Debt Management and Investment Behavior Among Postgraduate Borrowers: A Systematic Review

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ABSTRACT

Postgraduate borrowing is large and growing across higher-education systems, but little is known about how debt-management behavior, rather than amounts, influences investment outcomes. This review synthesizes, appraises, and sets a direction for research on the empirical, peer-reviewed evidence on education debt, debt-management behavior, financial literacy, and household investment outcomes. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement and its extension for search reporting (PRISMA-S), Google Scholar, Scopus, Web of Science, EconLit, and the Education Resources Information Center (ERIC) were searched for 2000-2026, resulting in 998 records, of which twelve studies were included after deduplication and screening. A checklist adapted from Kitchenham and Charters (2007) and an adapted Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) framework were used to judge quality: scores ranged from 4.5 to 7.5 out of 8, with none at risk of bias. Education debt was generally associated with less ownership of stocks, emergency savings, and delayed homeownership. However, two studies using the National Longitudinal Survey of Youth 1997 (NLSY97) found no or weak association with the latter. None related postgraduate borrowers' debt-management behavior to investment outcomes, and the sole test of financial knowledge as a moderator found no buffering effect. Certainty of evidence was low or very low. The review highlights four areas for future research: identifying postgraduate borrowers in respondent-level data, directly measuring debt-management behavior, testing the moderation of literacy on investment outcomes, and using designs that disentangle delayed from suppressed investment.

Keywords: Debt Management, Investment Decisions, Postgraduate Students, Student Loans, and Financial Literacy.

INTRODUCTION

Borrowing to finance postgraduate study has become routine in several large higher-education systems. In the United States (U.S.), graduate programs account for approximately half of all student loan debt, and average graduate borrowing increased by approximately 7% for master's degrees and 11% for professional degrees over five years (The Institute for College Access and Success [TICAS], 2024). The American Council on Education (ACE) (2024) reports that 53.4% of master's degree recipients surveyed in the 2019–20 National Postsecondary Student Aid Study borrowed for their graduate study, ranging from 18.6% of international recipients to 77.5% of Black or African American recipients.

In England, means-tested master's loans were introduced in 2016/17 (Mateos-González & Wakeling, 2020). Variations in the characteristics of borrowers may reflect underlying wealth differences rather than differences in financial behavior, so it is important to distinguish the two factors.

The key issues are whether education debt suppresses or postpones asset accumulation and whether the behaviors adopters of such debt develop in relation to their debt affect that outcome, and this article addressed those issues. There are three sets of literature relevant to the issue but seldom considered together: household finance studies relating student debt to wealth outcomes such as stock ownership and homeownership (Mezza, Ringo, Sherlund, & Sommer, 2020; Korankye & Guillemette, 2021); financial literacy research establishing

the connection between financial knowledge and market participation (van Rooij et al., 2011; Lusardi & Mitchell, 2014); and higher-education borrowing studies examining the effect of loans on progression to postgraduate study (Wakeling et al., 2017; Mateos-González & Wakeling, 2020). What is missing is a discussion of whether the management behaviors adopted by postgraduate borrowers, such as their tendency to make regular repayments and avoid costly revolving debt, are linked to investment outcomes.

This article reported a systematic review with three objectives:

- To establish what the empirical literature tells us about education debt, debt-management behavior, financial literacy and household investment outcomes.
- To assess the quality of that evidence.
- To establish a direction for future research on the question of how postgraduate borrowers' debt management relates to their subsequent investment behavior.

Four research questions (RQs), numbered RQ1 to RQ4 and aligned to the propositions formulated in Section 2, structure the review process and reporting of the findings:

- RQ1. How is education-debt burden associated with investment-type outcomes (stock ownership, savings and homeownership)?
- RQ2. How is debt-management behavior related to investment-type outcomes, and what determines it?
- RQ3. Is financial literacy associated with investment outcomes among borrowers, and does it moderate the debt–investment relationship?
- RQ4. How do loan design and institutional context shape who borrows and with what consequences, and how much of the evidence concerns postgraduate borrowers?

The study developed the theoretical framework, propositions, and empirical studies included in the synthesis. It then presented the review methodology, reported the findings by research question, discussed the findings in relation to existing literature, identified directions for future research, and concluded the study.

THEORETICAL FRAMEWORK

Life-Cycle and Permanent-Income Perspectives

The life-cycle hypothesis predicted that individuals will smooth consumption across their lifetimes by borrowing in periods when their income is less than their expected lifetime income and saving in periods when their income is higher than their expected lifetime income (Modigliani & Brumberg, 1954). The permanent-income hypothesis extends the life-cycle hypothesis by suggesting that individuals form their consumption decisions on their expectations about long-run income rather than current income (Friedman, 1957).

Borrowing to finance postgraduate study should not be regarded as irrational, since the student who expects to earn considerably more upon graduation makes a rational decision to borrow now and pay the debt back later.

Two caveats apply to the investment results. First, the repayment reduces disposable income in the early years of the career so that the individual cannot invest until either the repayment has been completed or substantially reduced.

Secondly, an expensive type of debt competes with the purchase of assets, since the same increase in income cannot simultaneously finance interest payments and deposits, contribute to, or allocate to a portfolio. The

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theory predicts asset accumulation to occur but at a later date and with attention given to the interplay between the timing of earnings and repayment schedules.

The Behavioral Life-Cycle Hypothesis

The behavioral life-cycle hypothesis offers an alternative by assuming that individuals have weak self-control and engage in mental accounting so that they regard their wealth as segmented into non-fungible accounts for spending, saving and investment (Shefrin & Thaler, 1988).

When applied to borrowing, the hypothesis predicts that individuals will favor repayment even if the expected return on the investment exceeds the cost of the debt, because the two activities reside in different mental accounts and debt is psychologically costly. The manner in which the borrower manages the debt, let alone its size, becomes a theoretically unique investment determinant.

Financial literacy is a candidate moderator, since enhanced knowledge of such concepts as interest, inflation, and risk may reduce the rigidity of mental partitions and enable the borrower to perceive the connection between the cost of debt and the expected return on assets. This is a theoretical conjecture, but it has not been tested on postgraduate borrowers.

Distinct Constructs

This review employed four constructs: debt burden, repayment capacity, debt-management behavior, and financial literacy. Debt burden refers to the size of the obligation, ideally relative to income. Repayment capacity is the proportion of income committed to required debt payments. Debt-management behavior encompasses observable patterns of paying bills on time and avoiding high-cost revolving credit.

Financial literacy involves knowledge of such concepts as compound interest, inflation, and risk diversification. The constructs were theoretically distinct and may be only slightly correlated: a borrower with a large balance may manage the debt well whereas a borrower with a small balance may fail to manage it. Their inclusion in a single composite variable would conceal the influence of any one of them.

