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Graduate indebtedness: its perceived effects on behaviour and life choices – a literature review

**Ariane de Gayardon, Claire Callender,
KC Deane and Stephen DesJardins**

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Contents

Abstract.....	4
1. Introduction.....	6
2. Student loans in England and the United States.....	8
3. Trends in graduate indebtedness.....	11
England.....	12
United States.....	14
Global trends.....	17
4. Consequences of student loan debt on life events.....	18
Postgraduate education	19
Career	22
Homeownership	25

Family formation	27
Health	30
Lifetime financial wellbeing.....	31
Other consequences of student loan debt.....	35
5. Limitations to existing research.....	36
Predominant focus on the United States	36
Reliance on secondary datasets.....	36
Methodologically weak surveys	37
Overrepresentation of particular academic fields.....	37
6. Directions for future research	38
Methodological improvements	38
Research questions.....	40
7. Conclusion	42
8. References	44
9. Appendix I: Methodology.....	59
10. Appendix II: Tables of Research Studies.....	60

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Abstract

Around the world, student loan debt is rising. Growing numbers of students rely on student loans to pay for their higher education and their levels of borrowing are increasing compared with previous decades. In countries like England it is anticipated that the majority of graduates will be repaying their loans for most of their working lives. For many, having student loan debt is no longer a short-term condition but is becoming the new normal. There is now value in exploring how student loan debt influences individuals' choices, behaviour and life events once they have left higher education. Yet, the academic literature on the impact of student loan debt on decisions made after leaving higher education and later in life is scarce. The few studies available, mostly based in the US, tend to show that individuals with student loan debt make different career choices, delay buying a home, have worse mental health, and are less well-off financially throughout their lifetime as well as being less prepared for retirement. Student loan debt among women is also negatively related

to family formation. The possible critical impact of student loan debt on the future of our societies and economies calls for further research to fill the gaps in this limited extant literature. This includes moving beyond its US-focus, its dependence on secondary datasets, and its narrow focus within a small number of disciplines. Future research should aim to improve and expand methodological research designs, in particular by using qualitative methods, analysing longitudinal datasets, improving sampling, and trying to show causality. Questions asked in these studies should encompass such issues as the evaluation of possible delays in decision-making, the difference between completers and non-completers, the importance of attitude to debt, and the impact of different student loan repayment plans.

1. Introduction

Student debt has been rising over the past decades in many countries around the world, following the increased availability of loans to cover higher education expenses. In some ways this expansion is beneficial—student loans address financial constraints that may prevent students from investing in higher education (Solis, 2017). However, many observers are beginning to worry that student loan debt is overburdening young graduates; delaying the onset of important societal milestones, such as marriage, child rearing, and home ownership; and negatively affecting life satisfaction. In other words, even in the presence of positive financial benefits that can accrue when students are able to borrow against their future earnings, there are other non-financial consequences to student loan debt. Indeed, the presence of student loan debt and its consequences for graduates may undermine some of the wider market and non-market benefits to individuals and society associated with higher education.

This literature review was written to inform the research project ‘The effects of student loan debt on graduates’ financial and life decisions in the UK and USA’, based at the ESRC/HEFCE-funded Centre for Global Higher Education. It gathers research evidence from the past 20 years on whether and how having student loan debt influences decisions made by graduates later in life. It describes the findings and methodological approaches of the existing research and identifies gaps in, and the limitations of, this body of literature. In addition to framing the empirical work to be conducted as part of our study, we seek to highlight research questions that remain unanswered and therefore help motivate our study.

The research project focuses on student loan debt in England¹ and the United States; therefore, our review here likewise focuses on empirical literature emanating from those two countries. Both countries have some of the highest levels of student loan debt across the globe. As such, they provide valuable insights for other higher education systems and countries considering the use of student loans as a financing solution. Additionally, England and the United States have two very different types of student loans, as explained below, thus providing two different outlooks on the issue and revealing possible differences in the way debt influences individuals’ lives after leaving higher education.

Student loan debt differs from other types of debt for several reasons. First, the loan is taken before the individual has the capacity to repay it and repayment does not usually start until the individual leaves higher education. Such debt is incurred at a time when the individual has few assets or equity and taking on such debt is therefore a bet on future financial well-being. Second, the loan is used to pay for an intangible asset: human capital – an investment that is hard to quantify. Unlike

¹ Higher education policy within the UK is devolved to the four countries: England, Scotland, Wales and Northern Ireland leading to different student funding policies in each country. In this study, the focus is on students living in England, and primarily those studying full-time.

financial or physical capital, it is an investment that cannot be taken away if a borrower defaults on repayment. Third, student debt is typically incurred early in life, and might alter individuals' life choices after leaving college.

The particularity of student loan debt therefore raises questions about its consequences for graduates' lives, as they enter the labour market and make life decisions but also need to start repaying on this investment. This potential influence over subsequent life events will be explored in this literature review: in particular, what does research tell us about the effect of student loan debt on post-collegiate life-course outcomes such as postgraduate education, career, homeownership, family formation, health, and financial wellbeing?

In spite of the clear relevance of these questions, the literature on the relationship between student loan debt and non-pecuniary life outcomes remains modest in scope. This is in contrast to the emerging body of literature, especially in the US, which analyses whether and how student loans impact the behaviour of individuals before and during college – most notably on college participation and choice, and persistence (e.g. Baker, Andrews, & McDaniel, 2017; Callender & Jackson, 2005, 2008; Callender & Mason, 2017; Chen & DesJardins, 2010; Dynarski, 2003; Jackson & Reynolds, 2013; Johnson, 2013; D. Kim, 2004; J. Kim, DesJardins, & McCall, 2009; Paulsen & St. John, 2002). We focus here on “student loan debt”² and its effects on subsequent outcomes, rather than the effect of borrowing on decisions made about whether to enrol in postsecondary education, where to attend, or other decisions that occur while the student is still enrolled in postsecondary education. Student loan debt is meant to reflect the debt incurred by students during their undergraduate studies, rather than debt incurred for graduate-level higher education (e.g., law school or medical school). Furthermore, we use the phrase postsecondary education to refer to all students enrolled in higher education in pursuit of a baccalaureate degree in the US or a first degree in the UK. Where possible, we distinguish between debt incurred by those who earn an undergraduate degree and those who leave higher education prior to earning a degree. When necessary, we also try and differentiate between debt incurred for a postgraduate or an undergraduate degree.

The review proceeds as follows. First, we examine general trends in student loan and debt, particularly in the United States and England, to provide the context in which to locate the findings from the research studies discussed in the review. Next, we explore the effect of student loan debt on the lives of graduates calling upon extant research, including its potential impact on postgraduate study, homeownership, family formation, health and financial wellbeing. Within each of these areas, we survey key general trends in England and the United States. The sections that follow explore limitations to the existing research before exploring in

² Throughout the review we refer to ‘student loan debt’ rather than ‘graduate debt’ in recognition of the fact that some students who take out loans may not complete their studies, and thus may not be graduates.

greater detail the ways in which future work can strengthen the student loan literature through choice of methodology as well as research topic. We conclude with a brief summary of the key findings, as well as the critical shortcomings, noting how our own work will integrate with this discussion.

2. Student loans in England and the United States

Although England and the US are similar in their increasing reliance on student loans as a means of financing a student's investment in higher education, the systems differ in the number of available loan plans, the basic conditions of repayment, and the role of the institution in administering loans to students. Globally, student loan systems in other countries have characteristics that overlap, at least in part, with either England or the US system, which contributes to the generalisability of findings uncovered by researching student loans in these two countries.

Student borrowers in England rely almost exclusively on income-contingent loans provided by the government for undergraduate study.³ The terms and conditions of these loans are set by the government, and the loans are administered by a government agency — the Student Loans Company (SLC).⁴ All English domiciled (and currently European Union) full-time undergraduate students attending a UK higher education institution are eligible for these government-subsidised loans to cover all of their tuition fees and a contribution towards their living costs.⁵

In contrast, in the United States, there exist several different types of student loans, the majority of which are administered by the federal government and only some of which are means-tested. Loan terms differ based on whether a student is enrolled as an undergraduate or a graduate student. Table 1 below provides an overview of these loans, including information on interest rates, repayment grace period after departing postsecondary education, and whether the loans are means-tested.

³ Government subsidised income-contingent loans for postgraduates were introduced for the first time in 2016. The student funding arrangements for part-time undergraduates have differed from full-time students. Up until 2012/13, part-time students' tuition fees were not capped and part-time students were ineligible for student loans.

⁴ Private loans are a very marginal, though slowly growing, part of English student aid. Historically, they have been aimed primarily at postgraduate and international students.

⁵ Loans for tuition fees are not means-tested and all students are eligible for loans that cover all of their tuition fees irrespective of their family household income. However, a part of the loans for students' living costs is means-tested. Consequently, all students are eligible for loans for maintenance, but the maximum they can borrow varies.

Table 1. Primary Student Loans Available in England and US

	Servicer	Interest Rate	Grace Period	Means Tested?
England				
Income-Contingent	Government	Inflation to Inflation + 3%	To April after end of course	Tuition fee loans –No Maintenance loans- Yes
United States				
Subsidised Stafford	Federal	4.45%	6 months	Yes
Unsubsidised Stafford	Federal	4.45% UG; 6% G	6 months	No
Parent PLUS	Federal	7%	NA	No
Grad PLUS	Federal	7%	NA	No
Perkins Loans (subsidised)	Federal	5% UG/G	9 months	Yes
State Loan Programmes	State	Varies	Varies	Varies
Private Loans	Private Banks	Varies	No	No

The process by which students repay their loans differs between the two countries where, once again, students in England follow a single repayment plan but students in the United States can choose from at least six different plans based on their needs. In England, individuals start repaying these loans after they graduate or leave higher education and once their income reaches a specified threshold, currently £21,000.⁶ They pay 9 per cent of earnings above this threshold until they have repaid their loan, with any outstanding debt forgiven after 30 years. Repayments are taken directly from the individual's salary through the tax system. Between 2006/07 and 2012/13, the interest rate paid was equal to inflation (the Retail Price Index) or the Bank of England base rate plus one per cent, whichever was lower (in effect, a zero or negative real interest rate). Then, in 2012/13, a real interest rate was charged which equalled inflation plus three per cent as soon as the student took out their loan and for the duration of their studies. Once students leave higher education, the interest rate is calculated on a sliding scale ranging from inflation to inflation plus three per cent, depending on the student's annual earnings. These real interest rates make the costs of borrowing more expensive for students but reduce government outlays.

In the United States, the repayment default is mortgage style lasting 10 years whereby a graduate pays a fixed sum each year. Income-driven repayment plans are available but not widely used among undergraduate borrowers, for whom the total amount of federal loan borrowing is capped at \$31,000, including \$23,000 in

⁶ In 2018/19, this will rise to £25,000.

subsidised loans. The repayment of federal student loans is handled by loans servicers on behalf of the government. Loan forgiveness schemes do exist in very specific cases – including for employment in the public service and for teachers, but the largest of these programmes has not yet resulted in loan forgiveness for any eligible students and is politically unpopular among those in the current (as of 2018) majority party. It is also extremely difficult and rare to get student loans discharged in bankruptcy or after a student's institution is shut down due to financial fraud. The difference in repayment methods between the United States and England raises the question of the transferability of research findings from one country to the other and the extent to which the two repayment schemes have different consequences for debtors.

Another difference between the countries is the tuition-setting agency granted to institutions. In England, maximum tuition fees are government-set (£9,250 as of 2017/18) and while institutions can choose to charge less for all or some of their courses, few do so. Any competitive advantage for universities of charging lower tuition fees is outweighed by the benefits of higher tuition income. By 2016, all universities, except one, charged the maximum for all their courses. Only further education (FE) colleges charged less (Office for Fair Access, 2015).

By contrast, in the United States, higher education institutions have a lot of discretion in setting student-related costs – tuition, fees, board and room – and are involved in both the allocation and collection of student loans. They build a financial aid package for each individual student, and act as intermediary for the actual money to be transferred from the government to the student. Some worry that this degree of institutional agency encourages colleges to raise fees to attract more federal aid. In addition, higher education institutions have to ensure students borrowing from a federal scheme complete an entry interview so they are acquainted with the terms and conditions of the loans, as well as an exit interview when leaving higher education to remind them of their obligations. Institutions are also held accountable for default rates among their students and can lose access to federal student loans and grants if default rates are too high.

These differences in policy contribute to the total indebtedness of graduates in the two countries. That said, since 1998 and in response to rising higher education participation rates, a series of cost-sharing policies were introduced in England, all of which have led to increases in undergraduate full-time student loan debt. First, there have been several large tuition fee increases, beginning with their (re) introduction in 1998 and the move away from means-tested fees in 2006/07. Between 1998/99 and 2017/18, the government-set cap on full-time tuition fees rose, from £1,000 (\$1,320)⁷ a year in 1998/99 to £9,250 in 2017/18 (\$12,210). Second, in 2006/07, government-subsidised income-contingent student loans were extended to cover students' tuition fees. Because these tuition fee loans cover all of a student's tuition fees, as the

⁷ Exchange rate £1=\$1.32, October 19, 2017. These tuition fees were means-tested, based on students' household income, and paid in cash up front.

tuition fee cap has risen over time since 2006/07 so has the amount a student can borrow. Third, means-tested government grants for low-income students' living costs were replaced with enhancements to pre-existing government-financed maintenance loans⁸ available to all students and with the same repayment terms and conditions as tuition fees loans. The maintenance grants, which were abolished in 1998 and reintroduced in 2004, eroded in value and were limited to a smaller number of eligible students until being abolished once again in 2016. The trends identified in the following section should be considered against the backdrop of these policy changes.

3. Trends in graduate indebtedness

Historically, the major questions related to student loan indebtedness relate to the financial consequences of borrowing, usually on the initial college choice, the decisions students make while in college and shortly after departing. This focus on behaviour while in college made sense in earlier decades, when student loan debt occupied a relatively small portion of total financial aid provided to students in England, the US and elsewhere. Now, however, large proportions of undergraduates borrow to pay for college, and the amount they borrow is on the rise in both England and the US. Furthermore, globally, private student loan providers have bloomed in number (Salmi, 2003). This shift in the composition of providers signals that student loans are a large enough market that private entities are eager to carve out a market for themselves.

The story of student loans in both England and the US is one of increase in their use. Students are more likely to borrow for college now than in previous decades, and the amount they borrow is on the rise. More worryingly, patterns in repayment suggest that graduates are struggling to repay their loans both immediately after graduation as well as in the years that follow. In contrast to early US concerns that high borrower amounts were the cause of increases in default rates, low borrowers have some of the highest default rates, suggesting that there is a mismatch in the US between the higher education received and a student's labour market success after graduation. These trends confirm that student loan debt is a problem at scale, and not a niche concern unique to either country.

As debt rises and trends in repayment show signs of struggling, it encourages reflection on the equally important question about the non-financial consequences of student loan borrowing. Research already suggests that graduates' financial decisions are influenced by student loan debt that they owe, but it is just as possible that other aspects of their lives are also affected. Now, as it becomes clear that

⁸ Since 1990, all full-time students irrespective of their family's household income, have been eligible for maintenance loans toward their living costs although the amount they receive depends on family income and where in England the student lives and studies. From 2018 part-time students will also be eligible for these loans.

increased borrowing is not a short-term status but instead the new normal, there is value in exploring the question of how student loan debt influences life events, especially with growing numbers of higher education students. The discussion that follows provides a high-level overview of these three distinct threads—number of borrowers, amount owed, and repayment—for both countries of interest: first England then the United States.

England

In England, recent policy changes related to tuition fees charged, fees eligible for payment using student loans, and the demise of a need-based grant programme have led to stark increases in the number of borrowers, the average student loan debt and the number of students not repaying their loans in full.

