Student Debt, Wealth, and the Intergenerational Impact of the Great Recession*

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Using the University of California Consumer Credit Panel (2004–2024), we study Americans aged 55+ to assess how Great Recession (GR) local shocks and student debt shaped later-life wealth and children's borrowing. Difference-in-differences and event-study estimates show a 1-pp higher GR unemployment shock raised borrowers' 2019 student-loan balances by about $620 and increased delinquency. GR-era borrowers—especially in high-shock commuting zones—carried persistently larger balances through 2024 and exhibited markedly lower wealth trajectories that persist through 2024. Parents who had student debt during the GR were just over twice as likely to have a child with student debt, and those children held larger balances.

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The Great Recession (GR) of 2007-2009 stands as a pivotal economic event, the ramifications of which continue to shape the financial landscape for many Americans. While extensive research has documented its impact on employment, housing, and the financial sector, less attention has been paid to its prolonged effects on household balance sheets, particularly for older individuals, and the compounding role of pre-existing debt obligations such as student loans. This paper investigates the enduring effects of the GR on the financial well-being of older individuals, defined as those aged 55 and over by the end of our panel (the University of California Consumer Credit Panel, UC-CCP, detailed in Section II) in 2024. The analysis focuses specifically on the intersection of the severity of local GR economic shocks, existing and new student loan debt obligations from that period, subsequent wealth accumulation, and the potential for intergenerational financial linkages, particularly concerning the student debt burdens of their children in recent years.

The motivation for this study is underscored by two significant trends. First, the cohort of older adults approaching or entering retirement in the U.S. is increasingly carrying debt, including student loans taken out for themselves or their dependents (Schaeffer, 2022; Consumer Financial Protection Bureau, 2017). This contrasts with previous generations who typically deleveraged in later life, raising concerns about retirement security and financial vulnerability. Second, the GR has been shown to have persistent, or "hysteretic," effects on labor market outcomes (Yagan, 2019), suggesting that its impact on financial well-being might also be enduring.

This research builds directly upon the framework established by Pinto and Steinbaum (2023) (P&S), who examined the impact of local GR shocks on student debt outcomes for younger individuals aged 17–34 in 2009. Using geographic variation in GR severity, P&S found that the recession significantly increased student indebtedness, delinquency, and non-repayment, with these effects amplifying over their 10-year study period. P&S identified mechanisms such as recession-induced re-enrollment in higher education and declining state support for public institutions. Unlike P&S, we utilize a difference-in-differences

and event study approach, making use of the pre-GR-period in our panel and individual fixed effects (FEs). This study adapts the P&S local-labor-market-shock identification strategy but applies it to an older cohort, using an extended data panel from the University of California Consumer Credit Panel (UC-CCP) spanning 2004 to 2024. Key distinctions of our approach include the explicit incorporation of a comparison group of individuals who did not hold student debt during the GR, and an analysis of intergenerational links to children's student debt, which is facilitated by intergenerational linkages in credit reporting data.

This research aims first to investigate whether the localized economic shocks of the Great Recession altered financial outcomes—particularly wealth accumulation and student debt burdens—for these older individuals, exploring whether these impacts parallel or diverge from those observed in younger cohorts. Second, it seeks to evaluate if the financial repercussions of the Great Recession, particularly for those with student debt, translate into changes in wealth trajectories and have intergenerational consequences, specifically concerning the student debt of their children. By integrating older borrowers and those without student debt from the same panel dataset, we assess whether the recession-induced financial distress is uniquely severe for older adults who carried educational loans into a period of significant economic upheaval, as opposed to their peers who never had such debt. We then link these outcomes to wealth accumulation and explore intergenerational financial connections.

To address these objectives, we employ a suite of fixed-effects panel regression models. Our main findings indicate that older individuals who carried student debt into the Great Recession experienced significantly more adverse wealth outcomes post-GR compared to their non-indebted peers. This disadvantage was further compounded for those living in local areas (commuting zones) that faced more severe unemployment shocks during the crisis. We also find evidence that local GR-shock severity led to an increase in older individuals' own student loan balances over time. Furthermore, our analysis reveals strong

intergenerational financial links, with higher parental wealth being negatively associated with both the likelihood and the amount of their children's student debt, while parents' own history of holding student debt during the GR is positively correlated with their children taking on more substantial student loan burdens.

This paper proceeds as follows: Section I provides an expanded literature review, situating this work within existing research on recessions, student debt, and household finance. Section II details the data sources and explains the summary statistics. Section III introduces the empirical specifications and presents the various findings. Section IV discusses the implications of these findings in the context of the literature and policy, and Section V concludes.

I Relevant Literature

This study draws upon several important strands of economic literature: the long-term impacts of recessions on individual labor market outcomes and household finances, the economics of student debt across the life cycle, the financial well-being of older adults and retirement security, and intergenerational financial linkages.

The Great Recession (GR) of 2007-2009 had profound and lasting effects on the U.S. economy. These impacts have been well-documented in the decade and a half after the crisis. Yagan (2019) demonstrated employment "hysteresis," where areas with severe GR unemployment shocks had persistently lower employment rates, a methodological benchmark for our local shock identification. Others like Mian, Rao and Sufi (2013) and Mian and Sufi (2014) emphasized household balance sheet shocks. Building on Blanchard and Katz (1992), recent work shows slow regional adjustment post-shock (Dao, Furceri and Loungani, 2017; Hershbein and Stuart, 2023). This paper extends this by examining wealth and debt for an older cohort, whose adjustment capacity may differ.

The rising prevalence of student debt among older Americans poses significant risks to their financial security. The share of 65-year-olds with student loans grew from under 1

percent to over 6 percent between 2003 and 2019 (Gallagher and Rendon, 2021). By 2020, Americans 65+ with student debt had increased fivefold from 2005, a "newish and growing problem" (Ghilarducci, 2022). This is not just from cosigning but also new borrowing by older adults. The number of federal student loan borrowers aged 62 years or older grew 59 percent from 2017 to 2023 (Consumer Financial Protection Bureau Office for Older Americans and Office of Students and Young Consumers, 2024), with nearly one-third in default pre-pandemic. Default can lead to Social Security benefit garnishment, which increased over 3,000 percent from 2001-2019 (Consumer Financial Protection Bureau Office for Older Americans and Office of Students and Young Consumers, 2024), often pushing recipients below the poverty line and forcing them to forgo essentials.

The growth in student debt at older ages is partly attributable to programs like Parent PLUS loans, which allow parents to take on debt to support their children's educational attainment as college costs have risen (see, for example, Gallagher and Rendon, 2021). These loans are increasingly utilized by a broader range of families. However, Parent PLUS loans can pose significant financial risks, particularly for low-income borrowers and families of color, potentially jeopardizing their financial security and retirement (Grant et al., 2024).

Widespread and growing student debt intersects critically with retirement preparedness, as 44 percent of households headed by 55–64 year-olds have zero retirement savings (Morrissey, Radpour and Schuster, 2023). In general, indebted seniors face higher poverty risks (Ghilarducci, 2022; Manickam, 2024). Wettstein and Liu (2023) find rising student loan incidence and delinquency among older adults, risking a 4–6 percent Social Security income loss from garnishment, with Black households disproportionately affected. This echoes evidence of debt straining later-life finances (Lusardi et al., 2020; Schaeffer, 2022; Geiman, 2023) and potentially delaying retirement (Butrica and Karamcheva, 2020). Older borrowers with loans for their own education often have low incomes and assets (Gallagher and Rendon, 2021). Around 6 percent of Americans over 50 carry student debt, with 8 percent delinquent (Zhong, Cohn and Harvey, 2024). This study examines how the

GR might have worsened these debt burdens.

Parental financial status is a well-established predictor of children's economic and educational outcomes (Black and Devereux, 2011; Solon, 1999; Chetty et al., 2020), including decisions around higher education financing (Boatman, Evans and Soliz, 2017). This study contributes by empirically examining the correlation between older parents' financial characteristics and their adult children's student loan outcomes in the post-GR era.

Intergenerational financial linkages are crucial to understanding the rise of student borrowing among older Americans. Amromin, Eberly and Mondragon (2024) find that during the GR, for every $1 of lost parental home equity, students typically took on an additional $0.40–$0.80 in student loans. This increased borrowing led to greater financial stress post-college, highlighting how economic shocks to parents can reverberate as debt burdens on their children. Federal Parent PLUS loans have also grown, with concerns that many low-income parents take on these debts despite limited repayment capacity, facing rising default rates and less access to income-driven repayment plans (Granville, 2022; Zhong, Cohn and Harvey, 2024). Hotz et al. (2021) find that parental financial support for college often leads to parents increasing their own housing-related debt, without substantially reducing children's student loan balances, hindering both generations. This research examines older borrowers who navigated the GR, shedding light on how the shock may have altered both their finances and their children's borrowing.

The GR's severity varied across local labor markets, leading to heterogeneous long-term effects. Pinto and Steinbaum (2023), focusing on young adults during the GR, found that a one percentage-point higher local unemployment rate led to an average $370 increase in student loan balances by 2019, with persistently higher delinquency rates. They attribute this to prolonged labor market weakness and "credentialization." Monarrez and Grosz (2025) estimate the GR accounts for 19–32 percent of post-2007 growth in undergraduate student loan balances and 10–25 percent of the rise in defaults, with pronounced effects for those in school during the downturn. While these studies focus on younger

cohorts, the mechanisms are relevant. Older workers (50+) who lost jobs during the GR faced greater reemployment difficulty; by 2010-2011, only 34 percent of unemployed workers aged 62+ became reemployed within a year, compared to over 60 percent of younger workers (Quinn, Cahill and Giandrea, 2010; Johnson, 2012). This could force older borrowers into forbearance, default, or drawing down retirement savings. Racial disparities also amplified the GR's impact; Black and Hispanic workers faced higher unemployment and larger wealth losses (Pfeffer, Danziger and Schoeni, 2013; Emmons et al., 2019). Older adults in predominantly Black, Hispanic, or American Indian communities exhibit significantly higher student loan delinquency rates (Zhong, Cohn and Harvey, 2024). This paper investigates these issues for older borrowers.

Classical human capital theory (Becker, 1964; Goldin and Katz, 2008) is challenged by these realities. Evidence of "credentialization" during slack labor markets suggests individuals pursue more education due to scarce jobs, potentially leading to modest wage gains against significant debt (Pinto and Steinbaum, 2023). This questions the direct link between schooling and higher earnings. Older adults have fewer working years to amortize education costs, making the return on investment (ROI) for later-life educational borrowing less certain (Bleemer and Zafar, 2018; Tran and Jeon, 2019). The rise of student borrowing among older individuals also counters life-cycle patterns of debt reduction approaching retirement (Lusardi, Mitchell and Oggero, 2019), a period where many face inadequate retirement savings to begin with (Morrissey, Radpour and Schuster, 2023). Structural inequalities further complicate this: women and minorities often do not reap the same rewards from equivalent education, making debt repayment harder (Blagg et al., 2022). Houle and Addo (2019) argue student debt can exacerbate wealth inequalities. This paper examines older borrowers for whom the expected payoff often failed to materialize, contributing to a critical perspective on human capital theory by identifying mechanisms like economic shocks that undermine educational investments.

This study contributes by focusing on older Americans (age 55+ in 2024) who carried

student debt through the GR, using regional GR severity to identify impacts. It extends P&S (2023) to an older cohort, adds a non-debtor comparison, and examines intergenerational outcomes, leveraging the ability to identify such linkages within credit reporting data. This research informs literature on student debt by focusing on an overlooked demographic, adds a midlife debt perspective to GR impact studies, and contributes to intergenerational finance by analyzing post-recession family debt profiles. Methodologically, we use the inverse hyperbolic sine (*asinh*) transformation for wealth data (Burbidge, Magee and Robb, 1988; Pence, 2006; Bellemare and Wichman, 2020) and two-part models for outcomes with mass at zero (Cameron and Trivedi, 2005; Wooldridge, 2010).

II Data

This study primarily utilizes individual-level longitudinal data from the University of California Consumer Credit Panel (UC-CCP). The UC-CCP is a 2 percent nationally representative sample of U.S. adults with credit records, providing anonymized quarterly tradeline information from 2004. Key data elements include loan balances, credit limits, payment histories, delinquency statuses, credit scores, basic demographics (birth year, gender, probabilistic race), and census-tract level geographic identifiers. For this analysis, we primarily use fourth-quarter observations annually from 2004 to 2024.

To measure local economic conditions, the UC-CCP data is linked with two external sources. First, commuting zone (CZ) level unemployment rates are derived from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS), aggregated from county-level data using the U.S. Department of Agriculture's crosswalk. Following Yagan (2019) and Pinto and Steinbaum (2023), the primary measure of Great Recession (GR) severity is the percentage-point change in a CZ's unemployment rate between December 2007 and December 2009. Second, house price indices (HPI) from the Federal Housing Finance Agency (FHFA) are used for wealth estimation.

The analytical sample focuses on older individuals, defined as those at least 55 years

old by 2024. We impose requirements for individuals to appear in the panel before, during, and after the GR (2004–06, 2007–09, and 2010 onward, respectively) and exclude deceased individuals or those with missing geographic data. This results in a primary sample of 1.54 million older borrowers. Notably, this sample explicitly includes individuals who did not hold student loan debt during the GR period, serving as a crucial comparison group. Further details on sample construction, including the assignment of a time-invariant "Great Recession CZ" and demographic variable processing, are provided in Appendix subsection 2.

Individual-level student loan variables (e.g., total balance, delinquency) are constructed through processing of UC-CCP tradeline data. This involves creating persistent loan identifiers to track loans across servicers or refinancing events, categorizing loans by repayment status, and applying imputation rules for missing balances. Similar aggregation is performed for other debt types (mortgages, HELOCs, credit cards). A comprehensive description of this loan data processing is available in Appendix subsection 3.

To estimate individual wealth, we develop a methodology that computes net worth primarily based on housing equity: Credit-Panel Wealth (CPW). This involves linking mortgage and home equity tradelines to FHFA HPI data to estimate current property values, accounting for origination dates and assuming an 80 percent loan-to-value (LTV) ratio at origination.[1] This LTV is used to determine housing equity at mortgage origination, and the HPI data allows us to calculate a growth factor to estimate the current market value of every home mortgage loan in each year of our panel. These property values are summed up for each individual to create total housing equity, which is then subtracted by sum of all liabilities to calculate individual wealth. The detailed methodology for wealth estimation is presented in Appendix subsection 4.

As a validation check, we benchmark our Credit-Panel Wealth (CPW) series against es-

[1]The 80 percent LTV benchmark, equivalent to a 20 percent down-payment, aligns with the 75th-percentile original LTV in the Federal Reserve Board's FR Y-14M mortgage schedule—a monthly loan-level filing by U.S. bank-holding companies with $\geq$ \$100 billion in consolidated assets

tablished references by aligning the 2016 wealth distribution across four groups (Bottom 50, Next 40, Next 9, Top 1) with: (i) the "Bulletin" and "Augmented" Survey of Consumer Finances (SCF) wealth distributions (Bricker et al., 2020*b*,*a*); (ii) the capitalized-income estimates of Saez and Zucman (2016, 2020); (iii) the administrative-tax–based re-estimates that allow heterogeneous asset returns from Smith, Zidar and Zwick (2023). See Appendix B and Table B.1 for more detail.[2]

A novel component of this research involves identifying consistent household units and intergenerational linkages within credit reporting panel data. Persistent household identifiers are constructed to track co-residential units over time. Potential adult children of the primary older sample members are then identified based on age differences within these households, allowing for the linkage of parental financial characteristics to children's student debt outcomes. The methodology for household and intergenerational linking is detailed in Appendix subsection 5.

