

Household Debt Across the Life Course: An Analysis of the Late Baby Boomers

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Dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor of Philosophy in the Department of  
Sociology in the Graduate School  
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2010

ABSTRACT

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## **Abstract**

As an aggregate, American households have shown rising debt levels over the past few decades. However, we do not yet understand how debt varies within households over time and what factors influence this variation in a meaningful way. To date, household debt appears predominantly as a component of measures of net worth, obscuring heterogeneity in the meaning of debt within a household. Moreover, most studies focusing specifically on indebtedness rely on cross-sectional data. In addition, no cohesive theoretical model exists to account for changing patterns of debt. This dissertation seeks to fill these gaps. Utilizing a variety of methodological approaches and drawing on longitudinal data from the National Longitudinal Survey of Youth 1979, it adds sociological explanation to a social process that has been previously ignored and under-theorized.

First, drawing from literature in economics and sociology, I propose a dynamic, life course model of indebtedness that proposes three mechanisms that drive differentiation in household indebtedness: institutional context (period), social heterogeneity, and patterned disadvantage, or structural risk. Second, I use multilevel logistic regressions to explore the association between the hypothesized mechanisms and the likelihood of holding non-collateralized debt. While experiencing negative life course risks increases the likelihood of holding debt, I find that occupying positions of structural disadvantage—being black, being in poverty—decreases the likelihood of holding debt, while having advantages—higher education, being married, holding

assets—increases the likelihood of holding debt, pointing to distinct differences in who can access debt to buffer life course shocks and who cannot. Examining the interrelationships between debts and assets further underscores the tenuous economic well-being of the disadvantaged. I find that those most likely to experience negative life events are both less likely to have financial assets with which to buffer these events and more likely to experience constrained access to non-collateralized debt.

Third, I employ multilevel linear regressions to examine the association between the proposed mechanisms and three unique indicators of debt burden. I find that many of the standard coefficients included in models of net worth are not significant predictors of the level of non-collateralized, non-revolving debt, suggesting that we know much more about the correlates of income and wealth than we do household debt. Rather, variation in debt burden may be better understood by heterogeneity in non-economic variables. To better estimate this heterogeneity, I utilize latent class regression models to estimate the early life course trajectories of debt burden for the NLSY79 cohort. I find four distinct trajectories of indebtedness, with varying consequences for later life financial outcomes. Overall, I conclude that household debt is nuanced and contextually contingent and can add to our understanding of long-term stratification processes when studied as a unique indicator of inequality.

For my parents

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## **1. Introduction**

Over the past few decades, American households saw significant wealth gains accompanied by dramatic increases in indebtedness. Specifically, more households are carrying some form of debt; ownership of non-collateralized debt is increasing; and the ratio of debt to income shows steady growth, at the same time as household savings have declined (Ritzer 1995). Similar patterns have been documented across a number of industrialized nations (Betti, Dourmashkin, Rossi, and Yin 2007; DeBelle 2004; Girouard, Kennedy, and André 2006; Mote and Nolle 2005), prompting research about the possible causes and consequences of rising household indebtedness.

Of most concern to those interested in inequality is that the growth in household wealth and the concomitant increase in indebtedness are not always experienced equally. The greatest increases in wealth occurred among the already wealthy, while indebtedness grew more rapidly among households with low incomes and lower wealth holdings (cf. Wolff 2007). These patterns raise questions regarding both (1) the structural underpinnings of the risk for household indebtedness and its growth and (2) the meaning of debt within different socioeconomic contexts. More specifically stated: who becomes indebted? And does debt carry the same consequences for different households? These questions have not received direct attention.

Extant research on indebtedness consists primarily of analyses of aggregate trends (Boushey and Weller 2006; Jickling 2002) and cross-sectional data on households (Dyner and Kohn 2007; Kennickell 2006; Lyons 2003; Wolff 2007; Yilmazer and DeVaney 2005). While there is evidence of growing household debt at an aggregate



level, we do not yet understand how debt varies within households over time and what factors influence this variation in a meaningful way. Standard age-based growth curves of wealth and indebtedness represent average trends and mask heterogeneity across and within age in wealth and debt levels (Alessie, Lusardi, and Aldershof 1997; Coile and Milligan 2009).

Households can carry two broad types of debt: collateralized or secured debt, in which the loan is tied to an asset, and non-collateralized or unsecured debt, in which the loan has no underlying collateral. Unlike collateralized debts, non-collateralized debts are not explicitly linked to asset ownership. More importantly, the consequences of debt differ by type; high levels of non-collateralized debt holdings are associated with negative financial outcomes (cf. Godwin 1996).

Through this project, I pursue two key aims. First, I incorporate indicators of debt into a broader conceptualization of stratification to try to untangle how debt is both distinct from, yet related to, household wealth. A review of the literature shows concern over Americans' debt burdens; however, no cohesive theoretical model exists to account for changing patterns of debt. Common approaches shift between explanations centered on the effects of age (life cycle/permanent income hypothesis; Ando and Modigliani 1963; Friedman 1957; Modigliani 1966), cohort (consumption and savings behavior; Jiang 2006; Kanajanapan 2005; Masnick, Di, and Belsky 2005; Twitchell 2002), and period accounts that focus on the devolution of risk (Hacker 2006; Medoff and Harless 1996; Shuey and O'Rand 2004), the decline of "equalizing institutions" (Levy 1998), increasing labor market instability (Bernhardt, Morris, Handcock, and Scott 2001), and

the deregulation of financial markets (Campbell and Hercowitz 2006). To date, empirical evidence on indebtedness is limited but it suggests that an adequate understanding of debt incorporates multiple explanatory factors. To this end, I propose a dynamic, life course model of debt. I hypothesize that three key mechanisms—institutional context, social heterogeneity, and patterned disadvantage or structural risk—structure access to credit and demand for debt in ways that create significant variation in patterns of debt and consequences of indebtedness.

Second, I provide one of the first longitudinal analyses of non-collateralized household indebtedness in the sociological and life course literature. I use the National Longitudinal Survey of Youth (1979) and employ multiple methodologies to examine differentiation in patterns of non-collateralized debt over the early life course of a cohort and how these patterns relate to other indicators of financial well-being. Given rising levels of household debt and the potential for debt to exacerbate inequality, this is an important area of research that deserves continued attention.

This dissertation begins with an overview of household indebtedness in the United States. I review aggregate trends in wealth and debt holdings and highlight the importance of utilizing debt as a unique indicator of inequality. Drawing on work from economics and sociology, I propose a theoretical model to understand dynamics of household debt over the life course. In Chapter 3, I provide detail on the NLSY79 and the measures employed throughout the dissertation.

Chapter 4 explores the social demography of non-collateralized debt across the early adult life course. Specifically, I explore the association of sociodemographic

covariates with the likelihood of reporting NCNR debt and the timing and duration of NCNR debt holding. In addition, I examine the extent to which life course events associated with increased demand for debt are unevenly distributed across race/ethnicity, as is the ability to access debt in the face of these demands. Last, I test whether the consequences of holding NCNR debt are the same across all households by using regression to examine the association between patterns of NCNR debt holding over 1985-2000 and net worth in 2000.

Chapter 5 extends the previous analysis by closely examining the interrelationships between non-collateralized debt and asset holding to better understand how debt is distinct from, yet tied to, wealth holdings. Joint analysis of assets and debts suggests that the process of indebtedness differs across households and adds nuance to the initial model presented in Chapter 4. Results underscore the tenuous economic well-being of already disadvantaged households.

In Chapter 6, I focus on the household's level of non-collateralized debt. Explorations of multiple measures of debt burden highlight cross-cutting and complicated patterns of stratification and inequality rooted in various sources: the labor market, discrimination, intergenerational transmission of wealth, access to financial markets, and financial product segmentation. While standard sociodemographic covariates are strongly predictive of the ability of households to obtain access to debt, the level of debt a household takes on appears less influenced by these covariates. To examine whether there is persistent unobserved heterogeneity in household patterns of indebtedness, I employ latent class regression models in Chapter 7. I identify four latent trajectories of

indebtedness. Heterogeneity in unobserved access to and demand for debt influences likelihood of trajectory membership, while these trajectories are differentially shaped by sociodemographic predictor variables also associated with access and demand.