Total number of borrowers

Between 2010/11 and 2016/17, the number of all undergraduate students taking out student loans in England rose from 908,700 in 2010/2011 to 1,083,900 in 2016/17 – a 19 per cent increase. This increase includes students at both public and alternative (private) institutions. Borrowing only for tuition fees increased by 39 per cent over this period, while the number of students borrowing for both tuition fees and maintenance increased by 21 per cent (Student Loans Company, 2017b).⁹ The vast majority of English students use student loans. In 2015/16, an estimated 89.5 per cent of English undergraduate students took out maintenance loans, up from 80 per cent in 2006/07, and 94 per cent of students took out tuition loans compared with 83.4 per cent in 2010/11 (Student Loans Company, 2017b). These figures are expected to continue rising, especially since in 2016 low-income students saw the end of maintenance grants and their replacement with loans (Bolton, 2017) and tuition fees rose to £9,250 for all students in 2017/18. The participation growth forecast due to the 2020 demographic upturn in England will only reinforce these trends.

At the same time that the number of borrowers was on the rise, so too was the average amount borrowed. In the most recent academic year (2016/17) in England, the average student borrowed £11,780 – a 91 per cent increase from six years earlier (Student Loans Company, 2017b). Some of this is the result of the country's rising tuition fees, from £3,000 in 2006/07 to £9,000 in 2012/13, although both the number of loans and the amount borrowed were already rising before the 2012 policy change. Estimates suggest that the average debt upon graduation for the 2012/13 cohort will be £44,000 under the new regime, while it would have only been at £25,000 under the previous tuition fees policies (Bolton, 2017).

⁹ In part, this is due to changes in eligibility criteria for loans in England.

A 2014/15 survey of full time English-domiciled students indicated that, after controlling for various factors, students from routine and manual family backgrounds and students whose parents had no experience of higher education were the most likely to take out maintenance loans. Students less likely to take out such loans included those aged over 25, Asian/Asian British students, those living at home while studying, and students studying health-related subjects (Maher et al., 2018). Students in the last category used to receive National Health Services (NHS) bursaries and grants, but since these were cut in 2017/2018, this trend is likely to change.

Average student loan debt

According to the Wealth and Assets survey, the median UK borrower with financial liabilities owes approximately £10,000. The UK's total student loan balance more than doubled in five years: from £40.2 billion in 2011 to £100.5 billion in 2017 (Student Loans Company, 2017a). It represents nine per cent of the total individual financial liabilities (Office for National Statistics, 2016). Most of the total student loan debt burden in the UK is held by individuals in England, where more students borrow and the average amount borrowed is higher than in Wales, Scotland, or Northern Ireland.

In 2014/15, full-time students in their last year of undergraduate studies¹⁰ had accrued an average of £28,811 (median= £32,423) in student loans (Maher et al., 2018). Debt levels at graduation vary depending on students' characteristics. Age, socio-economic background, housing situation and subject studied were all related to higher graduate net debt.¹¹ In particular, the following groups of students had higher levels of debt: those aged 25 or over compared to those aged under 25; students from routine manual background compared to those with professional or managerial background; students renting privately with friends compared to those living with their parents; and students studying sciences, engineering, IT or technology compared to those studying human and social sciences, business and law, who in turn had higher graduate net debt than those studying medicine or dentistry (Maher et al., 2018).

Recent estimates suggest that the average amount owed at graduation could reach an average of £47,000 under the 2017 funding system (Belfield, Britton, Dearden, & van der Erve, 2017). As of the 2016/17 year, low-income students can no longer receive maintenance grants and in 2017/18, the maximum tuition fees rose more to £9,250. Students from the poorest 40 per cent of families who take a three-year degree will graduate with debts of around £56,000, compared with debts of £42,000 for students from the richest 30 per cent of families (Belfield, Britton, & Hodge, 2017).

¹⁰ In England most undergraduate courses last 3 years.

¹¹ After deducting any savings.

Repayment

In England, loans are income-contingent and repayments are deducted automatically from the graduate's salary if it exceeds the income threshold. Given the nature of these loans, students can never default. However, this repayment structure does not guarantee that all students will repay their loans in full. The UK government estimated that in 2013, 35 to 40 per cent of outstanding student loans will never be repaid – which could amount to a £70-80 billion gap in 2042 when the outstanding debt is estimated to reach £200 billion (House of Commons, Committee of Public Accounts, 2014). As of 2017, 51 per cent of students who first entered repayment in April 2002 had fully repaid their loans. In contrast, only 19 per cent of the 2009 cohort and six per cent of the 2012 cohort have fully repaid their loans (Bolton, 2017). However, the government has consistently overestimated loan repayment (by about eight per cent), which suggests that their non-repayment estimates will underestimate true costs (House of Commons, Committee of Public Accounts, 2014). As of 2017, for every £100 a student borrows, the government is only expected to recoup £55 – an expensive policy for the government. As levels of student loan debt have risen, so have estimates of the proportion of graduates who will not repay all their student loan in full within 30 years, when, under current arrangements, any outstanding debt is forgiven. Latest estimates suggest that 83 per cent of graduates are not expected to repay their loans in full (Belfield, Britton, & van der Erve, 2017).

United States

Exacerbated by a complex system of higher education and tuition fees that vary drastically depending on an institution's control (e.g., public, private not-for-profit, private for-profit), student loans in America now dominate conversations about financial aid. Students can borrow large amounts of money from the federal government each year and, if federal financial aid is insufficient to cover costs, students with good credit scores can turn to the private student loan market for additional funds. The result of the complexity in both the system of higher education and in the nation's financial aid system is that the total number of borrowers and average debt is increasing, but that delinquencies and defaults are worst among borrowers with low balances. This discrepancy between who borrows the most and who defaults most frequently complicates our understanding of how the decision to borrow and the amount borrowed intersect with subsequent life events. At least in the United States, the important question is not just whether a student borrows but how much and in order to attend what type of institution.

Total number of borrowers

Since the early 2000s, the US has experienced a sharp increase in both the number of student borrowers and in the amount of money borrowed through student loans (undergraduate and postgraduate) (Gale, Harris, Renaud, & Rodihan, 2014). The

total number of individuals with federal student loan debt reached 43 million in 2014 (Haughwout, Lee, Scally, & van der Klaauw, 2015; Looney & Yannelis, 2016), an increase of 89 per cent between 2004 and 2014 (Haughwout et al., 2015). Overall, 68 per cent of bachelor's degree recipients in the United States graduated with debt in 2014 (The Institute for College Access and Success, 2016). The total amount borrowed per year from all federal loan sources tripled between 1995 and 2010, then began to slow in 2010, reflecting a change in policy regarding eligibility for federal subsidised loans (College Board, 2016). As of 2014-15, the average undergraduate borrower attending a baccalaureate degree-granting institution took out approximately \$7,500 in loans each year of her undergraduate enrolment (National Center for Education Statistics, 2017).

Average student loan debt

In the United States, student loan debt now outpaces all other forms of consumer debt, including credit card debt (Haughwout et al., 2015; Lee, 2013). Total student loan debt across all age groups more than tripled between 2004 and 2014, from approximately \$350 billion to \$1,150 billion USD, according to data from the New York Federal Bank Consumer Credit Panel/Equifax (Haughwout et al., 2015). Over the same period, the average balance size increased by 77 per cent, reaching on average \$26,700 (Haughwout et al., 2015). The distribution, however, is highly skewed, with many graduates holding relatively low debt while few hold really high debt. The number of households holding debt increased from 12 per cent in 2001 to 19 per cent in 2010 (Fry, 2012). While 40 per cent of households with a head of household under the age of 35 hold student loan debt (Fry, 2012), the outstanding balance for borrowers aged 40 and over has been increasing significantly faster (Haughwout et al., 2015). This suggests that households are continuing to carry their student loan debt long after the traditional student departs college.

Average cumulative loan debt for students in their fourth year or more of college varies substantially based on the type of institution a student attends, whether a student attends graduate school, and key student-level characteristics. In 2011, average cumulative loan debt ranged from \$21,900 at public four-year non doctoral institutions to \$40,800 at two-year and four-year private for-profit institutions (McFarland et al., 2017). Student loan debt is more common in the for-profit four-year sector, with 88 per cent of seniors (students in their final year) graduating with debt. In comparison, 75 per cent of seniors in the private not-for-profit four-year sector and 66 per cent in the public four-year sector have debt (The Institute for College Access, 2014). Among students who attend any form of graduate school, the average outstanding student loan debt increased by 50 per cent between 2001 and 2012: from \$17,562 to \$26,682 (Fry, 2012).

With respect to student-level characteristics, independent students are more likely to have debt, especially if they are unmarried with no dependents.¹² For dependent students, chances of borrowing and total amount borrowed vary across the income distribution. Among students whose families earn more than \$100,000, 52 per cent graduate without debt. In contrast, borrowing rates are much higher among students from lower-income families. Among students whose families earn less than \$30,000 a year, only 27 per cent of students graduate without debt (Baum & Steele, 2010). Examining borrowing rates by Pell Grant receipt reveals a more striking disparity: 88 per cent of those who ever received a Pell Grant had debt, while only 53 per cent of non-recipients graduated with debt (The Institute for College Access, 2014). When examined by race/ethnicity, Black graduates are the most likely to have debt (81 per cent), followed by Hispanics (67 per cent) and Whites (64 per cent). Asians have the lowest proportion of graduates with debt (60 per cent) (Baum & Steele, 2010). These racial/ethnic differences remain even after accounting for differences in wealth, in family backgrounds, in post-secondary education, and in the amount of family contribution to college (Addo, Houle, & Simon, 2016).

Repayment, delinquencies and default

When borrowers are unable to repay their debts, they enter delinquency (failure to make a payment by the due date) and subsequently default (9 months past due date). In the United States, the proportion of borrowers delinquent on student loans has been rising over the past decade, with individuals aged 30 to 39 years being most at risk. Overall, 17 per cent of student borrowers are 90+ days delinquent (Lee, 2013), with delinquency most common among borrowers with lower debt balances. Nearly 30 per cent of borrowers with less than \$1,000 student loan debt balance are 90+day delinquent, compared with less than 15 per cent of those still owing more than \$100,000 (Clifford, 2016). This is mainly due to those with highest debt having graduate degrees, being able to access high paying jobs, and thus have more ability to pay off their loans. The lower end of the debt scale, however, includes individuals who dropped out of college or attended community colleges, and thus have more limited employment opportunities and lower ability to pay off their debt. Delinquency has also been rising most among borrowers from low-income geographic locations (Haughwout et al., 2015).

The default rate (nine months past due) on student loans has also increased over the years, from about 2.4 per cent in 2004 to a high of 3.6 per cent in 2012 (Haughwout et al., 2015). These increases in the default rate were most pronounced among individuals living in disadvantaged areas (Haughwout et al., 2015). Cohort default rates have been both increasing as a cohort ages and getting higher for younger cohorts (Haughwout et al., 2015).

¹² In the United States, independent students are those who report their own financial information when applying for federal financial aid. Dependent students report their parents' financial information during the application process. For more detail, see: <https://studentaid.ed.gov/sa/fafsa/filling-out/dependency>.

The debt burden is not evenly distributed in the population. For households in the lowest economic quintile, student loans represented 24 per cent of their household income, while they only represented two per cent of the income of the richest households (Fry, 2012). The former amount, calculated in 2010, represents a 52 per cent increase since 2007, whereas the amount for the richest households remained stable over this period (Fry, 2012). Overall, data suggest that borrowers with large balances incurred debt mostly to attend graduate school, and therefore tend to earn more and are more able to repay their loans (Looney & Yannelis, 2016).

Several US studies have taken a closer look at who defaults on student loan debt. Looney and Yannelis (2015) found that students at for-profit and two-year institutions were more likely to default. Low family income and higher debt burden were also associated with the risk of default (Looney & Yannelis, 2015). Data from the Survey of Consumer Finances show that default rates are higher for individuals leaving school with low balances (Brown, Haughwout, Donghoon, Scally, & van der Klaauw, 2015). Non-traditional institutions and community college have the highest share of student borrowers who default (Clifford, 2016). At the institutional level, higher default rates are associated with lower completion rates, a higher concentration of low-income students, and a higher concentration of first-generation students (Clifford, 2016).

Global trends

Global trends mirror those trends observed in England and the US: increases in the total number of borrowers and average amount borrowed, with signs that the majority of countries will not recoup the full costs associated with administering government student loans.

Total number of borrowers

The increases in the number of student borrowers and in the average value of student loans are not limited to the United States and the United Kingdom. These trends have also been documented in Canada (Luong, 2010), Chile (The World Bank, 2011), Kenya (Higher Education Loans Board, 2015), as well as Japan and Korea among others – although in the two latter cases numbers have recently plateaued or even decreased (Japan Student Services Organization, 2017; Korea Student Aid Foundation, 2015). All this evidence points to a global upward trend in the number of individuals borrowing to pay for their tertiary education and in the average amount of loan indebtedness. However, the recent stabilisation of loan figures in the United States, Japan, and Korea could point toward a new trend for the future.

Average student loan debt

At the same time that the number of borrowers is increasing globally, so too is the average amount of student loan debt. For instance, in Canada the average total amount owed at graduation increased by 24 per cent between 1995 and 2005, from CAN\$15,200 to CAN\$18,800. At the same time, the proportion of students graduating with larger debts also increased sharply (Luong, 2010). Even as average debt loads in other countries continue to rise, England and the United States remain among the top countries with respect to average amount borrowed. Average debt at graduation in England under the new £9,000 fees regime is the highest in the Anglophone world, by a wide margin. It is followed by American private for-profit institutions, New Zealand, American private non-profit institutions, Australia, and American public institutions (Kirby, 2016).

Repayment, delinquencies and default

Issues with student loan repayment are not confined to England and the US. In South Africa in 2015, 33 per cent of private student loans borrowers were at least three months late on payment (Melzer, 2016); in the Netherlands repayment rates were expected to decrease from 90 per cent in 2015 to 86.4 per cent after September 2015 because of a reform of the loan system (Del Rey & Schiopu, 2015).

This global trend is a concern to both students and governments. For students, non-repayment and defaults often means increasing interest rates on outstanding debt as well as harming their chances of getting access to other loans and forms of credit. For governments, higher rates of default and non-repayment mean that loans become more costly, the government loses money, and policymakers may be increasingly unwillingly to subsidise students or reduce the number of students they are willing to finance. Shen and Ziderman (2009) found an average recovery ratio – the ratio of total repayments to total outlays – of 49 per cent across 26 countries, without taking administrative costs into account. Most low-income countries, particularly in Africa, have very low recovery ratios.

4. Consequences of student loan debt on life events

The trends outlined in the previous section suggest significant changes in the indebtedness of graduates as they conclude their studies and enter the next phase of their lives. In the section that follows, we seek to understand the avenues through which student loan indebtedness affects individual behaviour in the short- and long term. We focus on six main life events, including namely postgraduate studies and career choices, homeownership, family formation, health, financial wellbeing, and others. In addition to providing a clearer understanding of the gaps in the academic literature, this thorough review provides strong evidence that student loan debt has the potential to disturb much more than the financial status of individuals.

The sub-sections below all follow a similar format. First, we provide a brief overview of the ways in which we think student loan debt may affect the post-graduate outcome. Then, we examine general trends in the life event among all individuals in the United Kingdom and the United States. This exploration helps us understand whether the underlying trends are the result of student loan debt or other factors influencing the population. For instance, falls in homeownership may have nothing to do with rising student loan debt but may be associated with a host of other socio-economic factors. We then examine the research about how student loan debt relates to and might have an impact on graduates' choices and lives, taking note of the questions that remain unanswered within the literature.