1. Summary Statistics

The following descriptive statistics provide an overview of characteristics for our sample of 1.54 million individuals, stratifying by their student loan status during the Great Recession (GR) and by the severity of local economic shocks experienced in that period. Key summary statistics are detailed in Table 1 and Table 2. Complementing these tables, Figure 1 through Figure 8 illustrate prominent trends in estimated wealth across these groups over a twenty-year period. In all of the subsequent analysis, all wealth values are presented in 2024 dollars, while all other monetary figures, such as debt balances and credit limits, are reported as nominal values for their respective years.

A main part of the analysis is the distinction based on student debt burdens during

[2]Our benchmarking compares distributions from a single longitudinal sample rather than repeated cross-sections. The analysis follows one UC–CCP panel of borrowers who are age 55+ by 2024; thus the age composition in earlier years (e.g., 2016 includes individuals roughly 47+ given cohort aging) differs from the population at large. Year-to-year shifts in our wealth distribution therefore reflect both true dynamics and cohort composition/aging, not just changes in the underlying population distribution.

the Great Recession (2007–2009). The data in Table 1 reveal that approximately 7.5 percent of individuals in our primary sample held student debt during this period (termed the "Yes" group in Table 1, denoting those with student debt during the GR). The comparison cohort, individuals who did not hold student debt during the GR or after, is termed the "No" group. Demographically, individuals who did not have student debt were, on average, younger in 2006 (mean age 47.7 years) compared to those who did (53.3 years). Both groups faced similar mean Commuting Zone (CZ) unemployment shocks during the crisis. An important intergenerational aspect captured in Table 1 (shown for 2024) is the status of their children's student debt. Individuals who had student debt during the GR were substantially more likely to have children who incurred student loan debt at any point between 2021–2024 (33.3 percent) compared to individuals that never incurred student loan debt (14.2 percent).

TABLE 1. DESCRIPTIVE STATISTICS FOR OLDER ADULTS BY STUDENT DEBT STATUS DURING GREAT RECESSION (2006, 2015, AND 2024)

	2006		2015		2024	
Had Student Debt During Great Recession	No	Yes	No	Yes	No	Yes
Panel A: Demographics and Economic Context						
Mean Age (Years)	53.3	47.7	62.3	56.7	71.3	65.7
Mean CZ Unemp. Rate (%)	4.6	4.6	5.3	5.2	4.0	4.0
Share: Child Has Student Debt (%)	—	—	—	—	13.1	33.9
Panel B: Credit Profile, Wealth and Debt						
Mean Credit Score	751.4	705.1	754.0	712.6	758.6	749.7
Mean Credit Limit ($)	37,940.4	37,227.9	26,706.3	27,876.5	28,891.8	34,128.4
Mean Credit Util. (%)	27.6	45.5	20.2	33.6	17.3	25.4
Mean Est. Wealth ($)	22,218.9	−50,132.7	69,426.6	−18,185.5	175,527.1	147,971.0
Panel C: Student Debt Details						
Mean Student Debt Balance ($)	—	36,028.2	—	51,844.9	—	40,601.0
Mean Balance (Delinquent) ($)	—	786.7	—	1978.9	—	729.8
Share With Fully Repaid Debt(%)	—	—	—	—	—	17.5

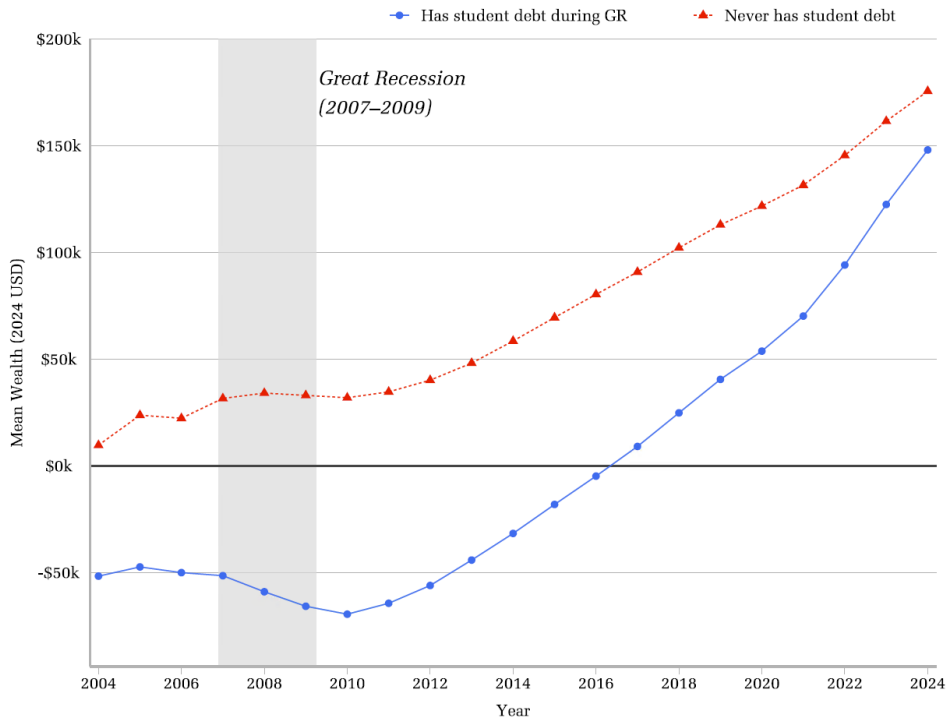
Notes: This table presents mean characteristics for a panel of individuals aged 55+ in 2024, shown for years 2006, 2015, and 2024. Individuals are stratified into two groups. The "Yes" group includes individuals who held an outstanding student loan balance at any point during the Great Recession (2007–2009). The "No" group includes individuals who did not hold student debt during the GR or at any point thereafter. Estimated wealth values are in 2024 dollars; all other monetary values are nominal. "Share: Child Has Student Debt" indicates the share of individuals in the sample whose identified adult child held student debt between 2018–2024. "—" indicates data are not applicable for the group.
Data sources: University of California Consumer Credit Panel (UC-CCP); Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS); Federal Housing Finance Agency (FHFA).

The financial characteristics also differed prior to and after the GR for the two groups. In 2006, the indebted group had lower mean credit scores (705.1 vs. 751.4) and higher credit utilization rates (45.5 percent vs. 27.6 percent), disparities that persisted, albeit narrowed, by 2024. The most striking contrast lies in mean estimated wealth.[3] The mean estimated wealth of the indebted group was already deeply negative at -$50,132, compared to a positive mean wealth of $22,219 for their non-indebted peers. This initial wealth disparity defines the financial trajectories of these two groups for the next two decades. The time-series plot in Figure 1 illustrates this persistent gap. The wealth of the non-indebted group grows steadily from 2004 to 2024. In contrast, the wealth of the indebted group remains negative until 2017 and, despite appreciating thereafter, never closes the gap, remaining

[3]It is important to reiterate that the wealth estimates used in this paper primarily capture housing equity, derived from property value estimates and mortgage and home equity loan balances, net of other reported non-student debt. This methodology, presented in Appendix subsection 4., does not incorporate other major components of wealth, such as liquid assets like cash and savings accounts, financial investments like stocks and bonds, or retirement accounts.

substantially lower through 2024.

FIGURE 1. MEAN ESTIMATED WEALTH BY YEAR AND STUDENT DEBT STATUS DURING THE GREAT RECESSION, 2004–2024



Notes: This figure plots the mean estimated wealth (in 2024 USD) for individuals aged 55+ in 2024. The sample is stratified by whether an individual held student debt during the Great Recession (2007–2009). The blue line represents individuals who had student debt during the GR; the red line represents those who did not.

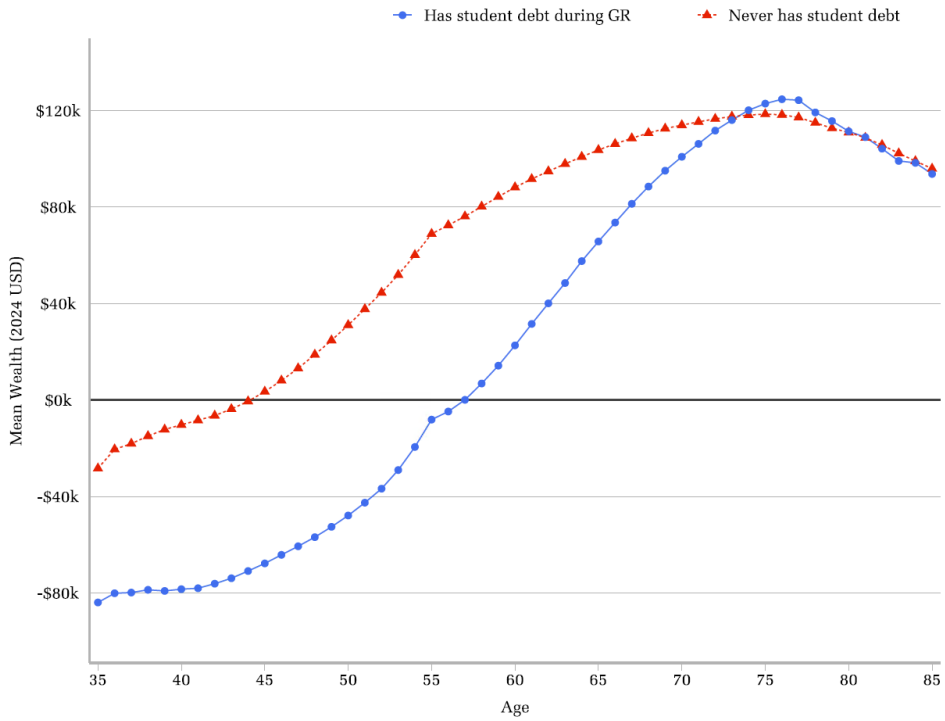
Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

The wealth disparity between groups does close up when looking at mean wealth by age, as illustrated in Figure 2, however, this occurs only after the 70 age mark. From that age onward, the mean wealth values are nearly identical for both groups. In other words, individuals with student debt during the GR have significantly less wealth than their counterparts during their prime working years, only reach similar estimated wealth values well after retirement age, and stay in the same trajectory as their peers into their 80s.[4] These findings suggest that instead of enabling student borrowers to increase their income during prime working years, student debt has increasingly shifted the cost of higher education

[4]It is important to note that the non-indebted group is older, meaning they went (or could have gone) to college when it was more affordable and could have paid off any incurred student debt before the onset of the GR in 2007.

from the public sector onto individuals, a trend that intensified for younger borrowers relative to older ones before and during the Great Recession. The supposed earnings premium from debt-financed education, therefore, offers little evidence of fostering a wealth advantage for this indebted cohort during their primary working and accumulation phases. Instead, any such premium appears largely negated in terms of timely wealth building, suggesting that for individuals navigating substantial educational debt through major economic crises, the traditional wealth-building pathways may be fundamentally disrupted or rendered ineffective.

FIGURE 2. MEAN ESTIMATED WEALTH BY AGE AND STUDENT DEBT STATUS DURING THE GREAT RECESSION

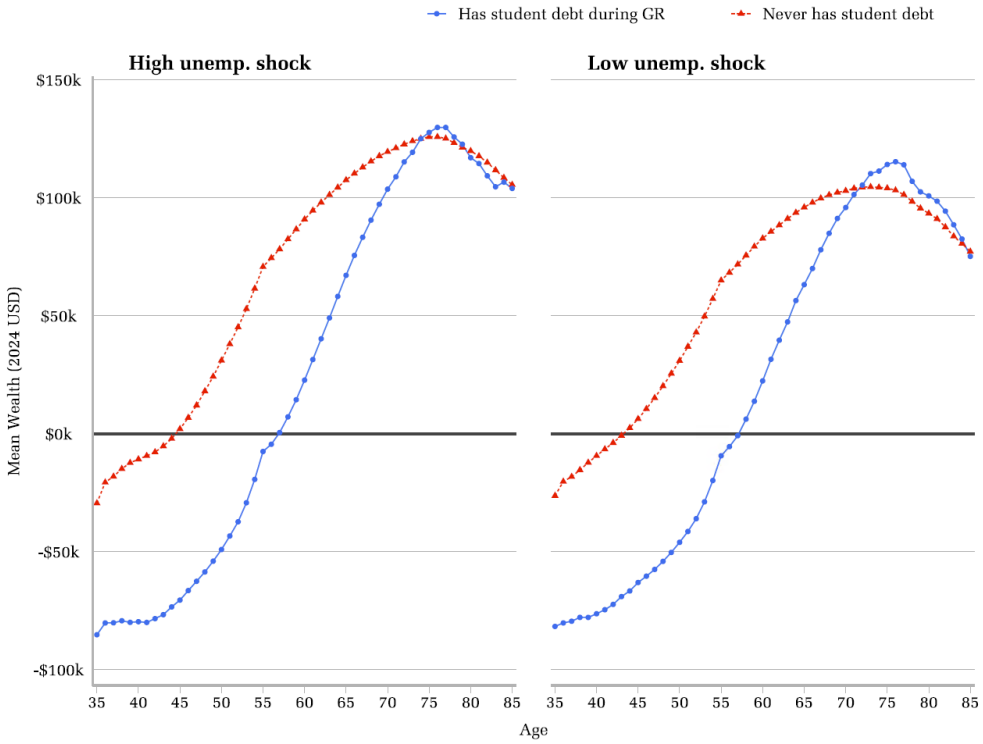


Notes: This figure plots life-cycle profiles of mean estimated wealth (in 2024 USD). The sample is stratified by whether an individual held student debt during the Great Recession (2007–2009). Each point represents the mean wealth for individuals at a specific age, pooling observations across the 2004–2024 panel. Data for ages over 85 are excluded due to small sample sizes.
Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

The immediate impact of the GR on wealth accumulation is also evident. Between the ages of 36 and 41, which for the sample corresponds to the period from 2006 to 2011,

the mean wealth for indebted individuals remains flat, while it continues to rise for their non-indebted counterparts. This stagnation was not uniform across groups; it was heavily concentrated among those who experienced both a student debt burden and a severe local economic shock. As shown in Figure 3, indebted individuals residing in commuting zones with above-average percentage point increases in the unemployment rate ("high-shock") saw virtually no wealth growth during the GR period and for a couple of years following.

FIGURE 3. MEAN ESTIMATED WEALTH BY AGE, STUDENT DEBT STATUS, AND LOCAL GR SHOCK SEVERITY



Notes: This figure plots life-cycle profiles of mean estimated wealth, disaggregated by student debt status during the Great Recession (GR) and the severity of the local unemployment shock in the individual's commuting zone (CZ). "High unemp. shock" refers to CZs with an above-mean increase in the unemployment rate from 2007–2009. "Low unemp. shock" is below-mean.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

In contrast, indebted individuals living in areas below-average unemployment rate upswings ("low-shock"), and even those in the non-indebted and high-shock group, continued to accumulate wealth, albeit at a slower pace. This demonstrates that the combination of student debt and a severe local labor-market crisis was particularly detrimental to wealth

building.[5]

Local economic conditions also correlate with the student loan debt, as exhibited in Table 2. For those who held student debt during the GR, residing in a high-shock area is with higher, and growing, average student loan balances and higher delinquent balances throughout the post-recession period compared to their counterparts in low-shock areas. In 2015, borrowers in high-shock areas averaged roughly $2,500 more in student debt balance than those living in low-shock areas ($52,790 compared to $50,225). By 2024, this difference increased to nearly $4,000 higher for high-shock zones ($41,941 vs. $38,277).

