans may crowd out private lenders. Several companies, such as SoFi and Common Bond, target very low risk borrowers at elite institutions, essentially "cream skimming" the federal loan program.

[4]Note that subsidized and unsubsidized are terms used by the Department of Education and that, in reality, all federal loans are subsidized in the general sense of the term.

Historically, the method for setting interest rates on federal student loans has varied, with formulas being set by Congress. Unlike loans from private lenders, for government loans an individual's credit score does not affect eligibility.

2.3. Repayment Plans and Default

Repayment begins at the end of a 6-month grace period, which starts when a student separates from school by either graduating or dropping out. Traditionally, borrowers are automatically enrolled in the standard repayment plan when they start making payments on their student loans. The standard plan relies on the interest rate that the borrower received when their loan was first originated and a 10-year monthly payment schedule. All types of federal loans are eligible for the standard plan. However, the standard plan is not the only available option. Graduated repayment plans adjust payments so they are smaller at first and gradually increase over time, theoretically as the individual accumulates more disposable income. Extended repayment options are available to borrowers with more than $30,000 in loans and are paid off over 25 years.

In the past 10 years, alternative repayment plans have surged in popularity. These plans are often collectively referred to as IDR plans. Borrowers pay a portion of their discretionary income, which is defined as any income above one-and-a-half times the federal poverty guideline. Under IDR, borrowers pay 10–15% of their discretionary income, depending on the particular plan, not to exceed the payment they would make under the standard plan. After 20–25 years, again depending on the plan, the remaining balance is forgiven.[5] In 2017, IDR plans accounted for 45% of balances in repayment (Karamcheva, Perry & Yannelis 2020).

The Department of Education considers a borrower to have defaulted on their loan if payments are 270 days late. Once a loan is in default, it is transferred from the servicer to a collection agency. Defaulting on student loans leads to harsher consequences relative to many other consumer loans. First, tax refunds and other government benefits may be withheld. Additionally, 15% of wages above a threshold may be garnished without a court order. Finally, student loans are effectively nondischargeable in bankruptcy. In order to successfully discharge loans, borrowers must prove a legal standard called undue hardship, which very few are able to do successfully.

3. CORE OF THE INCENTIVE PROBLEM

The core of the problem in the student loan market lies in a misalignment of incentives among students, schools, and the government. This misalignment comes from the fact that borrowers use government loans to pay tuition to schools. Schools' revenues come from these tuition payments, which arrive regardless of labor market outcomes or ability to repay loans. If borrowers end up getting poor jobs and defaulting on their loans, schools are not on the hook, and taxpayers end up footing the costs of the dollars charged off. This creates incentives for profit-maximizing schools to sign up students, get them to pay, and not necessarily be concerned with whether they can repay their loans.

This incentive misalignment leads to profit maximization that is not necessarily in the interest of students. Eaton, Howell & Yannelis (2020) show that the fraction of employees in sales and marketing departments is much higher at for-profit colleges than at other institution types. This is especially the case at private equity–owned for-profit colleges, which are particularly responsive

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[5] Under a Pay As You Earn (PAYE) plan, borrowers must pay 10% of discretionary income each month, and the remaining balance is forgiven after 20 years. The Revised Pay As You Earn (REPAYE) plan is similar, with minor differences in who qualifies and how income is determined. The Income-Contingent Repayment plan, which was introduced in the 1990s, is less generous and had much lower take-up relative to modern IDR plans.

to profit-maximizing incentives. This fact indicates that these schools focus on signing up students who pay for college with government loans, regardless of whether they default. One reason for-profit colleges may be able to escape negative reputational consequences is that owners operate multiple brands, which they can grow or shrink depending on scrutiny and public pressure (Goldstein & Eaton 2021).

Schools are skilled at capturing government loans under the current system. Former Secretary of Education William Bennett (1987) is largely credited with first noticing in that "increases in financial aid in recent years have enabled colleges and universities blithely to raise their tuitions, confident that Federal loan subsidies would help cushion the increase." Recently, several studies have shown that colleges raise tuition to capture federal aid. Cellini & Goldin (2014) use rules for institutional eligibility in receiving federal aid and find that for-profit colleges cut tuition in response to being expelled from federal loan and grant programs. Eaton, Howell & Yannelis (2020) find that for-profit colleges raise their tuition up to levels just below federal loan caps following private equity acquisitions. Additionally, student completion rates decline, and labor market outcomes worsen.

Lucca, Nadauld & Shen (2019) exploit variation in student loan eligibility and an increase in borrowing limits in 2007 and 2008. Using Department of Education data, they find that schools capture 20 cents of each dollar of unsubsidized loan increases and approximately 60 cents on the dollar for subsidized loans, which go to lower-income students. Additionally, for-profit colleges capture a larger portion of loan limit increases relative to other institution types. A common finding in many studies is that significant institutional heterogeneity exists, with for-profit colleges capturing federal loan and grant increases by raising tuition almost dollar for dollar. Kargar & Mann (2022) find further evidence of the Bennett hypothesis using the tightening of the PLUS program in 2011. They argue that the effect of credit supply on tuition is driven by colleges charging higher markups and that colleges capture more of the increases in loan subsidies than students do.