Appendix II includes accompanying tables of applicable studies related to each life event. Information is provided about the authors of the paper examined, the title of the paper, the country the research covers, the topics covered, its source of data, its methodological approach, and the key limitations of the study.

Postgraduate education

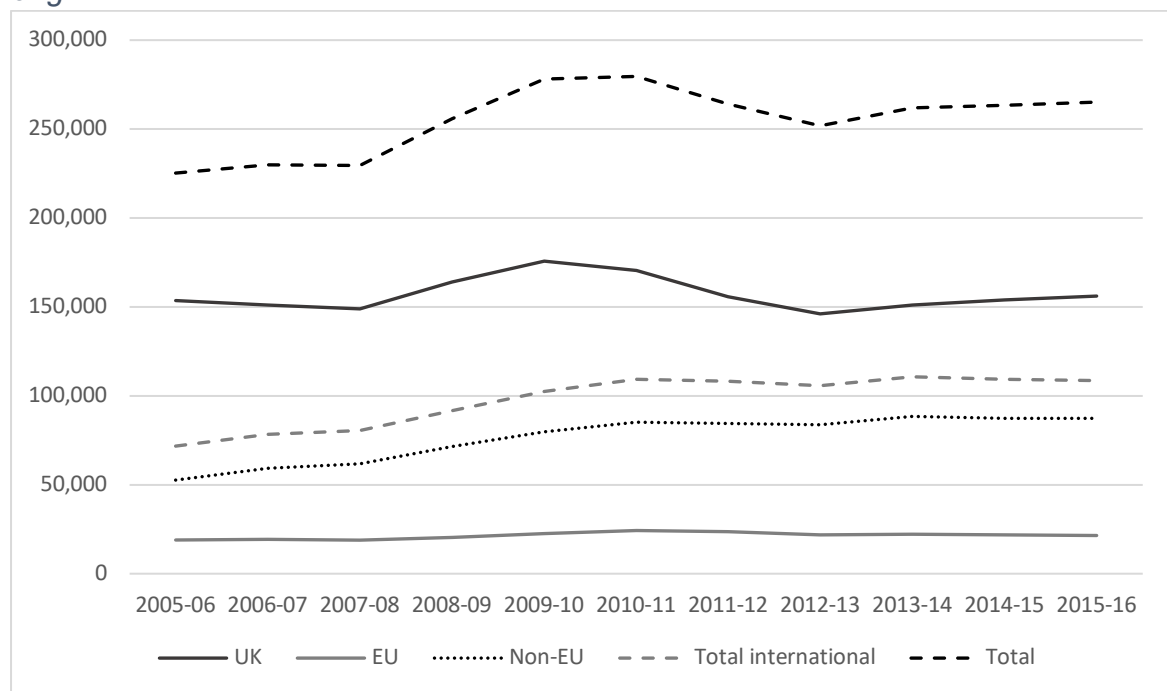
Human capital theory encourages investment in knowledge acquisition, because it leads to higher earnings. However, worry about repaying educational debt might prevent further educational spending for postgraduate education. Therefore, existing debt burden may lead an individual to make a decision that differs from what we might expect to occur under human capital theory. State dependence theory proposes that an individual's current state – indebtedness for instance – depends on that individual's previous state. By way of example, it posits that the probability of being in debt increases with the number of previous spells spent in debt. Furthermore, the duration of the current spell of indebtedness (or of all previous spells of indebtedness) influences the probability of becoming indebted again (Heckman & Borjas, 1980). Using state dependency theory, we would infer that student loan debt could encourage graduates to take out more debt in the future – in particular for educational purposes. It is possible, then, that increases in average indebtedness could either encourage or discourage subsequent enrolment in postgraduate education.

Postgraduate enrolment in both the UK and the US is on the rise. In the UK, the increase has amounted to an additional 4,000 students enrolled in graduate studies each year on average, rising from 225,000 to approximately 265,000 between 2005/06 and 2015/16 (Higher Education Funding Council for England, 2017). This growth has been mainly fuelled by an increase in international students (see Figure 1), while UK student enrolment remained approximately the same. Of note, graduate student enrolment among UK students peaked in 2010/11. In 2015/16, 50.3 per cent of entrants were 25-years-old or under, and 29.5 per cent were aged 26 to 35. Most postgraduate entrants study Arts, Humanities and Social Sciences, where the highest growth over the decade is also observed (Higher Education Funding Council for England, 2017). Furthermore, students from lower socio-economic backgrounds

are less likely to transition into Master’s or doctoral degrees, but are more likely to pursue other types of postgraduate qualifications (Higher Education Funding Council for England, 2013).

In the US, graduate student enrolment increased by about 2.9 per cent annually over the same time period (Okahana, Feaster, & Allum, 2016). Similar to the UK, this is mostly explained by the rise of the number of temporary residents enrolling in graduate education (22 per cent as of Fall 2015); enrolment among temporary residents increased by 9.4 per cent between 2005 and 2015, as compared to a 2.1 per cent increase among domestic students (Okahana et al., 2016). The average age of graduate students was higher in the US than in the UK as of 2007 (32.5 years), but by fall 2007, most enrolled graduates were aged between 25 and 29 (31 per cent) (Bell, 2009). Focusing on subjects studied, the highest average annual increase was observed for Mathematics and Computer Science over the decade 2005-2015, while Physical and Earth Sciences, Arts and Humanities, and Education all declined (Okahana et al., 2016). With respect to students’ socioeconomic backgrounds, increased family income does relate positively to enrolment in postgraduate education, while being a first-generation student reduces the likelihood of enrolment (Zhang, 2005).

Figure 1 – Postgraduate students in English institutions from 2005-06 to 2015-16, by origin



Source: Higher Education Funding Council for England, 2017

Research findings

The literature on the effects of student loan debt on graduates' willingness to engage in postgraduate studies is far from unanimous with inconsistent results which are rarely explained (Table A3). Research is mostly divided between studies that find no relationship between student loan debt and enrolment in postgraduate studies (Choy & Carroll, 2000; Millett, 2003; Monks, 2001; Perna, 2004; Rothstein & Rouse, 2011) and those that find a negative relationship (Choy, Geis, & Carroll, 1997; Heller, 2001; Malcom & Dowd, 2012; Weiler, 1994; Lei Zhang, 2013). Only three research studies find a positive relationship between student loan debt and postgraduate enrolment, but the context in which this relationship is observed is specific to a small portion of the student population (e.g., those studying aged 24, those with large debts or middle-income and male students only; Azmat & Simion, 2017; D. Kim & Eyermann, 2006; Minicozzi, 2005).

When borrowers are asked to reflect on whether their existing debt influenced their postgraduate enrolment decisions, the findings are equally inconsistent. The share of respondents reporting that their debt influenced their decision to go to graduate school ranges from 28 per cent to 64 per cent in the United States (American Student Assistance, 2015; Baum & O'Malley, 2003; EdAssist, 2016; Stone, Van Horn, & Zukin, 2012) and from 13 to 63 per cent in the UK (Allen, Goodlad, & Redman, 2006; Purcell et al., 2012; Purcell & Elias, 2010; Purcell, Elias, Davies, & Wilton, 2005; Strike, 2014; Stuart, Lido, Morgan, Solomon, & Akroyd, 2008).

However, most of the literature does agree that the effects of debt on decisions about postgraduate study vary considerably by student and institutional characteristics. The results are found to be sensitive to the type of postgraduate degree (Perna, 2004), the type of undergraduate institution attended (Lei Zhang, 2013), the amount of undergraduate debt already accumulated (Malcom & Dowd, 2012; Millett, 2003; Minicozzi, 2005; Monks, 2001), the student socio-economic background (D. Kim & Eyermann, 2006) and their ethnicity (Malcom & Dowd, 2012; Purcell et al., 2012).

Overall, the heterogeneity of students might be key to the relationship between student loan debt and participating in postgraduate studies. In particular, the combination of a culture of loans – i.e. the availability and acceptability of taking loans for higher education in the students' social and economic contexts – (D. Kim & Eyermann, 2006) and social class (Malcom & Dowd, 2012; Millett, 2003) create a unique set of decisions that is difficult to understand. The level of debt is also important, with indications that it should be examined in a way that properly accounts for extremes in indebtedness (i.e. those with very small debt and those with large ones). Finally, there is indication that the bottleneck is at the application stage to postgraduate study rather than at the enrolment stage (Millett, 2003); this suggests that graduates with debt are constrained early in the process since they do not even apply to graduate schools.

Career

Student loan debt has the potential to have a large impact on decisions individuals make about their career because of worries about the repayment of student loans, which might lead graduates to choose careers with higher financial rewards and/or to accept their first job offer so that they can start repaying their loans (see Table A4). Entrepreneurship might also be affected by student loan debt, as graduates might be both less willing and able to take the necessary financial risks to start their own business (see Table A5).

In the United Kingdom, the employment rate six months after graduation has been relatively stable since 2012. 77 per cent of the 2016 graduate cohort was working six months after graduation, including six per cent of all graduates who were working and studying simultaneously. During this same five-year period, unemployment declined from seven to five per cent (Higher Education Statistics Agency, 2017a). Three years after graduation, 81.4 per cent of graduates are employed (an increase from 79.4 per cent ten years earlier). The increase in three-year employment seems to be mirrored by a decrease in individuals simultaneously working and studying, from 8.6 per cent for the 2003 cohort to 5.4 per cent for the 2013 cohort. A United Kingdom research report showed that six months after graduation the socio-economic background of a graduate was not associated with them working in high status occupations, although those who attended private schools were slightly more likely to hold higher status occupations. The picture is, however, different three years after graduation when students from higher socio-economic backgrounds are more likely to be employed in higher status occupations (Macmillan & Vignoles, 2013).

Six months after graduation, the majority of UK graduates work in the following sectors: health professionals; retail, catering, waiting and bar staff; and marketing, HR and finance professionals (38 per cent of graduates worked in these three job categories). Public service professions ranked overall lower on the scale, with only 6.4 per cent of graduates being education professionals, 5.3 per cent in childcare, health and education occupations, and 4.9 per cent in legal, social, and welfare professionals (Logan & Prichard, 2016; Redman, 2015). Three years after graduation, however, first degree graduates favour human health and social work activities; education; and professional, scientific, and technical activities – thus turning more towards public interest professions (Higher Education Statistics Agency, 2017b).

Males earn higher median salaries than women both six months and three years after graduation. Six months after graduation, the median salary for male professionals with a first degree increased from £22,000 for the 2012 cohort to £23,000 for the 2015 cohort; for women the commensurate measure of salary is consistently £1,000 lower (Higher Education Statistics Agency, 2017a). Males and females in non-professional positions earned a median salary of £16,000 in 2016

(Higher Education Statistics Agency, 2017a). Three years after graduation, the median salary for graduates with a first degree is £27,500 for men and £25,000 for females (Higher Education Statistics Agency, 2017b).

In the United States in 2015, six months after graduation nearly 60 per cent of graduates were in standard employment (i.e., not entrepreneurs, temporary workers or freelancers) – an improvement from the 58.4 per cent in 2014. One per cent of remaining 2015 graduates identified themselves as entrepreneurs – double the share of entrepreneurs among 2014 graduates. Moreover, 17.7 per cent of US baccalaureate graduates in 2015 decided to pursue further higher education (National Association of Colleges and Employers, 2015, 2016).

Recent Bachelor's graduates in the United States in 2011 most frequently chose jobs in educational services, health care and social assistance, as well as professional and business services (Spreen, 2013). The average salary of Bachelor's graduates in the 2016 cohort six months after graduation was \$50,359, up from \$48,190 for the 2014 cohort (NACE staff, 2017; National Association of Colleges and Employers, 2016). The highest salary for the 2016 cohort was registered in the computer science sector, with an average reaching \$71,916—nearly four per cent higher than the previous year (NACE staff, 2017).

Finally, the media in both the US and the UK have drawn attention to concerns about underemployment – that is, when graduates hold 'non-graduate' jobs. Evidence from the UK is inconclusive as to the magnitude of the problem. O'Leary and Sloane (2016) found that young British graduates have been more likely to hold jobs with non-graduate wage levels between 2001 and 2010, while Green and Henseke (2016) found that the rate of underemployment has been stable at about 30 per cent. Research that examines a longer period of time – i.e. from the 1990s – does find evidence of a rise in underemployment, especially for women (Green & Zhu, 2010). In the US, underemployment is on the rise. A report from the Federal Bank of New York showed that underemployment among recent graduates has risen between 2001 and 2012, reaching 44 per cent in the later year. However this rise is not unprecedented and this level of underemployment was the norm in the 1990s, suggesting a possible cyclical model (Abel & Deitz, 2017; Abel, Deitz, & Su, 2014).

Research findings

The literature examining the relationship between career decisions and student loan debt tends to support the hypothesis that student loan debt restricts the jobs and occupations individuals consider and take. More precisely, studies show that student loan debt is related to graduates holding a job that was not their first choice (Purcell et al., 2012; Purcell & Elias, 2010) and graduates choosing not to work in education or other occupational/industrial sectors such as entertainment (Chapman, 2016). Studies on student loan debt and entrepreneurship all agree on a negative relationship, where individuals are prevented from taking the financial risks necessary to start a business by their debt burden (Ambrose, Cordell, & Ma, 2015;

Checovich & Allison, 2016; Krishnan & Wang, 2015). Only four studies find no relationship between student loan debt and career choices, including non-graduate employment (Purcell et al., 2005), choosing work in the public sector (Lei Zhang, 2013), career plan changing during the studies (Monks, 2001), and being on a temporary or permanent contract (Azmat & Simion, 2017).

The relationship between indebtedness and choice of career path is inconsistent among individuals with postgraduate education as well. A study of law school graduates found that graduates' choice of sector is influenced by the way in which loans were packaged. Students who were offered loans that would be forgiven if the student worked in the public sector were less likely to choose a public sector job than their colleagues who were offered grant aid that would revert to loans if the student took a job in the private sector (Field, 2009). This suggests a potential psychological cost to incurring debt while in higher education. Other studies in the law sector find no such relationship (Kornhauser & Revesz, 1995; McGill, 2006). Similarly, in the medical profession, most studies find no relationship between student loan debt and choosing to work as a primary care physician, a low-earning specialty that has a shorter time to graduation (Frank & Feinglass, 1999; Kahn et al., 2006; Youngclaus & Fresne, 2013). It is possible, however, that the level of debt matters in this decision. Those holding small and large amounts of debt may be less likely to choose primary care because of either socio-economic status or the need for higher earnings to repay higher debt (Phillips, Petterson, Bazemore, & Phillips, 2014).

Other research has examined the relationship between student loan debt and job satisfaction, consistently finding a negative relationship (Gervais & Ziebarth, 2016; Luo & Mongey, 2016; Weidner, 2016a). Indebted graduates are less likely to be unemployed and less likely to move jobs, which suggests less risky job market behaviour among indebted graduates (Chapman, 2016; Gervais & Ziebarth, 2016; Weidner, 2016a).

A number of studies have examined the relationship between student loan debt and earnings and found no consensus on the direction of the relationship. Several of these studies conclude that the relationship is negative with higher debt being related to lower earnings (Ji, 2017; Price, 2004; Weidner, 2016a), while others find the opposite (Chapman, 2016; Luo & Mongey, 2016; Minicozzi, 2005; Rothstein & Rouse, 2011). Finally, a high share of these studies, including one from Canada and one from the UK, suggest there is no relationship between student loan debt and earnings (Fry, 2014; Gervais & Ziebarth, 2016; Goodman, Isen, & Yannelis, 2018; Luong, 2010; Purcell & Elias, 2010; Lei Zhang, 2013). A study in the UK hints at a socio-economic gap in the relationship between student loan debt and earnings, with earnings increasing for individuals from high SES-backgrounds after the 2006 student funding reforms while they decreased for other categories (Azmat & Simion, 2017).