TABLE 2. DESCRIPTIVE STATISTICS FOR OLDER ADULTS BY LOCAL GREAT RECESSION SHOCK SEVERITY (2006, 2015, AND 2024)

	2006		2015		2024	
CZ Unemployment Shock	Low	High	Low	High	Low	High
Panel A: Demographics and Economic Context						
Mean Age (Years)	53.0	52.8	62.0	61.8	71.0	70.8
Mean CZ Unemp. Rate (%)	4.4	4.7	4.8	5.6	3.6	4.2
Share: Student Debt During GR (%)	—	—	—	—	8.1	7.1
Share: Child Has Student Debt (%)	—	—	—	—	15.3	14.3
Panel B: Credit Profile, Wealth and Debt						
Mean Credit Score	749.3	747.3	754.6	749.1	759.3	757.3
Mean Credit Limit ($)	37,774.4	37,944.8	27,094.3	26,639.1	29,399.4	29,279.7
Mean Credit Util. (%)	28.4	29.2	20.6	21.6	17.5	18.2
Mean Est. Wealth ($)	12,548.1	19,007.8	58,181.5	65,278.6	155,313.3	182,698.8
Panel C: Student Debt Details						
Mean Student Debt Balance ($)	35,237.7	36,484.3	50,225.1	52,779.7	38,277.5	41,941.8
Mean Balance (Delinquent) ($)	761.4	801.7	1801.7	2081.2	651.6	774.9
Share With Fully Repaid Debt (%)	—	—	—	—	17.4	17.5

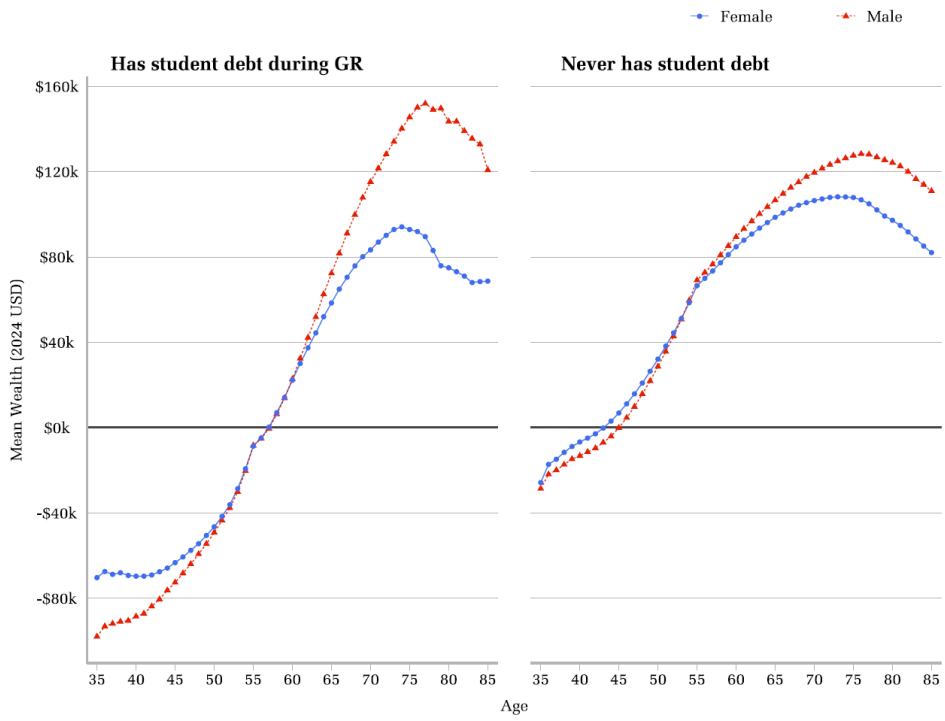
Notes: This table presents mean characteristics for individuals aged 55+ in 2024, shown for years 2006, 2015, and 2024. Individuals are stratified based on the severity of the Great Recession unemployment shock in their 2007–2009 commuting zone (CZ). "High Shock" indicates a CZ with an above-mean increase in the unemployment rate from 2007 to 2009; "Low Shock" is below-median. Panel C details are calculated only for the subset of individuals who held student debt during the GR. Estimated wealth is in 2024 dollars; all other monetary values are nominal. "—" indicates data not applicable.
Data Sources: University of California Consumer Credit Panel (UC-CCP); Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS); Federal Housing Finance Agency (FHFA).

These findings suggest that while eventual repayment outcomes were comparable, individuals with GR-era student debt situated in more severely affected local economies tended to carry higher debt loads and faced, on average, greater challenges with repayment and delinquency during the post-recession period.

[5]Approximately 66.3 percent of sampled individuals resided in Commuting Zones (CZs) with above-average percentage point increases in the unemployment rate during the Great Recession.

Additionally, these wealth disparities exhibit further heterogeneity across other demographic lines. The age-wealth profiles disaggregated by gender in Figure 4 and Figure 5 reveal that while men generally have higher mean estimated wealth, the gender wealth gap is substantially wider in later life for the cohort that held student debt during the GR. Notably, this gender wealth gap from age 65 onward is more pronounced for those who had student debt during the GR.

FIGURE 4. MEAN ESTIMATED WEALTH BY AGE, GENDER, AND STUDENT DEBT STATUS DURING THE GREAT RECESSION



Notes: This figure plots life-cycle profiles of mean estimated wealth, disaggregated by gender and by whether the individual held student debt during the Great Recession (2007–2009). The left panel shows individuals who had student debt; the right panel shows those who did not.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

While men in the indebted group see their mean wealth expand from around $60,000 at age 65 to nearly $150,000 by age 75, the mean wealth for the women in the same group grows more modestly from approximately $40,000 to $90,000 over the same age span, thereby substantially widening the gender wealth gap in later life for this cohort. Figure 5 indicates that these general patterns of men having a wealth advantage persist even when accounting for the severity of local GR shocks.

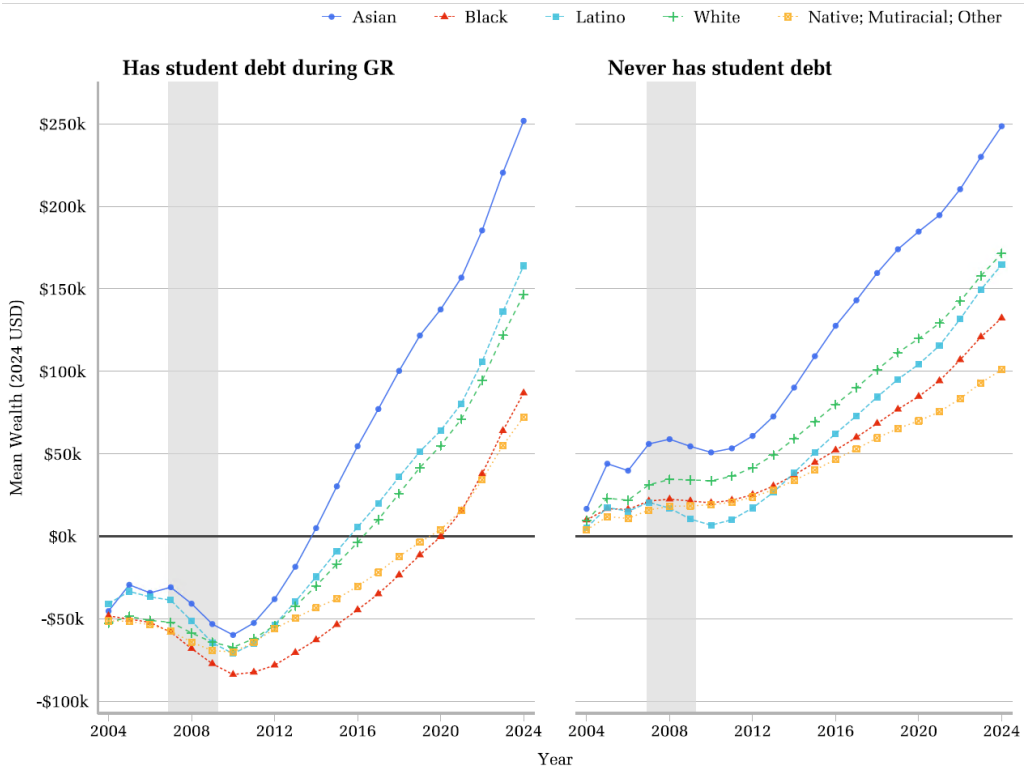
FIGURE 5. MEAN ESTIMATED WEALTH BY AGE, GENDER, STUDENT DEBT STATUS, AND LOCAL GR SHOCK SEVERITY

Notes: This figure plots life-cycle profiles of mean estimated wealth, disaggregated by gender, student debt status during the Great Recession (GR), and the severity of the local GR unemployment shock. Each quadrant represents a different combination of these characteristics.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

Racial and ethnic disparities are even more prominent.[6] The time-series plots in Figure 6 show that among indebted group, Black individuals began with the most negative mean wealth and experienced the sharpest decline during the recession, with a much slower recovery than all other racial and ethnic groups.

FIGURE 6. MEAN ESTIMATED WEALTH BY YEAR, RACE/ETHNICITY, AND STUDENT DEBT STATUS DURING THE GREAT RECESSION



Notes: This figure plots mean estimated wealth from 2004–2024, disaggregated by imputed race/ethnicity and by whether the individual held student debt during the Great Recession (2007–2009). The left panel shows individuals who had student debt; the right panel shows those who did not.

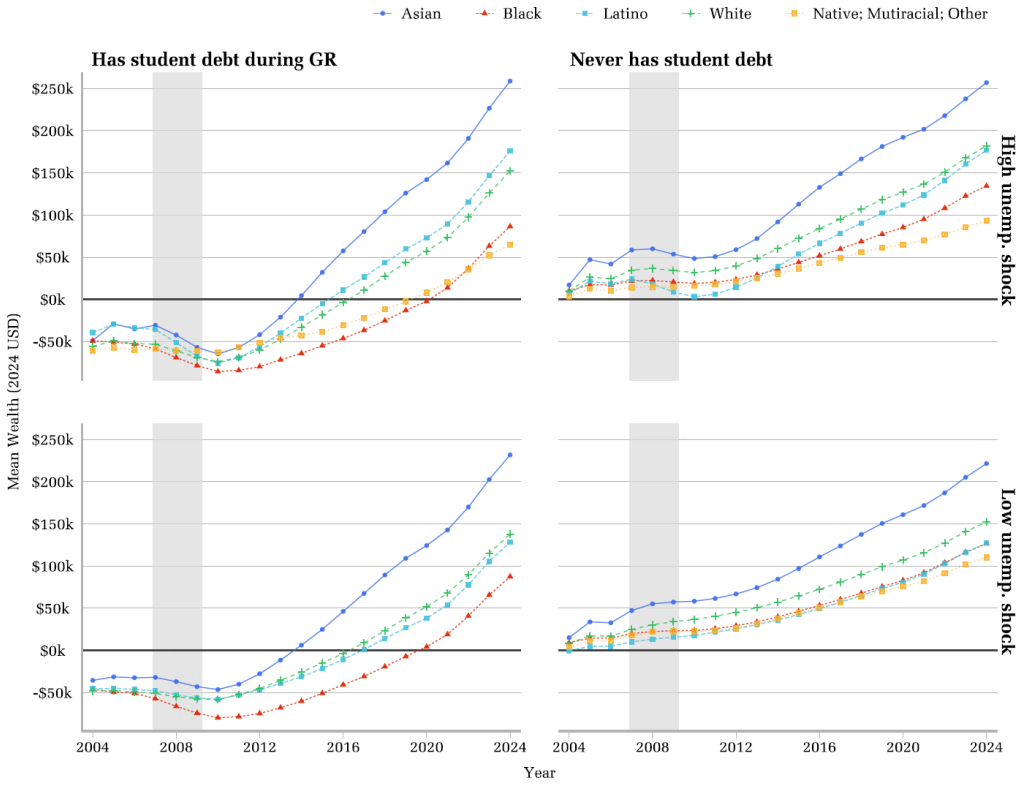
Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

On average, Black individuals who had student debt during the GR have a mean wealth of about $-\$50,000$ in 2004. This value fell further during the GR years to roughly $-\$80,000$

[6]The specific construction of our sample and the criteria used for stratification—particularly the definition of holding student debt during the GR—may lead to compositional effects within demographic subgroups. This means that observed wealth disparities between certain groups in our study, such as racial or ethnic groups, might differ from patterns reported in broader population statistics or other research contexts. For example, within our specific sample of individuals who held student debt during the GR, Latino individuals are observed to have a higher mean wealth trajectory from mid-life onward compared to White individuals in the same group. This particular outcome could arise if the criteria for inclusion in the "has student debt during GR" cohort disproportionately draws in a White subgroup that is, on average, less affluent than the Latino subgroup meeting the same conditions within our panel. Such sample-specific compositional factors should be considered when interpreting the presented comparative wealth findings.

in 2010. Their subsequent recovery was slower than most of their peers, resulting in persistently lower wealth levels in later years compared to other racial and ethnic groups who also had student debt during the GR. Additionally, this group experienced similar wealth patterns in both high- and low-shock areas, as seen in Figure 7. This is notably different than for other race/ethnicity groups, where trend is that of individuals who lived in high-shock CZs during the GR having a lower estimated wealth during from 2007 to 2011, but much higher wealth in more recent years.

FIGURE 7. MEAN ESTIMATED WEALTH BY YEAR, RACE/ETHNICITY, STUDENT DEBT STATUS, AND LOCAL GR SHOCK SEVERITY



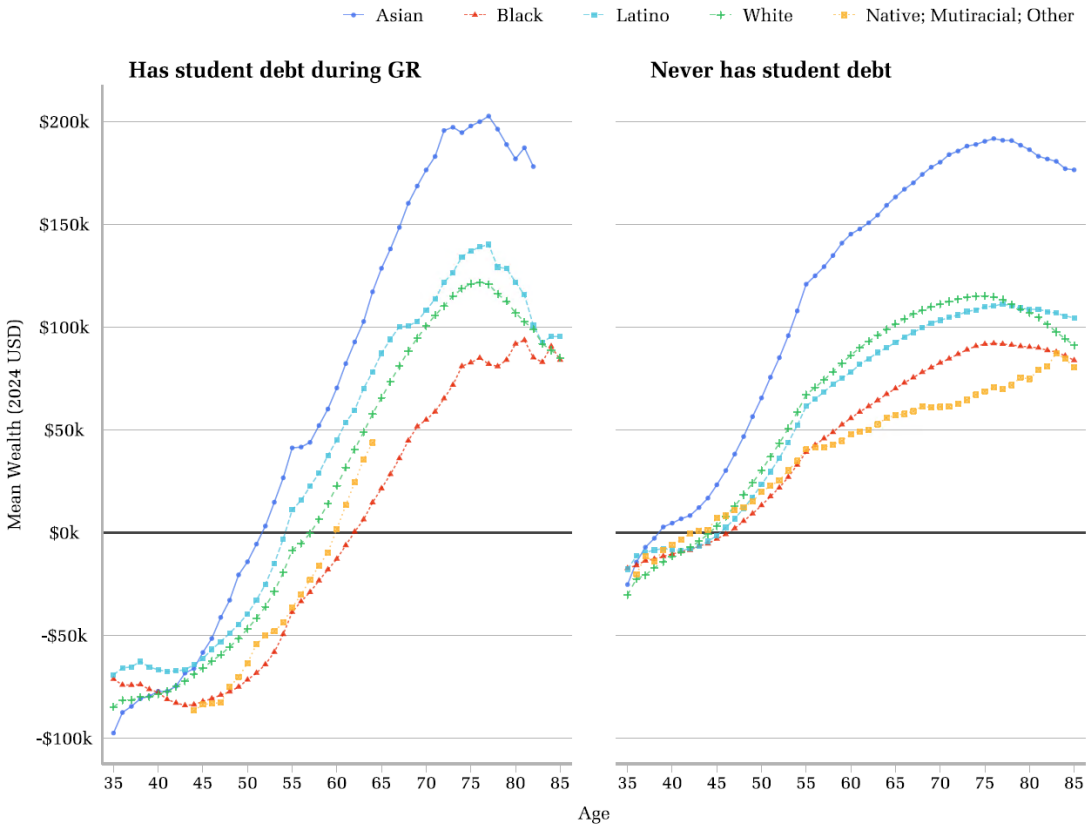
Notes: This figure plots mean estimated wealth from 2004–2024, disaggregated by imputed race/ethnicity, student debt status during the Great Recession (GR), and the severity of the local GR unemployment shock. Each quadrant represents a different combination of these characteristics.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

The age-wealth profiles presented in Figure 8 further underscore these persistent racial wealth gaps across the life cycle for cohorts with and without student debt from the GR period. On average, only Asian and White borrowers experienced wealth growth during

the GR and subsequent four years that followed (ages 36 to 43). These descriptive findings make clear that the confluence of student debt and a major economic crisis did not impact all individuals equally but instead deepened pre-existing structural inequalities.