Propositions

The framework in Figure 1 yields four propositions (P1–P4), each corresponding to one research question: P1 to RQ1, P2 to RQ2, P3 to RQ3, and P4 to RQ4.

P1 (debt burden): Higher education debt burden was associated with lower and later investment-type outcomes (participation in risky assets, savings, homeownership), holding income and human capital constant.

P2 (debt management): Conditional on debt burden, better debt-management behavior was associated with higher investment participation.

P3 (financial literacy): Financial literacy was independently associated with investment participation and may weaken the negative association between debt burden and investment (moderation).

P4 (context): Associations differed across institutional settings (loan design, repayment terms, access to formal financial accounts), so cross-setting differences should not be attributed to individual behavior alone.

Figure 1 integrates the framework. Institutional context determined who borrows and on what terms. Borrowing created a debt burden and a repayment obligation, debt-management behavior and financial literacy affected the servicing of that debt and its interaction with saving and investment decisions.

The life-cycle account predicted delay, while the behavioral account predicted that repayment priorities and mental accounting matter independently of the balance. The research questions tested each link in turn.

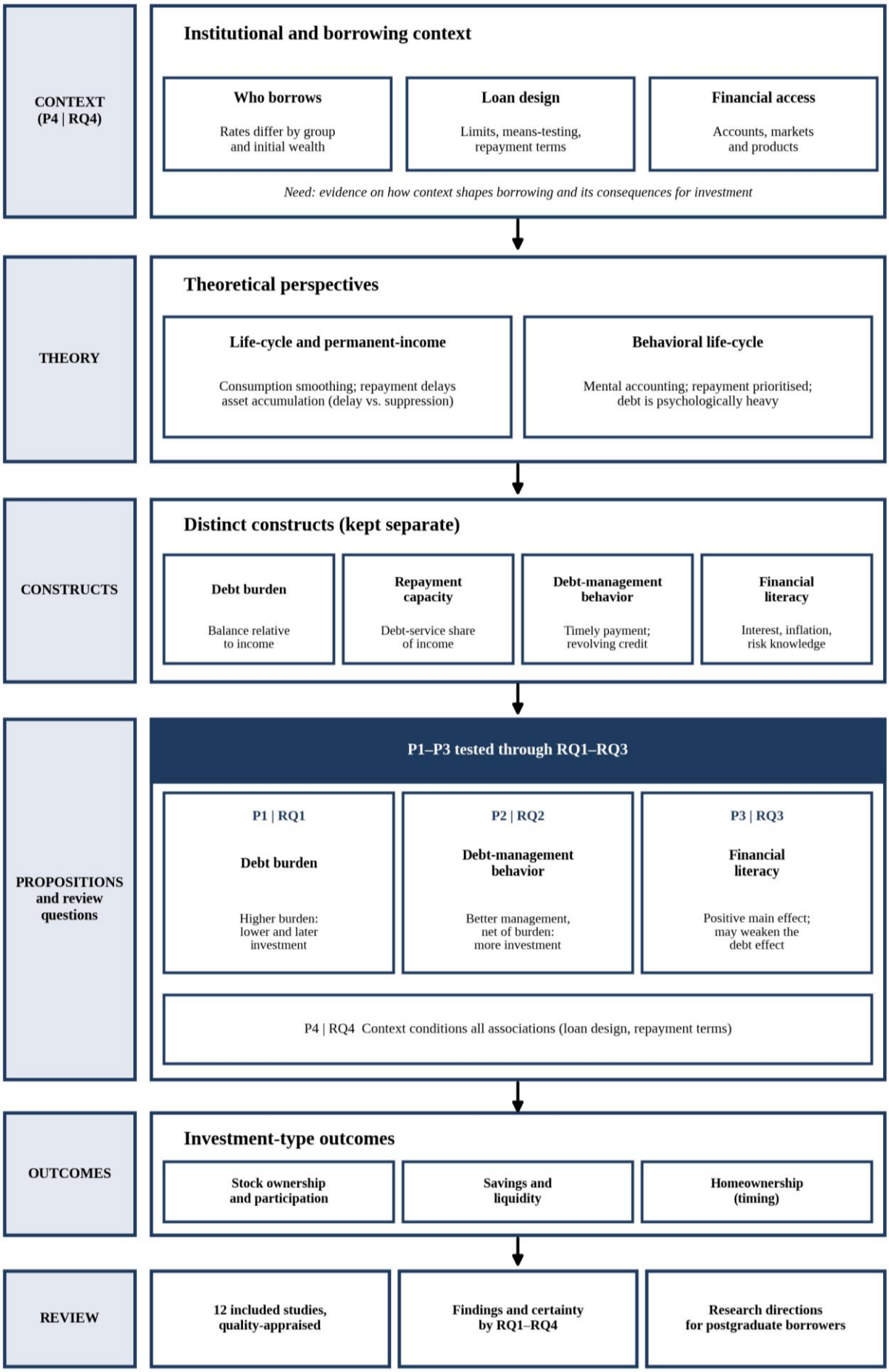


Figure 1. Theoretical framework of education debt, debt-management behavior and investment outcomes

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Empirical Review

This section reviewed the twelve studies identified by the systematic review reported, organized around four strands of evidence and comparing and contrasting findings, appraising their methods, and relating each strand to the study propositions.

Education Debt and Household Asset Accumulation

The most developed strand relates student debt and equity participation. Korankye and Guillemette (2021), using Panel Study of Income Dynamics (PSID) data, report that households with student debt are less likely to hold stocks outside retirement accounts and that larger balances are associated with lower participation. Coakley and Li (2020) found directionally similar results for young adults in the 2016 Survey of Consumer Finances (SCF). Korankye (2023) qualified both results: in a fixed-effects specification limited to married households, the presence of student debt lowers the likelihood of owning stocks, but the amount owed does not. Convergence in direction is thus genuine but fragile. The three studies share a major limitation in that student debt is measured at the household level without regard to who borrowed or for what program, so that undergraduate, spousal, and parental borrowing are conflated. They also vary in identification quality: Coakley and Li (2020) proceeded by cross-sectional comparison, whereas the PSID studies exploit within-household change at the cost of identifying effects only from households that change in their debt status.

Korankye, Pearson and Agyemang-Mintah (2024) extended the question to liquid assets. Using propensity-score and coarsened exact matching on Survey of Household Economics and Decision-making (SHED) data, they reported that student-loan holders are less likely to hold emergency savings. This complemented the equity findings by indicating that the first margin on which debt bites may be liquidity rather than risky investment, a reading consistent with the life-cycle prediction that repayment crowds out saving before it does portfolio allocation. Matching on observables, however, cannot eliminate selection on unobservables, and a binary exposure conceals variation in the size of the debt.