The lack of consensus on the topic of student loan debt and early-career earnings seems to verify both schools of thought on the behaviour of graduates with debt in the labour market. Some think that they take the job with the highest income to enable them to repay their debt more quickly. Others think that indebted graduates are more likely to take any job that is offered in order to start repaying their debt. Job security, as a guarantee to be able to repay debt, might also be a dynamic that needs more scrutiny.

Homeownership

Homeownership rates are important indicators of social and economic wellbeing. Homeownership has been linked to many positive spill overs, including wealth accumulation, improved outcomes for one's children, as well as engagement in the community and better citizenship (Andrews & Caldera Sánchez, 2011; Elliott, Grinstein-Weiss, & Nam, 2013a).

However, most homes are purchased using mortgages, which can only be accessed under specific financial conditions. They include the need for both a deposit and an income requirement in the UK (Andrew, 2010)¹³ or a threshold for debt-to-income ratio in the US (Mishory & O'Sullivan, 2012). Therefore, individuals already holding and repaying debt are less likely to have access to mortgages and therefore to buy a home, which directly links student loan debt to homeownership. In the United States, it is estimated that 11 to 35 per cent of the eight per cent decline in homeownership between 2007 and 2015 can be explained by tuition fees and student loan debt increase (Bleemer, Brown, Lee, Strair, & van der Klaauw, 2017).

Homeownership rates in England and in the US have declined in recent years. In England, the homeownership rate peaked at 71 per cent in 2003, but has been gradually decreasing until 2013, when homeownership rates began to level off at 63 per cent (Department for Communities and Local Government, 2017). The youngest English generation has been hit hardest. Some 58.6 per cent of 25- to 34-year-olds were homeowners in 2003, but only 38.2 per cent were in 2015 (Department for Communities and Local Government, 2017). Having a postsecondary degree improves the likelihood of homeownership, as does one's occupation and ethnicity (Coulter, 2016). White individuals are the most likely to be homeowners, while Asian individuals are the least likely. Couples are more likely than single people to be homeowners (Coulter, 2016; Department for Communities and Local Government, 2017).

In the US, homeownership rates decreased steadily between 2004 and 2016, from 69.2 per cent to 63.6 per cent. As in England, these trends have hit youngest people the hardest; the homeownership rate for under 35-year-olds decreased from 43.1 per cent in 2003 to 34.5 per cent in 2015 (United States Census Bureau, 2017).

¹³ In the UK, student loan debt weigh on the affordability score but not the credit score.

Education level is correlated with homeownership in the US, as it is in England. Individuals who did not finish secondary school are the least likely to own their home, while those educated to the higher education level are the most likely to be homeowners after the age of 30 (Aughinbaugh, 2013). When examined by race/ethnicity, Black individuals are the least likely to own homes while non-Black, non-Hispanic are the most likely to be homeowners. Homeownership rates are also higher among married individuals (Aughinbaugh, 2013).

In both countries, the proportion of young adults living with their parents is on the rise. In the UK in 2015, one in four 20- to 34-year-olds lived with their parents, up from one in five in 2008 (ONS Digital, 2016). In the US in 2014, 32.1 per cent of 18- to 34-year-olds lived with their parents, up from 20 per cent in 1960 and 28 per cent in 2007 (Fry, 2016).

Research findings

Holding student loan debt is negatively associated with owning a home; the literature analysing debt and homeownership is unanimous in this regard (Cooper & Wang, 2014; Elliott & Lewis, 2015; Gale et al., 2014; Luong, 2010; see Table A6). Likewise, the relationship between student loan debt and both housing value and equity is negative (Elliott et al., 2013a; Elliott & Lewis, 2015; Hiltonsmith, 2013; Zhan, Xiang, & Elliott, 2016). This negative relationship between debt and homeownership is confirmed in various surveys in the United States where between 38 and 71 per cent of respondents feel they delay buying a home because of student loan debt (American Student Assistance, 2015; Baum & O'Malley, 2003; EdAssist, 2016; National Association of REALTORS® Research Department & SALT, 2016; Stone et al., 2012). There is some evidence, however, that debtors catch up with non-debtors by the age of 30 (Mezza, Sommer, & Sherlund, 2014).

Even though the literature strongly suggests that homeownership rates are lower among those with debt, it is less clear whether the amount of debt an individual holds is associated with a lower probability of homeownership. Some studies find a small negative relationship (Baum & O'Malley, 2003; Bleemer, Brown, Lee, Strair, & van der Klaauw, 2017; Cooper & Wang, 2014; Elliott et al., 2013a; Houle & Berger, 2015; Mezza, Ringo, Sherlund, & Sommer, 2015; Shand, 2007) whereas others find no relationship (Gervais & Ziebarth, 2016; Gicheva & Thompson, 2015; Marks, 2009; Lei Zhang, 2013). Therefore, it seems that holding debt might be more important than the amount of debt when examining the effect on homeownership. An outlier study, however, finds that having higher borrowing limits for student loans is positively associated with homeownership (Goodman et al., 2018).

Some of this negative relationship is a result of the difficulty that student loan debt-holders experience accessing mortgages. In particular, in the United States in 2004, an average student loan debtor would not have had access to typical home mortgages (Mishory & O'Sullivan, 2012). In the United Kingdom, research indicates

that increased student loan debt does not change the age at which individuals reach the income requirements for a mortgage, but it does delay accumulating the required deposit by a minimum of two years (Andrew, 2010).

In contrast, some researchers have shown that eligibility for credit actually fails to account for lower homeownership among individuals with student loan debt (Mezza et al., 2015; Shand, 2007). They argue that the difference is instead linked to these households self-selecting out of buying a home because of the debt. Other explanations have included deepened debt aversion among student loan debtors – leading to a shortage of demand for other types of loans including mortgages – and/or tightening eligibility criteria – leading to a shortage in the supply of mortgage loans (Brown, Haughwout, Donghoon, Scally, & van der Klaauw, 2014; Elliott & Lewis, 2015; Lee, 2013). It has also been suggested that the big divide in the homeownership rate is not between graduates with and without debt, but between graduates and non-graduates (Dynarski, 2016). This distinction is worth keeping in mind when examining issues of homeownership and debt, especially when it comes to those who have student loan debt but do not obtain a degree.

As for whether student loan debt contributes to recent increases in the number of students moving back home after graduation, students report that their debt is a contributor. In different surveys, between 13 and 43 per cent of respondents felt that student loan debt prevented them from getting their own place (American Student Assistance, 2015; Baum & O'Malley, 2003; National Association of REALTORS® Research Department & SALT, 2016; Purcell et al., 2012; Stone et al., 2012). Research on the subject is scarce and divided. Bleemer et al. (2014) found that higher student loan debt is associated with higher rates of young adults living at home. Houle and Warner (2017) found no relationship between student loan debt and going back to live with family after graduation. Marks (2009) found a small negative relationship between student loan debt and odds of living with family.

In more than one-half of the studies examined, a limitation of the research on homeownership is the absence of a focus on differences in effects by geographic location. Homeownership rates are likely to vary geographically because of the large regional disparities in house prices. In the UK, London's house prices make homeownership nearly impossible for most young people. In the US, buying a house in New York or San Francisco is much more expensive than in the Midwest. Therefore, future research should strive to explore whether student loan debt influences homeownership differently in different geographical settings.

Family formation

The impact of student loan debt might go beyond the economic realm to lifestyle and social choices made by graduates. In particular, family formation might be affected by student debt. Marriage is increasingly considered an economic decision, with a generation of young adults who wait until they are financially established to make

this commitment. At the same time, marriage puts the weight of debt on the household instead of the individual, which could impact the relationship between student loan debt and marriage. Similarly, the cost of raising a child has been increasing in many developed countries, largely because of the growing cost of childcare and education. This means that student loan debt could indeed influence such social outcomes as getting married and having children (see tables A7 and A8).

Marriage rates in England and Wales have been declining; there were 23 marriages per 1,000 unmarried men and 20.9 marriages per 1,000 unmarried women in 2014 – down from approximately 80 for men and 60 for women in 1973 (Haines, 2017). Similarly, civil partnership numbers have been declining since their introduction in December 2005, from about 9,000 for men and 6,000 for women in 2006 to about 2,700 for men and 3,000 for women in 2013. In 2014, same-sex marriage was introduced in England, generating a further drop in civil partnerships in 2014 and 2015 (Haines, 2017). At the same time that marriage rates are declining, the average age at first marriage is increasing (Haines, 2017; Office for National Statistics, 2017). For heterosexual couples, the average age for single men marrying in 2014 was 32.7, while it was 30.8 for single women (Office for National Statistics, 2017). Unfortunately, in England national data and statistics detailing the average age of marriage by education or socio-economic status are not readily available.

In the United States, the number of marriages also declined, from 8.2 marriages per 1,000 unmarried individuals in 2000 to 6.9 per 1,000 unmarried individuals in 2015 (Centers for Disease Control and Prevention, n.d.). At the same time, the age of first marriage has been increasing for men and women. The average age of marriage in the US is about 28, with women marrying earlier than men (Aughinbaugh, Robles, & Sun, 2013). The age of first marriage differs by education for both men and women, ranging from 24.3-years-old for men who did not graduate from high school to 27.2-years-old for men with a Bachelor's degree or higher. Similarly for women, the average age ranges from 20.9-years-old for those who did not graduate from high school to 24.9-years-old for those with at least a Bachelor's degree (Aughinbaugh et al., 2013). The attention of US researchers has recently focused on a "historical reversal": the most educated women are now more likely to get married than their less educated peers (England & Bearak, 2012; Monte & Ellis, 2014; Reeves, Sawhill, & Krause, 2016).

At the same time that marriage rates are decreasing, so too is the number of children per woman. In Britain, more women are delaying their entry age to motherhood or choosing to remain childless (Knipe, 2016b), and this gap is exacerbated by education and socio-economic status. More educated women are becoming mothers later and having fewer children (Berrington, Stone, & Beaujouan, 2015; Dorling, 2013). The average age of entry into motherhood for UK-born mothers in managerial and professional occupations was 32.6 in 2014, compared to 27.9 for those in routine and manual occupations (Knipe, 2016a). Similarly, family size has stayed the

same over time for women with low levels of education, but has decreased significantly for women with a degree—from 2.23 for those born in the 1940s to 1.68 for those born in the 1960s.

The US is experiencing similar trends in the average number of children per woman, rates of childlessness, and age of entry into motherhood. The average number of children per woman dropped from more than three in 1976 to about two in 2012. Childlessness has also been rising in the past 30 years, reaching approximately 19 per cent in 2010 (Monte & Ellis, 2014). The education gap is again important in the United States, with more educated women having fewer children (1,725 children ever born per 1,000 women with graduate or professional degrees compared with 2,621 per 1,000 women who did not finish high school in 2012). The percentage of childless women also increases with education, from 11.6 per cent for women without a high school degree to 22.7 per cent for those with a graduate or professional degree in 2012 (Monte & Ellis, 2014). Finally, more educated women tend to delay entry into motherhood; among graduate women, birth rates are highest in their early 30s, compared to early 20s for those with less than a high school diploma (Monte & Ellis, 2014).

Research findings

The research literature is divided between studies that found a negative relationship between student loan debt and marriage (Addo, 2014; Bozick & Estacion, 2014; Gicheva, 2011, 2016; Sieg & Wang, 2017) and those that found no relationship (Choy, Li, & Carroll, 2006; Gervais & Ziebarth, 2016; Marks, 2009; Lei Zhang, 2013). Only one study found a positive relationship in the medium-term when analysing eligibility for higher levels of student loans and marriage (Goodman et al., 2018). This is reflected in the surveys that tend to show a small link between family formation and student loan debt. Between 14 and 21 per cent of respondents reported student loan debt delayed them getting married (American Student Assistance, 2015; Baum & O'Malley, 2003; EdAssist, 2016; Stone et al., 2012). Among those research studies that found a relationship between debt and marriage, the relationship either only existed for women or was much stronger among women than men. This suggests that debt influences marriage decisions differentially among men and women. One study also found no relationship between student loan debt and marriage satisfaction (Dew, 2008).

As with marriage, student loan debt seems to be negatively related to fertility (Marks, 2009; Sieg & Wang, 2017), with some studies indicating this relationship is true for women only (Nau, Dwyer, & Hodson, 2015). The most recent research on the topic highlighted an ethnic gap – including a negative relationship between student loan debt and first birth for Hispanic women as well as for marital first birth among White women, and a positive relationship for Black women (Min & Taylor, 2018). Two studies fail to find a relationship between student loan debt and having children (Chiteji, 2008; Yu, Kippen, & Chapman, 2007). However, these studies present a limited exploration of the relationship, since one examines only expected lifetime

fertility (Yu et al., 2007) and the other does not differentiate between types of debt (Chiteji, 2008). Like for marriage, Goodman et al. (2018) find a positive relationship in the medium-term between fertility and higher borrowing limits.

Overall, the literature seems to indicate that, for women, there is a negative link between student loan debt and family formation. However, this does not seem to be true for men. Whereas the majority of these research studies analyse marriage and fertility at a specific point in time, it is likely that family formation is simply delayed by debt. Future research should strive to analyse the relationship between student loan debt and family formation longitudinally to assess not only whether but also when women get married and have children.

Health

There is evidence that debt – in general – is related to health issues, particularly mental health problems (Fitch, Hamilton, Bassett, & Davey, 2011; Richardson, Elliott, & Roberts, 2013). Key pathways from debt to mental health seem to be related to psychological factors, including stress and associated depression and anxiety. In turn, these can lead directly and indirectly to short- and long-term physical health issues. This evidence supports the assumption that student loan debt might create health issues, and suggests that the intersection of student debt and health issues is an important research area that is, thus far, understudied.

The prevalence of reported common mental health disorders is increasing in both the UK and the US. In the UK, the percentage of the adult (over 16-years-old) reporting a common mental health disorder increased from 14 per cent in 1993 to nearly 18 per cent in 2014. Women not only consistently suffer from severe mental health issues at higher rates than men, but the reported rate of mental health issues has risen more steadily for women over time (Stansfeld et al., 2016). In 2014, 33 per cent of women reported having ever been diagnosed with a mental health disorder against 19 per cent of men (Mental Health Network NHS Confederation, 2016). Suicide rates in Britain have been falling for both men and women since 1982, with the largest fall occurring among 10- to 29-year-olds (John, 2017). In 2016, the suicide rate was 16 per 100,000 males and five per 100,000 females. The highest registered suicide rates are for those aged 40 to 59.

In the United States in 2015, about 18 per cent of adults aged 18 or over had mental health issues – a steady level since 2008 (17.7 per cent). Mental health issues among 18- to 25-year-olds increased from 18.5 per cent in 2008 to 20.1 per cent in 2014. Like in England, a higher proportion of women suffer from mental illnesses than men (21.2 per cent v. 14.3 per cent). Further statistics show that mental illness prevalence is not homogeneous among races, with a higher ratio for biracial people, Natives, and Whites (Center for Behavioral Health Statistics and Quality, 2015; National Institute of Mental Health, 2016). Like in Great Britain, suicide rates are higher for men than women, but contrary to Great Britain, rates have been increasing

for both genders – from 17.8 deaths per 100,000 in 1999 to 20.7 in 2014 for men and from 4.0 to 5.8 for women. In 2014, the highest registered rate of suicide for women was for 45- to 64-year-olds, while older men (75 and over) commit suicide in higher numbers (Curtin, Warner, & Hedegaard, 2016).