FIGURE 8. MEAN ESTIMATED WEALTH BY AGE, RACE/ETHNICITY, AND STUDENT DEBT STATUS DURING THE GREAT RECESSION



Notes: This figure plots life-cycle profiles of mean estimated wealth, disaggregated by imputed race/ethnicity and by whether the individual held student debt during the Great Recession (2007–2009). The left panel shows individuals who had student debt; the right panel shows those who did not.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

So far we have established the following facts by means of summary statistics: individuals with student debt during the GR were younger, had lower credit scores, higher credit utilization, and significantly lower (often negative) initial wealth compared to those without student debt. Those with GR-era student debt were also more likely to have children with student debt. GR shock severity appears correlated with higher student loan balances and delinquency for those who had debt during the recession. Wealth accumulation was visibly flatter during the GR for indebted individuals, especially in high-shock areas. Sig-

nificant wealth disparities exist by gender and race, with women and Black individuals who had student debt during the GR experiencing the most pronounced negative wealth impacts. These descriptive findings will be further investigated using regression analysis in the next section.

III Results

The descriptive statistics point to a strong relationship between student debt, the Great Recession, and long-term financial outcomes. To more formally investigate these connections, we employ three distinct empirical strategies. First, we adapt the local labor market shock framework of Pinto and Steinbaum (2023) to estimate the causal impact of the GR on the student debt outcomes of this older cohort. Second, we use a fixed-effects panel model to analyze how holding student debt during the GR, and the severity of the shock itself, affected subsequent wealth accumulation. Finally, we use a two-part model to explore intergenerational trends by analyzing the relationship between parental financial characteristics—including their wealth and GR-era student debt experiences—and their adult children's student debt outcomes.

1. The Great Recession's Impact on Older Adults' Student Debt

To assess the impact of the GR on the student debt of older cohort central to this study, we estimate a model relating changes in debt outcomes to the severity of the local unemployment shock experienced during the recession, controlling for baseline characteristics and other time-varying factors. This model is adapted from the local labor market shock identification strategy employed by Pinto and Steinbaum (2023). While P&S focused on younger individuals (aged 17–34 in 2009), this application of their framework examines individuals aged 55 and older in 2024. The estimated variants of the P&S model are specified

as:

$$y_{i,t} = \alpha + \beta_t \, \Delta\text{Unemp}_{c,2007\text{-}09} + \gamma X_{i,2008} + \delta Z_{i,t} + \epsilon_{i,t}, \quad (1)$$

where $y_{i,t}$ represents various student debt-related outcomes for individual i in year t. For continuous outcomes, this is the change from 2008 to 2019, using the middle of the GR as a baseline. The variable $\Delta\text{Unemp}_{c,2007\text{-}09}$ is the key independent variable, measuring the severity of the GR shock in individual i's commuting zone (CZ) of residence during 2007–2009. The model also includes baseline individual covariates from 2008 ($X_{i,2008}$), such as gender and 2008 student loan balances, and time-varying local controls like the contemporaneous CZ unemployment rate ($Z_{i,t}$).

The results from applying this specification to our older adult sample are presented in Table 3. The findings indicate that exposure to more severe local GR unemployment shocks had a significant and detrimental impact on several student debt metrics for this older cohort. Specifically, a one percentage point increase in the GR unemployment rate shock is associated with an average increase of approximately $619.9 in student loan balances relative to 2008 (Column 1) and an $89.1 increase in delinquent balances (Column 2). Furthermore, the shock significantly raised the delinquent ratio by 0.002 (Column 3) and increased the likelihood of any delinquency by 2019 by 0.3 percentage points (Column 4). These core results on increased indebtedness and delinquency due to GR shocks are broadly consistent with the findings of P&S for younger cohorts, suggesting a shared vulnerability in terms of debt accumulation and repayment struggles when facing severe economic downturns. However, there are some key distinctions, the main one being that the negative effects of the GR unemployment rate shock appear to be more severe for our sample of older borrowers. P&S find that for every one percentage point increase in the GR shock, student debt balances in 2019 increase by $370.3 relative to 2009 (compared to $619.9 for our sample). Additionally, P&S show that an increase in the GR shock is associated with a slight decrease in delinquent student loan debt ($-76.5) while our study reveals an increase ($89.1).

Among other covariates, being female in this older cohort is significantly associated with a substantially larger increase in student loan balances (by approximately $2,727), a 0.5 percentage point higher likelihood of any delinquency by 2019, a 0.5 percentage point lower probability of completed repayment, and a 0.3 percentage point higher likelihood of re-enrollment in the prior year as of 2019. These initial results therefore suggest that, much like their younger counterparts, older adults in harder-hit areas accumulated more student debt and experienced greater repayment difficulties as a consequence of the GR.

TABLE 3. REGRESSION ANALYSIS OF GREAT RECESSION SHOCKS ON STUDENT DEBT OUTCOMES FOR OLDER ADULTS

	(1) Change in balance (vs. 2008)	(2) Change in delinquent balance (vs. 2008)	(3) Change in delinquent ratio (vs. 2008)	(4) Any delinquency (2019)	(5) Completed repayment (2019)	(6) Re-enrolled over last year (2019)
Unemp. rate shock	619.924***	89.090***	0.002***	0.003***	-0.001	0.000
	(136.401)	(36.363)	(0.001)	(0.001)	(0.001)	(0.000)
Contemporaneous CZ unemp. rate	-139.958	0.448	0.001	0.001	-0.001	0.000
	(218.445)	(44.996)	(0.001)	(0.001)	(0.001)	(0.000)
Female	2,727.093***	89.105	0.001	0.005***	-0.005***	0.003***
	(356.007)	(95.189)	(0.001)	(0.002)	(0.002)	(0.001)
2008 student debt balance (000s USD)	-184.006***	10.579***	0.000	0.001***	0.001***	0.001***
	(5.214)	(2.718)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	97,058	97,058	97,058	97,058	97,058	97,058
R^2	0.283	0.021	0.017	0.019	0.069	0.903
Cohort x Age FEs	Yes	Yes	Yes	Yes	Yes	Yes

*** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Notes: This table presents OLS regression results adapting the Pinto and Steinbaum (2023) specification to an older cohort. The sample consists of individuals with student debt during the Great Recession (GR). The dependent variables are various student debt outcomes measured in 2019. The main independent variable, "Unemp. rate shock," is the percentage-point change in the commuting zone (CZ) unemployment rate from 2007–2009. All models include cohort-by-age fixed effects. Robust standard errors, clustered at the CZ level, are in parentheses.

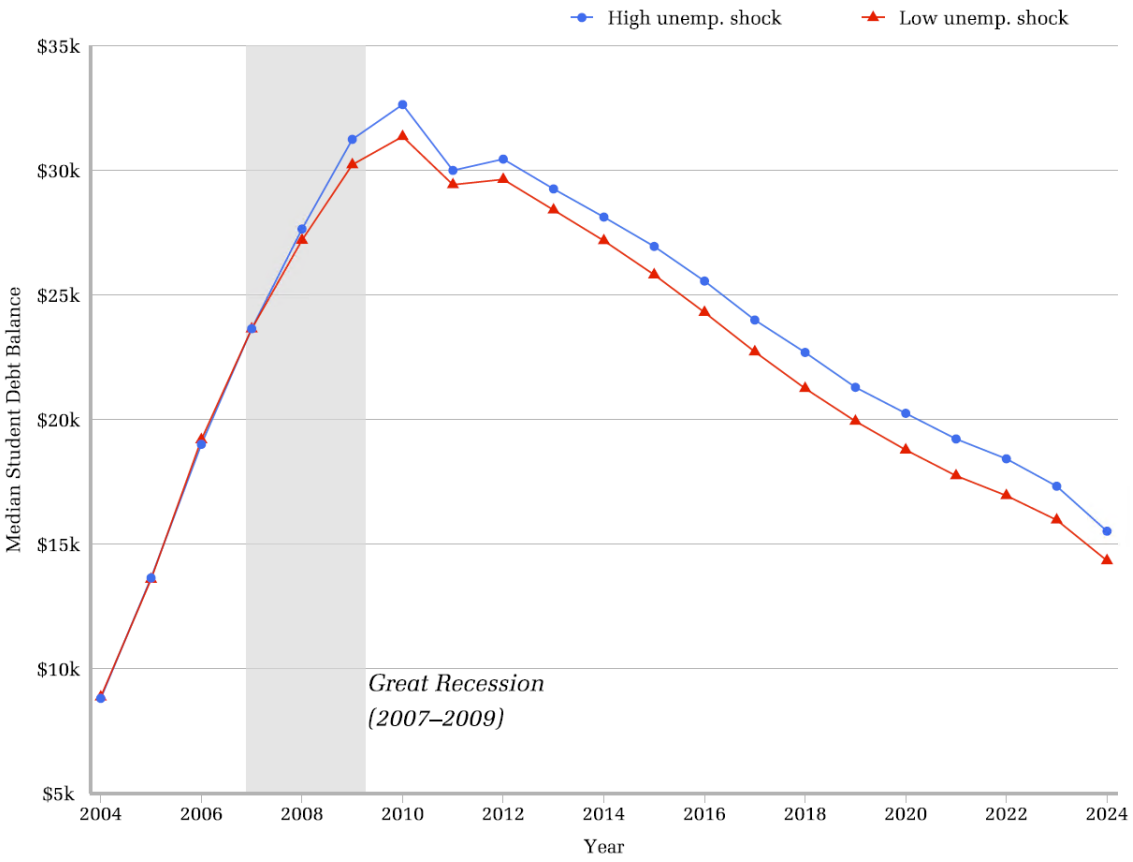
Data Sources: Author's calculations using data from UC-CCP and LAUS.

1.A. Event Study Extension

To explore the dynamic effects of these GR shocks on student debt balances over a longer horizon, we extend the P&S approach by implementing an event study design. Figure 9 provides a descriptive visualization of this, showing median student loan debt for individuals in high GR shock CZs began to diverge and rise above that of individuals in

low-shock CZs in the years following the recession.

FIGURE 9. MEDIAN STUDENT DEBT BALANCE BY LOCAL GREAT RECESSION SHOCK SEVERITY, 2004–2024



Notes: This figure plots the median outstanding student debt balance for older adults who held debt during the Great Recession. The sample is stratified by the severity of the local GR unemployment shock in the individual's commuting zone (CZ). "High unemp. shock" refers to CZs with an above-mean increase in the unemployment rate from 2007–2009.

Data Sources: Author's calculations using data from UC-CCP and LAUS.

The event study model more formally estimates the differences in student debt balances year by year. The estimated variants of the DiD model are as follows:

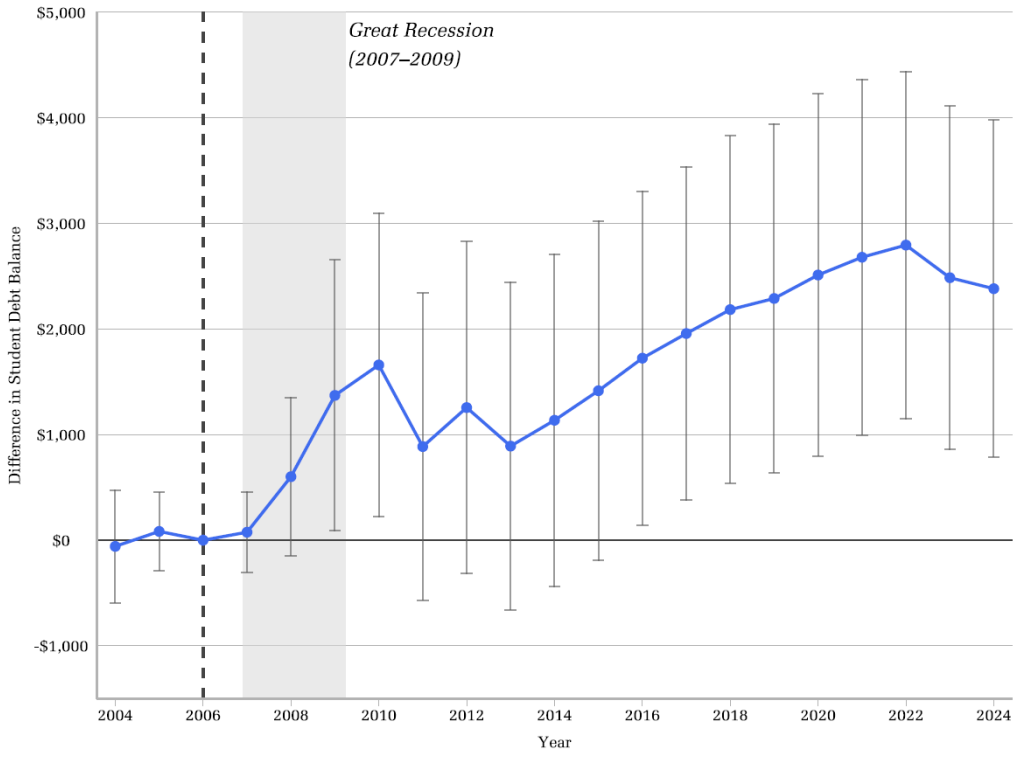
$$y_{i,t} = \alpha + \sum_{k \neq -1} \beta_k \{\text{Shock}_i = 1\} \times \{\text{Event}_{i,t} = k\} + \theta \, \text{Unemp}_{i,t} + \mu_i + \lambda_{a(i),t} + \varepsilon_{i,t}, \quad (2)$$

where $y_{i,t}$ is the student loan balance for individual i in year t. The term $\{\text{Shock}_i = 1\}$ is an indicator for residing in a CZ that experienced an above-mean GR unemployment shock. $\{\text{Event}_{i,t} = k\}$ is an indicator for year k relative 2007. Meaning, $k = -1$ (2006) is the omitted reference period, $k = 0$ corresponds to 2007 (the onset of the recession), and k ranges from -3 (2004) through 17 (2024). The coefficients β_k trace the differential effect on student debt balances for individuals in high-shock CZs for each year k relative to the onset of the GR (with $k = -1$, corresponding to 2006, as the omitted reference period), compared to those in low-shock CZs. The model includes individual fixed effects (μ_i), interactions of calendar year with baseline age deciles ($\lambda_{a(i),t}$), and the contemporaneous CZ unemployment rate ($\text{Unemp}_{i,t}$). The age-decile-by-calendar-year fixed effects ($\lambda_{a(i),t}$) are incorporated to capture the likelihood that the Great Recession exerted distinct, dynamically evolving impacts on different cohorts based on their age at the time of the downturn. Given that cohorts experiencing the Great Recession at different life stages might also have varying propensities to take out student loans—due to secular trends like rising tuition for instance—these fixed effects isolate the impact of the Great Recession itself from such compositional changes.