Relatedly, Marx & Turner (2018) study the interaction of federal grants and loans, using a sample of City University of New York students who are close to eligibility for Pell grants and a regression discontinuity. They find that a $1 increase in Pell grant aid decreases the amount of federal loans that students will take out by $1.80 among students who would borrow if they did not receive a Pell grant. This finding is consistent with a fixed cost to borrowing. One possibility for this fixed cost is student debt aversion, for which Gopalan et al. (2021) and Caetano, Palacios & Patrinos (2019) find evidence.

4. LOAN DEFAULTS

Student loan default rates have risen significantly since 2000. **Figure 2** shows average balances over time and the fraction of loan balances that are more than 90 days delinquent, using data from the Federal Reserve Bank of New York. In 2004, approximately 6% of loan balances were delinquent, while in 2017, 11% of loan balances were delinquent.[6] A key point is that the outcomes of borrowers vary widely. While the typical borrower ends up earning a relatively high salary and

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[6]Similar patterns exist for cohort default rates. Two-year cohort default rates are defined as the fraction of borrowers in a repayment cohort who default within 2 years of entering repayment. For example, the 2-year cohort default rate for the 2010 cohort is the fraction of borrowers who default by 2012. Cohort default rates are a standard tool used by the Department of Education to measure borrower distress and sanction schools.
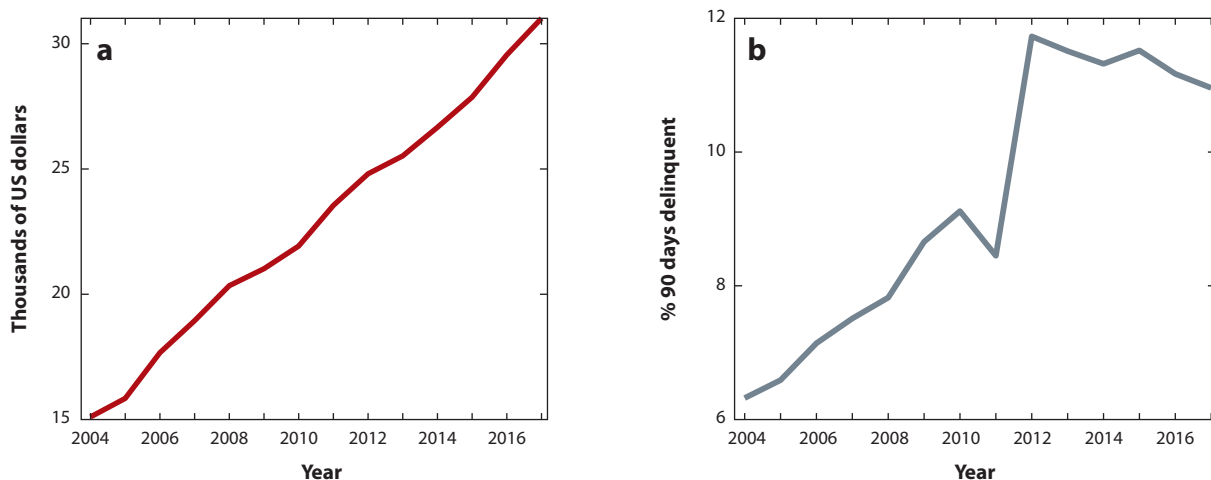
Figure 2

Average balances and delinquency. (*a*) The average student loan balance, by year, from 2004 to 2017. (*b*) The 90-day delinquency rate for student loan balances. Data are from the Federal Reserve Bank of New York (panel *a*, Cent. Microecon. Data 2018; panel *b*, Cent. Microecon. Data 2022).

has little difficulty paying back their loans, a significant portion of borrowers struggle. Much of this inability to repay is predictable.

Looney & Yannelis (2015) show that most of the recent increase in default rates is due to shifts in the composition of borrowers. Certain types of schools—specifically, for-profit schools—have much higher default rates, and enrollment increased rapidly at these schools during the 2000s. As a result, more borrowers defaulted. In the late 2000s, for-profit schools accounted for only 10% of enrollment but approximately 25% of student loan borrowers and 50% of loan defaults. In 2010, 7 of the top 10 schools with the largest absolute number of loan defaults in the country were for-profit institutions. Eaton, Howell & Yannelis (2020) show that these trends are driven especially by an increase in the number of private equity–owned for-profit colleges. Armona, Chakrabarti & Lovenheim (2018) use variation from changes in the demand for college induced by labor demand shocks and the supply of for-profit schools. They argue that attendance at for-profit institutions has a causal effect on loan defaults. This evidence suggests that schools' characteristics—not the students themselves—drive higher default rates at for-profit colleges.