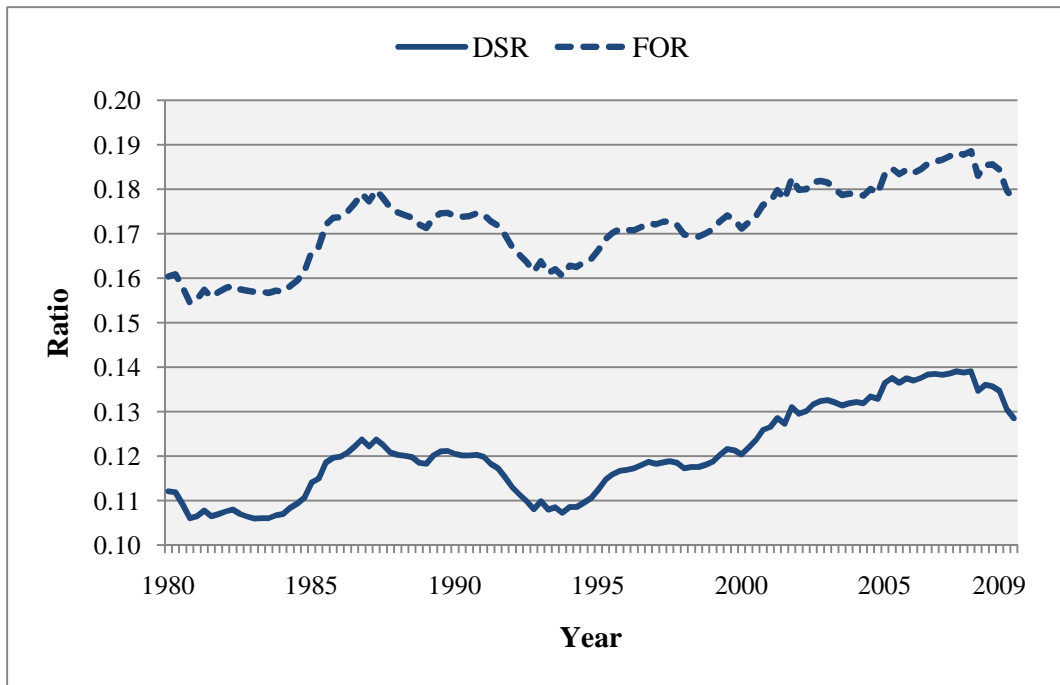
Finally, I discuss the implications of this project and directions for future research in Chapter 8.

## **2. Household Indebtedness in the United States: Trends, Literature, and Theory**

### ***2.1 Rising Household Indebtedness***

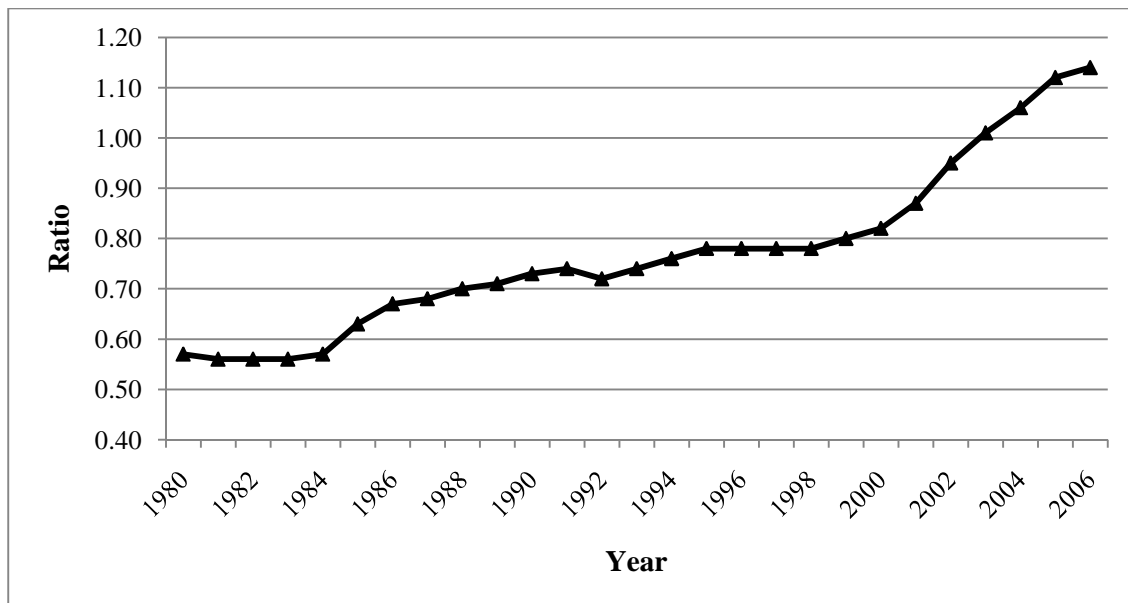
While many individuals have seen dramatic gains in real wealth over the past few decades, the indebtedness of American individuals and households has also been increasing over this same time period. Aggregate data from the Federal Reserve Board show that both household debt-service-ratios (DSR)—the ratio of monthly mortgage payments and consumer debt payments to after-tax income—and financial obligations ratios (FOR)—the DSR plus regular financial obligations such as rent, car lease payments, homeowners' insurance, and property taxes—increased through the 1980s, declined slightly in the early 1990s, and then steadily grew through the mid to late 1990s and into the 2000s (see **Figure 1***Error! Reference source not found.*). Examining changes in an alternative aggregate measure of household indebtedness, the ratio of household sector debt to personal income (**Figure 2**), shows marked increases in indebtedness over time, with particularly rapid debt growth beginning in the late 1990s and continuing into the 2000s. Much of this growth was driven by expanding mortgage lending and rapidly growing credit card debt (Dynan, Johnson, and Pence 2003). The high levels of indebtedness, particularly the growth in levels of non-collateralized debt (e.g. credit card debt), have elicited much concern, as have the steadily growing rates of personal bankruptcy (Brown and Burhouse 2005). Increasing household debt reduces the amount of income from which a household can save, simultaneously reducing savings while raising expenditures. These patterns may make households more

economically vulnerable when faced with income instability, negative life course events such as marital dissolution and disability, or external changes (from financial institutions) in prices and interest rates (Dyanan and Kohn 2007).



Source: Federal Reserve Board, [www.federalreserve.gov](http://www.federalreserve.gov)

**Figure 1: Aggregate Household Debt Service Ratio (DSR) and Financial Obligations Ratio (FOR), 1980-2009**



Source: Dynan and Kohn (2007); U.S. Flow of Funds Accounts and National Income and Product Accounts

**Figure 2: End-of-Year Ratio of Household Sector Debt to Personal Income**

Of most concern to those interested in inequality is that the growth in household wealth and the concomitant increase in indebtedness are not always experienced equally. These aggregate figures mask variation in debt growth and vulnerability within household subsets. While many households saw an increase in both real wealth (both financial and non-financial) and their debt burden, the greatest real wealth growth occurred among the very rich, while indebtedness grew more rapidly among lower- and middle-income households (Mishel, Bernstein, and Allegretto 2007; Wolff 2007). Analysis of Survey of Consumer Finance data shows that the amount of household debt increased faster than household asset increases (see **Table 1**; Bucks, Kennickell, Moore, Fries, and Neal 2006; Kennickell 2009), and Keister (2000) shows that overall wealth has been increasing at the same time that the percentage of households with zero or negative net worth has also been increasing.