The findings on homeownership are more mixed. Mezza et al. (2020) provided the strongest causal evidence in the review by instrumenting student debt with variation in in-state tuition. They found that each additional $1,000 of debt lowers the homeownership rate of borrowers in their mid-twenties by one to two percentage points. Robb, Schreiber, and Heckman (2020) reached a compatible conclusion using their own instrument. Using Baccalaureate and Beyond data on recent four-year graduates, they found that a $1,000 increase in private student loan balances lowered the likelihood of buying a home by about five percentage points, whereas federal loans have no significant effect. The difference between loan types is important because Black et al. (2023) report that the introduction of the Graduate PLUS shifted graduate borrowing from private to federal debt, so that the composition of debt may moderate its consequences.

By contrast, Houle and Berger (2015) reported in National Longitudinal Survey of Youth 1997 (NLSY97) data that the association is modest and reflects the contrast between debtors and non-debtors rather than the size of the debt, and Letkiewicz and Heckman (2018) find no difference once other factors, including behavioral traits, are controlled. These divergent results are unlikely to be random. The studies differed in cohort, in the life-cycle stage at which ownership is observed, in whether debt is treated as presence, amount, or type, and whether identification is based on an instrument or conditioning on observables. Through the life-cycle lens, the pattern matches delay that varies with cohort, debt composition, and market conditions better than it matches uniform suppression. However, no study in the set tracks borrowers long enough to distinguish delay from suppression.

What these studies collectively leave undetermined is whether the effect of debt works through the burden of its balance or through the response of its borrowers. All treat debt as a stock and none observes their repayment behavior alongside their investment. That omission motivates the next strand.

Debt-Management Behavior and Repayment

Evidence on debt management is sparse and indirect. Li (2021), using the 2018 National Financial Capability

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Study (NFCS) of the Financial Industry Regulatory Authority (FINRA) Investor Education Foundation, treats late student-loan payment as an outcome and finds that higher financial literacy is associated with both lower loan-taking and fewer late payments. The study identified a determinant of repayment behavior but, lacking asset outcomes, cannot state whether that behavior matters for investment.

Letkiewicz and Heckman (2018) came closer to the behavioral channel by distinguishing respondents who have paid off their loans (who are more likely to own a home) and showing that risk tolerance is independently related to ownership. However, repayment status reflected income and elapsed time as much as management skill, and the cross-sectional design cannot establish ordering. Both studies relied on self-report, and neither was restricted to postgraduate borrowers. Set against the behavioral life-cycle account, in which mental accounting and repayment priorities shaped investment, the proposition was plausible but untested.

Financial Literacy and Its Moderating Role

The link between literacy and market participation is the best established in the corpus, although only one included study addresses it directly. Van Rooij et al. (2011), using a purpose-built module in a Dutch household survey and addressing the endogeneity of literacy, demonstrated that low literacy was strongly associated with non-participation in stock markets. The result comes from outside the debt context and speaks to mechanism rather than to borrowers. Within the borrower population, Korankye et al. (2024) found that financial knowledge was positively associated with emergency savings but that the debt-knowledge interaction was statistically significant but has an odds ratio below one (0.90 under propensity-score matching and 0.86 under coarsened exact matching): the odds of emergency savings rise by about 1.18 per additional knowledge point for non-borrowers but by about 1.06 for borrowers, so that the advantage of knowledge is smaller, not larger, for borrowers and the gap between borrowers and non-borrowers widens as knowledge rises, although knowledge still helps borrowers. This contradicted the buffering conjecture and highlighted a broader difficulty, as literacy was measured with brief survey quizzes whose content and framing varied across studies, limiting comparability and introducing measurement error. Alongside Li (2021), the evidence suggested that literacy matters for borrowing, repayment and participation but does not show that literacy protects investment among those in debt.

Loan Design, Access and Postgraduate Participation

Two English studies touch on the context proposition and are the only ones centered on postgraduate study. Mateos-González and Wakeling (2020) analyzed administrative data on more than 1.3 million graduates in the United Kingdom and found that the introduction of non-means-tested master's loans was associated with increased progression to taught master's programs, particularly among graduates from the lowest socioeconomic group. Wakeling et al. (2017), surveying graduates of six selective universities, found that undergraduate debt is not a significant predictor of progression and concluded that underlying financial resources matter more than debt as such.

The two findings were compatible since loan availability expanded access where credit constraints bind, whereas accumulated debt does not deter those with resources. Both, however, examined participation rather than later financial outcomes, with one confined to a select set of institutions, and neither observes subsequent investment by borrowers. They identified who borrows for postgraduate study, not what borrowing does to them afterward.

Synthesis of the Empirical Record

Across the four strands, the record documents associations between student debt and weaker asset positions in adjacent populations, identified literacy as a correlate of participation and repayment, and describes who borrows for postgraduate study. It does not connect these elements: no study followed postgraduate borrowers from debt through repayment behavior to investment, and none tested whether literacy modifies that path. This review established this record rigorously and assesses how much causal weight it bore.

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METHODOLOGY

Protocol and Reporting

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement (Page et al., 2021) and its extension for literature searches (PRISMA-S; Rethlefsen et al., 2021). Study quality was appraised using the checklist approach of Kitchenham and Charters (2007) alongside an adapted Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) framework (Sterne et al., 2016); findings were synthesized without meta-analysis following the Synthesis Without Meta-analysis (SWiM) guideline (Campbell et al., 2020) and the narrative synthesis guidance of Popay et al. (2006). The research questions, eligibility criteria, and synthesis plan were specified before screening.

Research Questions and Framework

The review addressed RQ1–RQ4 using a Population, Exposure, Comparator and Outcome (PECO) framework. Population: individuals or households holding education (student) loan debt, and postgraduate borrowers where they can be identified. Exposure: education-debt presence, amount, or burden; debt-management behavior (repayment, delinquency, use of revolving credit); and financial literacy or knowledge. Comparator: individuals or households with no or less education debt, better or worse debt management, or lower or higher literacy. Outcomes: (a) investment participation and allocation, savings, wealth and homeownership; (b) debt-management behavior; and (c) postgraduate borrowing or enrolment in response to loan design. Evidence is organized according to propositions P1–P4, corresponding to RQ1–RQ4.