Research findings

The literature on student loan debt and health is scarce and examines different factors of health (Table A9). The limited literature that does exist almost unanimously concludes that there exists a negative relationship between student loan debt and an individual's health after leaving higher education. These results include student loan debt being related to lower psychological functioning (Walsemann, Gee, & Gentile, 2015), less sleep duration for Black individuals (Walsemann, Ailshire, & Gee, 2016), more healthcare hardship (Despard et al., 2016), and less mastery and self-esteem among older adults (Dwyer, McCloud, & Hodson, 2011). All this points to a negative relationship between student loan debt and health, although it might be moderated by factors such as socio-economic background (Dwyer et al., 2011; Walsemann, Gee, & Gentile, 2015), the amount of debt (Despard et al., 2016), and ethnicity (Walsemann, Ailshire, & Gee, 2016). Furthermore, there is ample evidence that student loan debt is associated with poorer health among students (e.g. Cooke, Barkham, Audin, Bradley, & Davy, 2004; Morra, Regehr, & Ginsburg, 2008; Ross, Cleland, & Macleod, 2006; Walsemann, Gee, & Gentile, 2015).

More research is however needed on this topic to confirm the aforementioned conclusions. This research will need to ensure that student loan debt can be disaggregated from other types of debt to assess the impact of student loan debt on short- and long-term health. Longitudinal studies would be particularly interesting, since student loan debt has the potential to linger on and affect most of an adult's working life. Particular attention should also be given to the definition of health, to include both reliable instruments to evaluate mental and physical health.

Lifetime financial wellbeing

The repayment burden of student loans means that, whatever the loan scheme, individuals have less money to spend on consumption or to invest. Taking on student loans to pay for higher education is a financial investment that could weigh on an individual's finances once their studies are over. In the US, monthly repayments must be made to loan servicers to reimburse both the loan and interest accrued. In England, repayments are deducted from a graduate's earned income. These repayments are equivalent to paying an additional nine per cent in marginal tax on income above the repayment threshold. In both countries, individuals with student debt have less income to spend on necessities and to build up savings – including for retirement. And as more young people enter higher education and more of them take out larger student loans, increasing proportions of young people are likely to be

affected. As such, student loan debt has a direct effect on financial wellbeing, including wealth, savings, financial distress, and in the longer-term on the ability of individuals to retire and/or to maintain their lifestyle in retirement.

In the United Kingdom, the median household gross financial wealth – i.e. the sum of financial assets held by members of the household plus endowments for mortgage repayments – between July 2012 and June 2014 was £8,500. Net financial wealth, which takes into account financial liabilities (including student loans), reached £5,900 between July 2012 and June 2014 (Chamberlain, 2015). This current figure for net financial wealth represents a modest increase since July 2006 and June 2008, but remains below comparable figures for the time period between 2008 and 2010. This is likely the result of the 2008 financial crisis (Chamberlain, 2015). As higher education participation rates continue to rise alongside student loan take-up rates and levels of student debt, it is unlikely that net wealth will grow, unless there is a considerable rise in wages and a full economic recovery.

Four additional financial trends in the UK are worth mentioning to set up the context for the study of student loan debt and financial wellbeing. First, more educated households are more likely to have higher net financial wealth. Nearly one-quarter of all households with a tertiary degree have more than £100,000 in net financial wealth, compared to seven per cent of households with no qualification. This trend holds even though the incidence of no or negative financial wealth is similar regardless of education level (21 per cent of those with a degree, 27 per cent of those with another qualification, and 21 per cent of those with no qualifications; Chamberlain, 2015). Second, the household saving ratio – the share of income saved – fell from 10 per cent in the mid-1990s to three per cent by 2016, and young people have reduced their savings most (Berry, Williams, & Waldron, 2009; Bank of England, 2017). Once again, rising levels of student loan debt for a greater number of young people are likely to eat into this savings ratio.

Third, more people are experiencing common indicators of financial distress, but having a degree reduces the likelihood of being in financial distress (Gathergood & Guttman-Kenney, 2016). Descriptive statistics from the *Wealth and Assets Survey* indicate that the percentage of consumer credit debt-holders late by two or more payments increased from 0.7 per cent in 2006-2008 to 1.9 per cent for 2012-2014. Home credit, pawnbroker loans, and payday loans are the products that generate the highest proportion of financial distress. Additionally, the number of individual insolvencies – people who cannot repay their debt and enter formal processes such as bankruptcies and voluntary arrangements – in England and Wales decreased after the 2008 recession but since 2015 has risen again with more than 25,000 people declared insolvent in the first quarter of 2017 (Hillis, 2017).

Fourth, saving for retirement in the UK has changed drastically since the introduction of automatic pension enrolment in 2012.¹⁴ Before 2012, only 25 to 35 per cent of young people (aged between 22 and 29) were enrolled in a private or occupational pension scheme. Automatic enrolment brought that proportion up to 54 per cent – the largest recorded increase across age groups. However, young people still seem to opt out in a higher proportion than those over 30, since about 65 per cent of that age group contribute to pension schemes (Pensions Policy Institute, 2016). Young people working in the private sector also tend to contribute lower proportions of their salary to workplace pensions. In 2014, they contributed one per cent of their salary while other age groups all contributed more than three per cent (Office for National Statistics, 2015). It is possible that as more students take out student loans, increasing proportions of graduates will be unwilling or unable to make sizable discretionary contributions to a pension scheme, affecting their long-term financial security.

Trends in these same areas are quite different in the United States. Critically, the net worth of households headed by 25- to 32-year-olds fell by \$7,000 between 1984 and 2011. The fall was least pronounced for those with a bachelor's degree (from \$29,521 to \$26,058) and most dramatic for those with no postsecondary education (from \$11,455 to \$3,137; Taylor et al., 2014). The average member of generation X earns more than his parents but holds \$5,000 less in wealth, mostly due to six times higher debt totals (The Pew Charitable Trusts, 2014). With rising student loan debt for millennials, this trend is likely to continue.

Second, personal saving ratios in the United States have been declining steadily over time, falling from 17 per cent in 1975 to 3.8 per cent in 2017 (Federal Reserve Bank of St. Louis, 2017). Americans with at least an undergraduate degree are more likely to save than those who are less educated (Lin et al., 2016), and a recent survey of millennials finds that they are saving 19 per cent of their income per year – a higher proportion than other generations (Merrill Edge, 2017).

Third, indicators of financial distress are trending downward. Delinquency rates on all commercial bank loans have decreased from between five and six per cent in the early 90s to between 1.5 and three per cent for the 1995-2007 period. Delinquency rates peaked at over 7 per cent in 2010, driven mostly by mortgage loan delinquency, before falling to below two per cent in 2017 (Board of Governors of the Federal Reserve System, 2017). Personal bankruptcy filings in the United States, which exceeded one million per year during the recession, dropped to just under 850,000 by 2015 (Judiciary Data and Analysis Office, 2015).

¹⁴ Automatic enrolment, via the Pensions Act 2008, requires all employers to offer workplace pension schemes and to enrol eligible workers into their schemes. Both employers and employees pay into the scheme. Automatic enrolment is being phased in, so all eligible workers should be enrolled into their workplace scheme by 1 February 2018.

Finally, retirement readiness in the United States is declining.¹⁵ Members of Generation X, born between 1966 and 1975, are less prepared for retirement than earlier cohorts. Most Generation Xers are only able to save 50 per cent of their pre-retirement income, compared to nearly 100 per cent among those born between 1936 and 1945. In addition to generational differences in retirement saving, there exist differences based on income (The Pew Charitable Trusts, 2013). Those with lower incomes are less prepared for retirement than their higher-income peers (Lin et al., 2016). Looking at younger cohorts, half of those aged 18 to 29 had no retirement savings (Larrimore, Dodoni, & Thomas, 2016), and millennials save more to achieve their desired lifestyle than to prepare for retirement (Merrill Edge, 2017). However, several surveys actually showed that millennials' retirement saving has increased more in recent years than among previous generations (Fidelity Investments, 2016; Tepper, 2017).

Research findings

There is a unanimous consensus throughout the literature that student loan debt is negatively related to wealth throughout the lifetime, including such varied outcomes as net worth, financial distress, and savings – including retirement savings (see Table A10). A first cluster of research articles examined wealth in general and all find a negative relationship between student loan debt and wealth – mostly defined as net worth (Cooper & Wang, 2014; Elliott & Nam, 2013; Fry, 2014; Hiltonsmith, 2013; Luong, 2010; Zhan et al., 2016). Other research has found a similarly negative link between student loan debt and investments (Batkeyev, Krishnan, & Nandy, 2016; Luong, 2010) as well as student loan debt and savings (Hiltonsmith, 2013; Luong, 2010). The relationship between debt and savings is the only one that contradicts the pattern, with two studies failing to find a relationship (Choy & Carroll, 2000; Goodman et al., 2018).

Every study that examined the link between student loan debt and financial distress found that student loan debt is positively associated with incidence of financial distress. Indeed, student loan debt was found to be related to financial struggle (Baum & O'Malley, 2003; Dugan & Kafka, 2014), skipping or making late payments (Akers, 2014; Bricker & Thompson, 2016; Despard et al., 2016; Fry, 2014; Gicheva & Thompson, 2015), being denied credit (Bricker & Thompson, 2016; Gicheva & Thompson, 2015), as well as having experienced bank overdrafts, bankruptcy, and food insecurity (Despard et al., 2016; Gicheva & Thompson, 2015). Many of these studies however highlight the fact that these negative consequences are aggravated if the individual did not complete their higher education (Akers, 2014; Bricker & Thompson, 2016; Despard et al., 2016; Gicheva & Thompson, 2015).

¹⁵ Pension schemes in the US include the Social Security system (a federal pension programme) as well as many private schemes provided by employers and insurance companies. Employers are, however, not mandated to provide access to a pension fund, and the most commonly used pension instrument is simply an individual retirement saving account.

Several studies have examined the relationship between student debt and retirement, focusing on the long-term consequences of loans. These studies have overwhelmingly found a negative link between student loan debt and retirement preparedness. Surveys found that between 62 and 78 per cent of respondents feel their student loan debt has impaired their ability to save for retirement (American Student Assistance, 2015, 2017; EdAssist, 2016). Research has also revealed that student loan debt will probably lead to less financial preparedness for retirement, as well as higher retirement ages (Egoian, 2013; Hiltonsmith, 2013). Other relationships with student loan debt include an increase in the number of retirees with outstanding debt (Jeszeck, 2014), a higher share of individuals not being able to maintain their lifestyle at retirement (Munnell, Hou, & Webb, 2016), and less retirement savings (Elliott, Grinstein-Weiss, & Nam, 2013b; Rutledge, Sanzenbacher, & Vitagliano, 2016). However, there seems to be no relationship between student loan debt and participation in a retirement scheme (Luong, 2010; Rutledge et al., 2016).

Overall, the literature suggests a negative relationship between student loan debt and financial wellbeing, in both the short- and long-term. Research on these topics needs to continue to go beyond estimations and assess the extent to which the high debt of current generations could damage their financial wellbeing when in work and when retired. This is particularly important in relation to future economic and social policies regarding pensions and affecting personal savings among current generations of young people with student loan debt. Given the scale and levels of student loan debt and the fact that most debtors (especially in England) will be repaying their loans throughout their working lives, it can no longer be assumed that the more highly educated will be financially secure in their old age. There is a need to monitor the relationship between student loan debt and investments in pensions in order to try and prevent extensive poverty in retirement and throughout graduates' working lives.

Other consequences of student loan debt

In addition to the consequences noted above, there are other ways student loan debt might influence graduates' lives (Table A11), but the literature in these areas is mixed in terms of findings. Some studies found a negative relationship between student loan debt and car purchases (Baum & O'Malley, 2003; Brown & Caldwell, 2013), others fail to find a relationship (Choy & Carroll, 2000), and others still uncover a positive relationship (Kurz & Li, 2015). Similarly the relationship between student loan debt and take-up of other debt could be negative (Lee, 2013) or positive (Fry, 2014). Finally, one study associated having student loan debt with a higher propensity to move to more educated neighbourhoods (Whitaker, 2015). The study of these issues is limited in terms of the quantity and quality of the research that might better explain the pathways from student loan debt to large purchases, mobility, and other types of debt.

5. Limitations to existing research

Even though we know far more today about the relationship between student loan debt and subsequent life events, the existing literature remains limited in important ways. Recognising the knowledge gains that have been made—and the unavoidable limitations related to gathering nationally representative individual-level data—we chronicle these limitations below. Our hope is that acknowledging these limitations can help us not only identify new lines of inquiry, but also suggest how new research can build on the existing body of knowledge.

Predominant focus on the United States

The most prevalent limitation of the literature is its US-centric focus, highlighting the absence of research on the consequences of student loan debt in England and elsewhere. The US-focus limits the generalisability of findings to other countries for two reasons. First, the United States has a large, highly diverse, and decentralised system of higher education. Public two- and four-year institutions operate in parallel with private not-for-profit and for-profit institutions, but benefit from varying levels of authority over tuition-setting decisions. Among public institutions, authority varies by state and institutional type, whereas private institutions have complete control over the tuition and fees charged. These differences have implications for student loan debt, because the amount of debt a student incurs is highly dependent upon the type of institution a student attends. It is noteworthy that in England, there is little variation in levels of debt by institution attended because of a lack of diversity in England's higher education system and the fact that nearly all universities charge the same tuition fees. Second, in the United States, the default student loan repayment plan assumes fixed payments over a 10-year period; this is in contrast to other countries, which rely more heavily on income-contingent loans. The choice of default repayment plan likely affects the severity of the financial burden that results from indebtedness, which means that studies of student loan repayment in the United States may not be generalisable to countries where the default repayment plan is different.

Reliance on secondary datasets

Most of the research articles reviewed here rely on US secondary datasets, which means the researchers have no control over the information available to them. Critically, most of these datasets have a particular focus, which prevents the researcher from building a complete picture of participants' educational and financial decisions over a lifetime. For instance, the US *Survey of Consumer Finances* provides comprehensive information on overall debt but little information about graduates' education and the portion of debt incurred during postsecondary education versus as part of a postgraduate degree. These degrees are likely to have very different influences on graduates' lives, and on their levels of debt. Another

popular dataset, *the Baccalaureate and Beyond Longitudinal Study*, has comprehensive data on education but it does not have complete and adequate information about life events beyond employment.

Furthermore, the data are often out of date, which affects the timeliness of the research. This is particularly important in the study of life events because research is by definition examining generations of graduates retrospectively, years and sometimes decades after they graduated. Results are therefore often not generalisable to current generations and can only offer moderate insight for possible future scenarios. Finally, secondary datasets leave researchers with little control over the composition of the survey sample, which can lead to incomplete results. For instance, the *Baccalaureate and Beyond Longitudinal Study* consists of a representative sample of graduates in the United States, but the decision to begin the survey with a cohort of graduates necessarily excludes individuals who did not complete their degree. Yet research suggests that such non-completers are particularly likely to struggle with student loan debt (Dynarski, 2016; Gicheva & Thompson, 2015).

Of the most commonly used secondary datasets, nearly all are based in the United States.

Methodologically weak surveys

A third limitation concerns the quality and robustness of surveys used in research about student loan debt and its effects (see **Error! Reference source not found.**, as well as other tables). Many are non-academic in nature and their sampling and survey designs are approximate, sometimes lacking rigour. Few of these surveys explain extensively the sampling process or report their response rate. In one case, the survey was taken by visitors to a website (Allen et al., 2006). Additionally, the survey questions themselves are often problematic and biased, without any methodological documentation to assess their reliability or the validity of the questions and what they aim to measure. Therefore, generalising from these surveys is problematic.

Overrepresentation of particular academic fields

Finally, the literature is dominated by economics researchers while other academic fields, such as psychology and sociology are underrepresented. This overrepresentation of economic studies limits our understanding of the phenomenon of student loan debt. In particular, a psychological theoretical framework could help researchers understand graduates' attitude toward debt and repayment, and how such factors as debt aversion might play a role. Although the concept of debt is heavily based on economics, its consequences detailed above are *inter alia* educational (postgraduate studies), economic (labour market, homeownership,

wealth, retirement savings), sociological (marriage, children), as well as medical and psychological (health). There is, therefore, a strong case for expanding this research to include concepts and theories from other disciplines.