**Table 1: Change in Mean Value of Asset and Liabilities for Families with Holdings, Survey of Consumer Finances, 1989-2007**

Percentile of Net Worth	1989	1992	1995	1998	2001	2004	2007	Three-Year Change (percent)					
								1992	1995	1998	2001	2004	2007
<i>Assets</i>													
Less than 25	12.5	14.0	19.4	22.0	21.0	23.1	29.2	12.0	38.6	13.4	-4.5	10.0	26.4
25-49.9	65.6	71.4	84.1	93.2	99.8	112.8	133.3	8.8	17.8	10.8	7.1	13.0	18.2
50-74.9	192.2	181.3	191.7	224.6	265.0	306.0	333.4	-5.7	5.7	17.2	18.0	15.5	9.0
75-89.9	426.0	374.4	377.6	488.7	617.4	693.0	713.5	-12.1	0.9	29.4	26.3	12.2	3.0
90-100	2102.6	1933.6	2059.5	2622.9	3400.1	3662.3	4244.8	-8.0	6.5	27.4	29.6	7.7	15.9
<i>Debts</i>													
Less than 25	17.7	19.2	25.2	32.9	26.6	35.1	41.8	8.5	31.2	30.6	-19.1	32.0	19.1
25-49.9	36.6	43.7	52.5	58.4	59.1	72.8	91.2	19.4	20.1	11.2	1.2	23.2	25.3
50-74.9	63.3	65.0	71.7	79.2	89.0	122.6	131.6	2.7	10.3	10.5	12.4	37.8	7.3
75-89.9	81.8	81.5	78.0	112.1	118.7	150.6	162.6	-0.4	-4.3	43.7	5.9	26.9	8.0
90-100	150.4	174.5	164.3	203.4	235.9	322.8	340.3	16.0	-5.8	23.8	16.0	36.8	5.4

**Source:** 2007 Survey of Consumer Finances Chartbook, Federal Reserve Board, [www.federalreserve.gov](http://www.federalreserve.gov)

\*Note: the calculations for these values *exclude* households with no holdings [~20-25% of those households at less than the 25<sup>th</sup> percentile of net worth hold no assets, while there is nearly 100% asset ownership among the higher quartiles. Debt holdings are more evenly distributed—about 65% of households in the bottom quartile hold debt while the proportion rises to nearly 80% for the middle to quartiles, and drops to approximately 75% for the top quartile.



## ***2.2 Debt as an Indicator of Inequality***

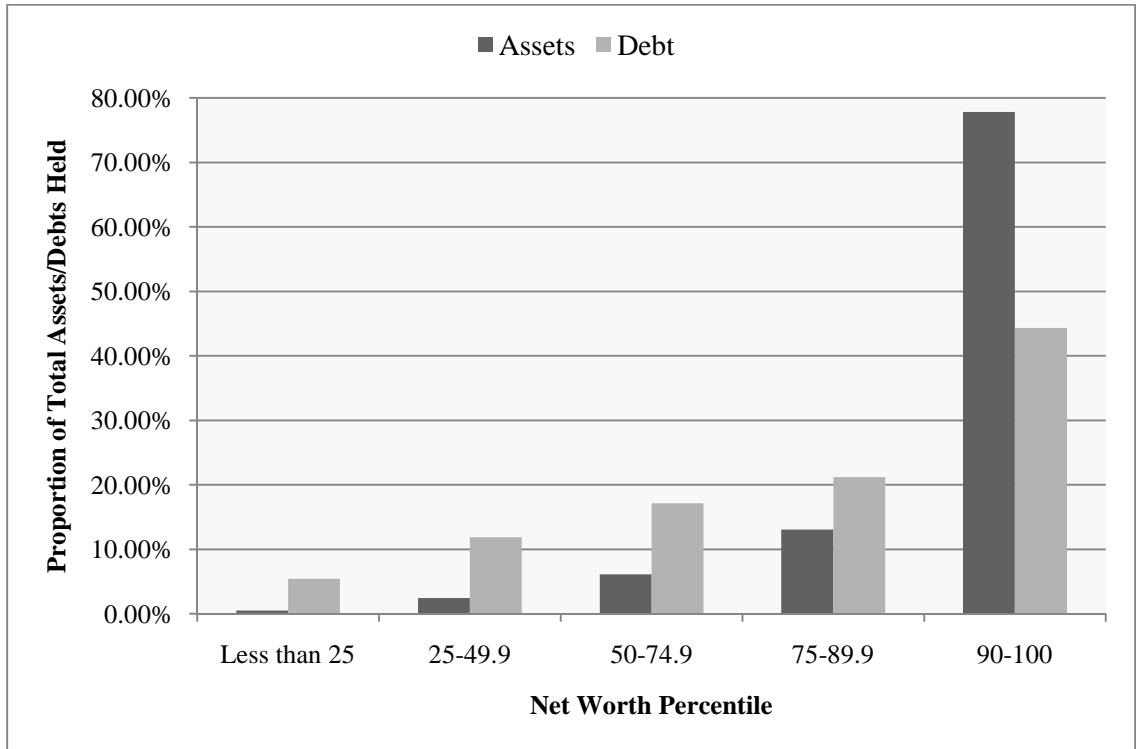
Research on inequality has a long tradition of emphasizing the importance of expanding the traditional conceptualization and measurement of socioeconomic status beyond education, income and occupation (following Blau and Duncan 1967) to augment our understanding of long-term stratification processes (Campbell and Henretta 1980; Conley 1999; Johnson 2006; Oliver and Shapiro 1997; Shapiro 2004; Spilerman 2000). In particular, growing emphasis is being placed on incorporating measures of household wealth to capture a broader picture of household economic well-being. Measures of income taken at one point in time can be a misleading indicator of financial security. In contrast, measures of household wealth provide an indication of the financial stocks from which a household can draw in times of income shocks, providing a buffer from negative life course events such as unemployment, poor health, and marital disruption (Conley 1999; Gruber 2001; Hurst and Stafford 2004; Meyer and Sullivan 2003).

Incorporating wealth into studies of stratification and inequality provides a different picture of advantage and disadvantage than studies that rely on measures of income alone (Keister 2000). Wealth is more unequally distributed than income and this inequality is growing (Wolff 2007). It is also more stable across generations than income (Conley 1999; Jianakoplos and Menchik 1997; Menchik 1979) and empirical evidence shows a weak correlation between income and wealth (Keister 2000; Keister and Moller 2000). Racial disparities in wealth accumulation are particularly salient (Conley 1999; Hao 2007; Oliver and Shapiro 1997; Shapiro 2004). Unlike occupation, income, and education, which, while strongly influenced by parental social status, must be attained by

individuals, wealth can be directly passed across generations. In addition to facilitating access to resources and services, wealth ownership may also serve as a means to access political power (Keister and Moller 2000; Wolff 2007). Improved knowledge about wealth thus provides insight into the intergenerational transmission of inequality and aspects of social class (e.g. power) not readily captured by income. While research on wealth has expanded our understandings of stratification and social class, examining the debt holdings of individuals and their households can further these understandings.

Debt offers yet another unique indicator of financial security and is related to wealth in two key ways. First, for many households, debt—in the form of mortgages or educational loans—is a critical step toward wealth accumulation (Belsky and Calder 2005; Hao 2007; Keister 2000). Second, in the absence of wealth, debt—particularly revolving credit—can serve as a buffer, or safety net, during temporary income shocks (Bird, Hagstrom, and Wild 1999; Krueger and Perri 2006). Although wealthy households have disproportionately more debt than non-wealthy households, debt holdings are far more evenly distributed across households than assets (see **Figure 3**Figure 3). Recent changes in debt holdings show a general trend of increasing household debt (Lyons 2003; see also **Table 1**), but this debt has been concentrated more and more among households with lower income and wealth (Bucks et al. 2006; Wolff 2007). **Figure 4** details the percentage change in median debt holdings (for all debts combined) among indebted households in the Survey of Consumer Finances by position in the income distribution. While low income households hold fewer absolute debts, their indebtedness grew more rapidly relative to higher income households. This is reflected in the consistently large

increases in median debt levels across surveys between 1989-1995, 1995-2001, and 2001-2007 for those households in the bottom income quintile. All households show comparably large increases in total debt holdings between 2001 and 2007, consistent with aggregate trends presented above in **Figure 1** and **Figure 2**.