Information Sources and Search Strategy

Five information sources were searched. Four bibliographic databases were chosen to span the finance, economics, and education literatures: Scopus and Web of Science Core Collection for broad, multidisciplinary coverage of household finance and consumer economics journals; EconLit for economics; and the Education Resources Information Center (ERIC) for education finance and student aid. Google Scholar (the first 200 results by relevance for each strategy) was included to capture any articles missed by database indexing; working papers and other grey literature found there were not eligible. Reference lists and citing articles of included studies were also searched. The search strategy combined three concept blocks: synonyms were linked within blocks using the Boolean operator OR, and blocks were linked using AND. Quotation marks indicate exact phrases, an asterisk indicates truncation, and proximity operators (W/3 in Scopus, NEAR/3 in Web of Science and N3 in EBSCOhost) require terms to occur within three words of each other.

Block 1, education debt: (“student loan*” OR “student debt*” OR “education* loan*” OR “education* debt*” OR (graduate W/3 (loan* OR debt* OR borrow*)) OR (postgraduate W/3 (loan* OR debt* OR borrow*)) OR (master* W/3 (loan* OR debt*)) OR (doctoral W/3 (loan* OR debt*)) OR “professional degree debt*”).

Block 2, debt management and literacy: (“debt management” OR “debt repayment” OR “loan repayment” OR repayment OR delinquen* OR default* OR “late payment*” OR “debt burden” OR “debt-to-income” OR “debt service” OR “financial literacy” OR “financial knowledge” OR “financial capability” OR “financial education”).

Block 3, outcomes: (invest* OR “stock ownership” OR “stock market participation” OR stockholding OR “risky asset*” OR portfolio OR “asset accumulation” OR wealth OR “net worth” OR homeownership OR “home ownership” OR “retirement saving*” OR “emergency saving*” OR saving*).

Two strategies were run—S1 (broad), which combined Block 1 and Block 3. S2 (targeted) combined Block 1 AND Block 2 AND Block 3 to find studies of debt-management behavior or literacy and asset outcomes. In Scopus, terms were searched in title, abstract, and keywords; the strings were translated to the fields and proximity operators of each source (Table 1). Limits were peer-reviewed journal articles, English language, and publication years 2000–2026.

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Table 1. Search Sources, Syntax and Limits

Source	Platform and fields	Operators	Limits	Strategies run
Scopus	Elsevier; title, abstract, keywords	OR, AND, " ", *, W/3	Articles; English; 2000–2026	S1 and S2
Web of Science Core Collection	Clarivate; Topic	OR, AND, " ", *, NEAR/3	Articles; English; 2000–2026	S1 and S2
EconLit	EBSCOhost; title, abstract, subject terms	OR, AND, " ", *, N3	Journal articles; English; 2000–2026	S1 and S2
ERIC	EBSCOhost; title, abstract, descriptors	OR, AND, " ", *, N3	Peer-reviewed; English; 2000–2026	S1 and S2
Google Scholar	Keyword search; first 200 results by relevance per strategy	OR, AND, " "	English; 2000–2026	Simplified S1 and S2
Citation searching	Reference lists and citing articles of included studies	Backward and forward	As for databases	Not applicable

Eligibility Criteria

Eligibility was guided by the PECO framework (Table 2). Reports were excluded at full text in a pre-specified order: not related to education debt, behavior, or literacy; outcome irrelevant; design not eligible; not a peer-reviewed article; beyond the language or time limits; duplicate report. Sources excluded solely for failing the publication criterion were retained as context for the empirical review and discussion and are not considered evidence for P1-P4.

Table 2. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Population	Individuals or households holding education loan debt; postgraduate borrowers where identifiable.	Studies of institutions or firms; theoretical populations; samples without education debt.
Exposure	Education-debt presence, amount or burden; debt-management behavior; financial literacy or knowledge.	Exposures unrelated to education debt, debt behavior, or literacy.
Comparator	No or less debt; better or worse debt management; lower or higher literacy.	Descriptive studies with no comparison

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Criterion	Inclusion	Exclusion
Outcome	(a) Investment, savings, wealth, homeownership; (b) debt-management behavior such as late payment; (c) postgraduate borrowing or enrolment response to loan design.	Outcomes such as health, life satisfaction, marriage, or labor-market choice, with no asset- or debt-management measure.
Design and data	Quantitative observational or quasi-experimental studies using respondent-, household-, or administrative-level data.	Reviews, commentary, qualitative-only studies, simulations, theoretical models, aggregate time series.
Publication	Peer-reviewed journal articles in English, 2000–2026.	Working papers, reports, theses, policy notes and Finance and Economics Discussion Series (FEDS) Notes (kept as contextual sources).
Setting	Any country	None

Study Selection and Data Extraction

Records from all sources were exported to a reference-management tool, and duplicates were removed. Two reviewers independently screened titles and abstracts, and then full texts against Table 2, with disagreements resolved by discussion. A standard form was used to extract the following for each study: citation; country; data source; sample and years; unit of analysis; exposure and outcome definitions; identification strategy; controls; effect size and direction; and relevance to the research questions. Authors were not contacted for missing data.

Quality Assessment and Risk of Bias

Methodological quality was assessed in two complementary ways. First, each study was scored against eight quality assessment (QA) criteria (QA1 to QA8), adapted from the quality checklist of Kitchenham and Charters (2007) to household-finance designs (Table 3). Each criterion was scored Yes = 1, Partly = 0.5, or No = 0 (total out of 8); totals of 7 or more were classed as high quality, 5 to 6.5 as moderate, and below 5 as low. Second, consistent with PRISMA 2020 item 18 (Page et al., 2021), risk of bias was judged using domains adapted from ROBINS-I (Sterne et al., 2016): confounding and selection (including credibility of instrumental-variable, fixed-effects, matching or policy-change strategies); measurement of exposure and outcome; selective reporting and missing data.

Each domain was rated as low, moderate, or serious, and the most serious domain determines the overall judgment. Two reviewers independently rated each study, with disagreements resolved through discussion. Ratings were not used to exclude studies; the synthesis was repeated for studies at moderate risk of bias or better as a sensitivity check.

Table 3. Quality Assessment Criteria and Scoring

Item	Criterion	Scoring: Yes (1), Partly (0.5), No (0)
QA1	Are the aims and research questions clearly stated?	Yes: explicit aims; Partly: implicit; No: absent.

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QA2	Is the data source or sample adequately described and appropriate?	Yes: source, period, and sampling described and suited to the question; Partly: described but poorly suited; No: not described.
QA3	Is the exposure (debt, behavior or literacy) valid and clearly defined?	Yes: individual-level, clearly defined measure; Partly: household-level, binary or proxy measure; No: undefined.
QA4	Is the outcome valid and clearly defined?	Yes: realized outcome clearly measured; Partly: proxy, self-report or expectation; No: undefined.
QA5	Does the design address confounding and selection?	Yes: instrument or policy change; Partly: panel, fixed effects, matching or longitudinal controls; No: cross-sectional conditioning only
QA6	Is the analysis appropriate and fully described?	Yes: methods, weights and missing data reported; Partly: incomplete; No: inappropriate or undescribed.
QA7	Are all findings, including null results, and limitations reported?	Yes: complete; Partly: selective; No: not reported
QA8	Is the study relevant to the research questions?	Yes: postgraduate borrowers with debt-management or investment outcomes; Partly: adjacent population or outcome; No: marginal

Synthesis and Certainty of Evidence

Heterogeneity in populations, exposure definitions, outcomes, and designs precluded meta-analysis. Studies were grouped by research question and outcome type, and direction of effect was summarized in an effect-direction table (vote counting on direction rather than statistical significance, with the strength of each design noted), following SWiM (Campbell et al., 2020).