Surprisingly little of the increase in cohort default rates is explained by changes in labor market outcomes. Mueller & Yannelis (2019) study the impact of the Great Recession and subsequent employment shocks on student loan defaults. The study uses administrative data and compares borrowers in regions differentially affected by home price declines during the 2006–2009 housing bust. They find that only one-quarter of the increase in loan defaults during this period can be explained by labor market shocks. Lochner, Stinebrickner & Suleymanoglu (2021) show that parental support and liquidity alleviate student loan defaults.

The recent rise in defaults follows cyclical patterns that have existed since the inception of federal student loan programs. Looney & Yannelis (2022) study these student loan default cycles. Pushes throughout the 1970s to increase credit access led to growth in borrowers at high-default institutions throughout the 1980s. During this time period, there were few penalties for loan defaults, loans were dischargeable in bankruptcy, and there was little accountability for schools. This regime led to a surge in student loan defaults. The surge peaked in 1991, when

more than one-fifth of borrowers would default within 2 years of entering repayment. This situation led to new accountability rules that screened out high-default institutions and caused default rates to drop throughout the 1990s. In the 2000s, the pattern repeated, as policy makers again pushed to expand credit access. The fact that a relatively small set of schools drives a large portion of loan defaults suggests that policy makers can address much of the default problem by focusing on a relatively small set of borrowers. Policy makers can also potentially address the issue by focusing on the underlying incentive structures that lead to many students' adverse outcomes.

5. CREDIT OUTCOMES

Despite significant evidence that access to credit increases enrollment (Sun & Yannelis 2016, Solis 2017, Marx & Turner 2019), many policy makers and academics have expressed concern that student debt drives the notable decrease in millennial home buying relative to earlier cohorts. For example, in 2020, Federal Reserve Chairman Jerome Powell noted in Senate testimony that "student debt...can get in the way of their credit history, of course, and their ability to own a home" (Warren 2020). Despite such concerns among policy makers and the general public, the effects of student debt on homeownership are mixed.

Mezza et al. (2020) look into the relationship between student debt and homeownership using data from the TransUnion credit panel linked to DegreeVerify and StudentTracker. They study instruments for student debt using average in-state tuition at 4-year state schools. To allay fears about correlations between in-state tuition and economic conditions in a given state, they split the sample into a treatment group, which consists of individuals who attended a 4-year state school, and a control group of other individuals. They find that the average increase in student loan debt of $3,300 between 2005 and 2014 implies a 4.4% decrease in the probability of homeownership, which is almost half of the observed 9% decrease in homeownership among the young. Furthermore, their study implies that an additional $1,000 in debt decreases the probability of owning a home by 1.8%, equivalent to a delay of approximately 4 months. Bleemer et al. (2021) investigate how the rising cost of college in the USA has affected student borrowing and homeownership, using data from the Federal Reserve Bank of New York Consumer Credit Panel. Using tuition as an instrument for student debt, the authors find that homeownership decreases as a result of increasing college costs. They find that the increasing cost of college could explain anywhere between 11% and 35% of the 7.7% decrease in homeownership among 28- to 30-year-olds from 2007 to 2015.

In contrast, some studies find that student debt actually increases homeownership or has a small quantitative effect. Goodman, Isen & Yannelis (2021) use the universe of federal student loan borrowers linked to tax data. They exploit a discontinuity in federal student loan limits induced by borrowers' dates of birth. Unlike the studies mentioned above, this variation in loan limits affects both debt and cash on hand, which theoretically have opposing effects on homeownership and consumption. The latter effect dominates. The authors find that increased loan limits actually increase rather than decrease homeownership. The main channel consistent with the results is alleviating liquidity constraints.

Mazzone & Folch (2021) explore the effect of student debt on individuals' choices after college by using the Baccalaureate and Beyond Longitudinal Study. They create an instrumental variable using data from the Integrated Postsecondary Education Data System on financial aid—specifically, institutional grants. The results indicate that negative net wealth causes trade-offs between careers and housing. Their model demonstrates that more debt for graduates of bachelors' programs leads to lower compensation for human capital and slower earnings growth. This makes homeownership more attractive; therefore, homeownership increases among people with

more debt. Those with lower debt and higher wage growth eventually catch up in both the data and the model.

Mabille (2021) shows quantitatively that student loans are unlikely to explain the bulk of the decline in homeownership among millennials. Using a calibrated macro model, he argues that, while there is a sizable retiming effect, student debt lowers homeownership by only two percentage points. This effect is more prominent in high-priced metro areas. Amromin, Eberly & Mondragon (2017) further study substitution between mortgages and student loans. They find that a dollar in lost home equity loans used to finance college leads to an increase in student loan borrowing of between 40 and 60 cents. The effect is driven by households with low liquidity.