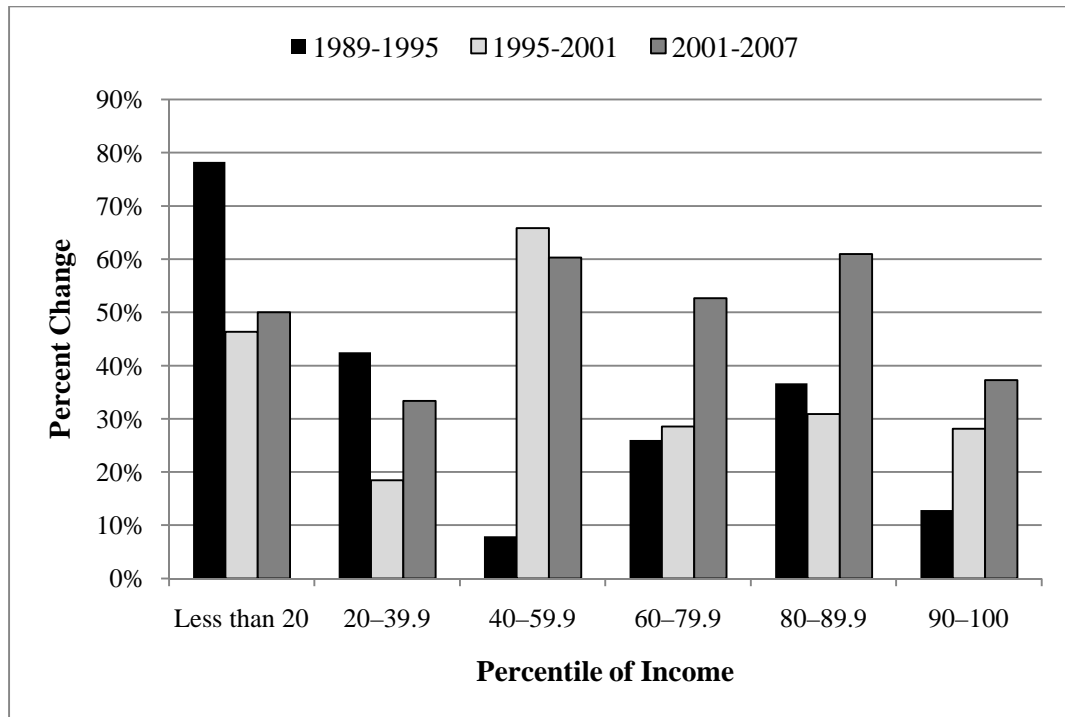


Source: 2007 Survey of Consumer Finances, Federal Reserve Board, [www.federalreserve.gov](http://www.federalreserve.gov)

**Figure 3: Proportion of Total Assets/Total Debts Held by Net Worth Percentile, Survey of Consumer Finances, 2007<sup>1</sup>**

---

<sup>1</sup> Although the distribution changes slightly from 1989 to 2007, the proportional distribution of wealth and asset holdings in 2007 is representative of the general pattern of the distribution of assets and debts in each of the years for which survey data is available.



Source: 2007 Survey of Consumer Finances Chartbook, Federal Reserve Board, [www.federalreserve.gov](http://www.federalreserve.gov)

**Figure 4: Percent Change in Median Debt Holdings among Indebted Households by Income Percentile, Survey of Consumer Finances (1989-2007, select years)**

Household debt is typically incorporated into wealth studies via measures of net worth, in which total liabilities are subtracted from total assets. While measures of net worth are instructive, they obscure heterogeneity in underlying asset and liability mixtures and fail to fully capture the risk of a household’s wealth portfolio. If growth in household indebtedness were completely offset by equal gains in household wealth—suggesting that household net worth remains relatively stable—questions would still remain regarding the specific risks attached to debt. Growing debt levels, even if counterbalanced by asset growth, place households at greater risk of default (Dynan and Kohn 2007), and recent asset gains have been primarily concentrated in rising home

values, not gains in liquid financial assets (Di 2007). Higher debt levels mean households face larger monthly debt obligations that place them at greater risk of failure to meet debt obligations during times of unexpected income shocks. Additionally, a large proportion of households have either zero or negative net worth (Land and Russell 1996) and another substantial segment has positive net worth, but at such a low level they are classified as “asset poor” (see, for example, Caner and Wolff 2004). A focus on debt allows us to better delineate what is occurring across the life course within these households.

## ***2.3 Understanding Debt***

### **2.3.1 Types of Debt**

Household indebtedness is complex; depending on the household, debt may be part of the process of asset accumulation or it may signal financial crisis. While high levels of any debt have the potential to cause financial problems, an array of debt forms exists and the consequences of holding debt may vary greatly depending on the type of debt a household has. Moreover, the sociodemographic correlates associated with debt holdings vary by the type of debt considered (Yilmazer and DeVaney 2005) and the underlying processes leading to a specific form of debt are distinct.

Household debt can be broadly divided into two categories: collateralized and non-collateralized debt. Traditionally, collateralized or secured debt is a loan tied to the purchase of an asset, such as a mortgage or a car loan. The value of the debt and subsequent monthly payments are based on the estimated value of the asset at the time of purchase, and failure to meet debt obligations means that the lender can reclaim the asset

upon which the debt is based. Certain collateralized debts, particularly mortgages<sup>2</sup>, are clearly linked to asset accumulation: with each debt payment, the household typically owns an incremental proportion of the asset to which the debt is tied (although recent trends in subprime borrowing contradicted this pattern). Other forms of collateralized debt, such as home equity lines of credit or car title loans, provide liquidity for the borrower to make bill payments or purchase goods. These types of collateralized debts require asset ownership but are not linked to the purchase of an asset, although they place the underlying asset at risk if the debt obligation is unmet.

Non-collateralized or unsecured debt is not tied to any asset and takes two forms: non-revolving and revolving. Non-revolving, non-collateralized debt is typified in traditional installment loans such as bank loans and student educational loans; it refers to a credit that is extended once with specific repayment guidelines and is not renewed upon repayment of the outstanding debt. In contrast, revolving debt allows households to borrow at their discretion, up to a pre-specified ceiling amount (i.e., credit limit). Monthly debt payments are not set beyond a minimum amount, and repayment of outstanding debt increases the credit available to the household. Credit card debt comprises more than 90% of non-collateralized, revolving debt (Johnson 2007).

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<sup>2</sup> Mortgages typically have been viewed as the most wealth-building type of debt. Conventional wisdom has been that homes are an investment that appreciates, with their value growing over time as the debt payment remains the same. These traditional models of home-secured debt and home value appreciation have been modified dramatically with developments in the financial market and the introduction of adjustable rate mortgages [which introduce variable monthly payments] and the significant loss of value experienced by housing markets around the nation, leaving many homebuyers “upside down” or “under water” in their homes, meaning that they owed more in mortgages than the estimated value of their home. In these instances, the meaning of mortgage debt has shifted dramatically for these households over time.

I focus my analysis on non-collateralized debt for two main reasons. First, of the two broad categories of debt, non-collateralized debt is more associated with negative outcomes (Brown, Taylor, and Price 2005; Del-Rio and Young 2005; Godwin 1996). High levels of non-collateralized debt holding are associated with increased likelihood of delayed or missed bill payments (Black and Morgan 1999; Sullivan and Fisher 1988) and bankruptcy (Sullivan, Warren, and Westbrook 1989), as well as decreased psychological well-being (cf. Brown et al. 2005). Second, unlike collateralized debt, non-collateralized debt is not explicitly linked to the ownership of an asset and analysis of it is thus not limited solely to asset-holding households. Additionally, non-collateralized debt can be a source of liquidity and consumption smoothing for households that lack adequate income and assets.

### **2.3.2 Theoretical Approaches**

To date, the life-cycle/permanent-income (LC-PI) hypothesis is the dominant conceptual framework for understanding consumption and savings behavior in economics. The LC-PI hypothesis proposes that households consume a constant portion of their expected income/wealth over the life course and borrow to finance consumption in periods where income is lower than expected life course income, with borrowing predominantly occurring early in the life cycle (Ando and Modigliani 1963; Friedman 1957; Modigliani 1966). Applications of the LC-PI model show that age-wealth profiles generally follow its predicted patterns, although the decline in household wealth begins later than predicted, perhaps in reaction to uncertainty about mortality or the presence of a bequest motive (Bosworth and Anders 2008; Keister and Moller 2000; Land and

Russell 1996; Love, Palumbo, and Smith 2009). Empirical work also finds substantial household heterogeneity, with large variations in wealth holdings within the same age group due to a variety of factors, including period and cohort effects (Alessie et al. 1997; Coile and Milligan 2009).