6. Directions for future research

The limitations noted above, as well as the conclusions from the literature review, suggest opportunities for new research to contribute to our understanding of the effects of student loans in two areas: adapting the empirical methodology and asking new research questions that fill the existing gaps in the literature. This section provides a brief overview of the potential strategies for addressing each of these broad categories of limitations.

Methodological improvements

There is considerable opportunity to improve the research design in studies that seek to understand the relationship between student loan debt and life events after graduation. Many of these areas for improvement relate to the effect of student loans on student behaviour while enrolled in postsecondary education as much as they do to what happens after departing. Dowd (2008), who critiques the methodologies used in studies that seek to understand this relationship while students are still enrolled, informs our own synthesis of the ways in which existing methodologies can be improved as it relates to the relationship between student loan debt and life events.

First, the absence of qualitative studies is a large methodological gap in the extant studies on the effects of student loan debt on outcomes. Although quantitative studies help us identify whether a relationship exists—and the factors that weaken or strengthen the relationship—qualitative research informs our understanding of how a relationship between student loan debt and the observed outcome comes about and the process by which an individual decides what behaviour to adopt. Where feasible, studies need to include surveys designed specifically to examine student loan debt in order to circumvent data issues associated with reliance on secondary datasets. These surveys should be properly prepared and piloted to ensure reliability and validity, and robust results. The sampling design should also allow for analysis of different categories of students, whose number may be too small in national databases (Dowd, 2008), for instance, students from underrepresented ethnicities or from rural areas. Moreover, the survey questions should include information about sociocultural and psychological characteristics of students – e.g. race, socio-economic background, self-worth, attitudes to debt and debt aversion – to help disentangle the effect of student characteristics on the take up of student loans and the effect of these same characteristics on the outcome of interest (Dowd, 2008).

Second, methodologies need to study the consequences of student loan debt longitudinally. The effects of student loan debt might be stronger soon after leaving postsecondary education or any effects might accumulate over time, having a greater impact later in life. In addition, some effects are more likely to be experienced at certain stages in an individual's life. Longitudinal analysis would allow analysis of the cumulative effects of student debt on graduates' behaviour, such as whether some graduates' actions and choices are delayed.

Third, greater consideration needs to be given to who is included in the research, and why. The most notable decision is whether to include completers and non-completers, as well as those with and without student debt. Although circumstances may dictate the composition of the sample in a given survey, research should try to include as many variations as possible to determine whether or not student debt is detrimental and if so, to whom. This also demands careful analysis of graduates' demographic and socio-economic characteristics such as their race, gender, and social class, as well as other factors such as repayment burden (Dowd, 2008). Student loan debt is unlikely to affect the behaviour of all graduates the same way and greater attention should be placed on examining any potential interaction effects. Moreover, factors such as race and social class impact the levels of debt incurred by graduates and therefore should be included in any research on student loans.

Fourth, research needs to account for a broader scope of student populations affected by borrowing. This includes differentiating between individuals who did and did not take out student loans; who took out loans for undergraduate and/or postgraduate studies; and who does and does not make on-time loan payments. These distinctions are likely to shed light on debt burdens later in life. Also important are differences in the amounts borrowed, how the amount of outstanding student loan debt differentially affects students over time, and how these trends vary by graduates' socio-economic characteristics and/or their subject of study when enrolled. Self-reporting on these issues can be problematic because a significant number of borrowers do not know their loan amount or balances, thus creating missing or unreliable data (Hillman, 2015). It is also essential to distinguish whether any positive and/or negative effect of loans stems from the initial loan take-up or from difficulties associated with loan repayment. Finally, studies need to include instruments to measure graduates' attitude towards debt, in order to disentangle the effect of the actual student loans/student loan debt and the effect of individuals' attitudes towards them.

A final point, not exclusive to the study of student loan debt, is the issue of causality. Research studies on student loan debt and life choices should aim to establish more than just a relationship between debt and these life events. Ideally, they should prove that student loan debt causes changes in graduates' behaviour. To achieve this aim, researchers should turn towards experimental and quasi-experimental techniques whenever possible (Dowd, 2008; Hillman, 2015). Some of the research on student loan debt and career choices uses experiments and some quasi-

experimental approaches. However, in the literature reviewed, many studies fail to take into account the potential bias in their results due to the self-selection of those receiving financial aid and the endogeneity of financial aid packages in the United States (what aid is offered often depends on student characteristics). These particularities of student loans create challenges in ascertaining whether student debt actually causes the outcomes we are so interested in knowing more about.

Research questions

In addition to the opportunities outlined above, all of which can strengthen the research design and therefore the internal validity and generalisability of findings on student loan borrowing, there are also a number of topics that remain underexplored within the current literature on student loan borrowers.

Researching delays

Some research suggests that student loan debt delays, not prevents, particular life events such as family formation (Bozick & Estacion, 2014; Houle & Warner, 2017; Nau et al., 2015; Weidner, 2016a). However, rarely does the extant literature analyse the possibility of a delay. As generations with high student loan debt in several countries become older, this gap needs to be addressed to assess the true effect of student loan debt on individuals and their choices and decision-making.

Completers v. non-completers

Success in higher education, as embodied by actual graduation, has become an important research and policy topic. Indeed, non-completion of higher education can have detrimental effects for individuals who are left with student debt to repay while not enjoying the full benefits of a higher education qualification. Research on the consequences of student loan debt often seems to forget these individuals, by either solely analysing those gaining a degree or by failing to distinguish between those who did and did not graduate. A comprehensive study about the consequences of student loan debt would compare completers with and without debt on the one hand, and non-completers with and without debt on the other.

Attitudes toward debt

In addition to the decision to borrow—and the actual accrual of debt—individuals' psychological attitudes towards holding debt are equally important to our understanding of how debt affects life events. Too few articles include attitudes to debt in their analysis of the impact of debt. The measurement of individuals' attitudes and perceptions of debt, however difficult that might be, needs to be improved and become more normalised in the study of student loan debt. Including these measures can help researchers disentangle the effect of actually owning debt and the effect of worries and stress due to owing money.

Balancing life events

The literature on student loan debt pays outsized attention to the impact of debt on graduates' careers, earnings, and homeownership. While there are several life events which receive little attention within the student loan literature—including marriage and health—the most worrying gap is the dearth of evidence on the effect of student loans on retirement savings. It would be an issue for governments if, as a result of having to repay student loan debt for a large part of their lives, individuals are not financially ready for retirement when they reach retirement age. Therefore, the retirement saving strategies of current generations of graduates need scrutiny to foresee and prevent possible issues in the coming decades.

Research should also examine how student loan debt relates to physical and mental health. In the US and other countries, student loan debt might affect the ability of individuals to take out health insurance and to access health services and treatments, medicines and dental services. And in both the US and England, more individuals are experiencing mental illness than among previous generations.

Finally, even when considering the most studied life events, some areas remain unexplored. For instance, when examining the effect of student loan debt on career, the current focus on early-career choices should be supplemented with studies of long-term career outcomes. Furthermore, graduate underemployment is an important issue for policy-makers and might be exacerbated by some graduates taking the first job they are offered because of their desire to repay their loans as quickly as possible. Research on the relationship between student loan debt and graduate underemployment would therefore be an important addition to the existing literature.

Economic context

Economic uncertainty affects most of the life events explored here, and previous economic downturns can lend insight into how borrowers might behave in future downturns. In light of that indisputable link between economic uncertainty and debt repayment, future studies could explore the general economic context in terms of the health of the labour market as well as the health of the housing market. Paying more attention to the economic context both increases the internal validity of a research design and can help researchers and policymakers alike explore potential strategies for adapting student loan policy to changes in the economic context.

Consequences of different repayment plans

The conditions of loan repayment, in particular income-contingent loans, might have different consequences for graduates and such contexts are worthy of investigation. Recent work in the United States has already highlighted the importance of income-contingent loans when exploring graduate career choices and salaries. Many of the authors suggest that the negative effect of student loan debt on graduates' careers

would be limited if the loan system were income contingent (Ji, 2017; Luo & Mongey, 2016; Weidner, 2016b). There is, however, considerable work to do on the effects of income-contingent loans. These loan policies have been studied in-depth in a few countries (England, Australia, and New Zealand), but the impacts of such policies are not as well known for other countries and contexts.

7. Conclusion

Student loan debt is now a permanent fixture in higher education financing not only in England and the US, but in dozens of countries around the globe. The trends observed in these two countries—rising numbers of borrowers accruing more debt and struggling to repay it—suggest that the consequences of student loan borrowing extend beyond financial outcomes. Already, more adults are delaying life events such as getting married, starting a family, and purchasing a home. High debt burdens relative to earnings threaten to further erode these trends and handicap a generation of young adults. These consequences extend to other life events as well, including physical and mental health, career choices, and the decision of whether to pursue postgraduate education. In other words, student loan debts are ingrained in the decisions and behaviours of individuals everywhere. This evidence brings into question the extent to which student loan debt erodes the economic and social returns to higher education by modifying individuals' behaviours.

Despite the potential for student loans to affect many areas of an individual's life, remarkably little is known about the existence and magnitude of the relationship between student loans and important life events. Existing evidence reveals inconsistent findings related to decisions to enrol in postsecondary education as well as choice of career and decisions related to family formation, while signs point to an almost universal negative relationship between student loan debt and physical and mental health.

Some of these gaps are the result of research questions that fail to account for a wide variety of life events, while much of it is the result of research designs that are limited in their ability to tease out not only whether the relationship exists but why. The predominant focus on the US loan system, as well as the limited number of qualitative research studies, limit our ability to speak broadly about the non-pecuniary consequences of student loan debt. Furthermore, the overreliance on descriptive surveys and secondary data analysis leave the researcher with little control over the population of interest.

Our own research seeks to respond to these gaps in the literature by identifying the ways in which methodologies we intend to employ can account for the limitations identified here and by exploring research questions for which the current literature suggests inconsistent answers. In England, researchers will analyse these relationships both through secondary data analysis for the short-term and through

the design of a survey for the long-term. Conducting research on these topics in the English context will be in itself a contribution to the literature, highlighting consequences for an income-contingent loan system. The survey will be the first of its kind globally – designed specifically to study the consequences of student debt, and using a gap in debt levels in England due to a change in the tuition fees cap. Controls over the questionnaire design and the sample analysed will enable researchers to fill many of the gaps highlighted in the literature. In the US, researchers will ask questions related to students' post-graduation decisions; to do so, we will draw on three different nationally representative samples which are representative of high school students, postsecondary education entrants, and graduates respectively. The use of quasi-experimental research methods that account for the methodological weaknesses in existing work will strengthen the internal and external validity, and choosing outcomes of interest which directly relate to existing gaps will ensure that the findings contribute to the existing body of knowledge in meaningful ways.

There is much still to learn about how student loans affect borrowers over the entirety of their lives, and our research agenda promises to improve our understanding of the multifaceted ways in which student loans influence decisions and behaviours.

8. References

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9. Appendix I: Methodology

This literature review builds on searches made using the University College London (UCL) Explore search engine – that searches the whole UCL library catalogue as well as all journal articles UCL subscribes to and other resources – filtering for books and articles to ensure quality. The search examined publications since 1994. This enabled the capture of articles relating to the effect of the Higher Education Reauthorization Act of 1992 in the United States, that extended the eligibility for student loans. Key search terms included “student loan” and “student loan debt” accompanied by search terms related to the life events of interest (e.g. “marriage” or “career”). The decision of whether to further explore or dismiss an article was based on its title and abstract. Finally, a snowballing technique was adopted, looking at references from articles found with the search parameters noted above. For those articles that were quite recent and prevalent in their field, the “cited by” option of the UCL Explore search engine was used to look for more recent articles on a similar topic.

In the sections exploring the wider societal context and trends in life events of interest, such as trends in homeownership or marriage, we used the Google search engine and the websites of prominent organisations and government agencies to find relevant reports, statistics and documents.

A small amount of additional evidence was obtained by contacting academics, using Mendeley suggestions, or from previous research projects undertaken by the authors.

10. Appendix II: Tables of Research Studies

Table A1: Common Data Sources

Acronym	Name	Country	Source
B&B93/97; B&B00/09	Baccalaureate and Beyond Longitudinal Study	US	Nationally representative longitudinal sample of postsecondary students, beginning at time of graduation. Sample draws from NPSAS student sample in initial year of observation (e.g., 1993 and 2000).
CIRP	Cooperative Institutional Research Program	US	Longitudinal data collected by the Cooperative Institutional Research Program (CIRP) of the Higher Education Research Institute (HERI) at the University of California at Los Angeles – student surveyed twice at entry and 4 years later
FRBNY CCP	FRBNY Consumer Credit Panel	US	Longitudinal database with detailed information on consumer debt and credit
IPEDS	Integrated Postsecondary Education Data System	US	Federally-operated survey of all colleges and universities eligible to receive federal financial aid. Institutions submit survey responses to the U.S. Department of Education, which then makes information available through the IPEDS data center.
NELS88	National Education Longitudinal Study	US	Nationally representative, longitudinal study of 8 th graders in 1988. Follows students through secondary and postsecondary education.
NLSY97	National Longitudinal Survey of Youth 1997	US	The National Longitudinal Survey of Youth 1979 is a longitudinal research project that follows the lives

			of a sample of Americans born between 1957 and 1964.
NPSAS	National Postsecondary Student Aid Survey	US	Cross-sectional survey with a two-stage sampling design (institutions then students). Repeated every three years between 1986-87 and 1995-96, every four years between 1995-96 and 2011-12. Sampling will occur every two years beginning in 2015-16.
NSC	National Student Clearinghouse	US	Nonprofit organisation that gathers data on student enrolments
NSRGC03	National Survey of Recent College Graduates	US	Cross-sectional biennial survey conducted from 1973 through 2010
PSID	Panel Survey of Income Dynamics	US	Nationally representative sample of individuals and families that began in 1968.
SCF	Survey of Consumer Finances	US	Cross-sectional survey of US families, which includes information on families' finances and demographic characteristics.

Note: Descriptions are pulled directly from informational pages on the data sources.

