

2-13-2018

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Recommended Citation

Kline, Zachary, "But I Need My Money Now: A Stratified Propensity Score Analysis of the Effects of Retirement Decisions made During the Great Recession on Income Mobility" (2018). *Master's Theses*. 1180.
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**But I Need My Money Now: A Stratified Propensity Score Analysis of the Effects of
Retirement Decisions made During the Great Recession on Income Mobility**

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B.A., West Chester University of Pennsylvania, 2015

A Thesis
Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts
At the
University of Connecticut
2018

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APPROVAL PAGE

Master of Arts Thesis

But I Need My Money Now: A Stratified Propensity Score Analysis of the Effects of Retirement
Decisions made During the Great Recession on Income Mobility

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Abstract

The Great Recession and accompanying financial crisis that occurred between 2007 and 2009 presented a host of emergency expenses to Americans with historically low traditional savings while at the same time limiting their access to credit. The resulting increase in poverty and decrease in real median family income raises the question: What if more Americans had access to liquid, emergency funds? The United States' retirement system increasingly relies on choice-based public policy programs that allow individuals to access their retirement funds by "cashing out" during financial hardship. Proponents of choice programs may expect individuals who cash out of their retirement plan to be more resilient to downward economic mobility while critics are skeptical of benefits that do not account for potential fees and negative long-term effects. This paper uses data from the Panel Survey of Income Dynamics (PSID) collected between 2005 and 2015 to conduct a stratified propensity score analysis investigating whether retirement decisions made during the Recession mitigated the crisis' effect on mobility outcomes. Specifically, this paper asks whether individuals, after being matched to groups that have similar labor market positions, socio-economic statuses, and demographic privileges, were able to use cash-out capital to avoid downward income mobility. Findings show little evidence in favor of cashing out on the aggregate or matched-group level. This paper calls for additional research into the potentially unequal consequences of choice-based retirement programs and the function of liquid capital during economic recessions.

Introduction

Economic restructuring since the 80s in both the public and private sector has given individuals and families additional responsibility in major sociological institutions like work, retirement, and healthcare (Hacker 2006). This additional responsibility often manifests in the form of choice programs that claim individual market freedom will remedy social problems. Concerning retirement, choice programs have taken shape in the public sector as a push for social security privatization. In the private sector, employers have largely transitioned from defined benefit (DB) pension systems, where employers guarantee qualified workers a monthly payment from a collective market fund during retirement, to defined contribution pension systems (DC), where individual workers are responsible for investing a portion of their wages in an individual market fund accessible at a predetermined age. Proponents for defined contribution systems hail the additional options afforded individuals while opponents lament the increased risk that comes with individually navigating a complex and potentially volatile market.

During times of economic stress, individuals have to negotiate addressing their current problems and the impetus to save for their future retirement. The Great Recession that began in 2007 presented an immediate economic crisis that many Americans did not have enough liquid, emergency savings to address. Considering financial institutions had low credit supply, some individuals chose to access the funds in their defined contribution pension plan so they could weather problems presented by the crisis. There is little research into whether this decision mitigated the crisis or how the decision affected individual economic outcomes years after the Recession. Moreover, choice programs operate within a complex web of social structure (Ingram and Clay 2000; Nee and Ingram 1998). Considering the negative outcomes associated with the Recession were not evenly distributed, research examining choice-based retirement during

economic crisis should consider the possibility that markets, culture, and social positions structure unequal consequences for retirement decisions (Hoynes et al 2012). Given increasing inequality in many aspects of social life, additional research is needed to understand how the effects of defined contribution pension systems that allow individuals to cash out of their retirement savings during economic crisis affects individuals from varying social positions.

This study uses data from the Panel Survey of Income Dynamics (PSID) collected between 2005 and 2015 to conduct a stratified propensity score analyses. First, stratified propensity score analysis isolates the effects of retirement plans from other labor market, socio-economic, and demographic factors by creating grouped strata containing individuals with similar Great Recession risk levels and social positions. Next, the paper uses multinomial logistic regression and mediation analysis to ask whether individuals were able to use their increased financial choice, namely the option to cash out of one's defined contribution pension plan, during the Great Recession to avoid downward income mobility measured before and after the Great Recession. By estimating the effect of cashing out for each propensity strata, this paper also asks whether consequences of retirement decisions vary depending upon social position. Generally, this paper speaks to whether individuals can use liquid funds from their retirement accounts to mitigate the effects of crisis.

This paper contributes to the study of choice programs by, first, taking advantage of newly released PSID data to look at the long-term effects of the Great Recession. Liquid capital may help individuals navigate crisis in the immediate sense, but current data allows us to examine whether the effect of those decisions remained persistent. Individuals have to navigate the current crisis in consideration of their short-term and long-term income security. This paper estimates how cashing out during the Great Recession affected income mobility measured

outside the Recession period. Second, analyses use counterfactual logic to isolate the effects of pension decisions by grouping respondents on important covariates that predict worse outcomes from the Recession using information about their pre-Recession social position. By isolating pension decisions, we can be more confident that we are measuring the effect of decisions and not social positions. Third, this paper examines whether choice programs have unequally distributed consequences with regard to cashing out of retirement savings.

CHOICE POLICIES

Free Market Ideology: Choice, Competition, and Personal Responsibility in the New Labor Market

In the iconic book, *Free to Choose*, Milton Friedman argues that ample choices in the marketplace is the key to economic growth and general prosperity (Friedman and Rose 1980). Friedman and others conform to the free market ideology, which argues that markets with little or no government intervention are the best solution for most of society's problems. Free markets afford individuals the freedom to maximize their utility consequently spurring economic growth (Smith 1776). Furthermore, these same scholars argue that economic growth can solve many social problems, even for the poor, better than government intervention (Dollar and Kray 2002).

Politicians and policy makers have also invoked "freedom of choice" rhetoric to justify shifting the responsibility imbedded in a broad range of social institutions, including both government agencies and businesses, to individuals and families. By giving individuals the responsibility for their successes and failures, proponents of choice argue they have created incentives that produce economic growth. For example, the federal publication of "A Nation at Risk" in 1983, which called for more competition in the supposedly failing, collective

educational system, paved the way for the No Child Left Behind initiative and the proliferation of charter schools (National Commission on Excellence in Education 1983; Renzulli and Roscigno 2005). Competition, incentives, and choice have increasingly defined the United States' education system. "Choice" has become a staple of American life.

Competition and choice is especially consequential in the labor market, which many researchers argue has become increasingly precarious. Traditionally, employers rewarded their employees' commitment to the company with retirement and healthcare plans that took care of their employees' long-term needs. In the new labor market, however, employers transferred their loyalty to their stockholders and implement policies that focus on increasing competitiveness and shareholder value (Kalleberg 2013). Some scholars suggest workers' loyalty has likewise declined, evidenced by increased job mobility (Jacoby 2001; Friedman 2014). For proponents of choice, the new economy's emphasis on competition as opposed to cooperation is good for businesses and workers. By emphasizing shareholder value as the primary measure of success, businesses are able to produce more efficiently, spurring economic growth for all (Rappaport 1986). The focus on competition incentivized workers to increase their productivity so that they are free to pursue better opportunities where their skills are most effective.

Critiques of the Choice Ideology

Some scholars argue that we need to be cautious of the potential risks associated with unregulated choice. Jacob Hacker argues that Americans are becoming increasingly responsible for navigating a complex range of social institutions previously controlled by the government and their employers (2008). He argues the personal responsibility crusade, which began in the 70s, has contributed to increased volatility and a sense of insecurity for middle class Americans despite economic growth. Beyond rising inequality, Hacker argues that economic restructuring

has greatly increased the rate of bankruptcy, foreclosures, and income swings that prevent Americans from feeling the increased prosperity that choice ideologues argue should have come with economic growth. For example, researchers have found a host of negative consequences for income instability after accounting for the effects of low and declining incomes (Wu 1996; Hill et al. 2013). These findings suggest that the uncertainty embedded in choice programs may contribute to a new set of concerns about inequality.

Many scholars are additionally skeptical of the shareholder value model that has reoriented corporate focus from the retention and re-investment of earnings to the distribution of earnings to shareholder. For the first time in history, household savings are dependent on the sustainability of a stock market that has less incentive to invest in the future (Lozonick and O'Sullivan 2000). Other scholars are doubtful that labor market outcomes have improved because of mobility. Whereas one study finds that job mobility can explain a third of early-career wage gains, there is less evidence that the increased mobility is providing long-term wage growth relative to the previous system (Topel and Ward 1992). In addition, others have found that social status mediates the effect of job growth, thereby complicating the choice model's focus on individuals and suggesting the need to look at other social processes (Rosenfield 1992; Fuller 2008; Loprest 1992; Wegner 1991). These findings together suggest that the new economy's focus on competition and choice may be harmful for aggregate economic growth, workers well-being, and social equality.

Choice Ideology and Inequality

In addition, not every social group has had an equal experience with the new economy. Kalleberg argues that the new job market is bifurcated, composed of good jobs requiring higher levels of education while providing pensions and health care plans and bad jobs requiring less education while not providing these benefits (2013). Moreover, the labor market position and social structure together privilege certain groups to access resources, including retirement options and choices (Tilly 1998). The changing economy can therefore exacerbate existing inequalities. For example, William Julius Wilson's book *When Work Disappears* highlights the problems economic restructuring brought to Black communities who already faced structural inequality (1996). Empirical analysis on the effect of choice programs should therefore consider individuals' social positions when examining decision-making and consequences.

Some scholars argue that choice programs do not take into account that knowledge is not equally available. Financial knowledge is especially important when making many long-term, economic decisions. The US National Financial Capabilities Study (NFCS) asks respondents five questions designed to capture financial knowledge. One study finds that while 40% of middle-age respondents with a college degree or more education correctly answer five financially related questions, only 10% of high school drop outs do (Lusardi et al. 2015). In addition to having poor financial knowledge, those with less education are less likely to consult a financial advisor. Even when an individual does consult a financial advisor, scholars are skeptical that financial advice can serve as a substitute for financial literacy (Collins 2012). The current state of regulation imposed on financial advisors makes it hard for those with poor financial knowledge to find reliable financial consulting that acts in their interest (GAO 2011). Choice programs

therefore reward financial literacy and punish financial illiteracy without taking into account disparities in financial knowledge.

The stakes of unequal financial information is high. Small differences in returns can lead to staggering long-term outcomes. For example, over the course of 50 years an investment with a return of 6% will be 7 times larger than an equivalent investment at 2%. Financial returns are especially important for individuals planning for their retirement with a defined contribution pension plan. For many behavioral economists, the new economy has ushered in a mode of retirement based on choice in the United States that has challenged individuals' ability to make economically rational decisions (Thaler and Sunstein 2008). Retirement decisions often involve navigating a complex market while making decisions with long-term, out-of-sight consequences. If we want to understand how the retirement transition might be affecting life outcomes, we have to examine the history of retirement since the 20th century.

CHANGING RETIREMENT

The New Economy's Reliance on Choice-Based Retirement

Societies have many ways of dealing with retirement. Before 1935, the United States' government largely took a laissez-faire approach to its citizen's social welfare (Atchley 1982). In the New Deal, the federal government took more responsibility for a host of social welfare institutions. The Social Security Act of 1935 created a collective fund managed by the government that helped ensure Americans had secure income in retirement. Over the decades that followed, the private sector contributed to the social welfare system by providing many employees with defined benefit pension and health care plans. Defined benefit plans, largely bargained for by unions, were part of the old social contract that ensured workers' long-term

loyalty (Klein 2006). The Employee Retirement Income Security Act (ERISA) made defined benefit pensions a secure partner with Social Security by providing a government guarantee that employees would receive entitlements. Originally proposed as a supplement to defined benefit pension plans, defined contribution plans, generally traced to the 1978 creation of the 401k, are a tax-sheltered personal savings fund designed to help individuals diversify their retirement plan. The United States' retirement system consequently has a unique composition of public and private social welfare institutions that provide for Americans old-age income security. Government provided social security, employer-provided pensions, and personal savings constitute what became known as the three-legged stool of retirement.