The certainty of the body of evidence for each research question was graded using an adapted Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (Guyatt et al., 2008), starting from low for observational evidence and rating down for risks of bias, inconsistency, indirectness and imprecision. Publication bias could not be tested formally with so few studies and is discussed qualitatively.

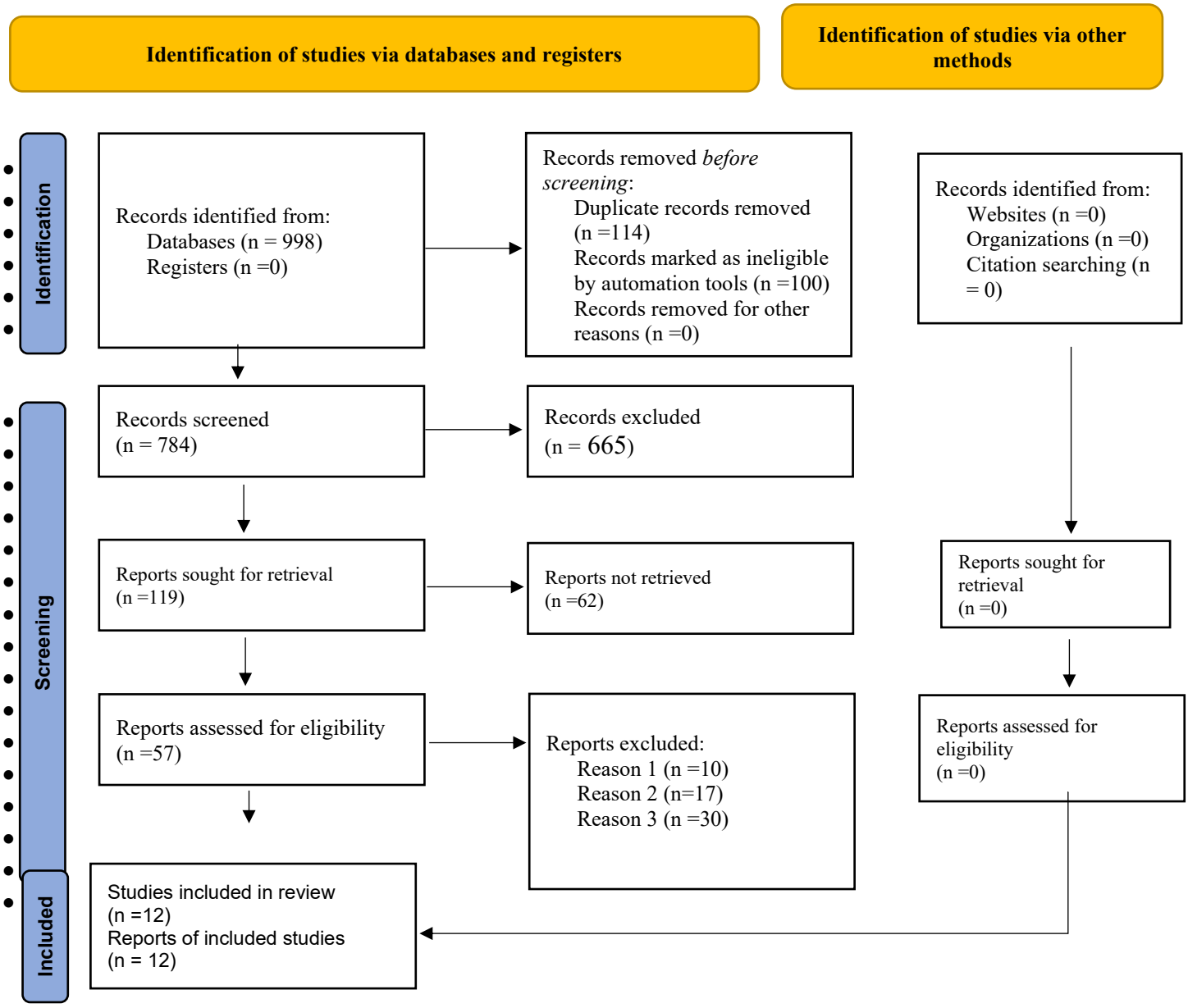
FINDINGS

Study Selection

The selection process is shown in Figure 2. The searches retrieved 998 records from the four databases, Google Scholar, and citation searching. After removing 214 duplicates, 784 records were screened by title and abstract, and 665 were excluded for not meeting the eligibility criteria (Table 2).

After that, 119 records were sought for retrieval, 62 were not retrieved. In the process, 57 were assessed for eligibility 45 were excluded and 12 studies remained for synthesis. The seven excluded sources are retained as context.

Fig.2. PRISMA 2020 Diagram



Characteristics and Methodological Quality of Included Studies

The twelve studies were published between 2011 and 2024 (Table 4). Nine used data from the United States (administrative credit records, the PSID, the SCF, the SHED, the NFCS, the NLSY97 and the Baccalaureate and Beyond survey), one used Dutch survey data and two used English data. Four looked at stock ownership or participation, four at homeownership, one at emergency savings, one at late payment on student loans, and two at progression to postgraduate study. None estimated the investment outcomes of postgraduate borrowers specifically, and none related a measure of debt-management behavior to investment outcomes.