In summary, this literature on student debt and credit outcomes finds largely mixed results, pointing to heterogeneous effects for different subgroups. On one hand, for credit-constrained borrowers in the short run, student loans may be an important channel for increasing liquidity and accessing homeownership and credit early in the life cycle. On the other hand, for less credit-constrained borrowers in the longer run, increased student debt fueled by tuition hikes may drive down homeownership and credit access later in the life cycle. Regardless, the quantitative literature suggests that student loans are unlikely to explain much of the decrease in homeownership among millennials.

6. EARNINGS

When examining the returns to education investments, understanding how increases in borrowing affect earnings is crucial in determining the benefits of student credit access. At present, the effects of student loans on earnings are not well understood, and studies have found negative, positive, and zero effects of student loans on future earnings. These findings are consistent with different theoretical mechanisms and suggest significant heterogeneity across different groups of students.

The first paper to empirically explore the effects of student loans on earnings is that by Rothstein & Rouse (2011). They exploit a no-loans policy at one elite US college and examine surveyed income across cohorts. Perhaps counterintuitively, they find that moving away from student loans and toward a grant-based system leads to lower earnings. They argue that students with loans are effectively credit constrained after college and have to work more to make loan payments. As a result, individuals with student debt take higher-paying jobs. One concern with drawing broad conclusions from this study is that students at elite colleges may not be representative of the broader population.

A recent study (DiMaggio, Kalda & Yao 2019) finds the opposite effect, that student debt depresses earnings. These authors use a creative empirical strategy focusing on private student loans and a company, National Collegiate, that owned loans but lost the chains of title. Court rulings following this loss led to the discharge of some debts, but only for borrowers already in default. The authors argue that their results are most consistent with a debt overhang channel. Given that the discharge occurred only for loans already in default, their results are similar to the effects of bankruptcy. Additionally, effects may differ for federal loan borrowers and borrowers not in default whose debt is forgiven. Black et al. (2020) use a sample of Texas college students and an increase in federal loan limits in 2007 and 2008. They find results similar to those of DiMaggio, Kalda & Yao (2019) and show that an increase in loan limits increases earnings. Chakrabarti et al. (2020) find that tuition increases lead to increases in student debt and depressed graduate enrollment, which could lead to earnings losses in the future depending on the type of degree earned. Krishnan & Wang (2018, 2019) also present evidence that student debt hinders entrepreneurship, which could have some effect on earnings over the life cycle.

Goodman, Isen & Yannelis (2021) use the universe of federal student loan balances—everyone in the country matched to IRS tax records—and a cutoff stemming from an individual's date of

birth. The cutoff varies effective loan limits. This identification approach disproportionately includes older students at less selective schools and finds a precisely estimated zero effect of loan limits on earnings. Goodman, Isen & Yannelis (2021) focus on a conceptually different parameter relative to Rothstein & Rouse (2011) and DiMaggio, Kalda & Yao (2019), as DiMaggio et al. use variation inducing a shock to debt but not to available cash on hand. In contrast, increasing limits affects both levels of debt and available cash on hand, which may have opposite effects on labor market outcomes. Denning & Jones (2021) also find no effects of student loans on earnings, using data from public universities in Utah and a discontinuity in federal loan limits stemming from the number of credit hours a student is enrolled in. Consistent with these studies, Bucarey, Contreras & Muñoz (2020) use Chilean administrative data and cutoffs based on test score eligibility. Their strategy is similar to that of Solis (2017). They also find zero effects on labor market outcomes.

In summary, there appears to exist significant heterogeneity in the effects of student loans on earnings. Depending on the sample and variation used, some borrowers may see earnings increases or decreases from discharging student debt or raising student borrowing limits. There is still significant uncertainty on this topic. This is an area where we need more research to understand how different policies raising loan limits or forgiving debt for different individuals would affect earnings. Furthermore, additional research such as that by Palacios (2015) in valuing aggregate human capital accumulation stemming from student borrowing would help quantify trade-offs.

7. POLICY SOLUTIONS

7.1. Loan Forgiveness

One proposal that is currently under consideration by policy makers is some form of blanket student loan cancellation. While many options for cancellation have been presented, including complete cancellation, cancellation up to a certain amount, or new IDR options, no significant actions have been undertaken as of September 2021. Canceling government loans will not reduce the average debt of Americans. Instead, cancellation would transfer private liabilities to the general public by increasing government debt. This transfer would lead to an increase in taxes or a decrease in spending, resulting in a redistribution of wealth.

Catherine & Yannelis (2020) study the distributional effects of student loan forgiveness to provide quantification regarding this point. They find that student debt cancellation is a highly regressive policy—it provides more assistance to higher-income rather than lower-income borrowers. This is primarily because people who go to college tend to earn more than those who do not go to college, and people who spend more on their college education—like those who attend medical and law schools—tend to earn more than those who spend less on their college education, like dropouts and holders of associate's degrees. The regressivity becomes even more significant when the present value of a loan is taken into account, namely the value of what will actually be paid and when it will be paid. This is because some individuals are already projected to see forgiveness under programs like Public Service Loan Forgiveness or IDR plans.