Since the 1970s, the individuals' retirement security has increasingly relied on choice programs and personal savings. Proponents of choice deployed the same arguments outlined earlier to attack defined benefit pension plans. They argued defined benefit pension plans' good intentions ended with worse outcomes for employees; collective funds inevitably collapse given the nature of business; and, forced retirement plans limit the freedom of employees to plan for their futures. Employers in the new economy, less interested in long-term loyalty and under less pressure from collective labor, reoriented their retirement programs from defined benefit to defined contribution plans so that households incur the responsibility for navigating retirement planning and the risks associated with old-age health and income maintenance (O'Rand and MacLean 1986; Smeeding 1997; Shuey and O'Rand 2004). In the new labor market, defined contribution plans have replaced rather than supplemented defined benefit plans as the primary retirement option available to workers.

The third leg of the stool, social security, is currently under threat of insolvency. The Social Security and Medicare Boards of Trustees currently estimates that the fund will be

depleted in 2034 (2016). Some reformers suggest reconfiguring the program to adjust for lower late-life mortality, raising additional revenues by increasing the tax rate, or expanding the tax base to include those with high incomes. Others support total or partial privatization. Privatization could take many forms with varying levels of government support and involvement. Global precedence and past proposals have led some scholars to suggest that privatization will likely involve increased personal responsibility likely in the form of a choice program (Hacker 2006; Orenstein 2011). Social security is the only remaining leg of many American families' retirement plans. Privatization may therefore involve transitioning to a system where most Americans only plan for retirement is an individually managed personal savings fund. Understanding the current state of choice-based retirement programs will help us understand the potential effects of future retirement changes. In order to understand how people use their choice-based retirement plans, we need to discuss the types of choices available in the many funds and savings plans that constitute choice-based retirement.

Types of Funds and Savings

While employers manage most of the decisions for defined benefit plans, individuals manage most of the options with their defined contribution plans. Choice programs consequently manifest as new retirement choices for individuals and families about their retirement. Beyond individual preference and social position, individual's choices are constrained by the design of choice programs that influence intentional and unintentional decision-making. Behavioral economists commonly call the design of choice programs the choice architecture. The choice architecture for defined contribution pension plans is embedded in the rules and regulations governing personal savings. The most common forms of retirement

savings are 401(k) plans, individualized retirement accounts (IRAs), and annuities. These plans offer varying tax benefits for holders, features, and punishments for early withdrawals.

401(k) plans are a form of defined contribution pension plan often offered by employers. Employees may invest a portion of their wages in a personal fund that is usually fully or partially matched by employers. The maximum contributions in 2015-2017 is capped at \$18,000, unless participants over the age of 50 qualify for an additional \$6,000 in catch-up contributions. The investment choices individuals have when managing the asset allocation vary. Some funds provide many options and others are run by financial experts chosen by the firm. Some employers offer features such as automatic enrollment, low-cost management, and increased fee visibility. Traditional 401(k) plans allow tax exempt contributions while Roth 401(k)s allow tax exempt withdrawals so long as certain conditions are met. The IRS assesses a 10% early withdrawal penalty for those who take funds out before age 59 ½ unless they qualify for hardship. Medical expenses, college tuition, and funeral expenses are common reasons for hardship withdrawal. Some 401(k)s allow participants to take a loan from the plan up to 50% of the account balance or \$50,000, whichever is lower. Loans generally must be repaid quarterly, within 5 years to avoid contribution taxes and early withdrawal penalties. In addition, employees who terminate employment may be required to make complete, immediate repayment.

Individualized retirement accounts (IRAs) offer an alternative or additional method of saving for retirement. Similar to 401(k) plans, contributions to traditional IRAs are tax exempt while Roth IRAs offer tax-exempt withdrawals. In 2015-2017, individuals can contribute up to \$5,500 (\$6,500 for those age 50 or older) in either traditional or Roth IRAs. Individuals earning over a contribution limit determined by their filing status are not eligible to contribute to an IRA. For example, a married couple filing jointly in 2017 cannot contribute if their income exceeds

\$196,000. Similar to 401(k) plans, withdrawing from an IRA before age 59 ½ carries a 10% tax penalty. Exemptions from this penalty, however, vary. In addition to hardship exceptions, participants may withdraw from their IRA to purchase their first home.

Annuities spread out retirement savings across an indefinite-length retirement. Financial institutions sell annuities to individuals during the accumulation phase and later pay out a stream of payments during the annuitization phase. The annuitization phase can continue until the death of a beneficiary or his or her spouse in the case of lifetime annuities or some other pre-determined length of time. Defined Benefit pension plans and social security are lifetime annuities. Annuities purchased with pre-tax money will be taxable at time of withdrawal including capital gains. After-tax investments, however, are only taxed on capital gains.

When making retirement decisions, individuals have to navigate the complex choice architecture embedded in their defined contribution pension plan. Before deciding to cash out, for example, an individual has to weigh all of the potential penalties alongside the potential benefits of liquid capital. In order to understand the potential consequences of the transition to defined contribution pension plans, we need to review existing critiques of choice-based retirement.

Critiques of Choice-Based Retirement

Choice programs in retirement carry potential risks. On an individual level, most people do not fully understand the rules and regulations governing their pensions (Mitchell 1988). In a complex and dynamic marketplace, even large funds managed by financial experts go bankrupt. The Pension Benefit Guarantee Corporation, created by ERISA, helps workers enrolled in direct benefit pension plans receive their promised benefits in the case of bankruptcy. 401k plans have

no such protection. In addition to the disparities in financial knowledge mentioned earlier, data from the Survey of Consumer Finances estimates less than one of three respondents consult finance professionals when making financially related retirement decisions (Bricker et al 2012). Choice programs consequently expose individuals to a complex, volatile market where they have largely variable degrees of financial literacy.

Jacob Hacker argues that the rise of choice programs has contributed to a less secure retirement for Americans. Individuals with defined contribution pension plans may have the potential for large returns, but they also assume responsibility for navigating stock market downturns, saving enough, or running out of savings (Hacker 2006: 14). The transition has left many Americans uncertain about retirement. Despite 6 years of post-Recession economic growth, Gallup found that 64% of Americans are worried about not having enough money for retirement (Gallup 2016).

Americans have reason for worry. The 401k developed while the stock market and the economy saw unprecedented, consistent gains. Despite the growth, families saw their average wealth saved for retirement decline (Moore and Mitchell 1997). To elaborate, the proportion of Americans who are likely to live on less than half of their income in retirement increased from less than 30% to over 40% between 1989 and 1998 (Hacker 2006: 122). During this period social security and defined benefit pension funds were also cut, contributing to an increase in the proportion of private pension wealth held in defined contribution plans from 6.6% to over 50% (Hacker 2006: 125). American's retirement increasingly rests in the fate of choice-based retirement programs. Important to note, aggregate effects alone do not show the effects of choice-based retirement. We also need to review the effect of choice-based retirement on inequality before addressing its merit as the sole retirement plan.

Choice-Based Retirement and Inequality

Some scholars argue the transition to defined contribution pension systems is exacerbating income inequality, which is already greatest among the oldest Americans (O’Rand 1996). Because choice-based retirement relies on individual decisions in a financial marketplace, disparities in financial knowledge perpetuate inequality through varying rates of returns and investment decisions. One study estimates that financial knowledge accounts for 30% to 40% of retirement wealth inequality (Lusardi et al. 2015). Moreover, some scholars have found that women, people of color, and those without a college degree have particularly low levels of access to financial knowledge (Lusardi and Mitchell 2005). Inequalities embedded in knowledge distribution complicate analyses of choice programs that ignore racialized and gendered knowledge oppressions.

Beyond access to financial knowledge, family structure, race/ethnicity, and gender also structure access to pensions and decision-making (Hardy and Shuey 2000; O’Rand and Shuey 2007). For example, Shuey and O’Rand find that defined contribution pension funds create a host of new, unregulated problems for women’s retirement income-security in 401(k)s beyond those already existing in defined benefit schemas (2006). The additional choices embedded in defined contribution pension plans open up new challenges for dealing with inequalities in other social institutions.

For proponents of choice programs, these additional choices also afford individuals who have low levels of social privilege more control over their savings. For example, one study found that many individuals who cashed out of their retirement accounts used their lump-sum distribution to purchase a home or pay bills (Moore and Muller 2002). Choice programs therefore provide individuals with the liquid capital necessary to make a down payment on a

home or to pay off a high-interest loan. Many Americans struggle to get access to liquid capital from traditional financial institutions. Financial or economic crisis often exacerbates this struggle.

NAVIGATING ECONOMIC CRISIS

Crisis and Liquidity in an Unequal Labor Market

In order to address the instability that comes with recessions, many people rely on emergency savings. The Federal Reserve's Report on the Economic Well-Being of U.S. Households, beginning in 2013, estimates that 44% of adults report they either could not cover an emergency expense costing \$400, or would cover it by selling something or borrowing money (2016). Unable to save, many Americans are just getting by paycheck to paycheck, one crisis away from falling behind (Desmond 2016). For proponents of choice, access to liquid capital, even in the form of debt, can have tremendously positive short and long-term effects for individuals struggling with poverty and crisis (Yanus 2007). Some economists have argued that short-term loans, even at high interest, can be worthwhile for people seeking to avoid late-fees. For example, paying \$45 in interest on a \$300 payday loan for a car repair may be more cost efficient than finding other transportation (Elliehausen 2009).

Critics argue that many people only use payday loans because they do not have emergency savings or access to traditional lenders. Some critics argue payday loans are part of a secondary financial market that exploits those with lower levels of social privilege (Reich 1973; Stoesz 2014). According to this perspective, the new economy simultaneously subjects certain groups to increased instability while at the same time precluding them from quality financial

opportunities. In sum, social position may structure how choice programs operate during economic crisis.

The Report on the Economic Well-Being of U.S. Households also found that 72% of non-retired adults have some form of retirement savings, most commonly a defined contribution plan (2016). Despite potential penalties, the report found that over 6% of adults with a retirement account borrowed from or cashed out of part of or their entire retirement plan in the year prior to the survey. Retirement funds may therefore act as a form of liquidity accessible during times of financial hardship. Between 2007 and 2011, American families navigated the worst economic crisis since the Great Depression. The global crisis presented challenges to many families with different levels of social privilege and unequal access to liquid capital.

The Great Recession's Liquidity Crisis

Between 2007 and 2009, the United States' GDP contracted by 5.1%, the largest drop in economic activity since the Great Depression. Unemployment peaked at 10% and the jobless recovery has come with high levels of underemployment. Beyond the growth and employment factor, the Great Recession has wide-ranging, enduring effects on a host of social institutions (Cherlin et al 2013; Danziger et al 2013a; Danziger et al. 2013b; Danziger and Bartels 2013; Grusky et al. 2011).

As mentioned above, individuals often require liquid capital in order to address personal problems presented by economic crisis; however, the financial institutions who usually provide liquid capital through loans were suffering from low credit supply during the Great Recession (Cornett et al 2011). While the Federal Reserve acted as a lender of last resort for financial institutions, capital was less accessible to individuals and families during the crisis.