Table A2: General Surveys of Student Loan Borrowers in the United States

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
American Student Assistance, 2015	Life delayed: The impact of student debt on the daily lives of young Americans	US	Career choice, start small business, homeownership, marriage and family, retirement savings	Survey of student loan borrowers nationwide conducted in April 2015	Descriptive statistics	No response rate Borrowers only
Baum & O'Malley, 2003	College on credit: How borrowers perceive their education debt	US	Homeownership, marriage, children, car, career, living at home	Surveys of Nellie Mae borrower (2002, compared to 1987, 1991, and 1997)	Descriptive statistics Some results indicate further analysis but there is little information	Response rate: 24% Borrowers who did not default only Lack of information on methods
EdAssist, 2016	Student loan debt: Who's paying the price	US	Retirement, homeownership, marriage and family, postgraduate, career, entrepreneurship, car	Survey of student loan borrowers nationwide conducted in March 2016 with borrowers age 18+	Descriptive statistics	No response rate Methods section not detailed enough
Stone, Van Horn, & Zukin, 2012	Chasing the American dream: Recent college	US	Homeownership, car, postgraduate, living at home, job	Own online survey with graduates from	Descriptive statistics	Only surveys graduates with a 4-year college degree

graduates and the Great Recession.	satisfaction, part- time, marriage	the classes of 2006 to 2011	Small n (444) although representative sample
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Table A3 – Research on the relationship between student loan debt and postgraduate education

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Allen et al, 2006	The market failure of postgraduate education: Financial and funding related issues	UK	Intention to pursue postgraduate studies	Online survey designed for the project	Descriptive statistics	No response rate and lack of generalisability Lack of statistical analyses of the data
Azmat & Simion, 2017	Higher Education Funding Reforms: A Comprehensive Analysis of Educational and Labor Market Outcomes in England	England	Further study	The National Pupil Database (NPD), the Higher Education Statistical Agency (HESA) and the Destination of Higher Education Leavers (DLHE)	Matching of students before and after each reform (2006 and 2012)	Study of the reforms, not the debt Outcomes are only 6 months after graduation
Choy & Carroll, 2000	Debt burden four years after college	US	Graduate degree enrolment	B&B93; B&B97	Mostly descriptive A linear regression for postgraduate studies	Lack of causality. Categorical debt amounts
Heller, 2001	Debts and decisions: Student loans and their relationship to graduate school and career choice.	US	Enrolment in graduate school	B&B93	Logistic regression	Enrolment a year and four years after graduation Lack of causality

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Kim & Eyermann, 2006	Undergraduate borrowing and its effects on plans to attend graduate school prior to and after the 1992 Higher Education Act amendments	US	Plan to attend postgraduate studies	CIRP	Logistic regression	Plan to attend, not actual enrolment. Old data – 1985 and 1994 cohorts Lack of causality
Malcom & Dowd, 2012	The impact of undergraduate debt on the graduate school enrolment of STEM baccalaureates	US	Graduate school enrolment	NSRGC03; Institution data from IPEDS, College Board and TICAS	Propensity score matching: • Treatment: typical borrowing and heavy borrowing • Control not borrowers Matched on propensity scores and race	Enrolment within two years of first degree graduation. STEM baccalaureates only
Millett, 2003	How undergraduate loan debt affects application and enrolment in graduate or first professional school	US	Graduate school application and enrolment	B&B93	Logistic regression	Old data Enrolment within two years of first degree graduation Lack of causality
Minicozzi, 2005	The short term effect of educational debt on job decisions	US	Graduate school attendance	NPSAS87	Probit regressions	Data from 1976 to 1985 Lots of restriction on the sample (including men only)

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Monks, 2001	Loan burdens and educational outcomes	US	Plan to attend graduate school in the fall	Own survey of 1998 seniors at 27 colleges and universities	Probit analyses	Lack of causality No response rate Lack of causality
Perna, 2004	Understanding the decision to enrol in graduate school: Sex and racial/ethnic group differences	US	Enrolment in graduate school	B&B93; B&B97	Multinomial regression	Looking at debt is not the aim of the study, it is a control in the model
Purcell and Elias, 2010	The impact of paid and unpaid work and of student debt on experience of higher education	UK	Would like to do postgraduate course, but don't want to add to debts	Future Track survey stage 3 linked to UCAS data Interviews	Mostly descriptive statistics Some multivariate analysis	Lack of methodological information about samples, weight etc. Statements provided to respondents – potential bias Descriptive survey
Purcell et al, 2005	The class of '99: A study of the early labour market experiences of recent graduates	UK	Had wished to go on to postgraduate study but they did not want to add to their debts;	Survey of '99 project – 4 years after graduation 100 interviews	Descriptive statistics	Focused on labour market not debt, thus a lot not explored with regards to debt. Self-completion questionnaires mean bias and

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
						attention needed to the way questions are phrased. Response rate: 24% Descriptive survey
Purcell et al, 2012	Futuretrack Stage 4: transitions into employment, further study and other outcomes	UK	I wanted to do a postgraduate course but did not want to add to my debts I had to apply for a postgraduate course where I could live at home rather than where I would have preferred to study	Future Track survey stage 4 linked to UCAS data Interviews	Mostly descriptive statistics Some multivariate analysis	Statements provided to respondents – potential bias Descriptive survey
Strike, 2014	Postgraduate taught scholarship scheme. Widening access to postgraduate study and the professions	UK	Attend postgraduate studies	Own surveys: one with current postgraduates and one with alumni	Descriptive statistics	Descriptive survey Low response rate: 8.7%

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Stuart et al, 2008	Widening participation to postgraduate study: Decisions, deterrents and creating success	UK	Intention to pursue postgraduate studies among final year students	Survey Follow-up interviews	Regression analyses Interview analyses	Survey undertaken at only two institutions Lack of causality
Weiler, 1994	Expectations, undergraduate debt and the decision to attend graduate school: A simultaneous model of student choice	US	Graduate school plan and actual enrolment	High School and Beyond	Multi-equation model, with equation for: <ul style="list-style-type: none"> • amount borrowed • plan to attend grad school • Type of HEI attended Then multinomial logit for expected plans for grad school and actual	4-year HEI graduates only Lack of causality
Zhang, 2013	Effects of college educational debt on graduate school attendance and early career and lifestyle choices	US	Graduate school attendance (attendance timing, length of enrolment), graduate program choice	B&B93; B&B97	IV analysis with aid policies of the college as instrument (% UG aided and % grants in all need based aid) Add college characteristics in equation to control for heterogeneity of instrument	Old data overall, even more for institutional aid policies (1988). 4-year degree only, no vocational, no dropouts. IV issue: financial aid is a factor in college choice

Table A4 – Research on the relationship between student loan debt and careers

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Azmat & Simion, 2017	Higher Education Funding Reforms: A Comprehensive Analysis of Educational and Labor Market Outcomes in England	England	Earnings, employment and unemployment, and contract types.	The National Pupil Database (NPD), the Higher Education Statistical Agency (HESA) and the Destination of Higher Education Leavers (DLHE)	Matching of students before and after each reform (2006 and 2012)	Study of the reforms, not the debt Outcomes are only 6 months after graduation
Chapman, 2016	Student loans and the labor market: Evidence from merit aid programs	US	Salary and career one year after graduation Salary, employment status, number of jobs and career four years after graduation	B&B08	IV: merit-aid qualification Regression discontinuity: states with sharp cut-off for merit aid Difference-in-difference: state with or without merit aid + students above and below cut-off	Only graduates from 4-year degree programs Merit-aid qualification might have an impact on college choice and on outcomes Job market paper, not published yet
Field, 2009	Educational debt burden and career choice: Evidence from a financial aid	US	Job placement two years after graduation – public interest or clerkship	Innovative Financial Aid Study data (collected through school,	Mean difference between treatment and control group: • Treatment: receive a grant	Small N, case study at one Law School → limits generalisability

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
	experiment at NYU Law School		Salary	several data sources)	that covers most tuition fees <ul style="list-style-type: none"> • Control: has to take up loans for tuition fees In control cases, NYU pays back the loans if goes into public law. In treatment, have to reimburse the grant to NYU if go private.	
Fry, 2014	Young adults, student debt and economic well-being	US	Average income	SCF	Descriptive statistics	Descriptive statistics, no analytical methodology
Gervais & Ziebarth, 2017	Life after debt: Post-graduation consequences of federal student loans	US	Salary Wages and hours worked	B&B93	Use demonstration of financial need to get loans as identification strategy	Conference paper – not published yet
Goodman, Isen & Yannelis, 2018	A Day Late and a Dollar Short: Liquidity and Household	US	Earnings	The National Student Loan Data System (NSLDS) and 2) individual tax	Regression discontinuity, using turning 24 as an instrument (become	Student loan limit not student debt Only students who turned 24 while enrolled (minority)

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
	Formation among Student Borrowers			records filed with the Internal Revenue Service (IRS)	independent student)	
Heller, 2001	Debts and decisions: Student loans and their relationship to graduate school and career choice.	US	Technical vs. professional jobs borrowing levels	B&B93	Descriptive statistics	Only descriptive statistics, no statistical analysis
Ji, 2017	Job search under debt: Aggregate implications of student loans	US	Unemployment duration Wage income	NLSY97	Estimates a quite complicated model	Job market paper, not published yet Excludes college dropouts Undergraduate individuals only
Luo & Mongey, 2016	Student debt and job choice: Wages vs. job satisfaction	US	Salary Job satisfaction On-the-job search Job relation to major Teaching job	B&B00; B&B08 IPEDS data	IV: ratio of total institutional grants to total loan in college for each cohort Estimation of effect of different repayment methods	Conference paper, not published yet IV: Presence of grants can influence college choice

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Luong, 2010	The financial impact of student loans	CAN	Employment status Total personal income	2007 Survey of Labour and Income Dynamics	OLS and logit regressions on all outcomes based on student loan status.	Little control variables Lack of causality
Minicozzi, 2005	The short term effect of educational debt on job decisions	US	Wage Wage growth Unemployment	NPSAS87	Linear regressions Probit regressions	Old data (1976 to 1985) Lots of restriction on the sample (including men only)
Monks, 2001	Loan burdens and educational outcomes	US	Change career plans over 4 years of college to higher paying career	Own survey of 1998 seniors at 27 colleges and universities	Probit analyses	No response rate Lack of causality Career plans not actual career
Purcell & Elias, 2010	The impact of paid and unpaid work and of student debt on experience of higher education	UK	First choice of job Expected income	Future Track survey stage 3 linked to UCAS data Interviews	Mostly descriptive statistics Some multivariate analysis	Lack of methodological information about samples, weight etc. Descriptive survey Work with expected debt and expected income according to respondents
Purcell et al, 2005	The class of '99: A study of the early labour market	UK	Career: non-graduate job vs high-quality job	Survey of '99 project – 4 years after graduation	Descriptive statistics	Focused on labour market not debt, thus a lot not explored

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
	experiences of recent graduates			100 interviews		with regards to debt. Self-completion questionnaires mean bias and attention needed to the way questions are phrased. Response rate: 24% Descriptive survey
Purcell et al, 2012	Futuretrack Stage 4: transitions into employment, further study and other outcomes	UK	Have the job they want	Future Track survey stage 4 linked to UCAS data Interviews	Mostly descriptive statistics Some multivariate analysis	Statements provided to respondents – potential bias Descriptive survey
Price, 2004	Educational debt burden among student borrowers: An analysis of the Baccalaureate & Beyond Panel, 1997 follow-up	US	Income 4 years after graduation	B&B93; B&B97	Multinomial logistic regression	Lack of causality
Rothstein & Rouse, 2011	Constrained after college: Student loans and early-career occupational choices	US	Industry/ occupation Salary	Institution data	Difference in difference using the case study of a university that	Case study of a private elite university in the US - limits generalisability

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					turned all loans into grants OLS IV using university aid formula	DID: recipients of financial aid might have changed overtime + intensity of effect different with different students
Weidner, 2016	Does student debt reduce earnings?	US	Occupational choice Income Unemployment duration	B&B93; B&B00; B&B08 Longitudinal Study IPEDS NLSY97	Mincer-style regression for earnings Survival analysis for unemployment duration Linear probability model for occupational choice	Job market paper, not published yet Heterogeneity of models and data Lack of causality
Zhang, 2013	Effects of college educational debt on graduate school attendance and early career and lifestyle choices	US	Early career choice: salary, public/non-profit sector, teaching in K-12 schools	B&B93; B&B97	IV analysis with aid policies of the college as instrument (% UG aided and % grants in all need based aid) Add college characteristics in equation to control	Old data overall, even more for institutional aid policies (1988). 4-year degree only, no vocational, no dropouts. IV issue: financial aid is a factor in college choice

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					for heterogeneity of instrument	

Table A5 – Research on the relationship between student loan debt and entrepreneurship

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Ambrose et al, 2015	The impact of student loan debt on small business formation	US	Business creation at the county level Size of created business	County Business Patterns, FRBNY CCP/Equifax, decennial census	Regression of changes in firm number per capita on student debt per capita and other debt per capita (w/ interactions on size of business)	County-level not individual, no educational data
Checovich & Allison, 2016	At the extremes: Student debt and entrepreneurship	US	Entrepreneurship rates	B&B:08/12	Descriptive statistics	Not causal, mostly an observation of trends
Krishan & Wang, 2015	The cost of financing education: Can student debt hinder entrepreneurship?	US	Starting a business Income of entrepreneurs Number of employees Turned down for credit	SCF (1992-2013)	OLS and Logit of starting business on student loan amount. IV using interaction between person age in 1993 and education level OLS starting business on interaction loan & age / interaction loan & high tech industry/interaction loan & dependent spouse/interaction loan & risk preference OLS late payment on started business	A lot of noise with too many analyses. IV only for one model, so causality not a result for the others Household level not individual

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					OLS annual income of entrepreneurs on student loans (+interactions) OLS number of employees OLS turned down for credit	

Table A6 – Research on the relationship between student loan debt and homeownership

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Andrew, 2010	The changing route to owner occupation: The impact of student debt	UK	Reaching income requirement Accumulating a deposit	12 waves of British Household Panel Survey	Estimation: • Real gross wage • Housing demand • Household formation • Housing tenure Simulations of student debt effect on first-time home ownership	Simulation using averages, do not show variation.
Bleemer, Brown, Lee & van der Klaauw, 2014	Tuition, jobs, or housing: What's keeping millennials at home?	US	Living with parents Flow between living independently and living with parents	FRBNY CCP; Quarterly Census of Employment and Wages CoreLogic home price index IPEDS	Fixed-effect models	Geographical aggregate means no individual variation
Bleemer, Brown, Lee, Strair, & van der Klaauw, 2017	Echoes of rising tuition in students' borrowing, educational attainment, and homeownership in	US	Early homeownership (24-30 years old)	FRBNY CCP; Integrated Public Use Microdata Series IPEDS	Aggregated fixed effects model of the dependence of homeownership at age 28, 29, and 30 on tuition, or,	IV might bias downwards. Lack of demographics in the data source, e.g. non-borrowers include

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
	post-recession America				alternatively, on the student debt accumulated by the state-cohort at age 24 IV estimate: tuition-induced changes in homeownership are due to student debt changes	those who did not go to college. However looks at the impact of the amount of debt, so somewhat mitigated.
Brown & Caldwell, 2013	Young student loan borrowers retreat from housing and auto markets	US	Homeownership	FRBNY CCP	Descriptive statistics	Non-borrowers include people who did not go to college No sample description
Brown, Haughwout, Donghoon, Scally, & van der Klaauw, 2014	Measuring student debt and its performance	US	Mortgages	FRBNY CCP	Descriptive statistics	Description of data only
Cooper & Wang, 2014	Student loan debt and economic outcomes.	US	Housing tenure	PSID; NELS88	PSID: Descriptive NELS88: OLS regression	Regression at t-time, does not

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					housing tenure in 2000 on loan debt, on log student debt, and on student debt relative to income	show delay in homeownership
Elliott, Grinstein-Weiss, & Nam, 2013a	Is student debt compromising homeownership as a wealth building tool	US	Home equity	SCF (2007-2009)	Median regression analyses to predict 2009 home equity: <ul style="list-style-type: none"> • using 2007 home equity percentiles • among households with outstanding student debt • among 4-year college graduates 	Data are before and after 2008 shock which impacted heavily home equity. No geographical control. Findings are inconsistent through age group (no link if the 25-30 range is not included).
Gervais & Ziebarth, 2017	Life after debt: Post-graduation consequences of federal student loans	US	Homeownership 10 years after graduation	B&B93	Use demonstration of financial need to get loans as	Conference paper – not published yet

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Gicheva & Thompson, 2015	The effects of student loans on long-term household financial stability	US	Homeownership	SCF (1995 – 2010)	IV: amount borrowed per FT equivalent student in constant \$2011 (College board data from when respondent was 17)	Household level data IV assumes high school seniors are influences in their decision to take loan by the generation before them
Goodman, Isen & Yannelis, 2018	A Day Late and a Dollar Short: Liquidity and Household Formation among Student Borrowers	US	Homeownership	The National Student Loan Data System (NSLDS) and 2) individual tax records filed with the Internal Revenue Service (IRS)	Regression discontinuity, using turning 24 as an instrument (become independent student)	Student loan limit not student debt Only students who turned 24 while enrolled (minority)
Hiltonsmith, 2013	How student debt reduces lifetime wealth	US	Home equity	SCF (2010)	Comparison of two average American households with and without student debts –	Projections are dependent on assumptions. Also no variation possible as at the beginning create

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					through model projections throughout time	two average households
					SCF used to approximate values for the model	
Houle & Berger, 2015	Is student loan debt discouraging homeownership among young adults?	US	Homeownership, amount of mortgage debt owed, home equity	NLSY97	Four models for each outcome: <ul style="list-style-type: none"> • OLS with debt amount as predictor, • OLS with debt amount and debtor status as predictors, • Robustness check: IV analysis with aid-to-price ratio as instrument, Series of models to look for heterogeneity across groups	IV instrument not exogenous, individuals may choose institutions based on price or financial aid availability.