The estimated coefficients β_k from this event study are plotted in Figure 10 and detailed in Table 4. The figure shows no significant pre-existing differential trend in student loan balances between high- and low-shock areas for this cohort before 2007, as the coefficients for 2004 and 2005 are small and statistically insignificant relative to the 2006 baseline. Following the onset of the GR, the impact of residing in a high-shock CZ on student loan balances begins to emerge. The coefficients become positive and statistically significant from 2009 onward. For instance, by 2009, individuals in high-shock areas had accumulated, on average, approximately $1,371 more in student debt than their counterparts in

low-shock areas (Table 4). This effect not only persisted but also amplified considerably over the following decade, peaking at an estimated additional $2,795 in student debt by 2022. Even by 2024, fifteen years after the end of the GR, the impact remained substantial and highly significant, with student balances approximately $2,382 higher in high-shock areas. This event study analysis reveals that the effects of severe Great Recession shocks on student debt accumulation for older adults were not immediate but grew progressively larger and were remarkably persistent long into the post-recession period.

FIGURE 10. THE PERSISTENT EFFECT OF GREAT RECESSION SHOCKS ON STUDENT DEBT ACCUMULATION



Notes: This figure plots the event study coefficients (β_k) from Equation 2, showing the differential change in student debt for individuals in high-shock areas relative to those in low-shock ones. The shaded gray area indicates the Great Recession (Dec 2007 – Jun 2009). Vertical bars represent 95% confidence intervals. The model includes individual and age-decile-by-year fixed effects.

Data Sources: Author's calculations using data from UC-CCP and LAUS.

TABLE 4. EVENT STUDY ESTIMATES OF THE EFFECT OF HIGH UNEMPLOYMENT SHOCK ON STUDENT DEBT OVER TIME

	Coefficient	(Std. Error)
High Shock × Year = 2004	−58.71	(272.8)
High Shock × Year = 2005	83.10	(189.1)
High Shock × Year = 2006	0.00	(0.0)
High Shock × Year = 2007	75.38	(194.4)
High Shock × Year = 2008	601.44	(382.6)
High Shock × Year = 2009	1,371.27**	(654.1)
High Shock × Year = 2010	1,659.94**	(734.7)
High Shock × Year = 2011	886.47	(742.0)
High Shock × Year = 2012	1,256.10	(802.5)
High Shock × Year = 2013	891.17	(792.0)
High Shock × Year = 2014	1,135.77	(803.8)
High Shock × Year = 2015	1,415.57*	(819.7)
High Shock × Year = 2016	1,724.02**	(807.1)
High Shock × Year = 2017	1,957.49**	(805.9)
High Shock × Year = 2018	2,184.19***	(839.7)
High Shock × Year = 2019	2,289.69***	(842.2)
High Shock × Year = 2020	2,511.86***	(874.8)
High Shock × Year = 2021	2,680.29***	(859.4)
High Shock × Year = 2022	2,795.36***	(839.7)
High Shock × Year = 2023	2,486.27***	(829.8)
High Shock × Year = 2024	2,382.33***	(814.2)
Fixed Effects:		
Individual	Yes	
Year × Age in 2006	Yes	
Observations	2,407,463	
R^2	0.791	

*** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Notes: This table reports the coefficients (β_k) from the event study model specified in Equation 2. The coefficients represent the estimated dollar difference in student loan balances for individuals in high-shock CZs compared to those in low-shock CZs for each year, relative to the 2006 baseline. Robust standard errors, clustered at the CZ level, are in parentheses.

Data Sources: Author's calculations using data from UC-CCP and LAUS.

2. *Impact of GR Shocks and Student Debt on Wealth Accumulation*

Having established the prolonged impact of Great Recession (GR) shocks on student debt balances for older adults, we now turn to one of the other central questions in this paper: how did carrying student debt through the GR and exposure to severe local economic downturns affect subsequent wealth accumulation. For older individuals approaching or entering retirement, net-worth serves as a key indicator of overall financial health and readiness for post-employment life, offering a more comprehensive measure than income alone as it reflects the long-term capacity to support consumption and absorb financial shocks.

In this study, individual wealth is estimated primarily based on housing equity, which involves imputing current property values from mortgage and home equity tradelines using Federal Housing Finance Agency (FHFA) House Price Index (HPI) data, and then subtracting total reported liabilities. It is important to acknowledge that this measure of net worth, constructed from administrative credit data, differs from more comprehensive estimates found in standard wealth surveys like the Survey of Consumer Finances (SCF). Our measure does not capture financial assets like retirement accounts, savings, or stock holdings. However, it provides a crucial and consistent proxy for tangible, debt-leveraged wealth over a long panel for millions of individuals, offering a unique lens on the balance sheet dynamics that survey data cannot capture at such scale and frequency. A detailed explanation of the methodology is provided in Appendix subsection 4. To investigate the determinants of this wealth measure, we employ fixed-effects panel regressions.

Working with wealth values presents common challenges for empirical analysis, as they often exhibits significant right-skewness and can take on zero or negative values, particularly for individuals carrying substantial debt. Standard logarithmic transformations are unsuitable for non-positive values. Therefore, to appropriately model wealth while addressing these distributional characteristics, we utilize the inverse hyperbolic sine (*asinh*)

transformation for our wealth measure (Burbidge, Magee and Robb, 1988). The *asinh* transformation allows for the inclusion of zero and negative values, mitigates the influence of extreme outliers, and, as discussed by Pence (2006) and Bellemare and Wichman (2020), offers an interpretation similar to a log-transformed variable when dealing with large values, while behaving linearly near zero.

To assess the impact of the Great Recession and student debt on this transformed wealth, we estimate the following fixed-effects panel regression model:

$$W_{it} = \alpha_i + \lambda_t + \delta_1(H_i \times P_t) + \delta_2(S_i \times P_t) + \delta_3(H_i \times S_i \times P_t) + \mathbf{X}'_{it}\beta + \epsilon_{it} \tag{3}$$

Where, W_{it} represents the transformed wealth of individual i in year t, specifically the inverse hyperbolic sine $asinh(\text{Wealth}_{it}/\$10,000)$. The α_i term captures individual fixed effects, controlling for all time-invariant unobserved heterogeneity, while λ_t accounts for year fixed effects; in some specifications, λ_t also includes interactions with an individual's 2006 wealth ventile. Key indicator variables include H_i, which equals 1 if individual i resided in a Commuting Zone (CZ) that experienced a High Great Recession unemployment shock, and 0 otherwise; S_i, which equals 1 if individual i held student debt during the Great Recession (2007–2009) (and 0 otherwise); and P_t, which equals 1 for the Post–GR period (years 2010–2024), and 0 otherwise. The coefficients of primary interest are $\delta_1, \delta_2,$ and δ_3, which estimate the differential impacts associated with GR shock exposure, GR-era student debt status, and their interaction in the post-recession period. The vector $\mathbf{X}_{it}$ includes time-varying controls such as the contemporaneous CZ unemployment rate and Age^2; linear age and the main effects for H_i, S_i, and their direct interaction ($H_i \times S_i$) are absorbed by the individual fixed effects. Finally, ϵ_{it} is the error term.

The results, presented in Table 5, reveal significant and adverse long-term consequences for the wealth of older individuals. Across several comprehensive regression specifications, some of which include individual, year, and year-interacted-with-2006-wealth-ventile

fixed effects, we find strong evidence that both holding student debt during the GR and experiencing a more severe local GR shock independently eroded wealth in the post-recession period (2010–2024).

Specifically, individuals who carried student debt into the Great Recession experienced a profoundly negative impact on their wealth accumulation thereafter. The coefficient on the interaction term *Had GR Student Debt* $\times$ *Post-GR* is estimated at -1.078, indicating a sizeable and persistent deterioration in wealth for borrowers who carried student loans into the Great Recession. Given the inverse hyperbolic sine transformation of wealth, the economic meaning of this coefficient varies with the level of baseline wealth. For individuals whose pre-recession net worth is close to the origin ($|\text{wealth}| \lesssim \$10{,}000$), the *asinh* function is approximately linear; consequently, the estimate implies an *absolute* decline in wealth of about $1.078 \times \$10{,}000 \approx \$10{,}780$. In contrast, at higher absolute wealth levels the *asinh* function approaches the natural logarithm, so the same coefficient reflects a *proportional* change. Transforming the coefficient in the usual log-interpretation way, a reduction of $1 - e^{-1.078}$ maps to approximately a 66 percent decline in estimated wealth. Thus a baseline wealth of \$50,000 would contract to approximately \$16,500, while a pre-existing deficit would deepen by nearly three-times. Under any interpretation the effect is economically large, signifying—even after accounting for individual-specific time-invariant characteristics and common time trends—a substantial reduction in wealth and/or a vastly hindered wealth recovery for older indebted individuals relative to those who did not have student debt during the GR. This suggests that the burden of student debt during a period of severe economic crisis had lasting detrimental effects on financial well-being as these individuals moved closer to or entered retirement.

Exposure to a deeper local labour-market contraction during the Great Recession also reduced later-life wealth. The coefficient on the interaction—*High GR Shock* $\times$ *Post-GR*—is -0.0812, implying an average shortfall of roughly \$812 for households with wealth near zero and about an 8 percent loss for those with substantial assets, highlighting the per-

sistent scarring of severe regional downturns even after controlling for individual fixed effects and student-debt status.

The analysis also examined whether these two factors—student debt during the GR and high local GR shock—had a compounding interactive effect on wealth beyond their individual impacts. This is captured by the triple interaction term, *High GR Shock* $\times$ *Had GR Student Debt* $\times$ *Post-GR*. In the specification that includes the full set of individual, year, and year $\times$ baseline-wealth-ventile fixed effects, but without the CZ-level clustering of standard errors (Table 5, Column 2), this triple interaction coefficient is -0.0249 and is statistically significant at the five percent level. This indicates an additional penalty beyond simply adding the coefficients of the first two interactions, which nets to -1.16. Relative to the baseline the "double-hit" cohort forfeits a further \$250 (or roughly 2.5 percent) so that the total effect reaches -1.184, equivalent to about a decrease of \$11,840 for those with baseline wealth near zero or nearly a 69 percent decline for those starting with sizeable positive wealth, confirming that the concurrence of these two conditions inflicts a slightly larger long-run setback than the sum of both factors.

Finally, the model includes a quadratic age variable to control for standard life-cycle dynamics. The negative estimate indicates that the positive association between age and wealth, not shown in the output as it is absorbed by the individual fixed effects, flattens and eventually turns downward as individuals move from late working life into retirement. As seen in Figure 2, wealth accumulation may begin to decline in old age (70+), a pattern consistent with standard economic theories of saving, asset accumulation during working life, and dissaving or wealth depletion during extended retirement.

TABLE 5. FIXED-EFFECTS PANEL REGRESSION SHOWING THE IMPACT OF GREAT RECESSION UNEMPLOYMENT SHOCKS AND STUDENT LOAN DEBT ON WEALTH ACCUMULATION

	(1)	(2)	(3)	(4)
Transformed Wealth (asinh)				
Contemporaneous CZ Unemp. Rate	-0.0853***	-0.0669***	-0.0853***	-0.0669***
	(0.0006)	(0.0005)	(0.0102)	(0.0093)
Age^2	-0.0020***	-0.0007***	-0.0020***	-0.0007***
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
High GR Shock × Post-GR	-0.0370***	-0.0812***	-0.0370	-0.0812***
	(0.0029)	(0.0021)	(0.0445)	(0.0191)
Had GR Student Debt × Post-GR	-0.0153	-1.078***	-0.0153	-1.078***
	(0.0101)	(0.0090)	(0.0225)	(0.0236)
High GR Shock × Had GR Student Debt × Post-GR	-0.0315**	-0.0249**	-0.0315	-0.0249
	(0.0128)	(0.0112)	(0.0336)	(0.0323)
Fixed Effects:				
Individual	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Year × Wealth Ventile (2006)	No	Yes	No	Yes
Clustering			CZ (2007-2009)	CZ (2007-2009)
Observations	32,271,517	32,271,517	32,271,517	32,271,517
R^2	0.6671	0.7391	0.6671	0.7391

*** $p<0.01$, ** $p<0.05$, * $p<0.10$.

Notes: This table presents fixed-effects panel regression estimates of the impact of the Great Recession (GR) and student debt on wealth for individuals aged 55+ in 2024. The dependent variable in all models is individual wealth transformed using the inverse hyperbolic sine: $asinh(\text{Wealth}/\$10,000)$. "High GR Shock" is an indicator for residing in a commuting zone (CZ) with an above-mean unemployment rate increase from 2007–2009. "Had GR Student Debt" is an indicator for holding student debt during the 2007-2009 period. "Post-GR" is an indicator for years 2010–2024. All models include controls for the contemporaneous CZ unemployment rate and Age^2. Column (1) includes individual and year fixed effects. Column (2) adds interactions for Year × 2006 Wealth Ventile. Columns (3) and (4) are identical to (1) and (2) but cluster standard errors at the 2007–2009 CZ level.