Moreover, many of the effects of the Great Recession were concentrated among already disadvantaged groups who faced additional credit access barriers. Young people, Blacks, and renters all suffered disproportionately poor outcomes during the recession (Bell and Blanchflower 2011; Stoll 2013; Newman 2008). These same groups additionally suffer less access to credit (Toussaint-Comeau and Rhine 2000). Some scholars have found that groups with low levels of social privilege and less access to credit are more likely to cash out of their pensions. For example, one study found that between the years of 1984 and 2001, over 25% of unmarried households headed by females cashed out of their pension, versus the 16% of unmarried households headed by males who cashed out (O’Rand and Shuey 2007). Although there is little research on how economic crisis in general or the Great Recession in particular influenced the decision to cash out among groups with low levels of social privilege, choice programs may be changing the relationship between economic recessions and retirement social welfare.

Choice-Based Retirement and the Great Recession

The Great Recession had a profound effect on many American’s retirement plans. The Center for Retirement Research constructed a National Retirement Risk Index (NRRI) that estimates the share of working households who are “at risk” of being unable to maintain preretirement standard of living in retirement. The NRRI grew from 44% in 2007 to 53% in 2010, suggesting retirement insecurity increased during the Great Recession (Munnell and Rutledge 2013). Scholars have found that the Recession delayed retirement expectations, lowered future incomes, and harmed retirement wealth (Szinovacz et al 2013; Bosworth 2012; Munnell and Rutledge 2013; Butrica et al 2011).

Some research has suggested having a retirement plan may have mitigated part of the effect of the Recession on retirement outcomes. Moreover, the type of retirement plan may moderate the mitigating effect. For example, one study found that having a defined benefit pension plan mitigated some of the effects of the Great Recession by decreasing the probability that an individual expects to work past age 65 (Szinovacz et al. 2013). Workers with defined contribution plans, however, saw no such benefit. Workers with defined benefit plans usually have clear guidelines that lay out their entitlement, which are unaffected by macroeconomic factors. Defined contribution plans, on the other hand, have no such guarantees. Other scholars have suggested defined contribution plans may even increase the probability of expecting a delayed retirement due to equity losses during financial crises (Gustman et al. 2009).

Economic policies during the 1930s created a strong, public social safety¹. Although instability has always been a component for poor Americans and disadvantaged groups, pension reform has particularly changed retirement planning for workers in the middle of the income distribution who once held secure jobs (Thaler and Sunstein 2008). This study therefore focuses on low income Americans, measured at 200% of the census needs poverty line. As the population continues to age, privatization forces may contest social security insolvency by offering choice programs. Although the Great Recession's negative effects on retirement security may have delayed the movement, some scholars predict a rebirth in privatization efforts during times of economic expansion (Orenstein 2011). For many Americans, social security is the last and only leg of their retirement plan. Understanding how people with retirement plans use retirement choices to navigate economic crisis in a changing work structure may have

¹ The new deal in many ways precluded its benefits from particular groups. Many immigrants, women, and Blacks were implicitly or explicitly denied public social entitlements (Katznelson 2005).

consequences for governments trying to provide stable retirement outcomes to an aging population. Choice programs in retirement have afforded individuals more options for dealing with both economic crisis and retirement. When trying to measure the success of choice-based retirement, the consequences of having a defined contribution plans and related decisions made during the Great Recession can signify the program's success. Moreover, the success of the program also depends how those effects varied across different levels of social privilege.

RESEARCH QUESTIONS

Does having a defined contribution retirement plan influence one's income mobility measured before and after the Great Recession?

Is the effect of having a defined contribution retirement plan on one's income mobility mediated by the decision to cash out of all or part of one's defined contribution retirement plan?

Do the effects of having a retirement plan or choosing to cash out of one's retirement plan on income mobility vary based upon an individual's social privilege?

HYPOTHESES

H1: Both proponents and critics of the choice mantra may expect those with a defined contribution retirement plan to have better experiences with income mobility before and after the Great Recession. Critics may expect the effect of defined contribution pension plans to be smaller than defined benefit pension plans while proponents may expect the opposite.

H2: Proponents of the choice mantra may expect cashing out to be a mechanism through which individuals were able to benefit from having a defined contribution pension plan. Critics

may expect that the effect of cashing out on income mobility would be limited, not warranting the potential fees and penalties associated with cashing out early².

H3: Proponents of the choice mantra may expect that cashing out is especially valuable underprivileged groups who may not have access to traditional financial institutions. Critics may expect that cashing out is beneficial only for those in better labor market positions who may have better access to financial knowledge and are therefore abler to take advantage of their liquid capital.

DATA AND METHODS

Data

This study uses data from the Panel Survey of Income Dynamics (PSID), a longitudinal, representative family panel survey of individuals and families in the United States. The PSID was originally designed to collect data for Lynden B. Johnson's war on poverty and was later expanded to include data on poor and non-poor families. At its creation in 1968, the PSID began collecting longitudinal data on an annual basis for approximately 4,800 families and proceeded to add the spin-off families created by individuals who left the family unit. In 1997, the PSID added an immigrant sample to the survey and shifted to biannual interviews. This paper draws data from six waves spanning 2005 to 2015. This period captures three stages of the Great Recession: before the Recession (2005 and 2007), during the Recession (2009 and 2011), and after the Recession (2013 and 2015)³. For the analyses included in this study, the sample was

² Important to note, this study does not examine the negative, retirement impacts of the decision to cash out. Future analysis may look into how cashing out during the Recession influenced long-term outcomes to further test whether the decision was 'worth it'.

³ Data collected in 2007 often reports on metrics measured in 2006. For example, income reported in 2007 actually measure total family income in 2006. Although the Great Recession

restricted to a final sample of 4,199 families that had the same head of household across all six waves. Analysis proceeds using only heads of households⁴. The PSID's unique timing and longitudinal structure make it an ideal data set to study the long-term ability of retirement decisions to mitigate the effects of the Great Recession.

Retirement plans and decisions

The key independent variables included in this analysis focus on the retirement plans and decisions with variables pertaining to retirement plans measured in 2007 values. Retirement plan combines two questions that asks whether the respondent reports having an employee provided pension plan of any type (*RPlan* 1 yes; 0 no) or an individual retirement account (1 yes; 0 no) into a single measure (1 yes; 0 no). Defined benefit measures whether a respondent only has an employee provided defined benefit pension plan (*DB* 1 yes; 0 no). Defined contribution measures whether a respondent only has any form of individual retirement savings, employer provided or personally created (*DC* 1 yes; 0 no). *Both* measures whether a respondent has both a defined contribution and a defined benefit retirement plan (1 yes; 0 no). Any defined contribution plan measures whether a respondent has any form of defined contribution retirement plan and combines those with a value of 1 for either *both* or *DC* (*ADC*: 1 yes; 0 no). *Cash Out* measures

began in the end of 2007, important variables considered before the Great Recession are measured using 2006 values. Although there is regional variation, the national Great Recession reached its trough in June 2008. Unemployment, however, continued to climb until its peak in October 2009.

⁴ Some scholars argue retirement is best analyzed at the family level (Shuey and O'Rand 2009). This paper recognizes the limitation of using some family level variables (for example income and poverty status) alongside other individual level variables (for example information about retirement plans). The data structure, for example, produce complicated and perhaps unreliable gendered findings. Given that past literature consistently finds high levels of gender inequality in US retirement systems, future analysis may benefit from addressing this limitation with a better family aggregation strategy or through utilization of multi-level modeling.

whether anyone in the respondent's household⁵ chose to cash out any part of their pension, private annuity, or independent retirement account between 2007 and 2011 (1 yes; 0 no).

Labor market factors

The control variables in this study are composed of labor market, social class, and demographic factors associated with both having a retirement plan and income mobility experiences surrounding the Great Recession. Three labor market variables measured before the Recession in 2005 and 2007 approximate the respondent's pre-Recession labor market position: whether the respondent reported working for a salary in both preceding years (*Salaried* 1 yes; 0 no); whether the respondent reported working over 35 hours a week in both preceding years (*Full-Time* 1 yes; 0 no); and, whether the respondent reported being gainfully employed in both preceding years (*Employed* 1 yes; 0 no).

Social class factors

Social class factors measure family level variables that characterize respondents' social class status. Table 1 presents the factor analysis used to create a scale composed of respondent's income, wealth, and education called *SES*. Income and wealth are measured in 2005 and 2007, adjusted for inflation, averaged, and recoded as quartile groups. The median income is around \$46,000 while the median wealth is around \$54,000⁶. The large ranges in the fourth quartile of income and wealth demonstrate the skewed nature of income and wealth and justify substantive quartile groupings. Education is recoded from years into four categories measuring whether the

⁵ The individual-level measure for *RPlan* and family-level measure for *cash out* create an anomaly where respondents may report cashing out of pensions they did not have. In order to address this problem, respondents with a value of 1 for *Cash Out* and 0 for *RPlan* were recoded to have a defined contribution pension plan ($ADC = 1$).

⁶ Income and wealth are reported in 2000 dollars.

respondent has less than a high school education (*education* = 1, less than 12 years), exactly a high school education (*education* = 2, exactly 12 years), some education beyond high school (*education* = 3, between 13 and 15 years), or a college degree equivalent (*education* = 4, 16 years or more). The final *SES* scale combines all three variables, ranges from 1 thru 10, and has a Cronbach's Alpha of .722. *5k in Savings* is a dummy variable measuring whether the respondent reported having a total of five thousand or more dollars in reasonably liquid accounts⁷ including checking or savings accounts, money market funds, certificates of deposit, government savings bonds, or treasury bills, excluding assets held in employer-based pensions or individual retirement accounts (1 yes; 0 no).

Demographic factors

Demographic factors associated with both retirement plans and the Great Recession were collected before the Recession in 2005 and 2007. Unless otherwise mentioned, the following measures use data from 2007. *FU Size* is a continuous variable measuring the amount of individuals in a family unit with a minimum of 1 and a top-code of 9. Two dummy variables were also computed for whether the respondent reported being non-Hispanic white (*nhwhite* 1 yes; 0 no) or female (*female* 1 yes; 0 no). *ln(age)* is a continuous measure that takes the natural log of the respondent's age in years ($\ln(\text{age}+1)$). Additionally, *retired* measures whether the respondent reported being retired in 2005 or 2007 (1 yes; 0 no). *Couple* measures whether the respondent's household was headed by a married or unmarried couple (1 yes; 0 no). Lastly, a regional control captures the Recession's geographic variation using six dummy variables for

⁷ The measure is computed using a continuous variable that asks how much the family has in liquid funds and dummy variables that ask respondents who reported not knowing exactly how much they had in the fund to estimate whether they were above or below certain thresholds.

whether the respondent lived in the *Northeast* (1 yes; 0 no), *South* (1 yes; 0 no), *Midwest* (1 yes; 0 no), *West* (1 yes; 0 no), or *Alaska/Hawaii* (1 yes; 0 no).