Catherine & Yannelis's (2020) study uses the 2019 Survey of Consumer Finances, which is conducted every 3 years by the Federal Reserve. The analysis simulates the effect of different cancellation policies on households by decile of income and race/ethnicity. To determine the impact of debt forgiveness, the analysis simulates the present value of households' loans. To find the present value, the authors consider the sample of loans in repayment in 2019 and forecast the payments forward until the remaining balance reaches zero or is forgiven.

The study considers a number of forgiveness policies that simply wipe away some amount of debt. The lump-sum cancellation policies considered are full cancellation, cancellation up to $10,000, cancellation up to $50,000, and cancellation up to $50,000 with an earnings cap. The

study shows that most of the benefits of universal loan cancellation would accrue to high-income individuals. Individuals in the top 20% of the earnings distribution would receive six times as much debt relief as those in the bottom 20%. Erasing all federal student debts would benefit the top decile of earners more than the bottom three deciles combined.[7]

While the distributional consequences of student loan forgiveness are regressive, a possible motivation for such a policy is incentive effects. Loan forgiveness could increase earnings. As mentioned in Section 6, the evidence on the effects of student loan forgiveness on earnings is mixed. The strongest evidence that loan forgiveness has incentive effects comes from DiMaggio, Kalda & Yao (2019). They argue that their results are most consistent with a debt overhang channel stemming from administrative wage garnishment. While their findings are convincing for the population studied, the effects in a broader population may differ. Their sample consists of low-income private student loan borrowers who are already in default. Thus, in terms of policy counterfactuals, their results may be more similar to the effects of reintroducing bankruptcy protection rather than blanket loan forgiveness.

7.2. Income-Driven Repayment

Another option for providing relief to borrowers is expanding the use of IDR plans which link borrower payments to their income. These plans provide a standard trade-off between the insurance value of consumption smoothing and potential welfare losses stemming from adverse selection and moral hazard. As discussed above, several different IDR plans with slightly different parameters exist. These plans typically require borrowers to pay 10–15% of their income above 150% of the federal poverty line. Depending on certain factors, like whether any of a borrower's loans were used for graduate school, remaining balances are forgiven after 20 or 25 years. Therefore, if a borrower's earnings are below 150% of the poverty line, they never pay anything, and their debt is eventually completely forgiven. If the borrower earns slightly above 150% of the poverty line, they make some payments and receive partial forgiveness. If the borrower earns a high income, they fully repay their loan.

From the perspective of both policy makers and borrowers, IDR plans have costs and benefits. For borrowers, IDR plans provide insurance. On one hand, if income drops, loan payments also automatically drop. Payments are typically lower early in the life cycle, when borrowers earn less, and then rise as incomes rise. On the other hand, under IDR plans borrowers may end up paying more over the duration of the loan. Policy makers face similar trade-offs. IDR plans provide benefits to borrowers, but information asymmetries may lead to significant costs for the government. Of particular concern is the possibility of adverse selection—borrowers with lower incomes may select into IDR plans, leading to lower repayments. There are also potential concerns regarding moral hazard. IDR plans operate in a similar fashion to income taxes and may be a disincentive for borrowers to work.[8] IDR plans are also a way to target transfers to low-income borrowers. One fact that is often missed in the policy debate is that a progressive student loan forgiveness program already exists through IDR. Borrowers who have low incomes for a significant period of time see significant forgiveness under IDR and may even make zero payments. IDR is thus a policy lever that can be used to target forgiveness to lower-income borrowers, by making existing plans more generous.

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[7]In related research, Ebrahamian (2021) uses a structural model and data from the Beginning Postsecondary Students Longitudinal Study to argue that publicly provided college is regressive.

[8]The tax literature has generally found small labor supply elasticities (for a review, see Saez, Slemrod & Giertz 2012). There is little reason to think that elasticities from IDR plans would be larger.