A benefit of the LC-PI model for understanding indebtedness is its explicit introduction of the element of time; household indebtedness is a process that unfolds over the life course and inherently involves a time horizon. Consistent with the model's predictions, studies have shown that expectations about future financial situation play a significant role in determining a household's willingness to take on debt (Brown, Garino, and Taylor 2008). The overall utility of the LC-PI model for describing and predicting patterns of household indebtedness is less clear, however, and research suggests that the underlying assumptions of the model are untenable. A key assumption of the model is a perfect credit market with no liquidity constraints, but substantial empirical evidence shows that more than 20 percent of U.S. households face liquidity constraints (Hall and Mishkin 1982; Iacoveiello 2005; Japelli 1990; Lyons 2003; Mariger 1986), with minority households, specifically blacks, facing the most constraints (Cox and Jappelli 1993; Crook 2001; Duca and Rosenthal 1993). Furthermore, the presumption of a rational, fully knowledgeable financial planner ignores that financial knowledge is not equally distributed across the population (Gustmann and Steinmeier 1999; Lyons and Scherpf 2005) and the "rational" behavior predicted by the model may be less appropriate for disadvantaged households who face income uncertainty and credit constraints (Andreasen 1993).



Adopting a broader approach that understands household indebtedness by linking it to shifting structures/institutions and extant patterns of social stratification may ultimately be more useful for understanding variations in household debt. These explanations for changing patterns of household indebtedness suggest three key factors: deregulation of markets, growing labor market instability, and the privatization of risk.

First, the deregulation of financial markets and the increased ability to utilize risk-based pricing (via credit scores) made the extension of credit to previously excluded segments of the population more profitable (Ausubel 1997; Johnson 2007; Williams 2004). The 1978 Supreme Court decision in *Marquette National Bank v. First of Omaha Service Corp* allowed banks to make loans in states other than where they were headquartered; this prompted banks to move to states with weak consumer protection laws and higher allowable interest rates (e.g., South Dakota). Two years later the Depository Institutions Deregulation and Monetary Control Act of 1980 undermined state usury laws that limited the rates on home mortgage loans. In 1982 the Garn-St. Germain Depository Institutions Act ushered in many changes, including raising the ceiling on maximum loan-to-value (LTV) ratios; this act is widely considered a contributing factor to the savings and loan crisis of the late 1980s.<sup>3</sup> In addition, the Fair Isaac Corporation (FICO) made scores to ascertain general creditworthiness broadly available for use in 1989. Concomitant with improvements in technology, this greatly facilitated the

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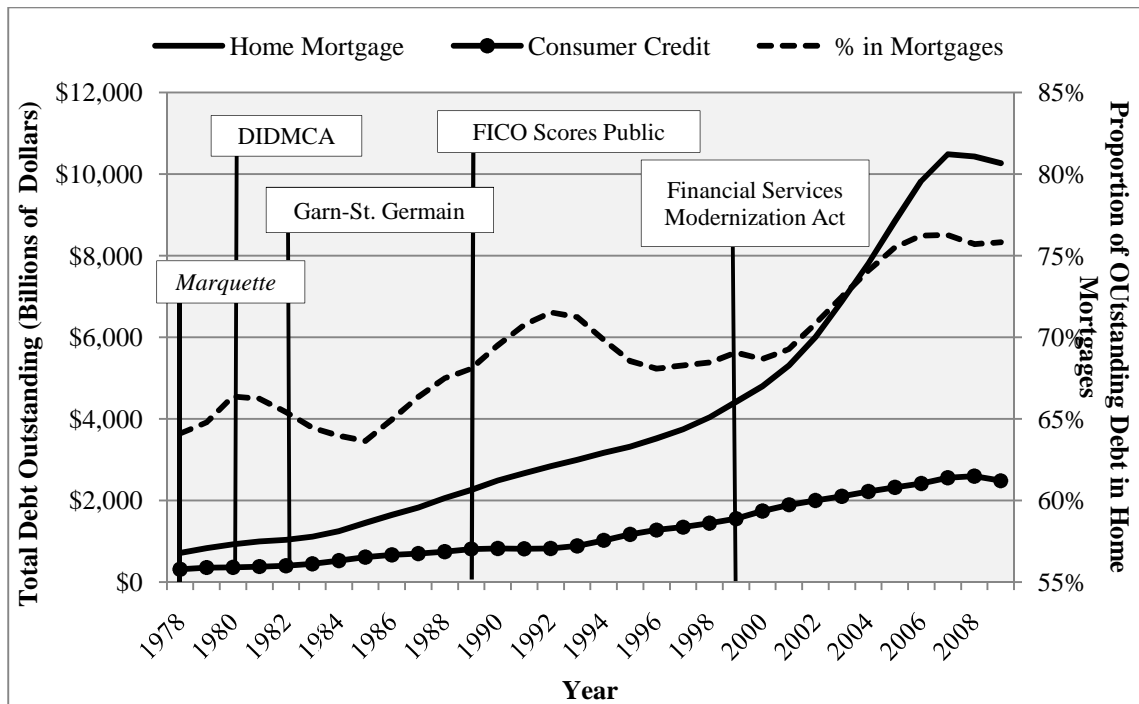
<sup>3</sup> A more recent legislative change was the Financial Services Modernization Act of 1999 (also known as the Gramm-Leach-Bliley Act). This repealed a portion of the Glass-Steagall Act of 1933 that prohibited the consolidation of banking, securities, and insurance companies.

application of risk-based pricing (cf. U.S. Department of Housing and Urban Development 2010: 30).

These changes, along with legislation that prohibited discriminatory lending practices such as the Equal Credit Opportunity Act of 1974 and the Community Reinvestment Act of 1977, led to a democratization of credit that expanded access to both consumer credit and mortgage loans (Black and Morgan 1999; Ford 1988; Mote and Nolle 2005). While disparate lending practices persist, with discriminatory mortgage lending the focus of a 1992 Federal Reserve study in Boston (Munnell, Browne, McEneaney, and Tootell 1992) and more recent work by non-profit groups such as the Center for Responsible Lending highlighting racial disparities in the distribution of payday loan shops (King, Li, Davis, and Ernst 2005; Li, Parrish, Ernst, and Davis 2009), there is a general trend of improved access to credit over the past few decades. Utilizing data from the Survey of Consumer Finances, Lyons (2003) finds that between 1983 and 1998 all households experienced a significant increase in access to credit with the greatest gains among low-income and minority households. Similarly, Bostic and Surette (2001) find that while homeownership grew among all households in the 1990s, it grew more rapidly for minority and low-income families, driven partly by improved mortgage access.

Aggregate trends for outstanding household mortgage debt and consumer debt from 1978 to 2009 are presented in **Figure 5***Error! Reference source not found.*. The timing of key developments in legislation is indicated in the figure. With the exception of 2009, American households, as a whole, experienced increasing levels of both

mortgage debt and consumer credit. While these numbers decreased following the beginning of the 2007 recession, this drop was significantly smaller than the average growth over the past 30 years. These broad trends are suggestive of the importance of shifting institutional contexts: home mortgage debt, in particular, increases at a greater rate following the passage of the Garn-St. Germain Depository Institutions Act of 1982 (raised ceiling on maximum loan-to-value ratios) and the Financial Services Modernization Act of 1999 (allowed consolidation of financial services across sectors). Looking specifically to 2000-2009, home mortgages became a larger proportion of overall outstanding household debt, reflecting expanding subprime lending (as well as possibly increased reliance on home equity loans).



Source: Federal Flow of Funds, [www.federalreserve.gov](http://www.federalreserve.gov)

**Figure 5: Outstanding Household Debt, 1978-2009**

A second factor contributing to rising household indebtedness is increasing labor market instability and growing wage inequality. In recent decades, workers have experienced stagnating wages, growing and potentially recurrent under-employment and unemployment, declining social and workplace benefits to support income- and health-maintenance, and increases in job changes (cf. Bernhardt, Morris, Handcock, and Scott 2001). Drawing from the Panel Study of Income Dynamics, Dynan (2010) documents increasing income volatility from 1975 to 2005, with notable increases in the frequency of large (50% or more) increases and decreases in household income. Such phenomena are no longer limited to blue-collar workers and are increasingly experienced by the middle-class (Leicht and Fitzgerald 2007; Mendenhall, Kalil, Spindel, and Hart 2006). Using the PSID, Sandoval, Rank, and Hirschl (2009) document the increasing life course risk of experiencing extreme poverty in America, regardless of age, gender, and race.