Dependent variables

The dependent variable for this research is income mobility experience before and after the Great Recession in relation to the census needs poverty line. Poverty is defined as the ratio between family income and census needs estimates. The census needs threshold accounts for the size of the family, number of related children under 18 years old, and the respondent's age. Two dummy variables are computed for whether the family's average income was below 200% of the poverty line before the Recession in 2005 or 2007 (*bpov* 1 yes; 0 no) or after the Recession in 2013 or 2015 (*apov* 1 yes; 0 no). Mobility outcomes between 2005 and 2015 are recoded into four experience groups. First, the respondent experienced low-income in 2005 or 2007 and experienced income above 200% of the poverty line between 2013 and 2015 (*Left Pov* 1 yes; 0 no). Second, the respondent experienced low income before the Recession in 2005 or 2007 and after the Recession in 2011 or 2013 (*Stay Pov* 1 yes; 0 no). Third, the respondent experienced income above 200% of the poverty line in 2005 and 2007 and kept his income above 200% of the poverty line in 2011 and 2013 (*No Pov* 1 yes; 0 no). Fourth, the respondent started with income above 200% of the poverty line in 2005 and 2007 before experiencing low income in 2011 or 2013 (*Fell Pov* 1 yes; 0 no). The final categorical variable, *Pov 200*, is the key focal contrast in the multinomial logistic regressions. The primary comparisons is between the two potential outcomes for those who had incomes above 200% of the poverty line before the Recession (*No Pov* vs. *Fell Pov*) and for those who had income below 200% of the poverty line before the Recession (*Stay Pov* vs. *Left Pov*).

Analytic Strategy

Logistic regression and propensity score matching

Analysis uses statistical software *STATA* and relevant, publically available statistical packages to produce the tables and figures presented in this paper. This study uses propensity score analysis to create matched strata on key social factors related to retirement decisions, Great Recession risks, and income mobility experiences. Propensity scores are derived from a logistic regression that predicts whether the respondent has any retirement plan or not. Given that *RPlan* is measured in 2007, results should not be interpreted as causal. Instead, the analysis shows how labor market, social class, and demographic factors structure access to retirement plans and income security. These temporal problems are embedded in the nature of how recessions interact with retirement plans. The close relationship between retirement plans and the controls included in this study makes it difficult for the regression analysis by itself to predict the effects of retirement plans. The propensity score analysis helps to isolate the effects of *RPlan* by matching individuals into groups – which went into the Recession with similar labor market positions, social class backgrounds, and demographic privileges – based upon their propensity to have a retirement plan.

The propensity score analysis used in this paper relies on counterfactual logic, which improves the researcher's ability to test for causality (Cochran 1953; Cochran and Chambers 1965; Morgan and Winship 2007). In experimental research, the researcher has control over treatment variables and can randomize selection in order to avoid bias that comes from unequal selection into treatment versus control groups. Most observational studies used by social scientists, however, do not have control over treatment variables, violating a key assumption required for causal claims. Propensity score matching addresses this violation by matching

individuals among key covariates associated with the key independent and dependent variables such that there are no observed statistical difference between the “treatment” and control groups”. This is called reaching “covariate balance”. A propensity score is the predicted probability of receiving treatment versus control after controlling for covariates. By ensuring individuals are matched on covariates, the researcher is more confident that he/she has isolated the effect of the key independent variable.

This paper aims to match individuals into strata with covariate balance on social factors related to both retirement decisions and income mobility experiences. Matching individuals on the covariates associated with both factors is difficult. I follow Rosenbaum and Rubin’s solution by stratifying my sample into five equal sized quintiles based on the predicted probabilities from my logistic models to reduce bias⁸ (1985). Rosenbaum and Rubin find that quintiles reduce at least 90% of covariate bias on outcomes (1984). Analysis uses statistical package *desmat* to produce a fully saturated version of the logistic regression mentioned earlier in order to increase the predictive power of the model and better achieve covariate balance⁹ (Hendrickx 1999; Hendrickx 2001). Although individual matching algorithms exist, this paper uses strata to construct groups that have varying Great Recession risk. Matching individuals into stratum therefore account for within stratum covariates while also adding a substantive group

⁸ Bias is measured as $\Delta X / \sqrt{(S_1^2 + S_2^2)/2}$ where ΔX is the mean difference between groups (before and after matching) and S_1^2 and S_2^2 are group respective variances (Rubin 2008: 407).

⁹ *desmat* is used to produce a logistic model that includes all relevant two-way interaction effects between categorical variables. A larger version of *STATA* would be required to account for three-way interaction effects. A fully saturated model serves to maximize the pseudo R^2 . As the predictive power of the logistic regression used to compute propensity scores increases, bias within propensity groups generally decreases.

interpretation (Pais 2011). Matched groups allow us to examine whether the effect of retirement decisions vary with the stratified nature of economic crisis.

Results detail the success the propensity score matching process using the following steps. First, a figure shows the probability distribution used to create bins of strata for the parallel analyses. Next, analyses examine covariate balance by analyzing the reduction in bias achieved by matching. Finally, multinomial logistic regression (MNL) compares poverty experiences in the total sample and each stratum, again controlling for factors used to construct propensity groups. Specifically, regressions test whether *RPlan* influences falling into low income (*Fall Pov vs. No Pov*) and leaving low income (*Left Pov vs. Stay Pov*).

Mediation analysis

Analyses proceeds by testing a potential mechanism through which retirement plans may affect experiences with low income. Specifically, this paper asks whether the decision to cash out of one's pension mediates the effect of defined contribution pension plans on poverty experiences. Traditionally, mediation is logically deduced by a set of testable axioms (Baron and Kenny 1986). In addition to arguing there is a mediation effect, researchers often want to measure the extent to which one variable mediates the effect of another. In order to assess magnitude, many methods decompose the influence of a variable into its direct and indirect effect (Preacher and Hayes 2008; Preacher and Hayes 2004; MacKinnen and Dwyer 1993; Alwin and Hauser 1975). Decomposition methods often compare the coefficients from multiple models in order to estimate indirect effects and their standard errors (Sobel 1982; Sobel 1986; MacKinnen et al. 1995; Bollen and Stine 1990).

A problem arises in situations where the dependent variable is categorical, as decomposition models will not return a 1:1 ratio between the total effect and its direct/indirect counterpart because of assumptions made about the error variance (Breen et al. 2013; Winship and Mare 1983). Researchers have presented a variety of methods for measuring mediation when the dependent variable is categorical (Breen et al. 2013; Buis 2010; Imai et al 2010a; Imai et al 2010b). This paper proceeds using the method presented by Breen, Karlson, and Holm, using the statistical package *khb* (Breen et al. 2013; Kohler 2011). This method adjusts the coefficients from multiple models so they may be compared to determine the extent to which a control variable mediates the relationship between a key independent variable and a latent dependent variable¹⁰. Important to this study, the method is applicable to multinomial logistic regression and allows us to break down the decomposition model in terms of average partial effects (Wooldridge 2002).

Mediation analysis gives a more accurate representation of the effect of cashing out on poverty outcomes than simply adding the *Cash Out* variable to the multinomial model. When adding *Cash Out* to the model as a binary indicator variable, the unstandardized beta coefficient represents the average effect of cashing out on income mobility outcomes by comparing those who did and those who did not cash out. Regular regression analysis would ignore that many in the reference group – those who did not cash out – did not have a defined contribution retirement plan and therefore had no option to cash out. The indirect effect computed using mediation analysis, on the other hand, compares the effects of cashing out only among those who had a

¹⁰ As seen in table 6 and 7, the unstandardized coefficients for the direct effects presented in table 7 do not equal the effects of *ADC* from the multi-nominal logistic regressions presented in table 6. Even though all the variables in the model are the same, the *khb* method decomposes the effect of *ADC* by adjusting the coefficients on the two models to the same scale (one with *cash out* and one without).

defined contribution retirement plan and consequently the option to cash out. Lastly, multinomial logistic regression models using only those who have a defined contribution retirement plan ($ADC = 1$) test whether choosing to cash out affects income mobility outcomes.

Results

Results are presented in two parts. In part 1, tables present descriptive statistics and a logistic regression model predicting whether the respondent has a retirement plan. Results next show covariate balance across key socioeconomic factors associated with retirement plans and mobility outcomes. In part two, results from multinomial logistic regressions estimate the effects of *RPlan* and other social factors before using mediation analysis to test whether *Cash Out* mediates the effect of *ADC*.

Part 1

Table 2 shows weighted descriptive statistics used in the analyses. Of the 4,199 respondents used in the analysis, 59% of respondents reported having a defined benefit pension plan, defined contribution pension plan, or individual retirement account after weighting. Only 8% of respondents report only having a defined benefit pension plan. Consequently, around 50% of respondents have a defined contribution pension plan of any type (37% + 13%)¹¹. In both survey years prior to the Recession, 71% of respondents reported being gainfully employed, of which 56% worked full-time hours and 25% worked for a salary. Although income and wealth are measured as quartiles, the four categories of education are not of equal proportions so the

¹¹ 37% + 13% does not equal 59% - 8%. The error is a result of rounding.

mean of SES is slightly greater than the median ($6.04 > 5.5$)¹². Interestingly, 58% of respondents reported having five thousand or more dollars in liquid assets. This finding may appear at odds with The Federal Reserve's Report on the Economic Well-Being of U.S. Households mentioned earlier that found 44% of Americans would not be able to cover an emergency expense of \$400 without borrowing or selling something. A few factors may explain some of this discrepancy including the expanded definition of liquid savings used in this paper's savings metric, varying financial understandings about what funds could or should be used in the case of an emergency, or the generally privileged sample. To elaborate, the sample is disproportionately non-Hispanic white, (78%), male (75%), and educated (57% have some college or more).

Table 3 shows the logistic regression predicting having a retirement plan. Findings are consistent with previous research finding unequal access to retirement plans (Kalleberg 2013). Individuals who have consistent, full-time, salaried employment are more likely to work for employers who offer pension coverage or disposable income to invest for retirement. For example, on average, being employed in the years preceding the Recession increases the odds of having a retirement plan by a factor of 2.91 versus those who experienced any other combination of employment statuses ($p < .001$). On average, a one-point increase in *SES* also increases the odds of having a retirement plan by nearly 50 percent ($p < .001$). Curiously, households with a female head are more likely to have a retirement plan than households with a male head ($p < .05$). Generally, factors that are associated with having a retirement plan in 2007 are also associated with better outcomes during the Great Recession (Grusky et al 2011).

¹² Ideally, education would also be measured on the same scale as income and wealth. The large portion of respondents reporting a High School education (education = 12) or a college degree (education > 16) prevents effective quartering.

Figure 1 illustrates the density of predicted probabilities for respondents in the retirement plan model overlaid by predicted probability densities for those with and without a retirement plan. Vertical lines show where quartiles designate strata. 12 respondents with a retirement plan are dropped from the analysis because their predicted probabilities are above the maximum propensity score of .985 for respondents without a retirement plan in the highest stratum. 111 respondents without a retirement plan are also discarded because their predicted probabilities are below the minimum propensity score of .016 for respondents with a retirement plan in the lowest stratum. In total, 123 cases are dropped for not having an appropriate counterfactual match.

Table 4 shows covariate balance for the analyses across the five matched strata before and after the matching process. Bias between covariates is displayed next to reduction in bias¹³ used to show matching success. T-tests provide additional evidence for covariate balance. Patterns in the covariates justify understanding matched strata as varying levels of Great Recession risk. We can see the varied risks by comparing the labor market positions, socio-economic statuses, and demographic composition of the first and fifth quartile. Respondents with a retirement plan in the first quartile were around half as likely to enter the Recession after a period of stable employment as their counterparts in the fifth quartile (about 36% versus around 91%). Respondents in the fifth strata are also more likely to be male, non-Hispanic white, and in a household headed by a couple than their first strata counterparts, all of which have been found to protect individuals during recessions. A significant difference in *SES* between those with and without a pension in the first quartile suggests a potential lack of covariate balance, potentially

¹³ Reduction in bias is measured as (bias after matching) / (bias before matching). Bias shows how much of the covariance is accounted for by matching while t-tests show whether there is a significant difference within strata. Both are therefore reported. Not all covariates for poverty are related to having a retirement plan, but covariate balance is still important to demonstrate retirement plan's isolation.

challenging results presented in later multinomial logistic regressions. *SES* bias in the other four quartiles is reduced by over 90%. Adding or removing quartiles did little to address problems with balance¹⁴.