Dependent Variable Transformation: The inverse hyperbolic sine transformation, $(asinh(\frac{wealth}{\$10,000}))$, is used because the underlying wealth data contains numerous negative values and exhibits significant skewness. the *asinh* handles negative and zero values, reduces outlier influence, and approximates the natural logarithm for large absolute values while behaving linearly near zero. Coefficients represent the effect on this transformed scale. For interpretation, a coefficient β approximates a logarithmic percent change in wealth when "wealth/\$10,000" is large (e.g., absolute wealth $>$ \$10,000), similar to a log-level model. When "wealth/\$10,000" is close to zero (e.g., absolute wealth $<$ \$10,000), β approximates a level change in wealth of $10,000 \times \beta$. See Bellemare and Wichman (2020) for discussion.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

2.A. *Dynamic Effects on Wealth: An Event Study Approach*

To further understand the timing and persistence of the wealth impacts, we turn to an event-study framework. This approach traces the year-by-year differential wealth trajectory for older adults who simultaneously carried student debt and lived in high-shock commuting zones—the "double-hit" group—relative to their pre-recession baseline and to individuals without that combination of factors. The estimated model is:

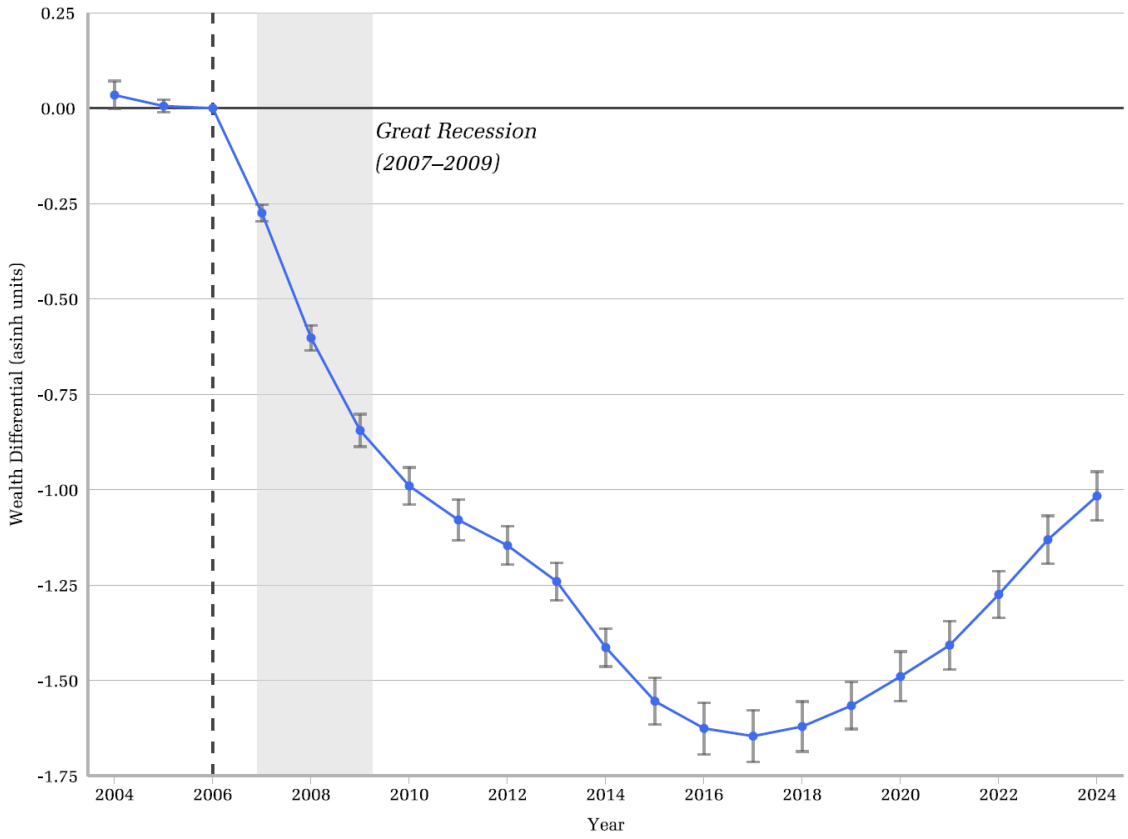
$$W_{it} = \alpha_i + \lambda_t + \sum_{k \neq 2006} \delta_k (T_i \times \mathbf{1}\{\text{Year}_t = k\}) + \mathbf{X}'_{it}\beta + \epsilon_{it} \tag{4}$$

where W_{it} is the $asinh(\text{Wealth}_{it}/\$10,000)$ for individual i in year t. The term α_i represents individual fixed effects, and λ_t represents year fixed effects, capturing common time trends for individuals not belonging to the "double-hit" group. The variable T_i is an indicator equal to 1 if individual i both held student debt during the GR ($S_i = 1$) AND resided in a High GR Shock CZ ($H_i = 1$), and is 0 otherwise. The terms $\mathbf{1}\{\text{Year}_t = k\}$ are indicator variables for each year from 2004 to 2024, with 2006 serving as the omitted reference year. The coefficients δ_k thus estimate the average difference in transformed wealth for the "double-hit" group ($T_i = 1$) in year k, relative to 2006, compared to individuals not in this specific group ($T_i = 0$). $\mathbf{X}_{it}$ includes the same time-varying controls as in Equation 3, such as the contemporaneous CZ unemployment rate and Age^2.

Figure 11 plots these estimated δ_k coefficients and their 95 percent confidence intervals, illustrating the dynamic impact on the "double-hit" cohort. Several key patterns are evident. First, the coefficients for the pre-recession years 2004 and 2005 hover close to zero and are not statistically distinguishable from the 2006 baseline. This suggests no significant pre-existing differential wealth trends for this specific "double-hit" group relative to others before the GR. Second, a sharp and statistically significant decline in relative wealth for this group begins precisely with the onset of the Great Recession in 2007. The coefficient

drops to approximately -0.25 on the *asinh* scale by 2007, continues to falls to approximately -0.55 by 2008, and is lower than -0.8 by the end of the GR in 2009.

FIGURE 11. DIVERGENT WEALTH PATHS: THE IMPACT OF THE GREAT RECESSION ON STUDENT DEBTORS IN HARD-HIT REGIONS



Notes: This figure plots the coefficients δ_k from Equation 4. The dependent variable is $asinh(\text{Wealth}_{it}/\$10,000)$. The coefficients represent the differential change in transformed wealth for individuals who both had student debt during the Great Recession and resided in a high GR shock CZ, relative to 2006 (the omitted year). The shaded area represents the 95% confidence interval. The model includes individual and year fixed effects, and controls for contemporaneous CZ unemployment rate and Age^2.

Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

Third, in the post-recession period, this negative wealth differential for the "double-hit" group continues to intensify substantially, indicating an expanding wealth gap. The adverse impact reaches its maximum severity around 2016–2017, with the coefficient bottoming out at a very large -1.6 on the *asinh* scale. This signifies a profound wealth disadvantage for those who faced both GR-era student debt and high local economic shocks, nearly a decade after the recession's onset. Finally, from approximately 2018 onward, there

is evidence of a gradual, though only partial, recovery in their relative wealth position, with the negative coefficient decreasing in magnitude. However, even by 2024, the coefficient remains around -1.0, indicating that this group still exhibited substantially lower wealth—by a very significant margin on the transformed scale—fifteen years after the recession, compared to others and relative to their pre-recession standing. This event study vividly demonstrates that the combination of holding student debt during the GR and experiencing severe local economic shocks imposed not only an immediate and severe penalty on the wealth of these older individuals but also one that was exceptionally deep and remarkably persistent over the long term.

In summary, the empirical analyses provide substantial evidence of the severe and lasting negative impacts on wealth accumulation for older adults who navigated the Great Recession with student debt or in hard-hit local economies. Our fixed-effects regression models (Table 5) demonstrate that both carrying student debt through the GR and residing in a commuting zone experiencing a more acute unemployment shock independently and significantly depressed subsequent wealth trajectories. While the statistical evidence for an additional, multiplicative compounding effect from experiencing both conditions simultaneously (the triple interaction term) is sensitive to model specification in our main regressions, our event study analysis (Figure 11) illustrates the particularly dire and persistent consequences for the "double-hit". This group experienced a profound and prolonged negative deviation in their wealth path relative to others, reaching a substantial deficit on the transformed wealth scale that, while showing some signs of recovery, remained significantly pronounced fifteen years after the recession. Collectively, these findings highlight a considerable and enduring financial fragility for older individuals marked by these recession-era experiences, with significant implications for their financial security as they approach and move through retirement.

3. *Intergenerational Impacts*

Beyond the direct impacts on the older cohort's own financial well-being, this study also explores potential intergenerational financial linkages. Specifically, we investigate how parental financial characteristics and their experiences during the Great Recession relate to the student debt outcomes of their adult children, analyzing post-GR data from December 2009 to 2024. Given that many adult children may have no student debt, while others have varying positive amounts, we employ a two-part model to address this data structure. This approach allows us to separately estimate the factors associated with the probability of an adult child having any student debt and the factors associated with the magnitude of that debt if it exists.

The first part of our model utilizes a Logit specification to estimate the probability that an adult child of a parent in our sample has any student loan debt:

$$P(D_{it}^* = 1 | \mathbf{Z}_{it}, \text{FEs}) = \Lambda(\gamma_0 + \mathbf{Z}_{it}'\gamma_1 + \mu_c + \tau_t + \phi_{vt}) \tag{5}$$

The second part employs an Ordinary Least Squares (OLS) regression to model the amount of the child's student debt, conditional on them having any debt, using an inverse hyperbolic sine (*asinh*) transformation for the debt amount:

$$C_{it} = \theta_0 + \mathbf{Z}_{it}'\theta_1 + \mu_c + \tau_t + \phi_{vt} + \nu_{it} \quad \text{if } D_{it}^* = 1 \tag{6}$$

In these models (Equations 5 and 6), D_{it}^* is an indicator if an adult child of parent i has any student loan debt. The term $\Lambda(\cdot)$ is the logistic cumulative distribution function. C_{it} represents the transformed maximum student debt of an adult child, specifically $asinh(\text{MaxChildDebt}_{it}/\$10,0$ where the sample for this second stage is conditional on the child having a positive student loan balance in any period from 2018–2024. The vector $\mathbf{Z}_{it}$ comprises time-varying parental characteristics observed in year t, including the parent's transformed wealth ($asinh(\text{ParentalWealth}_{it}/\$1$

an indicator for whether the parent held student debt during the GR, the contemporaneous CZ unemployment rate, the parent's age, and parent's age squared. Both models incorporate fixed effects (FEs) for the parent's GR-defined Commuting Zone (μ_c), year fixed effects (τ_t), and interactions of year fixed effects with the parent's 2006 wealth ventile (ϕ_{vt}). The vectors of coefficients γ_1 (for the Logit model) and θ_1 (for the OLS model) capture the associations between these parental characteristics and the respective child debt outcomes. Standard errors for these estimates are clustered by the parent's GR-defined Commuting Zone.

The results from this two-part model, presented in Table 6, reveal significant intergenerational financial correlations for the 2009–2024 period. Focusing on the Logit model for the probability of a child having any student debt (Column 1), we find that parental transformed wealth is negatively associated with the likelihood of their children incurring student debt, but this association is not statistically significant. However, a strong intergenerational pattern emerges with respect to parental debt history. Parents who themselves held student debt during the Great Recession are significantly more likely to have children with student debt, with a coefficient of 0.7533 indicating substantially higher log-odds. In other words, those who had outstanding student debt during the GR are just over twice as likely to have an adult child who ever shows up with their own student debt in our 2018–2024 window. The contemporaneous CZ unemployment rate faced by the parent shows no significant relationship with the child's likelihood of having debt. Parental age exhibits a significant non-linear association (initially positive, then concave due to the negative Age^2 term) with the probability of children holding student debt. The positive coefficient on parent age is likely because older parents tend to have children who are older, and older children are more likely to have had the opportunity to take on student debt before the end of the observation panel.

Turning to the OLS model for the maximum amount of child student debt, conditional on the child having any (Column 2), parental wealth plays a more discernible role. Higher

TABLE 6. INTERGENERATIONAL LINKS: THE ASSOCIATION OF PARENTAL FINANCES AND GR EXPERIENCES WITH ADULT CHILDREN'S STUDENT DEBT

	(1) Logit Model	(2) OLS Model
	$P(Child\ Has\ Any\ Student\ Debt)$	$asinh(\frac{\max Child\ Debt}{10k})$ $(Conditional\ on\ Student\ Debt > 0)$
Parental Characteristics:		
Transformed wealth (asinh)	-0.0010	-0.0045***
	(0.0019)	(0.0009)
Had student debt during GR	0.7533***	0.2449***
	(0.0181)	(0.0058)
Contemporaneous CZ Unemp. Rate	<0.0001	-0.0003
	(0.0035)	(0.0010)
Age (years)	0.2239***	0.0449***
	(0.0061)	(0.0022)
Age^2	-0.0027*	-0.0003***
	(<0.0001)	(<0.0001)
Fixed Effects:		
Commuting Zone (2007–2009)	Yes	Yes
Year	Yes	Yes
Year × Wealth Ventile (2006)	Yes	Yes
Clustering Unit	CZ (2007–2009)	CZ (2007–2009)
Observations	24,582,980	3,598,553
Pseudo R^2 (Logit Model)	0.1358	–
R^2 (OLS Model)	–	0.0308

*** p<0.01, ** p<0.05, * p<0.10.

Notes: This table presents results from a two-part model examining the association between parental characteristics and their adult children's student debt outcomes from 2009–2024. Column (1) is a Logit model where the dependent variable is an indicator for the child having any student debt; coefficients are log-odds. Column (2) is an OLS model for the amount of child's debt (transformed via asinh), conditional the individual having at least one child with a positive student loan debt balance in any period from 2018–2024. All models include fixed effects for the parent's GR-defined commuting zone, year, and year interacted with the parent's 2006 wealth ventile. Standard errors, clustered at the CZ level, are in parentheses.

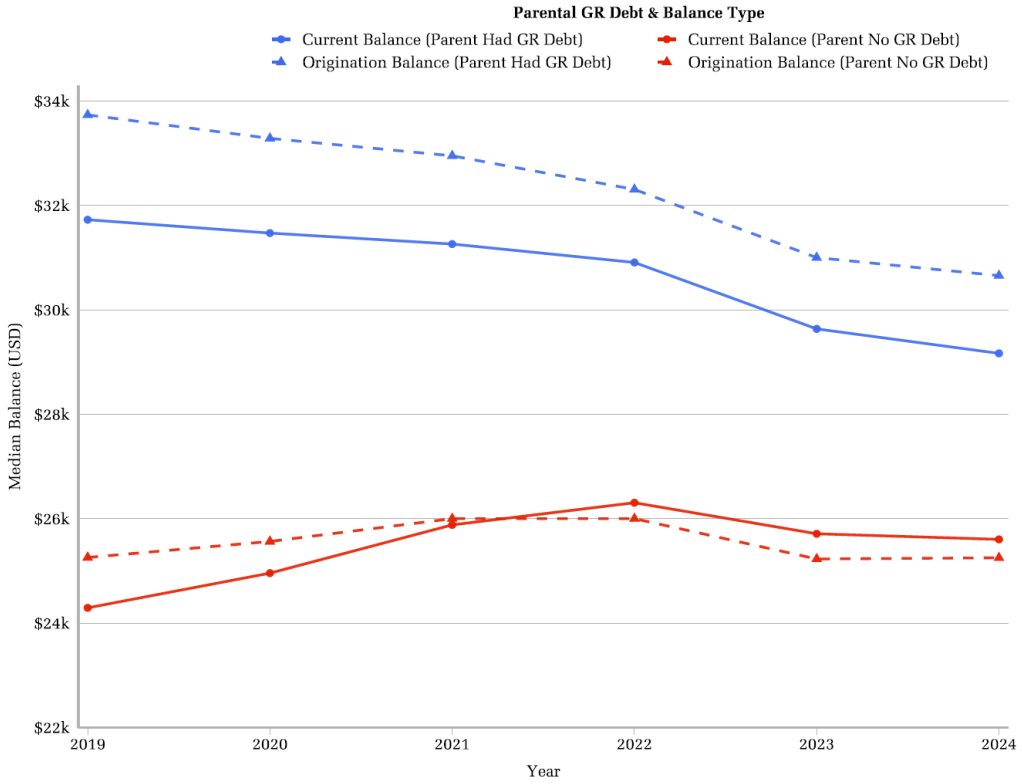
Data Sources: Author's calculations using data from UC-CCP, LAUS, and FHFA.

parental transformed wealth is strongly and statistically significantly associated with lower amounts of student debt for their children (coefficient of -0.0045). While the direct translation of this small change on the transformed scales into exact dollar figures would vary with the levels of wealth and student debt, the negative and significant relationship is clear: as parental financial resources on this compressed scale increase, the similarly transformed measure of their children's debt tends to be smaller. This suggests that, for individuals

who do take on educational loans, greater parental financial capacity is linked to smaller debt burdens. This suggests that wealthier parents have more ability to provide substantial financial assistance towards educational expenses, thereby reducing the total amount their children ultimately need to borrow. Furthermore, paralleling the finding on likelihood, parents who had student debt during the GR have children who, if they take on debt, tend to accumulate significantly larger amounts; the coefficient for parents who had student debt during the GR is 0.2449, indicating a substantial positive association with the child's student debt balance. The intergenerational penalty is not simply whether children borrow at all, but also how much of a student debt burden they end up carrying. Similar to the Logit model, the contemporaneous CZ unemployment rate shows no significant effect on the amount of child debt. Parental age again shows a significant, non-linear relationship with the amount of debt their children carry.