a Initial earnings: $30,000

b Initial earnings: $45,000
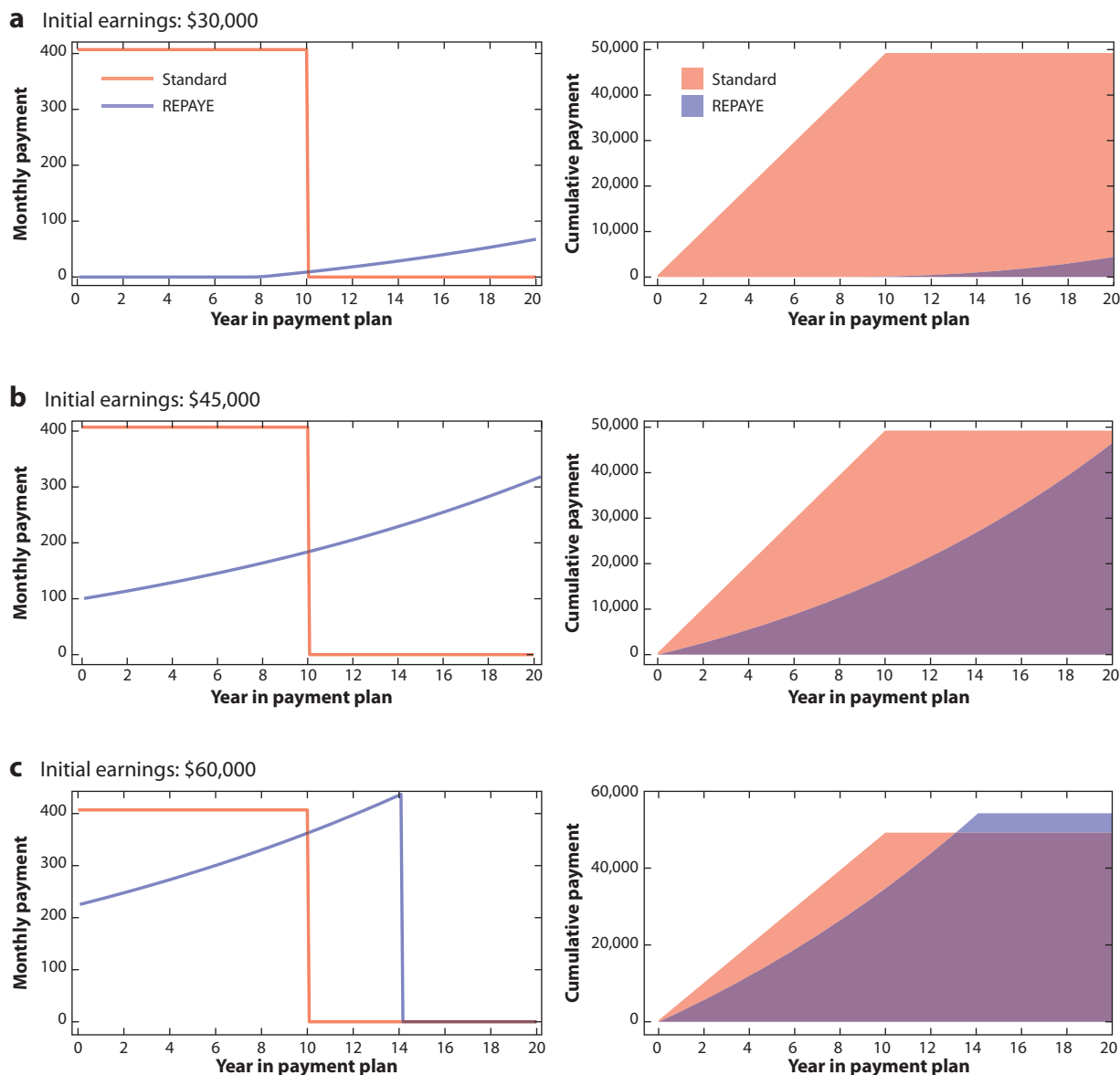

c Initial earnings: $60,000

Figure 3

Three scenarios for payment with the standard plan versus one income-driven plan, Revised Pay As You Earn (REPAYE), showing how the borrower's payments (both monthly and cumulative) would change if they enrolled in REPAYE instead of the standard plan. (*a*) A situation where a borrower has low earnings and therefore receives a large amount of forgiveness under REPAYE. (*b*) A borrower who has higher earnings still gets a small amount of forgiveness. (*c*) A borrower who has much higher initial earnings actually ends up paying more under REPAYE than under the standard plan and receives zero forgiveness.

Figure 3 illustrates how IDR payments work under Revised Pay As You Earn (REPAYE), one of the more recent and generous IDR plans, which was introduced in 2015. The figure shows payments over time, both monthly and cumulative, for an individual with varying levels of income right after college and with a student loan balance of $40,000. Assuming 3.5% earnings growth,

2.3% inflation, and an interest rate of 4.1%, based on the past 4 years' interest rates, we calculate payments both as made under the standard plan and as a fraction of income under REPAYE. The IDR plan effectively allows borrowers to smooth payments over time. They can end up paying more depending on interest and discount rates, but there is no prepayment penalty for federal student loans. The lowest-earning borrower, who has a starting wage of $30,000, ends up paying very little. The borrower with an initial wage of $45,000 pays a similar amount over the life of the loan as with the standard plan. However, the payments are smoothed over time. The highest-earning borrower, with an initial wage of $60,000, actually ends up paying more under IDR.[9]

Catherine & Yannelis (2020) also assess IDR policies other than simply forgiving a certain dollar amount for each borrower. They find that these policies are more progressive in terms of targeting forgiveness to lower-income borrowers. Under these plans, a small portion of forgiven balances goes to the top decile of earners. Furthermore, making IDR policies more generous can target additional forgiveness to low earners. They further estimate that increasing the IDR threshold from one-and-a-half times to three times the poverty line would benefit the bottom third of borrowers more than forgiving up to $50,000 for all borrowers. Nevertheless, the overall cost to taxpayers would be nearly three times smaller because it would barely reduce the payment of high earners. Expanding the generosity of IDR plans could offer more dollars forgiven for low-income borrowers at a lower total cost. If the goal of policy makers is to put dollars in the pockets of low-income individuals, this is a less expensive way of accomplishing it. Britton & Gruber (2019) also exploit notches in the UK student lending program to suggest that the labor supply effects of IDR are small, alleviating a potential concern.