Part 2

Table 5 shows a cross tabulation between *Pov 200*, the dependent variable used in the multi-nominal logistic regressions, and *Rplan*, the key independent variable in the regression models. This table illustrates why some of the multi-nominal logistic regressions have problems with convergence and quasi-complete separation. Some of the key outcome comparison groups have little to no variation. In the full model, there is over 100 respondents in each cell, but matching produces some cells within groups that have less than 10 respondents. Ultimately, some multinomial models are converted to logistic models, some relationships cannot be estimated, and some comparisons had to be dropped from the analysis.

Table 6 (a) presents results from six multinomial logistic regressions predicting falling into low income versus maintaining income above 200% of the poverty line for the full model and each of the five propensity-matched groups. The key independent variable in these models is *ADC*, but the factors used to produce the propensity groupings are included. The multinomial logistic regression for quintile five was unable to achieve convergence. In addition, quasi-complete separation in the first quartile produces unreliable standard errors and coefficients for the effect of *Salaried* and *DB*. Coefficients and standard errors for problem variables are reported as ∞ , and the significance of these variables are tested using a likelihood-ratio test. In the case

¹⁴ Previous analysis tested both four and six strata. Four strata had additional problems with covariate balance while six strata enhanced a problem with poverty variation seen in table 5. Analysis proceeds with five strata as it provided the best mix of covariate balance and statistical power.

where the problem variable is a dummy variable, coefficients for the other independent variables represent the maximum likelihood estimate for cases where the dependent variable varies¹⁵ (Allison 2008).

Findings from the full model are largely consistent with other research on the Recession. Respondents with a retirement plan of any type are, on average, less likely to fall into poverty than respondents without a retirement plan ($p < .05$). On average, those who work for a salary, are in families headed by a couple, and are non-Hispanic white are less likely to fall into poverty ($p < .05$). Importantly, those with over five thousand dollars in liquid savings are, on average, half as likely to fall into poverty as those without five thousand dollars in savings ($p < .001$). This finding suggests liquid capital amounting to as little as five thousand dollars can protect individuals from downward mobility. It is important to note here that the poverty rate considers marital status and family size, so results do not contest other researcher's findings that younger individuals suffered the worst individual income outcomes (Bell and Blanchflower 2011). Rather, results more accurately suggest that, on average, the risk of a family experiencing downward mobility increases as the head of household becomes older ($p < .001$).

Looking at each of the propensity groups, we find that having any form of defined contribution retirement plan remains at least marginally significant in three of the five stratum ($p < .10$). This suggests that even within a group where those who do and those who do not have a

¹⁵ For example, when interpreting the effect of independent variables in the first propensity group, the coefficients reported represent the effect of each independent variable for those cases where individuals do not only have a defined benefit retirement plan and are unsalaried. E.g. When looking at individuals who do not only have a defined benefit retirement plan and are also unsalaried, those who have at least five thousand dollars in savings, on average, are marginally less likely to experience downward mobility than their counterparts without at least five thousand dollars in savings ($p < .10$).

retirement plan share similar Recession risks, having any form of a defined contribution pension plan, on average, reduced the risk of experiencing downward economic mobility during the Recession. One should be cautious before only using p values to assume that having a defined contribution pension plan is more important than having a defined benefit pension plan. First, some of those who have any defined contribution pension plan also have a defined benefit retirement plan. In addition, because so few people have only a defined benefit retirement plan, the standard error may be more conservative than the standard error for the more commonplace defined contribution pension plan. Comparing unstandardized coefficients, the effect of having only a defined benefit retirement plan versus no retirement plan is often just as large or larger than the effect of having any defined contribution retirement plan versus no retirement plan. The effect of other independent variables appear to be the same across groups¹⁶.

Table 6 (b) presents results from six multinomial logistic regressions predicting leaving low income versus maintaining income below 200% of the poverty line for the full model and each of the five propensity-matched groups. Results are mostly consistent with table 6 (a) except in the opposite direction. For example, whereas on average increasing *SES* decreased the probability of falling into poverty versus staying out of poverty, increasing *SES* on average increases the probability of leaving poverty versus staying in poverty ($p < .001$).

Table 7 (a) presents results that decompose the total effect of having any defined contribution retirement plan on the probability of experiencing downward mobility into direct

¹⁶ Problems with model convergence limits the value of relatively comparing coefficients between groups. It would not be appropriate, for example, to compare the coefficient for *SES* of the first and second group because quasi-complete separation caused by some independent variables in the first group limit interpretation to a sub-sample (see footnote 15). Future analysis where matching was more successful may illuminate interesting findings between groups that can be more accurately compared.

and indirect effects via the decision to cash out for the full model and each of the five propensity-matched groups. Analysis uses statistical package *khb* (Kohler 2011). Each sample is tested for whether cashing out mediates the effect of having any defined contribution retirement plan. Generally, findings show no significant mediation. The direction of effects appears to suggest negative mediation, which if true would mean that, on average, respondents who cash out of their defined contribution retirement plan are suppressing the negative effect of having a defined contribution retirement plan on the probability of experiencing downward economic mobility. The effect is non-significant; however, it is worth noting that limited poverty variation and cash-out variation within some matched groups limits the statistical power of findings. Before assuming some exogenous factor affected individuals who chose to cash out, analysis should consider individuals in each of the matched-groups have similar risk levels during the Recession.

Table 7 (b) presents results that decompose the total effect of having any defined contribution retirement plan on the probability of experiencing upward mobility into direct and indirect effects via the decision to cash out for the full model and four of the five propensity-matched groups¹⁷. Generally, results from table 7 (b) suggest cashing out does not mediate the effect of having a defined contribution retirement plan on the probability of experiencing upward mobility.

Table 8 (a) presents results from six multinomial logistic regressions that compare the probability of maintaining income above 200% of the poverty line versus falling into low income for the full model and four of the five propensity groups when the sample is limited to only those with a retirement plan ($ADC = 1$). These analysis further examine whether choosing to cash out

¹⁷ Limited poverty variation in the 5th group prevents meaningful analysis.

of one's pension had any effect on income mobility by limiting the sample to only those who had the decision to cash out. Limiting the sample serves a similar purpose to mediation analysis by specifying the reference group of *cash out* to only those who had the option to cash out. Similar to the mediation analysis, results from the limited sample suggest that those who cash out did not have better mobility outcomes than those who did not (and had the option to). Interestingly, *cash out*, on average, has a marginal, positive effect on the probability of having one's income fall below 200% versus not falling into poverty¹⁸ for those in a privileged social position (group five). Taken with the findings from the mediation analysis that suggests *cash out* suppresses the effect of having a retirement plan, findings may suggest that those with high social positions who did cash out to avoid falling into low income did not access enough capital to avoid the negative effects they experienced during the recession.

Table 8 (b) presents results from multinomial logistic regressions that compare the probability of maintaining income below 200% of the poverty line versus leaving low income for the full model and three of the five propensity groups. Limited poverty variation is especially problematic for these comparisons, largely preventing meaningful interpretation. Beyond insignificant results, the direction and magnitude of the effect of *cash out* follow no discernable pattern. Other independent factors behaved similarly to findings presented in table 6 (b).

¹⁸ This finding is from a logistic regression where the sample is limited to those who started with incomes above 200%.

DISCUSSION AND CONCLUSIONS

Contributions

Although inconclusive results constrains this paper from making theoretical claims, findings from table 2 suggest that access to retirement plans is structured by individual's labor market position, socioeconomic status, and demographic privilege. Consequently, future research that looks into the consequences of choice programs should take into account the structures that dictate choice-program membership and the influence those structures may have on the success of choice-based retirement. For example, in discussions about how to structure a social welfare system, Libertarian Paternalism argues that governments and companies should maximize choices available to individuals while simultaneously “nudging” them towards better decisions by manipulating the choice architecture to promote socially beneficial outcomes (Thaler and Sunstein 2008). If social position determines access to choice programs, perhaps social position also influences how individuals interact with their choice architectures. If that is the case, proponents of libertarian paternalism should consider how social position constrains individuals' actions within choice architecture when designing social welfare programs in the public and private sector.

Despite inconclusive findings, this paper makes a methodological contribution to research examining the effects of defined contribution pension plans. Because one's labor market position determines one's access to a retirement plan, the effect of having a retirement plan may actually represent a proxy for the unmeasured labor market position of individuals. Although the analysis in this paper may not eliminate this problem¹⁹, propensity score matching makes us

¹⁹ Despite controlling for varying labor market factors, the effect of defined contribution plans remained significant despite the non-significance of its theorized mechanism – *Cash Out*.

more confident that we are measuring the effect of retirement decisions and not labor market positions. Moreover, when measuring the effect of decisions such as *Cash Out*, causal analysis should draw comparisons between those who cashed out and those who had the decision to cash out. Mediation analysis addresses this concern by specifying the reference group. Together, stratified propensity score analysis and mediation analysis can isolate the effect of decisions among people who share similar social positions.

This paper also offers substantive insights into the importance of liquid capital during times of economic crisis. Given that *5k in savings* yields significant and economically beneficial results, one may be surprised to find that cashing out of a retirement plan, which often gives more than five thousand dollars, does not have a similar, economically beneficial effect. Although results do not directly compare amounts in a savings account to amounts from cashing out of a retirement plan, findings suggest that future research may benefit by considering the possibility that different forms of capital may have different effects during economic crisis. As seen in the inconsistency between reports of liquid capital in the PSID and questions about emergencies, people may have different understandings of what constitutes a “liquid” fund that can or should be used in case of emergency.

Limitations and Areas of Future Work

Beyond the limitations of having insignificant findings, methodological limitations embedded in the data structure and analytic technique constrain the results’ empirical claims. First, the current data structure relies on a pre and post-test counterfactual structure. Although propensity score analysis matches groups based upon pre-Recession characteristics – which we expect structured similar experiences during the crisis – analysis does not consider any variable during the Recession besides the decision to cash out. Although this is necessary for causal

arguments using fixed-effect regression analysis, approaching the data structure using multi-level modeling may allow the research to understand the interrelatedness of factors that change during and after the recession. Multi-level modeling would also allow analysis to examine different independent and dependent variables that vary during and after the Recession. Addressing another limitation with the data structure, current analysis on heads of household limits the substantive interpretation in independent variable effects. Without understanding the level at which each variable is measured, the casual observer is prone to make ecological fallacies²⁰ (Robinson 1950). Future family-level prediction may want to consider aggregating all the variables used in the analysis to the family level or utilizing the individual-family nesting structure (Snijders and Bosker 2004; Croon and van Veldhoven 2007; Lüdtke et al 2008; Van Mierlo 2009).

This study was also limited by a lack of variation in its income mobility measure after propensity matching. Lack of variation precluded analysis of the most and least privileged groups in several of the regression models²¹. Omitted analysis consequently prevents comparisons among the most theoretically interesting groups. Attempts to address this problem were impeded by an interesting paradox arising from the need to have well-matched propensity groups and varied dependent outcomes across groups. As the fully saturated logistic model became better at predicting whether a respondent had a retirement plan, groups were more closely matched by their social privilege and Great Recession risk. Although this is necessary for demonstrating covariate balance, it became a problem when later analysis examined the variance

²⁰ For example, one may assume that older individuals were more likely to experience downward economic mobility during the recession. As discussed in the results., making this claim would be an ecological fallacy.