Table 4. Characteristics and Findings of Included Studies

Study	Data and Population	Outcome	Reported Finding	Caveat for Postgraduate Borrowers

Mezza et al. (2020)	U.S. administrative data linking credit records and enrolment; nationally representative cohort	Homeownership	Instrumental-variable estimates: each additional $1,000 of student debt lowers homeownership by roughly 1–2 percentage points in the mid-20s (a delay of several months).	Public four-year undergraduate attendees; housing, not securities.
Houle and Berger (2015)	NLSY97, young adults	Homeownership, mortgage amount, home equity.	Negative association with homeownership in some models, modest in size and driven by the borrower versus non-borrower comparison; no association for debt amount among borrowers.	Not graduate-specific; recession and life-transition markers matter more.
Letkiewicz and Heckman (2018).	NLSY97, young adults	Homeownership	No difference between those with and without student debt after controls; those who had paid off loans more likely to own; risk-tolerant respondents more likely to own.	Not graduate-specific; cross-sectional.
Robb, Schreiber, and Heckman (2020)	Baccalaureate and Beyond (B&B) survey of recent four-year college graduates; instrumental variable (in-state tuition rates).	Homeownership (buying a home)	A $1,000 increase in private student loan balances lowers the likelihood of buying a home by about 5 percentage points; federal loans have no significant effect.	Four-year graduates, not graduate-specific; short horizon.
Korankye and Guillemette (2021).	PSID, 2011–2017	Stock ownership outside retirement accounts	Households with student debt less likely to own stocks; debt amount also negatively associated.	All student debt; household level; short article.
Korankye (2023)	PSID, 2011–2017, married households	Stock ownership outside retirement accounts	Presence of debt lowers the probability of owning stocks; amount not significant (fixed-effects logit).	Married households only.
Coakley and Li (2020).	SCF 2016, young adults	Stock ownership	Negative association between student debt and ownership.	Cross-sectional; not graduate-specific.
Korankye et al. (2024)	Survey of Household Economics and Decisionmaking (SHED) 2018–2019, pooled cross-section;	Emergency savings (three months of expenses)	Student debt associated with lower odds of emergency savings (odds ratio about 0.48 to 0.51); knowledge positively associated;	Presence of debt only, no amounts; all borrowers;

	propensity-score matching (n = 10,380) and coarsened exact matching (n = 4,804)		interaction odds ratio 0.90 and 0.86, so the gap widens as knowledge rises although the slope stays positive for borrowers.	liquid savings, not investment.
van Rooij et al. (2011).	Dutch Central Bank household survey with purpose-built literacy modules	Stock-market participation	Low literacy markedly less likely to hold stocks; direction of causality examined.	Not about debt.
Li (2021)	NFCS 2018	Late student-loan payment; loan holding	Higher literacy associated with lower likelihood of taking student loans and of being late on payments.	Cross-sectional; all borrowers; no investment outcome.
Mateos-González and Wakeling (2020)	Administrative data, over 1.3 million UK graduates	Progression to taught master's	Introduction of non-means-tested master's loans associated with higher progression, especially for the lowest socio-economic group.	Participation, not investment.
Wakeling et al. (2017).	Survey of 2009 and 2012 graduates of six selective English universities	Progression to postgraduate study	Undergraduate debt not a statistically significant predictor in a multivariate logit; underlying financial resources appear more important.	Participation, not investment; selective universities.

Quality scores (Table 5) ranged from 4.5 to 7.5 out of 8 and had a mean of 6.4. Four studies were of high quality (Mezza et al., 2020; Robb et al., 2020; van Rooij et al., 2011; Mateos-González & Wakeling, 2020), seven of moderate quality, and one of low quality (Li, 2021). The lowest-scoring criteria were identification (QA5; mean 0.54), as only four studies used an instrument or a policy change, and the remainder used conditioning, matching, or fixed effects; relevance to the research questions (QA8; mean 0.50), as no study was confined to postgraduate borrowers; and exposure measurement (QA3; mean 0.71), as debt was recorded at a household level or as a binary indicator.

Table 5. Quality Assessment Scores (Kitchenham and Charters (2007) checklist, adapted)

Study	QA1–QA4	QA5–QA8	Score (of 8)	Quality
Mezza et al. (2020)	1, 1, 1, 1	1, 1, 1, 0.5	7.5	High
Houle & Berger (2015)	1, 1, 0.5, 1	0.5, 1, 1, 0.5	6.5	Moderate
Letkiewicz and Heckman (2018)	1, 1, 0.5, 1	0.5, 1, 1, 0.5	6.5	Moderate
Robb et al. (2020)	1, 1, 1, 1	1, 1, 0.5, 0.5	7.0	High

Korankye and Guillemette (2021)	1, 1, 0.5, 1	0.5, 1, 0.5, 0.5	6.0	Moderate
Korankye (2023)	1, 1, 0.5, 1	0.5, 1, 1, 0.5	6.5	Moderate
Coakley and Li (2020)	1, 1, 0.5, 1	0, 1, 0.5, 0.5	5.5	Moderate
Korankye et al. (2024)	1, 1, 0.5, 0.5	0.5, 1, 1, 0.5	6.0	Moderate
van Rooij et al. (2011)	1, 1, 1, 1	1, 1, 1, 0.5	7.5	High
Li (2021)	1, 1, 0.5, 0.5	0, 0.5, 0.5, 0.5	4.5	Low
Mateos-González and Wakeling (2020)	1, 1, 1, 1	1, 1, 1, 0.5	7.5	High
Wakeling et al. (2017)	1, 0.5, 0.5, 1	0, 1, 1, 0.5	5.5	Moderate

Risk-of-bias judgments were presented in Table 6. No study was judged to be at low risk of bias overall: seven were rated as moderate, two moderate-to-serious and three as serious, primarily due to confounding and selection in cross-sectional designs and the inability to link household debt to a borrower or program. Restricting the synthesis to the seven studies judged as moderate risk leaves the direction of the stock-ownership and homeownership-delay findings intact (Korankye & Guillemette, 2021; Mezza et al., 2020; Robb et al., 2020) but the two null homeownership results (Houle & Berger, 2015; Letkiewicz & Heckman, 2018), reinforcing the finding that the evidence on homeownership was mixed.

Table 6. Risk-of-bias Assessment (adapted ROBINS-I)

Study	**Confounding and Selection**	**Exposure and Outcome Measurement**	**Reporting and Missing Data**	**Overall**
Mezza et al. (2020)	Moderate: instrumental variable from tuition variation; exclusion restriction cannot be tested; public four-year attendees only.	Low: administrative credit and enrolment records.	Low: several specifications reported	Moderate
Houle and Berger (2015)	Moderate: longitudinal data with controls and several specifications; unobserved confounding possible.	Moderate: survey-reported debt and homeownership; not graduate-specific.	Low: null and modest results reported openly	Moderate
Letkiewicz and Heckman (2018)	Moderate: controls for demographic and behavioral traits; unobserved confounding possible.	Moderate: debt presence and paid-off status; not graduate-specific.	Low	Moderate