IDR plans provide relief to struggling borrowers who face adverse life events or are otherwise unable to earn high incomes. Despite benefits to borrowers, there have been significant problems with implementing IDR plans in the USA. However, the problems are administrative in nature, and some have been addressed by recent legislation, such as the FUTURE (Fostering Undergraduate Talent by Unlocking Resources for Education) Act. This law makes it simpler for borrowers to recertify their income and remain enrolled in IDR programs by enabling data sharing between the Department of the Treasury and the Department of Education. Lowering the hassle costs of enrollment can drastically increase the take-up of IDR. For example, Mueller & Yannelis (2022) study an experiment conducted by Navient, a large student loan servicer. They show that simple tweaks that make enrollment easier can drastically increase take-up. This had large effects on reducing delinquency, lowering payment burdens, and increasing consumption. Many countries such as the United Kingdom and Australia successfully operate universal IDR programs that are administered through their respective tax authorities, and these tend to work well. In these countries, all borrowers are enrolled in IDR programs, limiting concerns about selection (Karamcheva, Perry & Yannelis 2020). Chapman (1997) discusses the Australian student loan program, and Chapman (2006) provides a review of income-contingent loans.

Herbst (2021) uses administrative data from a student loan servicer and exploits variation in assignment to an agent and a difference-in-differences specification in which IDR enrollment is the treatment. The author finds that student loan payments decrease and delinquency rates decrease by 22% as a result of IDR enrollment. The difference-in-differences approach suggests a 2.0% increase in mortgage holding and a 1.8% increase in the likelihood of moving to a higher-income ZIP code as a result of IDR enrollment, which is consistent with credit constraints being alleviated.

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[9]Under REPAYE, unlike Income-Based Repayment, monthly payments are not capped by the amount that would be paid under the standard plan. As a result, it is probably not the best option for high earners.

There is also some evidence that the framing of choices can affect enrollment. Abraham et al. (2020) use survey data from University of Maryland students to investigate IDR framing in hypothetical decisions. They conducted an online survey of 18- to 29-year-old students who were stratified by demographic and educational characteristics and then randomly assigned. Their key finding is that students are much less likely to choose IDR enrollment if the information is presented to them in a way that emphasizes the costs rather than the insurance benefits.

In summary, existing research shows that IDR plans provide significant relief to borrowers. Expanding access to these plans is a progressive way to provide forgiveness to student loan borrowers. Take-up of these plans has historically been low, but information interventions can drastically increase utilization of these plans. The federal system is also highly adversely selected, with lower-income and high-balance borrowers disproportionately selecting into these plans. While little research has been done on moral hazard, and this is a fruitful avenue for future research, the tax literature suggests that incentive effects are likely to be low.

7.2.1. Income share agreements.

An option related to IDR is the income share agreement (ISA). ISAs, first proposed by Friedman (1955), essentially offer equity contracts. Rather than pay back a loan, borrowers pay back a portion of their income for a fixed period of time. ISAs are thus similar in format to a progressive tax, and higher-income borrowers pay more. Such contracts exist, and companies like Lumni and Stride offer ISAs. Some universities, such as Purdue, also offer ISA contracts for a subset of students. However, the size of this market is small, potentially due to information asymmetries. The structure of ISAs suggests the existence of a trade-off between insurance and incentive. Relevant parameters are not yet well understood, making implementation uncertain.

One potential reason for this uncertainty is information asymmetries, first noted by Nerlove (1975) in response to Friedman (1955). James Tobin also observed that "there is an obvious danger of adverse selection in offering both plans at once" (Yale Univ. 1971). There are also potential incentive effects. Herbst, Palacios & Yannelis (2021) attempt to measure the degree of adverse selection and moral hazard in ISAs, using a randomized experiment with an ISA provider. Preliminary results suggest some evidence of selection. Mumford (2020) studies the Purdue income share agreement, finding little evidence of selection. However, the program is restricted to individuals in certain majors that tend to be more selective, such as engineering. Thus, there might be different selection patterns in a universally implemented program. Hendren & Herbst (2021) provide a theoretical model of IDR plans and ISAs, complemented with survey data from the Department of Education. They find that individuals with lower earnings expectations are more likely to select into IDR plans, and they discuss implications for ISAs. In a general review, Ritter & Webber (2019) discuss many of the issues surrounding ISAs.

7.2.2. Bankruptcy.

Another policy option to provide relief to borrowers is making bankruptcy protection more accessible to borrowers. Unlike for other consumer loans, student loan borrowers must prove a legal standard called undue hardship. This is extremely difficult in practice, and very few borrowers are able to successfully discharge their student loans in bankruptcy. There is some rationale for this special treatment. Unlike other borrowers, when students leave school, they typically have no assets and negative net worth. Policy makers were concerned that student borrowers would abuse the bankruptcy system by discharging loans early and accumulate assets later (Am. Bar Assoc. 1973).