²¹ Table 5 and the relevant discussion illustrates this problem using descriptive statistics.

in mobility outcomes among groups that have high levels of privilege (when examining downward mobility) or low levels of privilege (when examining upward mobility).

Theoretically, it makes sense that a group entering the Recession with secure labor market positions, high socio-economic statuses, and privileged demographic backgrounds would experience little downward mobility. The resulting analysis predicts mobility based upon only a few cases in the comparison group. Models therefore have problems with convergence and perfect-prediction. Analysis addresses these problems by ignoring part of the sample by using logistic regression or allowing for quasi-complete separation. Consequently, this study cannot make conclusions by comparing coefficients between groups.

Beyond the fact that privileged groups may be less likely to experience downward mobility, the static nature of the mobility measure prevents analysis from capturing the full range of income mobility. Specifically, the current measure does not capture the following types of income mobility variation: A) upward mobility for those who started above 200% of the poverty line; B) downward mobility for those who started well-above 200% of the poverty line; C) upward mobility for those who started well-below 200% of the poverty line but were unable to cross the low-income boundary; and, D) downward mobility for those who started above 200% of the poverty line but did not cross the 200% threshold. Although the 200% threshold is theoretically important (as it differentiates those with low-income) patterns develop in the missing variation after propensity-group matching. Regressions predicting downward mobility underestimates variation type D in the first propensity group and variation type B in the fifth propensity group. This problem is mirrored for regression predicting upward mobility, underestimating variation type C in the first propensity group and variation type A in the fifth

propensity group. Although analysis provides little evidence of autocorrelation, future analysis may consider mobility measures that capture more income variation.

The research is also limited in its ability to generalize to future recessions. The dynamic nature of choice-based retirement and economic recessions means that the choice architecture governing the decision to cash out of one's pension is in constant flux. For example, future Recessions may not come with a financial crisis and credit crunch. Individuals with access to capital through traditional financial institutions may make different decisions when dealing with crisis. The system of rewards and penalties governing the decision to cash out of one's pension may also change depending upon the composition of retirement plans in the country, political laws regulating retirement, and demographic changes related to population aging. Varying understandings of what can or should be done in times of economic crisis may also structure the decision to cash out. Although this study controls for many of the factors we may associate with financial praxis, cultural change in addition to choice-architecture constrain individuals' financial decisions. Qualitative research that takes into account culture, social structure, and choice architecture may reveal the mechanisms that enable and constraint retirement decisions.

Future quantitative research may consider breaking the research question for this paper into two analytic components. This first component could look at how the liquidity and amount of different types of capital mitigated the negative effects of economic shocks experienced during the Recession. For example, research may consider whether cashing out, having money in liquid savings, or having other forms of capital mitigates the probability of a family experiencing foreclosure, late-bill payments, or unemployment. Longitudinal, multilevel modeling methods may improve this project. The second component could consider the negative side effects experienced by those who chose to cash out of their retirement plans during the Recession. Given

that this paper finds little evidence that cashing out helped individuals mitigate the effects of the Recession, analysis may look into whether cashing out during the Recession affected future contributions to retirement plans, overall amounts within plans, or retirement expectations. This research may use a pre and post-test structure similar to the methods presented in this paper.

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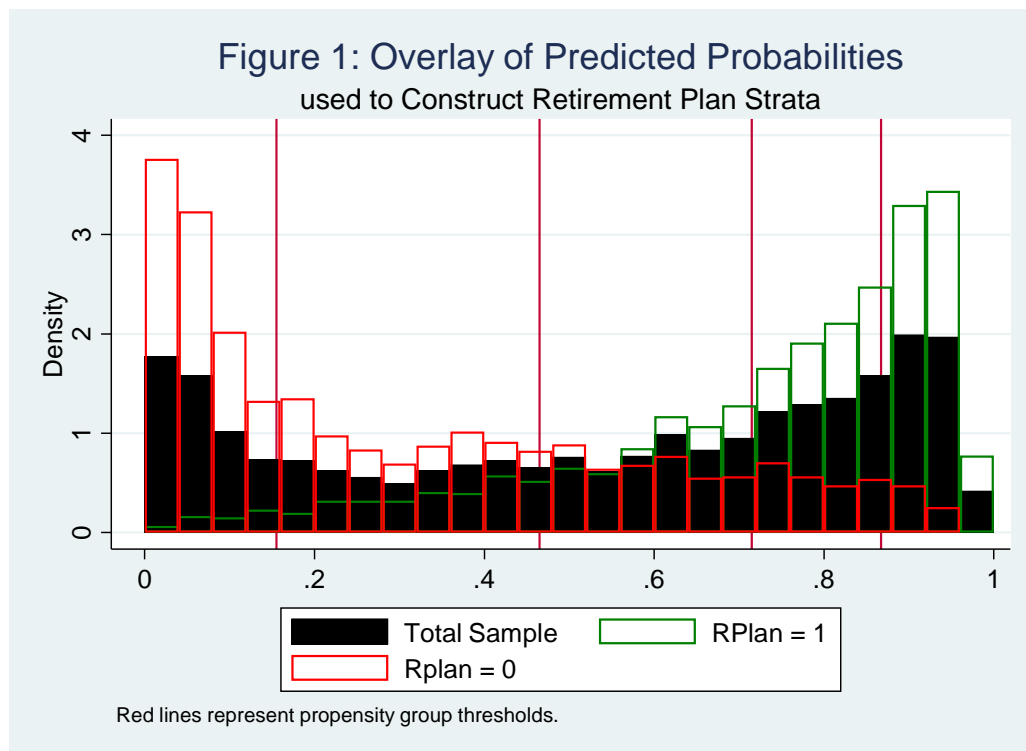
Figures and Tables

Table 1. Factor Analysis Creating SES Scale from Three Socio-Economic Components

	Income		Wealth		Education	
	Min	Max	Min	Max	Min	Max
Ordered Groups						
Group 1 Range	\$0	\$24,035	-\$188,695	\$5,398	0 years	11 years
Group 2 Range	\$24,036	\$46,101	\$5,399	\$54,820	12 years	12 years
Group 3 Range	\$44,101	\$77,802	\$54,821	\$210,029	13 years	15 years
Group 4 Range	\$77,803	\$2,637,997	\$210,030	\$34,275,052	16 years	17 years
Factor Loadings	0.871		0.815		0.714	
Factor Eigenvalue	1.931					
Cronbach's Alpha	0.722					

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 4,330 (before propensity group matching).

Note: Income and wealth are reported in 2000 dollars.

Note: Factor analysis uses orthogonal rotation.

Table 2. Descriptive Table of Variables used in the Analysis

Variable	Mean	Description
Dependent		
Pov 200		R's experience with the poverty threshold measured at 200% of census needs.
Stay Pov	0.20	Whether R had low income before and after the Recession (1=yes, 0=no).
Left Pov	0.09	Whether R had low income before but not after the Recession (1=yes, 0=no).
Fall Pov	0.09	Whether R had low income after but not before the Recession (1=yes, 0=no).
No Pov	0.63	Whether R did not have low income before or after the Recession (1=yes, 0=no).
Independent		
Retirement		
RPlan	0.59	Whether R has any form of retirement savings (1=yes, 0=no).
DB	0.08	Whether R only has a defined benefit retirement plan (1=yes, 0=no).
DC	0.37	Whether R only had a defined contribution retirement plan (1=yes, 0=no).
Both	0.13	Whether R has both a DB and DC retirement plan (1=yes, 0=no).
Cashout	0.13	Whether R cashed out of any part of his or her retirement plan(s) (1=yes, 0=no).
Labor Market		
Salaried	0.25	Whether R was paid salary in 2005 and 2007 (1=yes, 0=no).
Full-Time	0.56	Whether R worked 35 or more hours a week in 2004 and 2006 (1=yes, 0=no).
Employed	0.71	Whether R reported employment in 2005 and 2007 (1=yes, 0=no).
Social Class		
SES Scale	6.04	R's SES scale ranging 1 through 10 combining income, wealth, and education.
5k in Savings	0.58	Whether R has \$5,000 or more in liquid assets (1=yes, 0=no).
Demographic		
Couple	0.58	Whether R's family unit is headed by a couple (1=yes, 0=no).
NH White	0.78	Whether R is non-Hispanic and white (1=yes, 0=no).
Female	0.25	Whether R is female (1=yes, 0=no).
FU Size	2.42	Total household residents.
ln (age)	3.87	Natural log of R's age in years.
Retired	0.16	Whether R is retired before the Recession in 2005 or 2007 (1=yes, 0=no).
Region		
Northeast	0.19	Whether R's family lives in Northeast (1=yes, 0=no).
Midwest	0.32	Whether R's family lives in Midwest (1=yes, 0=no).
South	0.28	Whether R's family lives in South (1=yes, 0=no).
West	0.21	Whether R's family lives in West (1=yes, 0=no).
Alaska/Hawaii	0.00	Whether R's family lives in Alaska/Hawaii (1=yes, 0=no).

Data Source: *Panel Study on Income Dynamics* (PSID).

N = 4,199.

Note: Weighted with 2005 Core/Immigrant Family Weight.

Table 3. Logistic regression predicting whether Respondent has a Retirement Plan (1=yes, 0=no).

	β	S.E.	$\exp(\beta)$	S.E.
Constant	-4.72 ***	(0.59)	0.01 ***	(0.01)
Labor Market				
Salaried	0.21 *	(0.11)	1.24 *	(0.13)
Full-Time	0.88 ***	(0.09)	2.42 ***	(0.22)
Employed	1.07 ***	(0.13)	2.91 ***	(0.39)
Social Class				
SES Scale	0.40 ***	(0.02)	1.49 ***	(0.03)
5k in Savings	0.56 ***	(0.09)	1.75 ***	(0.16)
Demographic				
Couple	-0.05	(0.14)	0.96	(0.13)
NH White	0.21 *	(0.09)	1.24 *	(0.11)
Female	0.28 *	(0.14)	1.32 *	(0.18)
FU Size	-0.14	(0.03)	0.87	(0.03)
ln (age)	0.29 †	(0.15)	1.33 †	(0.20)
Retired	0.54 ***	(0.18)	1.71 ***	(0.31)
Region				
Northeast (Reference)				
Midwest	0.15	(0.13)	1.16	(0.15)
South	0.05	(0.13)	1.05	(0.13)
West	-0.03	(0.14)	0.97	(0.13)
<i>Pseudo R</i> ²	0.293		0.293	

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 4,199.

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

β — Unstandardized regression coefficients (standard errors in parentheses).

$\exp(\beta)$ — odds-ratio.

Note: Stata package *Desmat* produces a fully saturated logistic model

that includes all interaction effects for propensity scoring ($R^2 = .361$).