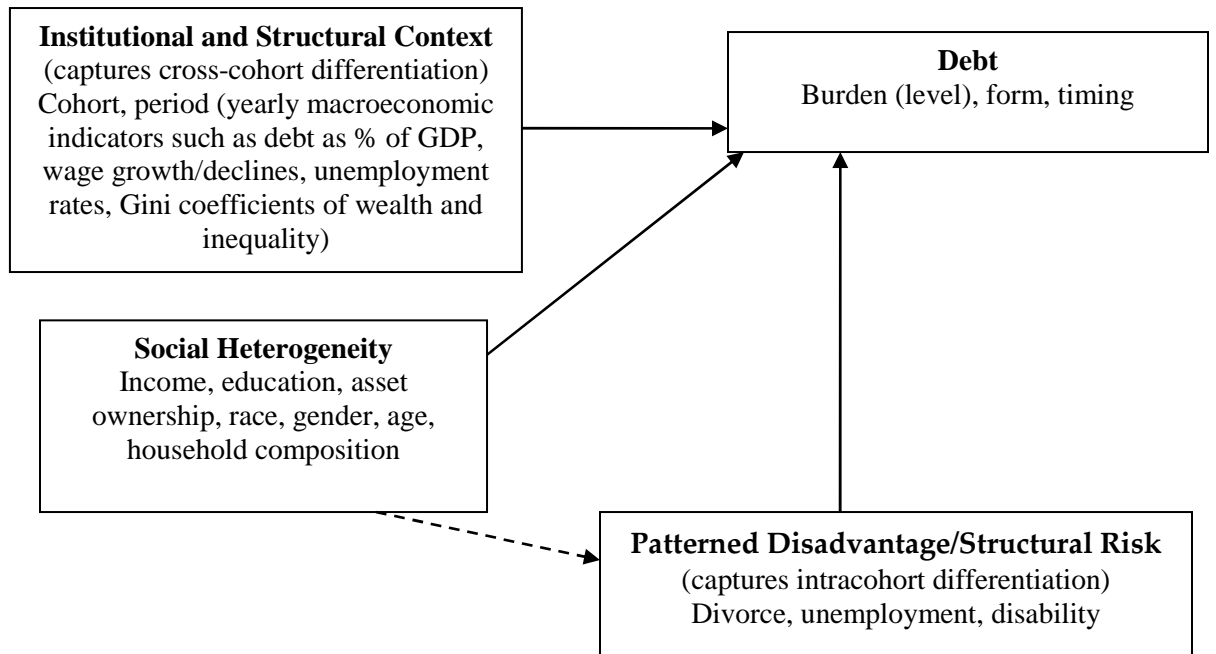
As households face increasing risks to income, they are less able to prepare for and adequately anticipate financial emergencies. These households may compensate by a greater reliance on debt to finance temporary income shocks (e.g. Sullivan 2008), and they are more likely to face negative financial consequences such as missed payments and bankruptcy. Using the 1998 Survey of Consumer Finance, Getter (2003) finds strong associations between unexpected negative life events, particularly income loss, and loan delinquency and default. A cross-national analysis of income changes and mortgage delinquency in the European Union reveals a significant and positive association between income volatility and likelihood of delinquency (Diaz-Serrano 2005). While increasing wage inequality is a driving factor in the growth of aggregate household indebtedness

(Barba and Pivetti 2009; Iacoviello 2008), the likelihood of overindebtedness and its associated negative consequences are not equally distributed across all households.

Concomitant with rising instability has been an increase in living costs brought by the privatization of risk and a retrenchment of public services (Hacker 2006; McCluskey 2002; Medoff and Harless 1996; Mendenhall et al. 2006). Planning for retirement is increasingly individualized, with decreasing employer responsibility. This is particularly notable in the shift away from defined benefit pension plans to defined contribution plans, which replace guaranteed retirement benefits with retirement accounts linked directly to the market and its fluctuations (cf. Shuey and O’Rand 2004, 2006). In addition, households face rapidly growing costs for medical care at the same time they must cope with declines in employer health coverage and rising insurance costs (Daly, Oblak, Seifert, and Shellenberger 2002; Zeldin and Rukavina 2007). Medical problems and their associated costs play a large role in household indebtedness, and are increasingly associated with negative financial outcomes such as bankruptcy. While medical debt was a primary contributing factor in less than 10% of bankruptcies in 1981, a review of recent bankruptcy filings by Himmelstein, Thorne, Warren, and Woolhandler (2009) found that this proportion had increased to 46.2% in 2001, and increased again to 62.1% in 2007. Three quarters of those families bankrupt due to medical causes had health insurance coverage, pointing to the important role rising costs for health maintenance play in household indebtedness.

### 2.3.3 Conceptual Model of Debt

Household debt is not merely a household characteristic, but a dynamic process structured by extant patterns of stratification and responsive to institutional changes and life course events. I propose a conceptual model of debt (**Figure 6**Figure 6) that focuses on three specific mechanisms of differentiation in patterns of indebtedness: 1) *institutional and structural context* or period to capture deregulation of financial markets, democratization of credit, and shifting patterns of risk and instability across time; 2) *social heterogeneity*, particularly age, race, class, gender, and household composition; and 3) *patterned disadvantage*, or *structural risk*, that is, the extent to which the risk of experiencing life course shocks such as unemployment, marital dissolution, and medical crises and the consequences of these shocks are structured by existing patterns of stratification, following recent studies of related dynamic processes like retirement and job mobility (Han and Moen 1999; Williamson and McNamara 2003).



**Figure 6: Conceptual Model of Debt**

### 2.3.4 The Demography of Debt and Structural Risk

The types of debt held by households vary dramatically across wealth subgroups (Kennickell 2006) and the most expensive types of debt, such as payday loans and rent-to-own contracts, are concentrated among low income, low wealth and minority households (Bates and Dunham 2003; Caskey 1994; Stegman and Faris 2003). Even within the same type of debt, low income and minority households continue to pay more: they are more likely to hold subprime<sup>4</sup> mortgages, have higher APR on their credit cards,

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<sup>4</sup> At its most basic, subprime refers to loans offered at a higher rate than the current prime rate. Agarwal and Ambrose (2007) note, however, that the term “subprime” is poorly defined, and “has come to encompass the origination of mortgages to households that traditionally were unable to obtain traditional

and be denied access to mainstream financing options (Apgar, Calder, and Fauth 2004; Belsky and Calder 2005; Edelberg 2007; Hudson 1996; Hurd and Kest 2003). Cox and Jappelli (1993) find that, more than any other racial/ethnic subgroup, black households experience the greatest credit constraints. Working with 1995 SCF data, Crook (2001) finds similar results. He also finds no racial differences in demands for debt, meaning that black households are credit constrained not because they desire more credit than other households and fail to get it, but because they receive less credit than other comparably situated households.

Findings point to structural factors that produce heterogeneous debt patterns directly and the consequences of these patterns indirectly. These structural factors are attached to at least two interrelated contexts: 1) broad socioeconomic contexts associated with changing credit regulations and labor markets and 2) household contexts that vary according to key demographic variables associated with household composition. To better understand these heterogeneous patterns, I propose that debt is comprised of two distinct but interrelated components: **access** and **demand**. Access refers to the availability of or eligibility for credit and the subsequent ability to borrow money in times of need, while demand is the household's need or desire for additional debt.

Access to credit and debt is affected by the practices and policies of financial institutions and the credit rating of the borrowing household—both of which are

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mortgage debt products. Typically, these households had poor credit history, unverifiable income, or had insufficient capital for traditional downpayment levels” (8).



correlated with demographic characteristics noted above and socioeconomic status. Low income and minority households are disproportionately “unbanked” and “underbanked,” with either no or limited use of mainstream financial institutions due to a variety of circumstances: economic costs of mainstream bank accounts, poor financial knowledge, and lack of access in their communities (Barr 2004; Hogarth, Anguelov, and Lee 2005). Once in contact with a financial institution, receiving access to credit is a function of many variables, including age, education, income and occupation, employment status of the spouse (if present), and the number of earners in a household—high credit ratings tend to go to highly educated, high income, married households.