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Houle & Warmer, 2017	Into the red and back to the nest? Student debt, college completion, and returning to the parental home among young adults	US	Boomeranging (going back to living with parents after college)	NLSY97	Discrete time analysis model	Self-reported debt No causality as student debt not random
Lee, 2013	Household debt and credit: Student debt	US	New mortgage originations	FRBNY CCP/Equifax	Descriptive statistics	Description of data only
Luong, 2010	The financial impact of student loans	US	Homeownership Mortgage	2007 Survey of Labour and Income Dynamics	OLS and logit regressions on all outcomes based on student loan status.	Little control. Regression with no time component to examine delays Lack of causality
Marks, 2009	The Social Effects of the Australian Higher Education Contribution Scheme (HECS)	AUS	Homeownership	Household Income and Labor Dynamic in Australia	Logistic regressions	Lack of causality
Mezza, Ringo, Sherlund & Sommer, 2016	Student loans and homeownership trends	US	Homeownership as proxied by mortgage	Credit bureau records data (1997 to 2010);	IV: cumulative student loan balances at the final school exit is	Using mortgage does not allow to include cash-

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
				NSC; NSLDS; IPEDS	based on the average in-state tuition at public 4-year schools in the state where an individual lived before enrolling in college for the first time +OLS and probit models: log student debt and controls on homeownership	buyers or have repaid mortgage IV: links to geographical background, which can matter for homeownership No research on delay
National Association of REALTORS® Research Department & SALT, 2016	Student loan debt and housing report 2016: When debt holds you back	US	Ability to buy a house Delay in doing so Delay moving out of parent's house	Own survey	Descriptive statistics of the survey	Very low response rate: 2.4%
Shand, 2007	The impact of early-life debt on the homeownership rates of young	US	Homeownership	SCF (1992, 1995, 1998, 2001, 2004)	Bivariate probit specification, using also credit constrained as a control	Household level data Data on outstanding debt only

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
	households: An empirical investigation					
Zhan, Xiang, & Elliott, 2016	Education loans and wealth building among young adults	US	Market value of primary housing	NLSY97	Treatment effect model: Selection equation (probit) predicts outstanding student loans Regressions amount of debt associated with assets accumulation	Lack of causality No variable on employment
Zhang, 2013	Effects of college educational debt on graduate school attendance and early career and lifestyle choices	US	Homeownership	B&B:93/97	IV analysis with aid policies of the college as instrument (% UG aided and % grants in all need based aid) Add college characteristics in equation to control for	Old data overall, even more for institutional aid policies (1988). 4-year degree only, no vocational, no dropouts. IV issue: financial aid is a factor in college choice

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
					heterogeneity of instrument	

Table A7 – Research on the relationship between student loan debt and marriage

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Addo, 2014	Debt, cohabitation, and marriage in young adulthood	US	Union transition: first cohabitation (defined as sexual relationship w/ co-residence with person from other sex for a minimum of a month) or first marriage	NLSY97	Multinomial logistic regression on person-year data until transition happens	Non-causal General debt, not student debt
Bozick & Estacion, 2014	Do student loans delay marriage? Debt repayment and family formation in young adulthood	US	First marriage	B&B93	Discrete time hazard regression models (first marriage on student debt amount) – know month of marriage <ul style="list-style-type: none"> • Aggregate • By gender With interaction month since bachelor's degree x total loan debt remaining	Missing data for cohabitation, no data for household debt and income (just individual). Age of data Having student debt is not random, so no causality

Choy, Li, & Carroll, 2006	Dealing with debt: 1992-93 bachelor's degree recipients 10 years later. Postsecondary education descriptive analysis report.	US	Marriage 10 years on	B&B93; NPSAS92-93	Descriptive statistics	No analysis, descriptive statistics only.
Dew, 2008	Debt change and marital satisfaction change in recently married couples	US	Change in marital satisfaction	National Survey of Families and Households (W1 in 1987 and W2 between 1992-94)	Change Score OLS	Old data Non-causal
Gervais & Ziebarth, 2016	Life after debt: Post-graduation consequences of federal student loans	US	Married in 2003	B&B93	Use demonstration of financial need to get loans as identification strategy	Conference paper – not published yet
Gicheva, 2011	Does the student-loan burden weigh into the decision to start a family	US	Marriage (including living with a partner)	SCF(1995 - 2007) Four-wave panel survey of GMAT registrants (separate analyses) –	Instrument for size of student debt = average amount borrowed the year respondent was 17 (College board data)	Working paper – not yet peer-reviewed Household level data IV assumes high school seniors are

				interviews between 1990 and 1997	IV probit model – not clear what instrument is	influences in their decision to take loan by the generation before them
Gicheva, 2016	Student loans or marriage? A look at the highly educated	US	Marriage (also marriage expectation link to amount borrowed)	Four-wave panel survey of GMAT registrants (separate analyses) – interviews between 1990 and 1997	Probit estimation by gender for marriage; tobit estimations and OLS for effect of marriage expectation on amount borrowed	Same as above Plus very specific type of students: MBA
Goodman, Isen & Yannelis, 2018	A Day Late and a Dollar Short: Liquidity and Household Formation among Student Borrowers	US	Marriage	The National Student Loan Data System (NSLDS) and 2) individual tax records filed with the Internal Revenue Service (IRS)	Regression discontinuity, using turning 24 as an instrument (become independent student)	Student loan limit not student debt Only students who turned 24 while enrolled (minority)
Lei Zhang, 2013	Effects of college educational debt on graduate school attendance and	US	Have been married by 1994 and 1997	B&B93/97	IV analysis with aid policies of the college as instrument (% UG aided and %	Old data 4-year degree only, (no vocational or dropouts).

	early career and lifestyle choices				grants in all need based aid) Add college characteristics in equation to control for heterogeneity of instrument	IV issue: financial aid is a factor in college choice
Marks, 2009	The Social Effects of the Australian Higher Education Contribution Scheme (HECS)	AUS	Getting married	Household Income and Labor Dynamic in Australia	Logistic regressions	Non-causal

Table A8 – Research on the relationship between student loan debt and the choice to have children

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Chiteji, 2008	To have and to hold: An analysis of young adult debt	US	Becoming a parent	PSID	Regression analysis, using: <ul style="list-style-type: none"> • indebtedness levels • whether has non-collateral debt • whether has mortgage debt 	Non-causal; Debt for young adults, but not necessarily student debt

					• whether has negative net worth	
Goodman, Isen & Yannelis, 2018	A Day Late and a Dollar Short: Liquidity and Household Formation among Student Borrowers	US	Having children	The National Student Loan Data System (NSLDS) and 2) individual tax records filed with the Internal Revenue Service (IRS)	Regression discontinuity, using turning 24 as an instrument (become independent student)	Student loan limit not student debt Only students who turned 24 while enrolled (minority)
Marks, 2009	The Social Effects of the Australian Higher Education Contribution Scheme (HECS)	AUS	Having children	Household Income and Labor Dynamic in Australia	Logistic regressions	Non-causal
Min & Taylor, 2018	Racial and Ethnic Variation in the Relationship Between Student Loan Debt and the Transition to First Birth	US	First birth	1997 National Longitudinal Survey of Youth	Discrete time hazard regression models, using propensity scores to account for non-random selection into student loans	Student loan debt is self-reported Respondents entered college in the 90s/early 00s – making them less prone to high debt

						than current generations
Nau, Dwyer, & Hodson, 2015	Can't afford a baby? Debt and young Americans	US	Fertility	NLSY97	Discrete time event history: risk of having a child per year. Debt as spline: having debt + amount Analysis by gender	Incomplete data for debt as modules only undertaken at 20-25-30
Sieg & Wang, 2017	The impact of student debt on education, career, and marriage choices of female lawyers	US	Having children	<i>After the JD</i>	Method of Simulated Moments	Sample of female law graduates – not generalisable
Yu, Kippen, & Chapman, 2007	Births, debts and mirages: The impact of the Higher Education Contribution Scheme (HECS) and other factors on Australian fertility expectations	AUS	Expected lifetime fertility	Household Income and Labor Dynamic in Australia	Regression analysis	Outcome is personal estimation, not reality. Non-causal

Table A9 – Research on the relationship between student loan debt and health

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Despard et al, 2016	Student debt and hardship: Evidence from a large sample of low- and moderate-income households	US	Health care hardship: the participant indicated they could not afford to see a doctor or go to a hospital for medical care, to see a dentist, or to fill a prescription in the six months after filing taxes	Refund to Savings	Propensity score analysis	Only low and middle income individuals All is self-reported Debt is at household level
Dwyer, McCloud, & Hodson, 2011	Youth debt, mastery, and self-esteem: Class-stratified effects of indebtedness on self-concept	US	Mastery Self-esteem	NLSY79	OLS regression	Non-causal
Walsemann, Ailshire, & Gee, 2016	Student loans and racial disparities in self-reported sleep duration: evidence from a nationally	US	Sleep duration	NLSY97	Multivariate linear regression and within-person fixed-effects models	Non-causal Old data

	representative sample of US young adults					
Walsemann, Gee & Gentile, 2015	Sick of our loans: Student borrowing and the mental health of young adults in the United States	US	Psychological functioning	NLSY97	Multivariable linear regression	Non-causal Old data

Table A10 – Research on the relationship between student loan debt and financial well-being

Authors, Date	Title	Cny	Outcome of interest	Data source	Methodology	Limitations
Akers, 2014	Survey of Consumer Finances – 01, 04, 07, 10	US	Financial hardship	SCF (2001, 2003, 2007, 2010)	Mostly descriptive figures, some regressions	Descriptive statistics Household-level data
Batkeyev, Krishnan, & Nandy, 2016	Student debt and personal portfolio risk	US	Risky investments	SCF (1992 – 2013)	Regression on those in HE when HEA implemented (1992) IV analysis using time spent in HE post-HEA regime	Household level data

Bricker & Thompson, 2016	Does education loan debt influence household financial distress? An assessment using the 2007-2009 Survey of Consumer Finances panel: Education loans and financial distress	US	Late payment and credit denial	SCF (2007 - 2009)	Linear models Transition probability models for transition into distress in 2009 when no distress in 2007	Non-causal
Choy & Carroll, 2000	Debt burden four years after college	US	Savings	B&B:93/97	Descriptive statistics	Non-causal Categorical debt amount
Cooper & Wang, 2014	Student loan debt and economic outcomes.	US	Wealth (financial assets added to housing equity minus non-housing liabilities)	PSID; NELS88	PSID: Descriptive NELS88: OLS regression housing tenure in 2000 on loan debt, on log student debt, and on student	Regression at t-time, does not show delay in homeownership

					debt relative to income	
Despard et al, 2016	Student debt and hardship: Evidence from a large sample of low- and moderate-income households	US	Material hardship	Refund to Savings	Propensity score analysis	Only low and middle income individuals All is self-reported Debt is at household level
Dugan & Kafka, 2014	Student debt linked to worse health and less wealth	US	Financial struggle	Gallup-Purdue index Web study	Descriptive statistics	Web survey, no response rate, low generalisability
Egoian, 2013	73 will be the retirement norm for millennials	US	Age of retirement Retirement savings	Unclear	Projections by profiling three potential types of retiree: the median, struggling, and well-off graduates	Source of data and methodology unclear Blog on Nerdwallet
Elliott & Nam, 2013	Is student debt jeopardizing the short-term financial health of US households?	US	Net worth	SCF (2007 – 2009)	Median regression	Short time frame and 2008 crisis. Survey respondent might not be the head of household, plus

						info at household level.
Fry, 2014	Young adults, student debt and economic well-being	US	Net worth Financial well-being	SCF	Descriptive statistics	Descriptive statistics
Gicheva & Thompson, 2015	The effects of student loans on long-term household financial stability	US	Credit denial, bankruptcy, & late payments	SCF (1995 – 2010)	IV: amount borrowed per FT equivalent student in constant \$2011 (College board data from when respondent was 17)	Household level data IV assumes high school seniors are influences in their decision to take loan by the generation before them
Goodman, Isen & Yannelis, 2018	A Day Late and a Dollar Short: Liquidity and Household Formation among Student Borrowers	US	Savings	The National Student Loan Data System (NSLDS) and 2) individual tax records filed with the Internal Revenue Service (IRS)	Regression discontinuity, using turning 24 as an instrument (become independent student)	Student loan limit not student debt Only students who turned 24 while enrolled (minority)
Hiltonsmith, 2013	How student debt reduces lifetime wealth	US	Lifetime wealth Retirement savings	SCF (2010)	Comparison of two average American households with and without	Projections are dependent on assumptions. Also no variation possible as at the

					student debts – through model projections throughout time	beginning create two average households
					SCF used to approximate values for the model	
Jeszeck, 2014	Older Americans: inability to repay student loans may affect financial security of a small percentage of retirees.	US	Households headed by over 65 years old with outstanding student debt	SCF (2004, 2007, 2010) NSLDS; Data on payments withheld from Social Security benefits for student loans Data from the Social Security Administration's Master Beneficiary Record	Descriptive statistics	Descriptive statistics
Luong, 2010	The financial impact of student loans	CAN	Net worth	2007 Survey of Labour and Income Dynamics	OLS and logit regressions on all outcomes based on student loan status.	Little control. Regression with no time component to examine delays Lack of causality

Munnell, Hou, & Webb, 2016	Will the explosion of student debt widen the retirement security gap?	US	National Retirement Risk Indexes	SCF (1983 – 2013)	Calculation of National Retirement Risk Index based on projected replacement rates	Estimation work and use of averages does not show variations
Rutledge, Sanzenbacher, & Vitagliano, 2016	How does student debt affect early-career retirement saving?	US	Early retirement savings	NLSY97	Linear regression models	Non-causal
Zhan, Xiang, & Elliott, 2016	Education loans and wealth building among young adults	US	Net worth	NLSY97	Treatment effect model: Selection equation (probit) predicts outstanding student loans Regressions amount of debt associated with assets accumulation	Non-Causal. No variable on employment

Table A11 – Research on the relationship between student loan debt and other outcomes of interest

Authors, Date	Title	Country	Outcome of interest	Data source	Methodology	Limitations
Brown & Caldwell, 2013	Young student loan borrowers retreat from housing and auto markets	US	Auto debt	FRBNY CCP	Descriptive statistics	Non-borrowers include people who did not go to college No sample description
Choy & Carroll, 2010	Debt burden four years after college	US	Owning a car	B&B:93/97	Descriptive statistics	Non-causal Categorical debt amount
Fry, 2014	Young adults, student debt and economic well-being	US	Other debt	SCF	Descriptive statistics	Descriptive statistics
Kurz & LI, 2015			Car purchases			
Lee, 2013	Household debt and credit: Student debt	US	Other debt	FRBNY CCP/Equifax	Descriptive statistics	Descriptive statistics
Whitetaker, 2015	Are millennials with student loans upwardly mobile?	US	Mobility to more educated neighbourhood	FRBNY CCP/Equifax	Descriptive statistics and graph	Correlational Study

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