Table 4 (a). An assessment of covariate balance on Labor Market, Social Class, and Demographic Factors for Each Propensity Group

before and after propensity score matching		With	without	reduction		
		Rplan	Rplan	bias	in bias	t-value sig
Labor Market						
Salaried	Before	0.34	0.10	-61.03		-19.40 ***
	After Q1	0.04	0.01	-19.52	68.01	-2.12 *
	After Q2	0.08	0.09	3.95	93.53	0.52
	After Q3	0.17	0.12	-11.92	80.48	-1.67 †
	After Q4	0.32	0.31	-4.13	93.24	-0.49
	After Q5	0.59	0.61	5.11	91.62	0.40
Full-Time	Before	0.74	0.42	-66.62		-21.61 ***
	After Q1	0.24	0.16	-18.66	71.99	-1.43
	After Q2	0.48	0.48	-0.87	98.70	-0.12
	After Q3	0.74	0.70	-8.31	87.53	-1.18
	After Q4	0.73	0.72	-2.79	95.81	-0.33
	After Q5	0.86	0.87	1.61	97.58	0.13
Employed	Before	0.86	0.60	-60.97		-19.94 ***
	After Q1	0.36	0.36	0.00	100.00	-1.00
	After Q2	0.77	0.74	-7.70	87.38	-1.02
	After Q3	0.87	0.86	-3.09	94.93	-0.44
	After Q4	0.86	0.83	-8.07	86.77	-0.98
	After Q5	0.91	0.90	-4.19	93.13	-0.34
Social Class						
SES	Before	6.92	4.17	-125.62		-40.55 ***
	After Q1	3.11	2.57	-41.85	66.68	-2.99 **
	After Q2	4.29	4.22	-4.33	96.55	-0.59
	After Q3	5.64	5.45	-11.75	90.65	-1.66 †
	After Q4	7.08	6.93	-9.05	92.80	-1.07
	After Q5	8.80	8.66	-11.09	91.17	-0.88
5k in Savings	Before	0.69	0.27	-91.28		-29.45 ***
	After Q1	0.11	0.06	-15.61	82.90	-1.26
	After Q2	0.23	0.25	5.32	94.17	0.71
	After Q3	0.48	0.45	-6.71	92.65	-0.95
	After Q4	0.75	0.72	-7.25	92.05	-0.87
	After Q5	0.97	0.91	-25.98	71.54	-2.68 **
Demographics						
Couple	Before	0.72	0.49	-48.84		-15.84 ***
	After Q1	0.38	0.27	-23.60	51.68	-1.77 †
	After Q2	0.58	0.59	2.81	94.25	0.38
	After Q3	0.64	0.63	-1.31	97.32	-0.19
	After Q4	0.73	0.72	-2.11	95.67	-0.25
	After Q5	0.84	0.82	-5.61	88.52	-0.45
NH White	Before	0.72	0.47	-51.69		-16.77 ***
	After Q1	0.35	0.32	-6.25	87.91	-0.45
	After Q2	0.55	0.49	-11.92	76.95	-1.60
	After Q3	0.56	0.61	8.21	84.12	1.16
	After Q4	0.77	0.72	-11.30	78.14	-1.36
	After Q5	0.86	0.88	5.71	88.96	0.44
Female	Before	0.17	0.33	37.86		12.34 ***
	After Q1	0.40	0.50	19.98	47.24	1.42
	After Q2	0.24	0.24	1.40	96.31	0.19
	After Q3	0.23	0.23	-1.52	96.00	-0.21
	After Q4	0.16	0.19	5.79	84.72	0.69
	After Q5	0.10	0.12	5.42	85.70	0.44

Data Source: 2009 Panel Study on Income Dynamics (PSID).

N = 3,965; Q1 = 795, Q2 = 791, Q3 = 793, Q4 = 798, Q5 = 788.

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Note: Bias analysis does *not* use sample weights.

Table 4 (b). An assessment of covariate balance on Demographic and Social Class Factors from Logistic Model

before and after propensity score matching	With Rplan	without Rplan	bias	reduction in bias	t-value	sig
Demographics continued						
FU Size	Before	2.72	2.78	4.07		1.33
	After Q1	2.71	2.68	-1.49	63.46	-0.10
	After Q2	2.79	3.00	12.76	213.20	1.70 †
	After Q3	2.81	2.71	-7.35	80.41	-1.04
	After Q4	2.62	2.70	5.90	44.87	0.69
	After Q5	2.72	2.63	-7.84	92.38	-0.61
ln(age)	Before	3.83	3.74	-29.09		-9.47 ***
	After Q1	3.70	3.70	-1.08	96.30	-0.08
	After Q2	3.71	3.74	10.41	64.22	1.39
	After Q3	3.77	3.75	-7.29	74.93	-1.04
	After Q4	3.85	3.84	-0.47	98.38	-0.06
	After Q5	3.91	3.87	-13.44	53.80	1.16
Retired	Before	0.10	0.12	8.06		2.62 **
	After Q1	0.13	0.14	4.49	44.35	0.32
	After Q2	0.12	0.10	-4.81	40.32	-0.65
	After Q3	0.08	0.11	8.76	8.62	1.26
	After Q4	0.12	0.13	1.88	76.70	0.22
	After Q5	0.07	0.06	-4.65	42.34	0.35
<i>Region</i>						
Northeast	Before	0.17	0.11	-15.14		-4.86 ***
	After Q1	0.11	0.10	-4.45	70.61	-0.33
	After Q2	0.10	0.09	-1.56	89.70	-0.21
	After Q3	0.13	0.14	2.23	85.24	0.32
	After Q4	0.18	0.14	-10.81	28.58	-1.24
	After Q5	0.20	0.25	13.25	12.45	1.08
Midwest	Before	0.27	0.23	-10.47		-3.37 ***
	After Q1	0.16	0.20	10.34	1.17	0.72
	After Q2	0.23	0.21	-5.11	51.21	-0.69
	After Q3	0.25	0.26	1.62	84.53	0.23
	After Q4	0.30	0.32	3.74	64.30	0.44
	After Q5	0.28	0.24	-9.61	8.14	-0.74
South	Before	0.37	0.48	23.29		7.53 ***
	After Q1	0.56	0.55	-2.16	90.73	-0.16
	After Q2	0.47	0.47	1.51	93.54	0.20
	After Q3	0.44	0.44	-0.84	96.37	-0.12
	After Q4	0.36	0.38	3.42	85.32	0.41
	After Q5	0.28	0.28	-0.02	99.91	0.00
West	Before	0.19	0.17	-4.38		-1.41
	After Q1	0.16	0.15	-4.35	0.53	-0.32
	After Q2	0.20	0.22	4.52	3.26	0.60
	After Q3	0.17	0.16	-2.83	35.44	-0.40
	After Q4	0.15	0.16	1.61	63.14	0.19
	After Q5	0.24	0.22	-3.11	28.87	-0.24

Data Source: *Panel Study on Income Dynamics* (PSID).

N = 3,965; Q1 = 795, Q2 = 791, Q3 = 793, Q4 = 798, Q5 = 788.

† — $P < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Note: Bias analysis does *not* use sample weights.

Table 5. Cross Tabulation of Poverty Outcomes by whether R has a Retirement Plan for each Propensity Group

	Stay Pov	Left Pov	Fall Pov	No Pov
Full Model				
With Rplan	158	144	168	1789
Without Rplan	855	235	196	654
Q1				
With Rplan	30	13	3	9
Without Rplan	608	91	45	41
Q2				
With Rplan	66	45	33	117
Without Rplan	196	101	81	201
Q3				
With Rplan	66	45	33	117
Without Rplan	196	101	81	201
Q4				
With Rplan	18	23	48	574
Without Rplan	8	6	20	143
Q5				
With Rplan	2	10	29	731
Without Rplan	2	1	4	60

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 4,199; Q1 = 840; Q2 = 840; Q3 = 840; Q4 = 840; Q5 = 839.

Table 6 (a). Multinomial Logistic Regressions Comparing the Predicted Probability of Maintaining Income above 200% of the Census Needs Poverty Line versus Falling into Low Income for Full Model and each Propensity Group

	Full Model		Q1		Q2		Q3		Q4		Q5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	-4.33	(0.97)	-2.97	(2.94)	-3.02	† (1.77)	6.75	*** (2.12)	-5.68	† (3.10)	-5.03	(4.87)
Retirement												
ADC	-0.43	** (0.14)	-0.93	(0.76)	-0.47	† (0.27)	-0.45	† (0.24)	-0.44	* (0.31)	0.22	(0.65)
DB	-0.47	* (0.22)	∞	∞	0.05	(0.46)	-0.68	† (0.41)	-1.18	(0.51)	1.02	(0.72)
Labor Market												
Salaried	-0.44	* (0.18)	∞	∞	-0.68	(0.42)	-0.04	(0.36)	-0.15	(0.35)	-0.91	* (0.45)
Full-time	-0.18	(0.15)	0.09	(0.62)	0.05	(0.25)	0.03	(0.34)	-0.50	(0.45)	1.04	(0.71)
Employed	-0.18	(0.22)	0.59	(0.57)	0.05	(0.34)	-0.16	(0.61)	-0.27	(1.11)	-1.78	* (0.88)
Social Class												
SES Scale	-0.34	*** (0.04)	-0.31	† (0.17)	-0.28	** (0.09)	-0.24	** (0.09)	-0.54	*** (0.12)	-0.41	* (0.17)
5k in Savings	-0.59	*** (0.14)	-1.16	† (0.68)	-0.60	* (0.29)	-0.22	(0.26)	-0.66	* (0.31)	-1.11	(0.73)
Demographic												
Couple	0.42	* (0.20)	-0.30	(0.64)	-0.41	(0.38)	-0.15	(0.39)	-0.43	(0.52)	0.03	(0.85)
NH White	-0.48	*** (0.14)	-0.25	(0.47)	-0.49	* (0.24)	-0.88	** (0.26)	0.04	(0.35)	-0.61	(0.47)
Female	0.01	(0.21)	0.42	(0.74)	0.06	(0.43)	0.34	(0.39)	0.14	(0.47)	-0.43	(0.99)
FU Size	0.12	* (0.06)	0.14	(0.19)	0.14	(0.11)	-0.02	(0.12)	0.08	(0.16)	0.23	(0.18)
ln (age)	1.40	*** (0.25)	1.03	(0.77)	0.90	* (0.44)	1.77	*** (0.48)	2.11	* (0.68)	1.78	(1.12)
Retired	-0.18	(0.28)	0.29	(0.67)	0.37	(0.51)	0.66	(0.71)	-1.40	(1.19)	-0.36	(0.97)
Region												
Northeast (Reference)												
Midwest	0.51	* (0.22)	0.10	(0.69)	0.48	(0.47)	1.11	* (0.45)	0.59	(0.47)	-0.17	(0.57)
South	0.25	(0.21)	0.21	(0.64)	0.30	(0.44)	0.44	(0.45)	0.36	(0.48)	0.32	(0.54)
West	0.57	* (0.23)	0.42	(0.70)	0.46	(0.48)	1.16	* (0.48)	0.28	(0.54)	-0.16	(0.63)
<i>Pseudo R</i> ²	0.384		0.234		0.169		0.163		0.214		0.131	

Data Source: *Panel Study on Income Dynamics* (PSID).

N = 4,199; Q1 = 840; Q2 = 840; Q3 = 840; Q4 = 840; Q5 = 824.

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

β — Unstandardized regression coefficients (standard errors in parentheses).

Note: Coefficients presented for group five are from logistic regression where sample is limited to those who were above the poverty line in both 2005 and 2007.

Note: ∞ is reported where logistic regression failed to resolve the quasi-complete separation issue. P-values are computed using a likelihood-ratio test.