Robb et al. (2020)	Moderate: instrument from in-state tuition rates; exclusion restriction cannot be tested; recent four-year graduates only.	Low: federal and private loan balances measured separately; realised outcome.	Low: both loan types reported	Moderate
Korankye and Guillemette (2021).	Moderate: panel data with controls; time-varying confounding possible.	Moderate: household-level debt, not tied to borrower or programme; self-reported ownership.	Moderate: short article with limited detail	Moderate
Korankye (2023)	Moderate to serious: fixed-effects logit uses only households whose status changes; married households only.	Moderate: as above	Low: mixed results reported openly	Moderate to serious
Coakley and Li (2020).	Serious: cross-sectional; reverse causality and selection.	Moderate: household debt, not graduate-specific	Moderate	Serious
Korankye and Agyemang-Mintah (2024)	Moderate to serious: matching on observables in a pooled cross-section; unobserved confounding	Moderate to serious: binary debt presence only; self-reported emergency fund; no amounts.	Low: limitations stated	Moderate to serious
van Rooij et al. (2011)	Moderate: instrumental variables address endogeneity of literacy; not about debt.	Low: purpose-built literacy module	Low	Moderate
Li (2021)	Serious: cross-sectional; borrowers differ from non-borrowers.	Moderate: self-reported lateness; not graduate-specific	Moderate	Serious
Mateos-González and Wakeling (2020)	Moderate: policy-change design; concurrent trends possible	Low: administrative progression records.	Low	Moderate
Wakeling et al. (2017).	Serious: graduates of six selective universities; survey self-selection.	Moderate: undergraduate rather than postgraduate debt	Moderate	Serious

RQ1: Education Debt and Investment-Type Outcomes

Eight studies addressed RQ1 (Table 7). Six found worse asset outcomes for indebted households: lower stock ownership (Coakley & Li, 2020; Korankye & Guillemette, 2021; Korankye, 2023, for the presence of debt), lower emergency savings (Korankye et al., 2024), and delayed or lower homeownership (Mezza et al., 2020; Robb et al., 2020, for private loans only). Two found a modest or no association with homeownership (Houle & Berger, 2015; Letkiewicz & Heckman, 2018). None reported a positive association. Where dose–response

was investigated, the amount of debt mattered in one study (Korankye & Guillemette, 2021) but not in two others (Houle & Berger, 2015; Korankye, 2023), and the type of debt in one (Robb et al., 2020). The two instrumental-variable estimates relate to housing, not investment in securities. The certainty of evidence was low: debt was generally associated with worse or delayed asset accumulation in adjacent populations; the association is not uniform; it is most prominent for liquidity, equity participation, and private loans, and is sensitive to design and cohort.

RQ2: Debt-Management Behavior

No included study related debt-management behavior to investment outcomes, so the central question of the review is unaddressed by the existing record. Two studies offer indirect evidence: Li (2021) found that higher financial literacy was associated with fewer late student loan payments, and Letkiewicz and Heckman (2018) found that respondents who had paid off their loans were more likely to own a home. Both are cross-sectional, one of low quality, and neither distinguishes management from capacity to pay. The certainty of evidence was very low.

RQ3: Financial Literacy and Moderation

Three studies addressed RQ3. Higher literacy was associated with greater stock-market participation (van Rooij et al., 2011), greater emergency savings (Korankye et al., 2024), and lower loan-taking and fewer late payments (Li, 2021). Moderation was tested once: the debt–knowledge interaction had an odds ratio below 1, indicating that the gap between borrowers and non-borrowers widened with knowledge (Korankye et al., 2024). The certainty of evidence is low for the main effect and very low for moderation, and no study tested moderation on investment participation or among postgraduate borrowers.

RQ4: Loan Design, Context and Postgraduate Borrowers

Two studies addressed RQ4, both from England. Non-means-tested master's loans were associated with higher progression, concentrated among the lowest socio-economic group (Mateos-González & Wakeling, 2020). In contrast, undergraduate debt did not predict progression once resources were taken into account (Wakeling et al., 2017), nor did it examine later financial outcomes. Across all twelve studies, the evidence base was concentrated geographically (nine U.S., one Dutch, two English studies, none from a low- or middle-income economy), and no study is confined to postgraduate borrowers' investment outcomes. The certainty of evidence is very low.

Summary of Findings

Table 7 mapped each study to the research questions, and Table 9 summarized the principal finding, quality of evidence, and certainty for each question.

Table 7. Effect-Direction Summary by Research Question

Study	RQ1 debt burden	RQ2 debt management	RQ3 literacy	RQ4 context
Mezza et al. (2020).	Delays homeownership (↓)	Not examined	Not examined	Not examined
Houle and Berger (2015).	Modest association; none for amount among debtors (↓/0)	Not examined	Not examined	Not examined

Letkiewicz and Heckman (2018).	No association (0)	Loans paid off: more likely to own (repayment status)	Not examined	Not examined
Robb et al. (2020).	Private loans lower ownership (↓); federal loans no effect	Not examined	Not examined	Not examined
Korankye and Guillemette (2021).	Lower stock ownership; amount ↓	Not examined	Not examined	Not examined
Korankye (2023)	Presence ↓; amount no effect	Not examined	Not examined	Not examined
Coakley and Li (2020).	Lower stock ownership (↓)	Not examined	Not examined	Not examined
Korankye et al. (2024).	Lower emergency savings (↓)	Not examined	Main effect ↑; interaction odds ratio < 1 (no buffering)	Not examined
van Rooij et al. (2011).	Not examined	Not examined	Higher participation with literacy (↑)	Not examined
Li (2021)	Not examined	Higher literacy, fewer late payments (determinant of behavior)	Literacy ↓ loan-taking	Not examined
Mateos-González and Wakeling (2020)	Not examined	Not examined	Not examined	Loan design ↑ progression, mainly lowest socio-economic group.
Wakeling et al. (2017).	Not examined	Not examined	Not examined	Undergraduate debt no effect; resources matter

Table 8. Summary of findings and certainty of evidence by research question

Research question	**Studies (n)**	**Principal finding**	**Quality of studies**	**Certainty (GRADE-adapted)**
RQ1 Debt burden and investment-type outcomes.	8	Lower stock ownership (3 studies), lower emergency savings (1), and delayed or lower homeownership (2;	2 high, 6 moderate	Low

		one only for private loans); two NLSY97 studies found modest or no association with homeownership		
RQ2 Debt-management behavior	2 (indirect)	No study relates debt-management behavior to investment; literacy predicts fewer late payments; paid-off loans associated with ownership	1 moderate, 1 low	Very low
RQ3 Financial literacy and moderation	3	Literacy positively associated with participation, savings and repayment; one moderation test found no buffering	1 high, 1 moderate, 1 low	Low (main effect); very low (moderation)
RQ4 Loan design and context	2	Loan availability widened progression among lower-income groups; undergraduate debt not a deterrent; no investment outcomes	1 high, 1 moderate	Very low

DISCUSSION

Principal Findings

The review determined whether the way borrowers manage education debt relates to their investment outcomes. Education debt was generally associated with weaker or later asset accumulation (RQ1); the behavioral channel through debt-management behavior has not been tested (RQ2); literacy was associated with participation and repayment but has not been shown to moderate the debt–investment relationship (RQ3); and the evidence on loan design concerns who borrows rather than what borrowing does (RQ4). All of it is of low or very low certainty, and none is confined to postgraduate borrowers.