Bankruptcy restrictions were put in place in 1976 and 1998. Before 1998, student loans were dischargeable after 7 years in repayment. This provision was designed to alleviate the concern that students have no assets, but substantial liabilities, when they leave school. Yannelis (2020)

studies whether students defaulted strategically. While there is some evidence of strategic default, the magnitudes are quite small, and cost–benefit analyses suggest that there would be welfare gains from reintroducing bankruptcy protection. Athreya, Sanchez & Tam (2018) discuss bankruptcy with unsecured debt, such as student debt. Ionescu (2011) discusses alternative bankruptcy regimes, and Ionescu (2009) and Chatterjee & Ionescu (2012) more broadly discuss insuring the student loan program.

7.2.3. Skin in the game. Policy makers can directly incentivize schools to improve the outcomes of students, for example, by charging schools for loan defaults or noncompletion financed by government loans. Indeed, Darolia (2013) and Looney & Yannelis (2022) find that policies excluding credit access to high-default schools had significant effects on enrollment and school closure. Beyond excluding schools from federal loans, policy makers can offer financial incentives for schools to improve outcomes. Similar policies have recently been suggested in the USA— through the Skin in the Game Act and the Student Borrower Bill of Rights—and implemented in Brazil (Stratford 2013, Rifkin 2019).

Financial incentives for schools that are linked to student outcomes lead to a trade-off, since value added is unobservable (Hoxby 2020). On the one hand, linking revenues to outcomes may lead to improvements in quality. On the other hand, schools may screen students from more challenging backgrounds. Barahona et al. (2021) study a recent Brazilian reform that made schools pay penalties for students who default or drop out, using administrative data and focusing on prepolicy reliance on government loans. They find evidence of both screening and quality improvements.

7.6. Welfare

More research linking empirics to theory and evaluating the costs and benefits of modifying human capital investment programs would be useful to both researchers and policy makers. This research can be based on existing frameworks. For example, Lochner & Monge-Naranjo (2011) provide a model of credit constraints and human capital investment, and Caucutt & Lochner (2020) study borrowing constraints and investment over the life cycle. In an innovative study, Joensen & Mattana (2021) use Swedish administrative data and a structural model to explore whether human capital should be financed using grants or loans. They find that loan repayment terms have large increases in dropout rates and that shifting to grants can increase completion.

Given that most student loans come directly from the federal government, many traditional industrial organization approaches are poorly suited to study the student loan market. The cost curve approach of Einav, Finkelstein & Cullen (2010) may be a more fruitful avenue for evaluating the welfare consequences of student loan policies. DeFusco, Tang & Yannelis (2021) adapt the cost curve approach to consumer financial products. Barahona, Dobbin & Otero (2021) also provide a novel framework for studying the supply and demand of student loans.

8. CONCLUDING REMARKS

Student loans are understudied relative to their importance to the overall economy, but while there exist many fruitful avenues for future research, several facts are clear from existing research. First, heterogeneity among types of borrowers is important to consider. The typical student borrower earns more than the average person in a similar age range, and loan balances are positively correlated with earnings. Second, a large portion of the total balance is held by graduate and professional students, who, on average, earn significant amounts. Adverse outcomes are predictable, with a small portion of schools, predominantly for-profit institutions, driving a large share.

Targeted forgiveness for groups of borrowers through programs like IDR can provide relief to those borrowers who struggle. Administrative barriers like excessive paperwork and recertification hassles are a barrier to enrollment in these relief programs, but the process can be streamlined. In providing relief to borrowers, it is important to keep incentive effects in mind, given the wealth of evidence showing that schools respond to increase credit availability by raising tuition and changing the selection of students.

While the points mentioned above are clear, several research questions remain open. First, various studies have found different effects of student debt on income using different strategies and populations. These findings suggest that, like regarding defaults, there are heterogeneous effects. These can be studied more systematically, in particular by paying attention to school type and major. Second, more research should focus on finding ways to solve the core incentive problem—that school revenues are not tied to student outcomes. There are many policy options, including directly aligning the incentives of schools using fees or grants or income-share agreements where students pay a portion of their income directly to schools. Most of these policy options could distort incentives themselves. For example, penalizing schools on the basis of default or dropout rates could reduce enrollment of low-income students, and tying loan payments to income could reduce labor supply. Beyond measuring the effects of student loans on outcomes, these trade-offs also call for more normative thought, weighing the costs and benefits of various policies and evaluating borrower welfare. There is also important work to be done to evaluate the progressivity and heterogeneous effects of different interventions in student loan markets. Additionally, while most research focuses on the liability side of student debt, more should be done to quantify the asset side in terms of valuing the human capital accumulation financed by this debt.

DISCLOSURE STATEMENT

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