Descriptive trends offering visual context for these regression findings are presented in Figure 12 and 13, which track median student loan balances of the adult children of our primary sample from 2019 to 2024, distinguishing between median current balances (solid lines) and median origination balances (dashed lines). Figure 12 displays these trends for the pooled sample, categorized by whether the parents had outstanding student debt during the GR. A notable intergenerational gap in children's student debt is immediately apparent. In 2019, the median current balance for children whose parents themselves held student debt during the GR (represented by the blue line) was just over $31,500. This was approximately $7,000 higher than the median balance of just over $24,000 for children whose parents never had student debt (the red line group). While this gap persists throughout the period, it does narrow over time; by 2024, the blue line group's median current balance decreases to approximately $29,000, while the red line group's balance, after a slight rise, settles around $25,500, reducing the gap to about $3,500–$4,000

FIGURE 12. MEDIAN STUDENT LOAN BALANCES OF ADULT CHILDREN BY PARENTAL GR STUDENT DEBT STATUS, 2019–2024



Notes: This figure tracks the median current (solid lines) and origination (dashed lines) student loan balances of the adult children of the primary sample. Children are grouped based on whether their parents held student debt during the Great Recession (2007–2009).

Data Sources: Author's calculations using data from UC-CCP and LAUS.

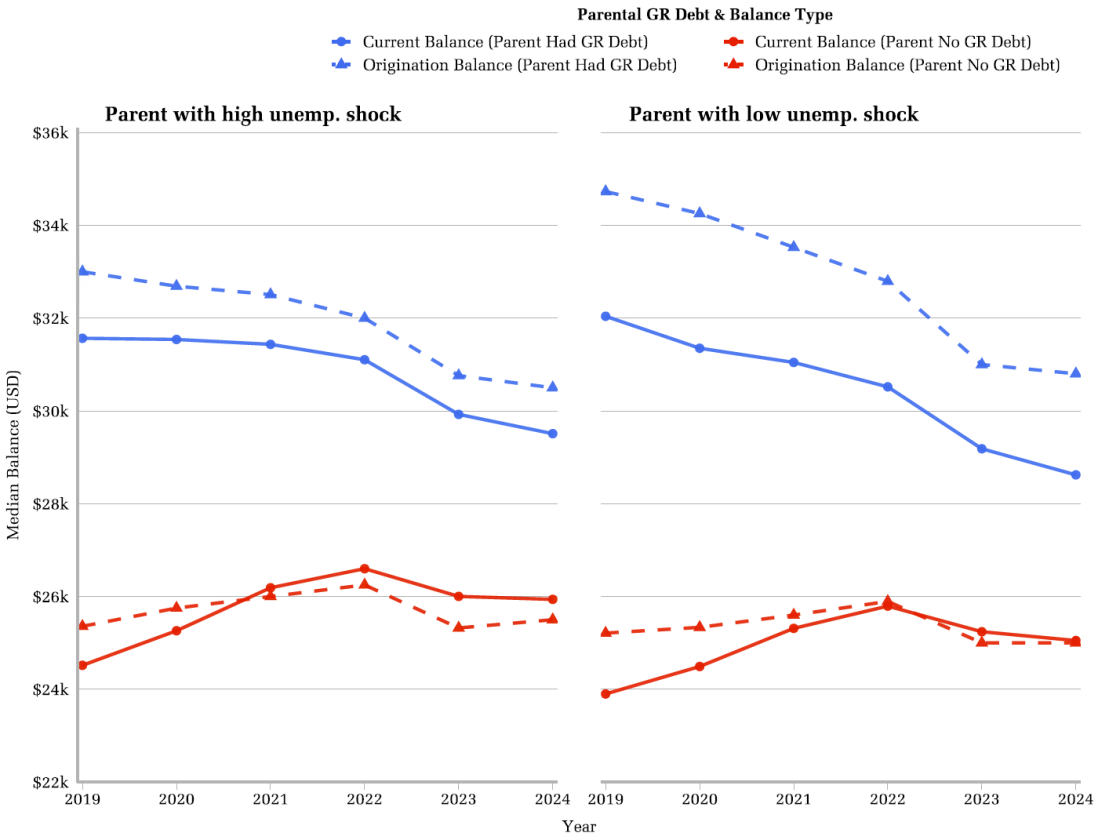
A key pattern is the consistent downward trajectory of both current and origination balances for the blue line group, suggesting more rapid amortization or a greater propensity for accelerated repayment among these borrowers. This may reflect an intergenerational transfer of general information or adaptive repayment strategies stemming from parental experiences with student debt, undoubtedly amplified by opportunities such as the COVID-19 repayment pause. In contrast, children of student debt-free parents (the red line group) exhibit a mild increase in their loan balances through 2021–2022 (peaking around $26,500 current balance), followed by a flattening or slight decline. The relationship between origination and current balances further differentiates these groups. For children from indebted parental backgrounds, median origination balances consistently exceed current balances (dashed line above solid), signaling net repayment, but the gap narrows and

then stagnates, meaning slight decrease in repayment pace over time. Conversely, for children of student debt-free parents, median current balances rise to slightly exceed their median origination balances from 2022 onward, suggesting this group may be, on average, adding to their principal balance, possibly through new borrowing or capitalized interest in these later years.

Figure 13 provides a more granular view by disaggregating these trends based on whether the parent experienced a "high" versus a "low" unemployment shock in their commuting zone during the Great Recession. This stratification reveals distinct underlying dynamics. In low-shock CZs—areas where the parental GR unemployment rate shock was at or below the national mean—children from both parental debt backgrounds generally show healthier repayment patterns. Median origination balances tend to exceed current balances throughout the period. This gap signifying net repayment is widest for children whose parents had GR-era debt, suggesting more favorable conditions for loan amortization or a stronger repayment capacity in these less economically distressed environments. For children of debt-free parents in these low-shock areas, median current and origination balances become nearly identical from 2022 to 2024, indicating relative stability in their debt loads. In stark contrast, the left panel for high-shock CZs highlights two distinct financial stresses on the adult children. First, children whose parents held student debt during the GR and lived in these high-shock areas exhibit a much narrower gap between their current and origination balances compared to their counterparts in low-shock zones. This suggests a slower payoff of principal and potentially greater difficulties in reducing their debt burdens, likely reflecting constrained family financial capacity that was exacerbated by the parents' GR experience in a hard-hit locality. Second, children of debt-free parents who nonetheless resided in these high-shock regions during the GR see their median current balances rise above their median origination balances from 2022 onward. This pattern provides evidence that this group, despite their parents not having GR-era student debt, may be accumulating debt (possibly through new borrowing or capitalized

interest) rather than paying it down, a trend potentially driven by the persistent adverse economic conditions or intergenerational transmission of financial fragility rooted in these high-shock zones.

FIGURE 13. MEDIAN STUDENT LOAN BALANCES OF ADULT CHILDREN BY PARENTAL GR DEBT STATUS AND SHOCK EXPOSURE, 2019–2024



Notes: This figure tracks the median current (solid lines) and origination (dashed lines) student loan balances of adult children. Children are grouped based on their parents' student debt status during the Great Recession (2007–2009) and by whether the parent resided in a high-shock or low-shock commuting zone during that period.
Data Sources: Author's calculations using data from UC-CCP and LAUS.

In summary, this investigation of intergenerational impacts reveals significant correlations between the financial circumstances and GR experiences of older parents and the student loan burdens of their adult children. Our regression models (Table 6) indicate that a parental history of carrying student debt through the GR is strongly associated with both an increased likelihood of their children taking on student loans and with those children accumulating larger debt amounts. Conversely, while higher parental wealth does not show

a statistically significant link in our models to whether children borrow in the first place, it is robustly associated with smaller loan balances for those children who do incur debt, suggesting parental resources can help mitigate the extent of borrowing. The contemporaneous local unemployment rates faced by parents did not emerge as a significant direct factor for these child debt outcomes.

Furthermore, the descriptive evidence from Figures 12 and 13 adds important nuance to these findings by displaying dynamic patterns in children's loan balances from 2019 to 2024. These figures highlight that children whose parents experienced student debt themselves have different median debt trajectories, including a narrowing gap over time and patterns suggestive of potentially distinct repayment behaviors (such as faster amortization, particularly evident for those whose parents were in low-shock CZs during the GR). Critically, these children's debt dynamics also appear to be influenced by their parents' exposure to severe economic shocks during the GR. Specifically, children whose parents resided in high-shock commuting zones during the recession show signs of greater strain in managing their own student debt years later—such as slower payoffs for those whose parents also had GR-era debt, or current balances rising above origination amounts even for children of parents who were themselves debt-free during the GR. These combined regression and descriptive findings underscore the potential for financial histories and vulnerabilities, particularly those shaped during major economic crises like the Great Recession, to have lasting echoes across generations, influencing the educational debt landscape and financial starting points for the next cohort.

IV Discussion

The findings of this paper provide compelling and specific evidence on the severe and protracted financial consequences faced by older Americans who navigated the Great Recession while burdened with student loan debt. Our analysis makes several critical contributions, offering a granular understanding of how macroeconomic shocks, personal debt,

and life-cycle stage intersect to fundamentally alter long-term financial well-being and transmit economic vulnerability across generations.

First, this research demonstrates that the detrimental impact of the Great Recession on student indebtedness was not confined to younger cohorts; indeed, it was magnified for older individuals. By extending the methodology of Pinto and Steinbaum (2023), we establish that local GR shocks not only exacerbated student loan burdens but also led to a $620 increase in average balances for older borrowers per percentage point increase in the GR unemployment shock. This stark difference underscores a heightened vulnerability among the older cohort, likely stemming from a shorter time horizon to recover from income loss, greater existing financial responsibilities, or potentially distressed re-enrollment in education as a last resort in a failing labor market. The persistence of these increased debt loads for over a decade post-GR, as shown in our event study, reveals a long-term drain on financial resources precisely when these individuals should be consolidating assets for retirement.

Second, this analysis confirms that the intersection of GR–era student indebtedness with acute local labor-market distress brought about substantial and enduring losses in estimated wealth. The fixed-effects models show that older individuals carrying student debt through the GR were set on a significantly diminished wealth trajectory relative to their non-indebted peers. The estimated coefficient of -1.078 on our transformed wealth measure for this group represents a substantial wealth penalty that, for many, translated into tens of thousands of dollars in lost or eroded net worth. For those with student loan debt, the forced delay in wealth accumulation effectively nullified any wealth-building advantage from their educational investments during their prime earning and pre-retirement years. For them, the "investment" became a significant financial impediment.

The event study focusing on the "double-hit" cohort—those with GR-era student debt in high-shock CZs—amplifies this narrative of financial difficulty. The immediate, sharp decline in their relative wealth from 2007 onward, culminating in a wealth gap that bot-

tomed out at -1.6 on the *asinh* scale nearly a decade later, illustrates a deep and persistent scarring effect. This signifies a tangible loss of financial security, potentially leading to a reduced standard of living, increased dependence on safety nets, and a compromised ability to weather subsequent financial shocks as these individuals entered retirement. Even fifteen years after the GR's official end, this group remained demonstrably poorer.

Third, our analysis of intergenerational linkages provides insight into how financial precarity may be transferred across generations. The positive correlation between parents holding student debt during the GR and their adult children subsequently incurring larger student loan burdens is a concerning finding. This suggests potential transmission mechanisms beyond general wealth effects, possibly including depleted parental capacity for financial assistance due to their own debt struggles, the normalization of high debt burdens within families, or even children taking on debt to indirectly support financially strained parents. The descriptive evidence further showing that children whose parents resided in high-shock GR CZs—even if those parents never held student debt—face greater difficulties managing their own student loans years later, highlights the ripple effects of severe localized recessions, potentially embedding financial fragility across generational lines.

The descriptive statistics on racial and gender disparities bring these heterogeneous impacts into relief. The particularly negative wealth trajectories for Black individuals who carried student debt through the GR, irrespective of local shock severity, provide evidence of how economic crises can disproportionately penalize certain communities, deepening pre-existing inequalities. Similarly, the observed widening of the gender wealth gap in later life for women who were indebted during the GR points to differential vulnerabilities that compound over the life course. These are manifestations of how macroeconomic distress, when combined with educational debt, can carve deeper fissures along established lines of societal inequality.

These results carry significant and urgent policy implications. The financial strains and the passing of debt between generations are direct consequences of policies that have in-

creasingly made individuals and families bear the primary cost of higher education. For families with limited or no wealth, this shift often results in intergenerational debt, which can impede their economic progress and lead to ongoing financial instability. A central aim for reform should be for the public sector to reclaim a larger share of the financial responsibility for higher education, distributing the costs more fairly. This could include providing more funding to colleges and universities, reforming tuition structures, or increasing financial aid for students.

The combination of sizable, long-lived wealth destruction and rising student-loan balances among older adults exposed to GR shocks shows that the present U.S. retirement architecture is inadequate for households whose balance sheets were scarred by crisis. Echoing the "Gray New Deal" proposals advanced by Ghilarducci (2024), reform should begin by shielding Social Security benefits from student-loan offsets for low-income seniors and by expanding the system itself—either through a higher minimum benefit or an across-the-board bump—to restore its role as the core, inflation-protected income floor. Because student-loan burdens and wealth shortfalls clearly spill over to the next generation, a parallel agenda is needed higher up the education-finance pipeline—one that reduces reliance on family resources through deeper grant aid—so that economic shocks absorbed by parents are not simply re-capitalized as debt for their children. A retirement system that recognizes macroeconomic volatility and intergenerational debt transmission is critical if policy makers aim to prevent the long shadow of the GR from darkening the financial prospects of two cohorts simultaneously.

While our wealth estimation focuses primarily on housing equity and our analysis relies on observational data, the use of a large longitudinal panel and robust fixed-effects models, including an event study design that controls for pre-existing trends, lends strength and credibility to our causal inferences. Future research could explore the impact on a broader array of wealth components, including liquid savings and retirement accounts, and further dissect the precise behavioral and financial mechanisms driving the intergenerational

transmission of student debt.

V Concluding Remarks

This paper has demonstrated the severe and enduring financial toll exacted upon older adults in the U.S. who confronted the Great Recession while carrying the burden of student loan debt. Our empirical evidence is clear and conclusive: this concurrence of macroeconomic crisis and personal indebtedness inflicted significant, measurable, and persistent damage to their financial well-being, fundamentally altering their wealth accumulation trajectories and jeopardizing their retirement security.

We establish conclusively that older individuals encumbered with student debt during the GR experienced substantially diminished wealth outcomes for more than a decade when compared to their non-indebted peers. This financial detriment was critically amplified for those residing in local economies that bore the brunt of the recession's unemployment shock, with the "double-hit" cohort enduring a profound and lasting wealth deficit. Furthermore, this study reveals that the GR directly contributed to an increase in the student loan balances of these older individuals themselves, an effect that our findings indicate was even more pronounced than that observed in younger cohorts affected by the same downturn.

Crucially, this research uncovers compelling evidence of strong intergenerational financial linkages, where a parental history of holding student debt during the GR is robustly associated with their adult children subsequently accumulating larger student loan burdens. This finding outlines a troubling cycle of debt, suggesting the financial injuries sustained by one generation during a period of economic crisis and educational indebtedness can be directly transmitted, shaping the financial landscape for the next generation and potentially hampering their future economic well-being.

Overall, these findings challenge the simplistic and commonly optimistic views of student debt as merely a benign investment in human capital, especially for individuals in the

later stages of their working lives who encounter severe and prolonged economic downturns. They underscore the profound financial vulnerability of older indebted individuals and highlight how major macroeconomic shocks can exacerbate existing financial instability and deepen societal inequalities, with effects that ripple across generations. This research compels a deeper and more urgent consideration of policies designed not only to mitigate such lasting damage but also to ensure genuine financial stability for aging populations and to proactively prevent the perpetuation of debilitating debt burdens within families. The Great Recession may be receding in historical memory, but its financial consequences continue to shape, and in many cases constrain, the economic lives of older adults and their children.