Demand for debt increases with life events such as marriage and divorce, child birth, medical emergencies, unemployment spells, and household moves, while the likelihood of experiencing these events, and their associated consequences, varies by age, race/ethnicity, gender, income and occupation, and educational level. Recent work by Lyons and Fisher (2006), for example, shows variation in delinquency and default rates by marital status and finds significant gender differences among divorced respondents, with divorced women struggling more to meet debt obligations than divorced men.

### 3. Data and Measures

Much of the prior empirical research on household debt has focused on aggregate trends or cross-sectional survey designs. While such research has highlighted the importance of institutional context (Bertola and Hochguertel 2005; Duygan and Grant 2006) and social heterogeneity (Bird et al. 1999; Kennickell 2006; Wolff 2007) on household debt, such analyses may mask influences of heterogeneity across households and neglect variation within households across time. This dissertation research required data that were longitudinal and contained regular measurements of a household's asset and liability holdings (Singer and Willett 2003). The ideal dataset had short intervals between measurements with lengthy coverage over the life course and also included measures of income and employment, union formation and dissolution, and disability and health outcomes. The *National Longitudinal Survey of Youth 1979* (NLSY79), with thirteen waves of data containing asset and liability measures across a 19-year time span, met these requirements.<sup>1</sup> The NLSY79 data are particularly well-suited for studying

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<sup>1</sup> Other datasets considered were the *Panel Study of Income Dynamics* (PSID), the *Survey of Consumer Finances* (SCF), *Survey of Income and Program Participation* (SIPP), and the *Health and Retirement Survey* (HRS). In comparison to the NLSY79, these datasets have some advantages in asset/liability coverage (particularly in the SCF and SIPP) and all except the HRS are representative of the national population. Though the SCF is widely recognized as a benchmark wealth survey (Jäntti and Sierminska 2007), it was not used due to its cross-sectional design. Although it contains multiple measurements of assets and liabilities, the SIPP was not used because the overall time frame of the panel coverage is short (4 years) and it has been shown to have a number of shortcomings in its estimates of wealth (Czajka, Jacobson, and Cody 2003). The HRS, while rich in data, with 8 waves across 14 years, was not used because it focuses on households at the end of the life cycle. Although the PSID data contain asset and liability measurements for 1984, 1989, 1994, and biennially from 1999-2005, it was not my primary choice due to its long lags (5 years) between measurements of assets and liabilities prior to 1999 and changes in the measurement over time (comprehensive debt indicators were not introduced until 1999).

patterns of indebtedness, as the respondents were entering adulthood during extensive deregulation of financial markets that expanded access to credit.<sup>2</sup>

### **3.1 Data**

Managed by the Center for Human Resource Research at The Ohio State University, the *National Longitudinal Survey of Youth 1979* is a panel study of a nationally representative sample of 12,686 men and women aged 14-22 when first surveyed in 1979 (born between January 1, 1957, and December 31, 1964, representing the Late Baby Boomer cohort). Major data elements of the NLSY79 include labor market experiences, income and assets, and health conditions and health care. To date, there are 22 waves of interview data (data from 2008 is not yet available). The cohort was interviewed annually from 1979 until 1994 and has been interviewed biennially since 1994. The initial sample was comprised of three subsamples: 1) a cross-sectional sample representative of noninstitutionalized civilian youths (n=6,111); 2) supplemental oversample of civilian Hispanic, black, and economically disadvantaged non-black/non-Hispanic youths (n=5,295); 3) a military sample (n=1,280). Although overall retention of the initial sample has been strong (over 80%), all but 201 individuals in the military subsample were dropped in 1985 and the economically disadvantaged non-black/non-Hispanic subsample was dropped after 1990. As of 2004, the total sample size was 7,646. Because of the well-documented racial differences in income, asset, and liability

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<sup>2</sup> The credit card industry was deregulated in 1978 with the Supreme Court's decision in *Marquette* and regulatory changes in 1982 (Garn-St. Germain) significantly affected the mortgage industry.

holdings, this analysis retains the black and Hispanic subsamples to draw more detailed conclusions about patterns of indebtedness across race and ethnicity.

With asset and liability indicators of comparable quality to those found in the SCF and the PSID, the NLSY79 data are a popular source for research on household wealth (Caputo 2003; Keister 2000, 2005; Lusardi, Cossa, and Krupka 2001; Rendon 2006; Yamakoski and Keister 2006; Zagorsky 1999, 2005). The NLSY79 first incorporated an assets and liabilities module asked of all respondents in 1985; with the exception of 1991, 2002, and 2006, when budget cuts reduced survey coverage, all waves of the survey contain the asset and liability module. A major strength of the NLSY79 data is that it contains comparable indicators of a variety of asset and liability holdings across waves (see **Appendix A** for question details). Due to significant question changes in 2004, this analysis is limited to the 1985-2000 waves (excluding 1991). This restriction yields a maximum of 12 observations per respondent. The data capture asset and liability holdings of respondents as they age from 20-28 to 35-43, providing detailed information about household dynamics at the point in the life course when they are most likely to be entering into and accumulating debt.<sup>3</sup>

Because some chapters examine trajectories of indebtedness and wealth, I retain only those respondents with 3 or more interviews between 1985 and 2000 to have the same base analysis sample for all chapters. This restriction results in a total loss of 144 respondents (67 with one interview, 77 with only two). The overall loss is small because

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<sup>3</sup> Although both the Panel Study of Income Dynamics (PSID) and the Health and Retirement Study (HRS) are good sources of longitudinal data on assets and liabilities, the NLSY79 was chosen for its greater detail and coverage over a critical time period for initial entry into indebtedness.

the asset and liability module begins six years after the survey's inception, suggesting that respondents most likely to be lost at follow-up have already exited the survey. **Table 2** shows the frequency distribution of respondent interviews. The majority of respondents (61.7%) are interviewed in every wave and the cluster of respondents with 6 interviews (13.5%) is due to the loss of the economically disadvantaged non-black/non-Hispanic subsample after 1990.

**Table 2: Total Number of Interviews, 1985-2000**

<i>Number of Interviews</i>	<i>Frequency</i>	<i>%</i>
<b>3</b>	100	0.95
<b>4</b>	119	1.13
<b>5</b>	162	1.54
<b>6</b>	1389	13.17
<b>7</b>	149	1.41
<b>8</b>	189	1.79
<b>9</b>	307	2.91
<b>10</b>	489	4.64
<b>11</b>	1093	10.36
<b>12</b>	6551	62.11
<b>Total</b>	10548	100%

### **3.2 Measures**

Outlined below are the key dependent variables and explanatory variables that recur throughout the dissertation. Variables specific to a given chapter are introduced and discussed in detail in that chapter.

#### **3.2.1 Key Outcome Variables**

**Non-collateralized, non-revolving (NCNR) debt holding.** I construct dichotomous state indicators (yes/no) indicating whether the household holds non-

collateralized debt. Households are coded yes (1) if the respondent says “yes” to the question “Aside from any debts you have already mentioned, do you (and your spouse) now owe over \$500 to any stores, doctors, hospitals, banks, or anyone else, excluding 30-day charge accounts?”<sup>4</sup> By requesting respondents exclude “30-day charge accounts” it specifically asks them to exclude non-collateralized, revolving debt (i.e., credit cards) from their estimate. As such, I treat this variable as a measure of a household’s non-collateralized, non-revolving debt (referred to throughout as NCNR debt) that captures traditional installment loans (e.g., school loans and bank loans), outstanding bill payments, and other unsecured, non-credit card debts. See **Appendix B** for an extended discussion of this measure.

**Timing** of debt consists of onset and duration of non-collateralized, non-revolving debt holding. Onset is indicated by the respondent’s age (in years) during the wave in which they first report holding NCNR debt. Duration is the length of time (in years) that a respondent reports continuously holding NCNR debt. The same respondent may experience repeated events of NCNR debt holding.