Table 6 (b). Multinomial Logistic Regressions Comparing the Probability of Maintaining Income below 200% of the Census Needs Poverty Line versus Leaving Low Income for Full Model and each Propensity Group

	Full Model		Q1		Q2		Q3		Q4		Q5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	1.43	(0.90)	2.27	(1.48)	3.65 *	(1.72)	0.67	(0.52)	-2.09	(5.01)	---	---
Retirement												
ADC	0.59 ***	(0.16)	1.11 **	(0.40)	0.50 †	(0.25)	0.37	(0.34)	0.20	(0.66)	---	---
DB	0.43	(0.31)	-0.30	(1.21)	-0.17	(0.55)	0.67	(0.52)	∞	∞	---	---
Labor Market												
Salaried	0.31	(0.27)	∞	∞	0.50	(0.46)	0.86	(0.57)	0.04	(0.82)	---	---
Full-time	0.21	(0.15)	0.45	(0.31)	-0.29	(0.24)	-0.02	(0.51)	1.17	(0.94)	---	---
Employed	0.52 **	(0.17)	0.62 *	(0.26)	-0.10	(0.34)	-0.51	(0.84)	0.06	(1.39)	---	---
Social Class												
SES Scale	0.44 ***	(0.05)	0.50 ***	(0.11)	0.28 **	(0.10)	0.22	(0.14)	0.45	(0.30)	---	---
5k in Savings	0.38 *	(0.18)	0.73 †	(0.44)	0.41	(0.31)	0.34	(0.38)	-0.17	(0.73)	---	---
Demographic												
Couple	0.16	(0.22)	-0.14	(0.38)	0.71 †	(0.38)	-0.10	(0.58)	0.70	(1.09)	---	---
NH White	0.41 **	(0.15)	0.63 *	(0.25)	0.04	(0.24)	0.57	(0.40)	-0.27	(0.81)	---	---
Female	-0.38 *	(0.19)	-0.41	(0.31)	-0.17	(0.35)	0.63	(0.53)	-0.18	(0.87)	---	---
FU Size	-0.12 *	(0.05)	0.15 †	(0.09)	-0.14	(0.09)	-0.05	(0.13)	-0.42	(0.28)	---	---
ln (age)	-1.16 ***	(0.24)	-1.65 ***	(0.40)	-1.29 **	(0.43)	0.72	(0.68)	0.02	(1.20)	---	---
Retired	0.41	(0.28)	0.93 *	(0.45)	0.04	(0.52)	1.20	(1.06)	-1.09	(1.62)		
Region												
Northeast (Reference)											---	---
Midwest	-0.21	(0.25)	0.65	(0.47)	-0.82 †	(0.45)	0.06	(0.56)	0.10	(0.89)	---	---
South	0.01	(0.23)	0.59	(0.45)	-0.11	(0.41)	-0.05	(0.52)	-0.68	(0.96)	---	---
West	0.24	(0.26)	0.03	(0.53)	-0.55	(0.45)	0.40	(0.60)	0.38	(1.06)	---	---
<i>Pseudo R</i> ²	0.384		0.234		0.169		0.163		0.214		-----	

Data Source: *Panel Study on Income Dynamics* (PSID).

N = 4,199; Q1 = 840; Q2 = 840; Q3 = 840; Q4 = 840.

† — p < .10; * — p < .05; ** p < .01; *** p < .001 (two-tailed tests).

β — Unstandardized regression coefficients (standard errors in parentheses).

Note: Limited poverty variation in the 5th group prevents meaningful analyses.

Note: ∞ is reported where logistic regression failed to resolve the quasi-complete separation issue. P-values are computed using a likelihood-ratio test.

Table 7 (a). Decomposition of Total Effect of Having any Defined Contribution Retirement Plan (ADC) on the Probability of Maintaining Income above 200% of Census Needs versus Falling into Low Income into Direct and Indirect Effects via the Decision to Cash Out

	Full Model	Q1	Q2	Q3	Q4	Q5
Coefficients						
Total effect	-0.44 ***	-1.06	-0.47 †	-0.46 †	-0.45	-0.44
Direct effect	-0.52 ***	-1.30	-0.53 †	-0.56 *	-0.38	-0.59
Indirect effect						
Cash Out	0.08	0.25	0.06	0.11	-0.07	0.15 †
Mediation Percentage						
Cash Out	-19.39%	-23.32%	-11.62%	-23.19%	15.42%	-35.27%

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 4,199; Q1 = 840; Q2 = 840; Q3 = 840; Q4 = 840; Q5 = 824.

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

Note: Coefficients are unstandardized multi-nomial logistic coefficients for the effect of *ADC*.

Note: Coefficients presented for group five are from logistic regression where sample is limited to those who were above the poverty line in both 2005 and 2007.

Note: Mediation analysis includes control variables presented in table 4.

Note: Analyses use statistical package *khb* in statistical software STATA.

Table 7 (b). Decomposition of Total Effect of Having any Defined Contribution Retirement Plan (ADC) on the Probability of Maintaining Income below 200% of Census Needs vs Leaving Low Income into Direct and Indirect Effects via the Decision to Cash Out

	Full Model	Q1	Q2	Q3	Q4	Q5
Coefficients						
Total effect	0.60 ***	1.09 **	0.48	0.36	0.19	---
Direct effect	0.56 **	1.05 *	0.33	0.43	0.23	---
Indirect effect						
Cash Out	0.04	0.05	0.14	-0.06	-0.04	---
Mediation Percentage						
Cash Out	6.14%	4.30%	30.00%	-17.40%	-18.40%	-----

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 4,199; Q1 = 840; Q2 = 840; Q3 = 840; Q4 = 840; Q5 = 839.

† — p < .10; * — p < .05; ** p < .01; *** p < .001 (two-tailed tests).

Note: Coefficients are unstandardized multi-nomial logistic coefficients for the effect of *ADC*.

Note: Limited poverty variation in the 5th group prevents meaningful analyses.

Note: Mediation analysis includes control variables presented in table 4.

Note: Analyses use statistical package *khb* in statistical software *STATA*.

Table 8 (a). Multinomial Logistic Regressions Comparing the Probability of Maintaining Income above 200% Poverty versus Falling into Low Income for Full Model and each Propensity Group when Sample is Limited to those with a Defined Contribution Plan

	Full Model		Q1		Q2		Q3		Q4		Q5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	-4.93 **	1.66	---	---	-2.74	3.83	-6.88 *	3.21	-19.79	1094.13	-17.14	1549.05
Retirement												
Cash Out	0.34	0.22	---	---	0.20	0.59	0.56	0.39	-0.41	0.45	0.86 †	0.49
Labor Market												
Salaried	0.47 †	0.26	---	---	-1.38	1.11	-0.76	0.66	0.15	0.44	-0.89 †	0.52
Full-time	0.13	0.24	---	---	0.74	0.54	0.32	0.50	-0.94	0.58	1.02	0.79
Employed	-0.50	0.38	---	---	-0.16	0.73	-0.05	0.72	∞	∞	-1.47	0.95
Social Class												
SES Scale	-0.28 ***	0.06	---	---	-0.03	0.18	-0.25 †	0.13	-0.51 ***	0.16	-0.39 †	0.21
5k in Savings	-0.71 ***	0.21	---	---	-0.22	0.65	-0.33	0.39	-1.15 **	0.39	-1.82	0.79
Demographic												
Couple	-0.14	0.35	---	---	0.35	0.84	-0.11	0.59	-0.45	0.68	∞	∞
NH White	-0.68 ***	0.21	---	---	-1.15 *	0.56	-0.87 *	0.37	-0.09	0.46	-0.20	0.58
Female	0.23	0.35	---	---	-0.15	0.84	0.24	0.60	0.16	0.62	∞	∞
FU Size	0.08	0.09	---	---	-0.26	0.25	0.06	0.16	0.15	0.22	0.34 †	0.19
ln (age)	1.34 ***	0.42	---	---	0.57	0.99	1.43 *	0.73	2.25 *	0.90	1.09	1.23
Retired	-0.63	0.47	---	---	0.35	1.05	-0.35	0.90	∞	∞	∞	∞
Region												
Northeast (Reference)												
Midwest	0.60 †	0.34	---	---	0.49	0.96	1.39 †	0.82	1.12 †	0.63	-0.34	0.66
South	0.39	0.34	---	---	0.20	0.89	1.08	0.80	0.75	0.64	0.04	0.64
West	0.69 †	0.36	---	---	0.34	1.01	1.86 *	0.83	0.71	0.74	0.01	0.68
<i>Pseudo R</i> ²	0.286		-----		0.162		0.206		0.170		0.148	

Data Source: *Panel Study on Income Dynamics (PSID)*.

N = 1,940; Q2 = 221; Q3 = 420; Q4 = 524; Q5 = 679.

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

β —Unstandardized regression coefficients (standard errors in parentheses).

Note: Coefficients presented for group four and five are from logistic regression where sample is limited to those who were above the poverty line in both 2005 and 2007.

Note: ∞ is reported in the case of quasi-complete separation. P-values are computed using a likelihood-ratio test.

Note: Limited poverty variation in the 1st group prevents meaningful analyses.

Table 8 (b). Multinomial Logistic Regressions Comparing the Probability of Maintaining Income below 200% Poverty versus Leaving Low Income for the Full Model and each Propensity Group when Sample is Limited to those with a Defined Contribution Plan

	Full Model		Q1		Q2		Q3		Q4		Q5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Constant	-4.44 *	1.86	---	---	-1.72	3.91	12.98	626.91	-6.79	8.39	---	---
Retirement												
Cash Out	0.10	0.29	---	---	0.39	0.54	-0.36	0.63	1.96	1.54	---	---
Labor Market												
Salaried	0.68 †	0.41	---	---	1.87	1.21	0.80	0.90	1.06	1.63	---	---
Full-time	0.76 **	0.29	---	---	-0.83	0.54	-0.63	0.87	-1.00	1.54	---	---
Employed	0.80 †	0.42	---	---	-0.81	0.95	∞	∞	-3.86	2.98	---	---
Social Class												
SES Scale	1.03 ***	0.09	---	---	0.23	0.21	0.37	0.24	-0.21	0.72	---	---
5k in Savings	0.51 †	0.28	---	---	0.70	0.68	-0.27	0.61	-0.14	1.24	---	---
Demographic												
Couple	1.73 ***	0.41	---	---	0.72	0.79	-0.40	0.86	-1.66	2.52	---	---
NH White	0.12	0.28	---	---	0.29	0.53	0.63	0.63	1.04	1.86	---	---
Female	-0.32	0.36	---	---	0.30	0.69	-0.54	0.75	1.20	1.74	---	---
FU Size	-0.72 ***	0.11	---	---	-0.25	0.21	0.13	0.19	0.91	0.67	---	---
ln (age)	0.15	0.48	---	---	0.38	0.97	-0.49	1.04	1.71	2.38	---	---
Retired	-0.82	0.57	---	---	-2.40 †	1.29	∞	∞	-3.20	2.91	---	---
Region												
Northeast (Reference)												
Midwest	0.14	0.39	---	---	-0.21	0.89	0.39	0.82	1.84	2.46	---	---
South	0.45	0.39	---	---	0.72	0.87	0.60	0.81	3.62	2.53	---	---
West	0.83 †	0.47	---	---	0.61	0.92	2.46	1.28	---	---	---	---
<i>Pseudo R</i> ²	0.286		-----		0.162		0.206		0.270		-----	

Data Source: *Panel Study on Income Dynamics* (PSID).

N = 1,940; Q2 = 221; Q3 = 420; Q4 = 37

† — $p < .10$; * — $p < .05$; ** $p < .01$; *** $p < .001$ (two-tailed tests).

β —Unstandardized regression coefficients (standard errors in parentheses).

Note: ∞ is reported in the case of quasi-complete separation where logistic regression is ineffective P-values are computed using a likelihood-ratio test.

Note: Limited poverty variation in the 1st, 4th, and 5th group prevents meaningful analyses.

Note: Coefficients presented for group four are from logistic regression where sample is limited to those who were below the poverty line in both 2005 and 2007.