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Appendix A

Data Details and Extended Methodology

This appendix provides supplementary details on the data sources, sample construction, and variable creation methodologies employed in the associated chapter.

1. Data Sources

The core dataset is the University of California Consumer Credit Panel (UC-CCP), a 2 percent random sample of U.S. individuals with a credit history, covering the period 2004Q1–2024Q4. It contains individual-level quarterly tradeline data (balances, limits, payment status, etc.), credit scores, demographics, and geographic identifiers (down to census tract). Supplementary data include:

- **Local Area Unemployment Statistics (LAUS):** Provided by the Bureau of Labor Statistics (BLS), used to construct commuting zone (CZ) level unemployment rates.
- **House Price Indices (HPI):** Provided by the Federal Housing Finance Agency (FHFA), used for wealth estimation.
- **Commuting Zone Definitions:** From the U.S. Department of Agriculture (USDA) to map counties to CZs.

2. Sample Construction and Descriptive Statistics

The construction of the final analytical sample involved several steps:

1. **Age Restriction:** The UC-CCP sample was first restricted to individuals who would be at least 55 years old in the final year of observation (2024). Birth dates were reconciled by assigning the modal birth year and month reported across all archives for

each individual. Individuals younger than 55 in 2024 or with persistently unidentifiable birth dates were dropped.

2. **Panel Presence:** Each individual was required to appear in the panel at least once in the pre-GR period (2004Q4–2006Q4), during the GR (2007Q4–2009Q4), and at least eight times in the post-GR period (2010Q4 onward), including 2024Q4.

3. **Exclusions:** Individuals flagged as "deceased" at any point in the panel or those with missing geographic identifiers necessary for merging CZ-level data were dropped.

These screens yield a final sample of 1.54 million older borrowers. This sample includes individuals who never held student loan debt, providing a comparison group to those with student debt.

2.A. Demographic Variables and Commuting Zone Assignment

Gender is imputed by the credit bureau from first names and is available for approximately 91 percent of observations in the final sample. **Race** is provided as a Bayesian Improved Surname and Geography (BISG) probability vector. To assign a stable race identifier, we averaged the four quarterly probability vectors in 2024 (or the latest available year if missing in 2024) and assigned the race category with the highest mean probability. This resulted in a distinct race value for about 85 percent of individuals in the sample.

Commuting zones (CZs) were determined for each individual in each archive using their county of residence and the USDA county-to-CZ crosswalk. To create a time-invariant "Great Recession CZ" for measuring the local economic shock, we identified all CZs an individual resided in during the 2007–2009 period. For the vast majority who resided in a single CZ during these years, that CZ was assigned. For the small fraction who moved across CZs, their modal CZ of residence during 2007–2009 was assigned. This fixed GR CZ ensures that the unemployment shock measure is exogenous to post-recession migra-

tion. The local GR shock is defined as the percentage-point change in this assigned CZ's unemployment rate between December 2007 and December 2009.

3. Aggregating Loan-Level Student Debt Data

Determining accurate individual-level measures of student loan debt required significant cleaning and processing of the raw tradeline data from the UC-CCP.

Persistent Loan Identifiers: A significant challenge in tracking loans over time is that loan identifiers can change when loans are transferred between servicers or refinanced. To address this, we implemented a process to create persistent loan identifiers. This involved identifying sequences of loans for the same individual that are likely continuations despite changes in the reported loan ID. The logic searches for a new loan appearing shortly after an old one closes, with similar origination amounts ($\pm$10%) and origination dates (within 90 days). A mapping was created that links multiple loan IDs to a single unique ID representing the continuous loan obligation. This "persistent ID" is then used for all subsequent loan-level analysis and aggregation, ensuring that the full history of a debt obligation is captured. Original account open dates and origination amounts are propagated using this persistent key.

Student Loan Categorization: Once persistent loan identifiers were established, student loans were categorized by their repayment status, following a methodology similar to that of Pinto and Steinbaum (2023). Loans are classified as:

- In deferment (e.g., based on *enhanced special comment* code 29, "payment deferred").
- In forbearance (e.g., based on code CP, "account in forbearance").
- Repaid due to refinancing/consolidation (balance is zero and *account condition code* is 05, "account transferred to another office", or 10, "account renewed or refinanced").

- Repaid due to being paid off (balance is zero and *account condition code* is not 05 or 10).
- In repayment (all other active loans).

Delinquency and default statuses are also determined at the loan level. A loan is categorized as delinquent or in default if its *enhanced payment status* falls within specific ranges (e.g., 22–29, 42, 67, 69, 71–84, or 87–98), provided the loan does not have a zero balance.

Handling Missing Student Loan Balances: Balances are set to zero if *account condition codes* indicate the loan is paid, closed, transferred, refinanced, or discharged through bankruptcy or other means (codes A2: "paid account/zero balance"; A3: "closed account"; 05: "account transferred to another office"; 10: "account renewed or refinanced"; 67: "Debt included in or discharged through Chapter 7, 11 or 12 Bankruptcy"; 68: "Account legally paid in full for less than the full balance"; 69: "Debt included in or discharged through Chapter 13 Bankruptcy"; 88: "claim filed with government for insured portion of balance on defaulted loan"; and 97: "Unpaid balance reported as a loss"). For open accounts (code A1: "open account") with missing balances, imputation rules are applied:

1. If a subsequent positive balance exists and the reporting date is after origination, the subsequent balance is carried back.
2. If the reporting date is not after origination, the balance is set to zero. This process is iterated.
3. Remaining missing balances for open loans with prior positive balances are imputed forward.
4. Open loans with perpetually missing balances are dropped.

For seriously past-due accounts (code 93: "account seriously past due/account assigned to attorney, collection agency or credit grantor's internal collections department"), if an *en-*

hanced special comment indicates permanent assignment to the government (code 44: "Student loan permanently assigned to government"), the balance is set to zero; otherwise, if a prior balance exists, it is carried forward until 2024.

After these loan-level cleaning and categorization steps, data are aggregated to the individual level for each year. For student loans, this includes calculating the total outstanding balance, total delinquent balance (sum of balances on loans coded as delinquent and not in deferment), and an indicator for any delinquency. Similar aggregation processes are applied to derive total balances for home mortgages, home equity lines of credit (HELOCs), and credit card loans, which are then used as liabilities in the wealth estimation.

4. Wealth Estimation Methodology

The estimation of individual wealth from credit panel data requires several steps to create a proxy for net worth, primarily focusing on housing equity.

1. **Data Extraction:** All mortgage and home equity tradelines for individuals in the sample were extracted from the December UC-CCP archives for each year from 2004 to 2024.

2. **House Price Index (HPI) Integration:** Annual HPI data from the FHFA were re-indexed so that 2024 serves as the base year. HPI datasets at five-digit ZIP, three-digit ZIP, state, and national levels were used for matching.

3. **Mortgage Origination Year and Paid-Off Status:**

    - The origination year for each mortgage was primarily taken from its *account open date*. For mortgages with missing dates, the origination year was imputed as the archive year if the difference between the original loan amount and the current balance was within $\pm$\$10,000. Origination years prior to 1975 are bottom-coded to 1975.

- A mortgage was flagged as paid off if its *account condition code* first indicated a closed account with a $0 balance and the loan has been active for at least 15 years. For such cases, a cumulative variable storing the last observed positive balance was created to represent the appreciating value of the now outright-owned property.

4. **Property Value Estimation:** The mortgage-tradeline file was merged to the HPI dataset at the five-digit ZIP level, matching both the mortgage's origination year (HPI_{i0}) and each archive year t (HPI_{it}). The growth factor was then defined as

$$g_{it} = \frac{\text{HPI}_{it}}{\text{HPI}_{i0}},$$

where i indexes the loan and 0 denotes the origination year. If ZIP-level HPI was missing, the match rolls up hierarchically to the three-digit ZIP, state, or national series. Assuming an 80 percent loan-to-value (LTV) ratio at origination, the original property value is estimated as $\frac{\text{Origination Balance}}{0.80}$; the market value in year t is then equal to $(\text{Original Property Value}) \times g_{it}$.

5. **Aggregation and Net Wealth Calculation:** For each individual in each year:

   - The estimated current market values of all properties were summed.
   - Total outstanding debt balances (mortgage, home equity, credit card, and student debt), converted to 2024 dollars, were summed.
   - Estimated wealth was computed as:
     (Total Current Property Value) - (Total Liabilities) + (Cumulative Value of Paid-Off Mortgage).

6. **Cleaning and Adjustments:**

- These wealth estimates were winsorized at the 1st and 99th percentiles to mitigate outliers.
- For individuals with only home equity loan data (and no first mortgage), property value was imputed using median property values for their geographic area (e.g., county or CZ) if available, or a broader regional measure otherwise.
- Data gaps for intermittent missing years in the wealth series were filled by carrying forward the most recent prior year's estimated wealth value.
- A three-year rolling average of the resulting wealth values was calculated for each individual to smooth year-to-year fluctuations. This rolling average is what we determine to be "wealth" for the purposes of our analyses.

5. Household Identification and Linkages

A key component of this research is the construction of consistent household units over time and the identification of parent-child relationships within the UC-CCP data.

Persistent Household Identifier Construction: The raw household identifier (*hhld id*) provided in the UC-CCP quarterly archives can change over time for the same underlying household. To assign a constant household identifier:

1. We processed quarterly UC-CCP attribute files (2004–2024) to gather all historical *hhld id*s for each individual in our primary sample of older Americans.
2. Using these attribute files again, we identified every individual (with a credit score and not marked as deceased) who shared the same raw *hhld id* with primary sample members in any given quarter.
3. Consistent birth dates were established for all individuals by reconciling varying entries across archives. Age was then calculated for each individual in each quarter.

4. A persistent household identifier was created by processing data quarter by quarter. Individuals sharing the same raw *hhld id* in a quarter were initially grouped. Households were restricted to a maximum size of nine individuals.

5. Within each such household group, the oldest individual belonging to our primary sample was designated as the potential household head.

6. An iterative process generated a new, persistent household ID for the first observation of a household head. This ID was carried forward as long as they continued as head.

7. This persistent ID was then assigned to all other co-resident members sharing the original raw household IDs with the identified head in each quarter.

Identifying Potential Adult Children: With persistent household identifiers established, potential adult children of the older individuals in our primary sample were identified:

1. The age difference between the oldest primary sample member (potential head) and all other non-primary members within the same persistent household was calculated.

2. An individual was identified as a potential child if they were a non-primary member of the household and were between 21 and 45 years younger than the oldest primary household member.

3. Student loan tradeline information for these identified potential children was extracted for the years 2021 to 2024 and linked back to the primary sample members (parents).

This linkage enables the analysis of intergenerational financial connections, specifically how parental financial characteristics and GR experiences correlate with their adult children's student debt outcomes.

Appendix B

Wealth Distribution Evaluation

This appendix benchmarks our constructed wealth series by comparing the **2016** distribution of aggregate wealth across four common bins—Bottom 50, Next 40 (P50–90), Next 9 (P90–99), and Top 1 (P99–100)—to widely used references in the literature. Specifically, we align our series to: the Survey of Consumer Finances (*SCF*) in its "Bulletin" concept; the *SCF Augmented* concept, which allocates defined-benefit (DB) pensions and adjusts for Forbes 400 families; the Saez–Zucman World Inequality Database/Distributional National Accounts *WID/DINA* reconciliation; and the Smith–Zidar–Zwick (*SZZ*) administrative-tax re-estimates under heterogeneous returns.

All comparisons use a single UC–CCP panel conditioned on being age 55+ by 2024. Consequently, each historical year contains an older slice of the adult population than a full cross-section would, and the cohort ages in place over time. These choices improve internal consistency for longitudinal analysis but can skew the level and shape of annual wealth distributions relative to population benchmarks.

Two points guide interpretation. First, for the middle and lower parts of the distribution, our series is conceptually closest to *SCF Augmented* (because our approach anchors net worth in housing equity and liabilities while SCF Augmented explicitly broadens the SCF balance sheet to include DB pensions and a top adjustment). Second, *WID/DINA* and *SZZ* provide complementary context for the very top: WID via reconciliation choices at the top tail, SZZ via capitalization with heterogeneous returns using administrative tax data. Note that SZZ publish Top 1 and P90–99 but not a Bottom 50 vs. Next 40 split. We therefore show (i) their published cells and (ii) a *hybrid* row that allocates SZZ's Bottom 90 using WID's Bottom-90 composition; the hybrid should not be read as a pure SZZ estimate.

TABLE B.1. U.S. WEALTH DISTRIBUTION COMPARISONS BY SOURCE (2016)

	Bottom 50 (P00–50)	Next 40 (P50–90)	Next 9 (P90–99)	Top 1 (P99–100)
UC–CCP Credit-Panel Wealth (2016)	0.43%	45.10%	38.50%	15.90%
SCF (Augmented, 2016)	2.00%	27.00%	37.00%	34.00%
SCF (Bulletin, 2016)	1.00%	22.00%	38.00%	39.00%
Saez–Zucman / WID (2016)	-0.40%	27.60%	37.30%	35.50%
Smith–Zidar–Zwick (2016, baseline)	—	—	34.90%	33.70%
SZZ (2016)—Bottom 90 split via WID[a]	-0.46%	31.86%	34.90%	33.70%

Notes: SCF Augmented includes DB pensions and Forbes 400; Bulletin does not. WID refers to DINA-style reconciled series. SZZ values shown are published cells (Top 1 and Next 9) with a clearly marked comparability row for the Bottom 90. See Bricker et al. (2020*a*); Saez and Zucman (2020); Smith, Zidar and Zwick (2023).

Panel caveat: Values are from a single longitudinal sample (individuals 55+ by 2024). Annual distributions reflect cohort aging and sample conditioning, not a population cross-section.

[a] SZZ do not publish Bottom 50 and Next 40. We allocate SZZ's Bottom 90 using *Saez–Zucman (WID)* composition: WID Bottom 90 $= 100 - 37.3 - 35.5 = 27.2$. Bottom 50 share within Bottom 90 $= -0.4/27.2 \approx -0.015$, Next 40 share within Bottom 90 $= 27.6/27.2 \approx 1.015$. Applying to SZZ Bottom 90 (31.40) gives Bottom 50 $= 31.4 \times (-0.015) \approx -0.46$ and Next 40 $= 31.4 \times 1.015 \approx 31.86$.

Overall, the 2016 panel indicates that our UC–CCP CPW series is broadly consistent with established references once concept *and* sample differences are taken into account. Because the series is housing-anchored—constructed from mortgage/HELOC tradelines and omits non-housing assets (Appendix subsection 4.), mass shifts from the top tail toward the middle, yielding a Top 1 share of 15.9% versus 33.7–39% in SCF, WID, and SZZ. In addition, we track a single longitudinal borrower panel conditioned on being 55+ by 2024, so earlier years reflect cohort aging rather than population cross-sections, which can further tilt the distribution toward P50–90. Given these features, *SCF Augmented* is the most appropriate benchmark for the middle of the distribution, while WID and SZZ are more informative for the top tail; residual gaps are expected due to DB pensions, Forbes 400 adjustments, unit-of-observation differences, and top-tail estimation methods. The takeaway is that a housing-equity-focused wealth distribution places a greater share of wealth in what Piketty (2014) terms the "Patrimonial Middle Class" than estimates that include financial wealth, which is not surprising given prior understandings of how asset classes are differentially-distributed.