Findings in Light of the Extant Literature

The finding on RQ1 accords with the life-cycle prediction that repayment crowds out saving and investment during the early career (Modigliani & Brumberg, 1954; Friedman, 1957), and with descriptive evidence that homeownership among college-educated debtors and non-debtors converges by about age 35 (Mezza et al., 2014). It is harder to reconcile with a uniform-suppression account, since two NLSY97 studies find little or no association. The composition of debt may help to explain the divergence. Robb et al. (2020) find an effect for private but not federal loans, and Black et al. (2023) show that the removal of federal borrowing caps shifted graduate borrowing from private to federal debt, which suggests that loan design shapes how much a given balance constrains later asset accumulation. The more informative reading is that debt shifts the timing of asset acquisition and that its visibility depends on the cohort, market conditions, and the observed margin. Discretionary margins such as liquidity and equity participation appear more sensitive than homeownership, which is lumpy and plausibly supported by family resources and policy. This is an interpretation rather than a finding, because no included study tracks borrowers beyond early adulthood. The review also shows that the evidence on stocks and savings is thinner than is often assumed, since it rests on household-level, largely

cross-sectional data that cannot isolate postgraduate debt. The qualification matters because graduate debt is larger, grows faster, and is distributed differently from undergraduate debt (TICAS, 2024; ACE, 2024). A separate literature indicates that student debt carries costs beyond balance-sheet effects (Kim & Chatterjee, 2019; Korankye & Kalenkoski, 2021). Those studies were excluded because their outcomes are not asset measures. However, they are consistent with the behavioral claim that debt is psychologically heavy and may shape risk-taking, a channel that none of the included studies observe.

The absence of evidence on RQ2 is itself the central result. The behavioral life-cycle hypothesis (Shefrin & Thaler, 1988) implies that repayment priorities and mental accounting should shape investment independently of balance, yet the literature measures balances rather than behavior. The two indirect studies indicated where progress might come from: Li (2021) illustrated that behavior is predictable from literacy, and Letkiewicz and Heckman (2018) suggested that repayment progress is associated with ownership. Neither separates management from capacity to pay, a distinction that any future test must preserve.

The positive association between literacy and participation corroborates the broader literature (Lusardi & Mitchell, 2014; van Rooij et al., 2011) and the evidence that financial literacy was low in many countries (Klapper et al., 2015), indicating why the mechanism matters at the population scale. The moderation result departs from the expectation that knowledge cushions the burden of debt. One explanation is that knowledge heightened awareness of the cost of debt and the risks of investing, so that informed borrowers deleverage before investing; under the life-cycle model, this would be rational rather than a failure of buffering. Another is measurement error in short literacy quizzes. A single study cannot discriminate between the two.

The English studies resonated with U.S. evidence that loan expansion changes who borrows without necessarily improving access. Black et al. (2023) find that the removal of graduate borrowing caps in the United States did not improve access and was followed by higher prices. In contrast, Mateos-González and Wakeling (2020) found that England's master's loans widened progression among lower socio-economic groups. The divergence demonstrated that the effect of loan design depends on institutional pricing and means-testing, and it supports the caution against importing behavioral conclusions across systems.

Implications

For theory, the review demonstrated that the life-cycle and behavioral accounts yield distinct, testable predictions about borrowers, and that only the former has received empirical attention. For policy and practice, the evidence does not show that literacy programs or improved repayment behavior improve investment outcomes among postgraduate borrowers; therefore, interventions should be evaluated rather than assumed effective. The end of Graduate PLUS lending for new borrowers and the new federal limits, effective 1 July 2026 (One Big Beautiful Bill Act, 2025; Federal Student Aid, 2026), change borrowing conditions in the United States and provide a basis for evaluating how loan design affects borrowing, repayment, and subsequent asset accumulation. Group differences in borrowing (ACE, 2024) further suggested that outcomes cannot be attributed to individual behavior alone, so grant aid and repayment design deserve attention alongside behavioral interventions.

Research Directions

The review pointed to one priority question: among postgraduate borrowers, does better debt-management behavior, net of debt burden and repayment capacity, predict higher investment participation, and does financial literacy moderate that relationship? Answering it required five directions.

Identify Postgraduate Borrowers: Use respondent-level data in which education debt can be tied to a borrower and a postgraduate programme, rather than household education debt that may be undergraduate or held for another person, and distinguish federal from private loans.

Measure Debt-Management Behavior Directly: Use observable behaviors, such as late payment, use of revolving credit, and repayment-plan choice, as separate measures, kept distinct from debt burden and the debt-service ratio.

Test Literacy Moderation on Investment Outcomes: Estimate the debt–literacy interaction on investment participation and risky-asset share, reporting predicted probabilities and marginal effects rather than interaction coefficients alone.

Strengthen Identification: Use panel and quasi-experimental designs, including loan-limit changes, and include former borrowers so that delay can be separated from permanent reductions in participation.

Widen the Settings: Study settings beyond the United States and England, including low- and middle-income economies with student loan schemes, where postgraduate debt data are scarce.

Limitations

The review has limits. Searches were restricted to English-language journal articles from 2000 to 2026, so relevant studies outside those limits may have been missed, and publication bias could not be tested formally with twelve studies. No included study was at low risk of bias; the studies were heterogeneous, and meta-analysis was not possible. Many studies are short articles, the evidence base is concentrated in the United States, and the quality and risk-of-bias ratings, although independently made, involve judgment about designs that the checklists were not built for. In addition, a 2025 study of debt and stock market participation (Favreau et al., 2025) was identified near the end of the search window. However, its full text could not be retrieved for assessment, so its eligibility should be confirmed when the review is updated.

CONCLUSION

This review found that education debt was generally associated with lower asset accumulation among borrowers in adjacent populations, with mixed evidence on homeownership, consistent with delay rather than suppression. No study has examined whether the debt-management behavior of postgraduate borrowers shapes their investment outcomes, and the single test of financial knowledge as a moderator found no buffering. The evidence was of low or very low certainty and is concentrated in the United States. The contribution of the review was therefore a documented and quality-appraised map of what was known and a research direction. Future work should identify postgraduate borrowers in respondent-level data, measure debt-management behavior directly, test literacy moderation on investment outcomes, and use designs that separate delay from suppression.

Declarations

Data availability: This review draws only on published studies. The data extracted from them, along with the quality and risk-of-bias ratings, are presented in Tables 5 to 9.

Reporting guidelines: The review is reported in accordance with PRISMA 2020 and PRISMA-S.

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