**Debt burden.** While there is no universally used measure of debt burden, most indicators incorporate some comparison of the level of debts to the household’s ability to meet debt obligations by drawing from income flows or wealth stocks (Betti et al. 2007). I focus on the ratio of NCNR debt to total household income. I also construct a measure of the ratio of NCNR debt to total liquid assets as an alternative measure of debt burden;

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<sup>4</sup> While covering a broad variety of potential household debts, the NLSY79 data are limited in that they explicitly ask respondents to *exclude* information about their revolving debt holdings (e.g., credit card debt).

recent research on the consequences of household indebtedness suggests that the debt-to-assets ratio has stronger predictive power on the likelihood of missing a debt payment than the debt-to-income ratio (Dyanan and Kohn 2007: 25). The specific details of ratio construction are discussed in Chapter 6.

### **3.2.2 Explanatory Variables**

I employ a variety of indicators to capture social heterogeneity, household experiences of disadvantage and heightened risk, and institutional context. With the exception of race/ethnicity and the indicators for period, all explanatory variables are time-varying.

*Age* and *age-squared* are continuous variables. Age is measured to the nearest month to retain respondents who do not have a birthday between interview dates (e.g., 20.417 if the respondent was 20 years and 5 months at the date of the interview).

*Race/ethnicity* is measured with a set of dummy variables comparing Hispanics, non-Hispanic blacks, and white respondents. This racial/ethnic classification is drawn from two measures: a survey constructed variable that draws on respondents' self-identification and parental race to classify respondents as black, Hispanic, or non-black, non-Hispanic, and the 1979 interviewer's recorded observation of the respondent's race (white, black, or other) at the end of the interview. A review of the ethnic self-identification of respondents suggests that the majority of those in the non-black, non-Hispanic category are non-black, non-Hispanic whites, although it also captures a few

Asian, Native American, and “other” respondents.<sup>5</sup> While recent research documents the fluidity of these racial classifications, particularly with respect to how social status influences interviewer’s perceptions of respondent’s racial category (Penner and Saperstein 2008), the effect this may have on my analysis is anticipated to be minimal.<sup>6</sup> Respondents initially coded as black or Hispanic in the survey constructed race/ethnicity variable remain coded as such in my analysis. Respondents initially coded as non-black, non-Hispanic with interviewer observed race as white are coded as white in my analysis; all others are coded as other. Due to the small number of other respondents (n=185), they are excluded from the analysis samples.

Several measures capture socioeconomic status. *Highest grade* is a continuous measure (in years) of highest school grade completed. *Household Income Equivalent* is a continuous measure of dollars earned per year from all sources by the respondent and his/her partner/spouse. This value was divided by the square root of family size to adjust for household size and logged in the modeling process. *Weeks worked last calendar year* is a continuous measure of the number of weeks the respondent reports participating in the paid labor force in the prior calendar year. *Unemployment* is a dummy variable coded one if the respondent reports any spell of unemployment in the prior calendar year.

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<sup>5</sup> Due to high response rates of “Native American”—nearly 5% compared to national estimates of the Native American population at 0.5%—relying entirely on the self-reported race/ethnicity measure may lead to an overestimate of the number of other respondents. See <http://www.nlsinfo.org/nlsy79/docs/79html/79text/race.htm>

<sup>6</sup> Coefficients estimated for models in Chapter 4 and Chapter 5 remain nearly identical in both value and significance when other respondents are included in the reference category and when they are excluded.



*Poverty* is a survey-created dummy variable coded one if the total household income fell below the poverty line in the prior year.

Household structure is measured by a set of dummy variables for *marital status* comparing married, divorced or separated, and single respondents (widowed respondents were excluded from analysis due to the small sample size) and a dummy variable for presence of dependent children (*have kids*). An additional variable, *female head*, captures whether the household is headed by a single female. Female respondents who are unmarried and not cohabiting are coded as one; all other respondents are coded as zero.<sup>7</sup>

*Health limitation* is a dummy variable indicating whether the respondent reports any health problems that limit the kind and/or amount of work that can be performed.

Asset ownership is measured by dummy variables for *financial* and *non-financial* assets. Financial asset ownership is coded as yes if the respondent indicates ownership of any of the financial asset subcategories: stocks/bonds, cash accounts, savings accounts, IRAs/Keogh, 401K/403B, and CDs/other. Non-financial asset ownership is coded as yes if the respondent indicated owning a home, a car, or any item or collection worth more than \$500.

*Net worth* is a continuous variable measuring the difference between total assets and total liabilities. The value of total assets was calculated by adding the total estimated value of the household's financial assets (stocks/bonds, cash accounts, savings accounts,

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<sup>7</sup> Because the unit of analysis is the household, the respondent's gender is not included in the models as a control (i.e., a dummy variable for male). Instead, household variables control for gender via variables for marital status and female-head.

IRAs/Keogh, 401K/403B, and CDs/other) and non-financial assets (home, car, business, and items or collections valued at more than \$500). Total liabilities were calculated by summing the total value of outstanding mortgages, vehicle loans, business debts, and non-collateralized, non-revolving debt. Respondents who reported “don’t know” or refused to provide a value for an asset or liability were coded as missing on net worth (see **Appendix C** for a discussion of the decision not to use the NLSY79 imputed values for assets). This measure of net worth was logged in the modeling process to adjust for extreme values. For negative values, the absolute value of the net worth variable was logged and then multiplied by negative one.

Last, I include dummy indicators for survey wave to capture *period*-specific effects of shifting institutional contexts. Access to credit expanded throughout the 1980s and 1990s while inequality in income and wealth grew, trends reflected in increasing household debt burdens across this time period (e.g. Dynan et al. 2003). For the available survey waves (1985-1990, 1992-1994, 1996, 1998, and 2000), 1985 represents the lowest point of aggregate household indebtedness (refer to **Figure 1**) and is used as the reference category throughout the analysis.

### **3.2.3 Selected Descriptive Statistics**

A summary table of descriptive statistics is included in **Table 3** below for the full sample and racial/ethnic subgroups. Compared to both Hispanic and white households, the average black household is significantly disadvantaged; a higher proportion of black households experience unemployment spells, are single, and are female headed. Economically, both black and Hispanic households are disadvantaged relative to whites.

They report, on average, lower educational attainment, lower incomes, fewer weeks worked in the past calendar year, higher unemployment rates, lower rates of asset ownership, and significantly lower levels of net worth.

**Table 3: Sociodemographic Characteristics of Full Sample and Racial/Ethnic Subgroups, Means for Pooled Data, 1985-2000**

	<b>Black</b>	<b>Hispanic</b>	<b>White</b>	<b>Total</b>
<i>n (total observations)</i>	32,281	20,376	60,531	112,723
<i>Sample Proportion</i>	0.28	0.18	0.54	
<b>Age</b>	30.69	30.62	30.25	30.44
	<i>5.15</i>	<i>5.16</i>	<i>5.05</i>	<i>5.10</i>
<b>Highest Grade (yrs)</b>	12.61	12.10	13.17	12.82
	<i>2.04</i>	<i>2.61</i>	<i>2.45</i>	<i>2.41</i>
<b>Income (\$2004)</b>	37735	47543	61216	52594
	<i>68276</i>	<i>83156</i>	<i>111290</i>	<i>97368</i>
<b>Weeks Worked Last CY</b>	34.71	36.81	40.23	38.05
	<i>21.40</i>	<i>20.63</i>	<i>18.60</i>	<i>19.95</i>
<b>Unemployed</b>	27%	20%	17%	20%
<b>Below Poverty Line</b>	29%	21%	11%	17%
<b>Family Size</b>	3.34	3.60	2.96	3.18
	<i>1.94</i>	<i>1.82</i>	<i>1.48</i>	<i>1.70</i>
<b>Marital Status</b>				
Married	32%	53%	59%	50%
Divorced/Separated	17%	16%	13%	15%
Single	51%	31%	27%	35%
<b>Female Head</b>	30%	18%	15%	20%
<b>Have Kids</b>	52%	61%	52%	54%
<b>Health Limitation</b>	5.4%	4.5%	4.7%	4.8%
<b>Asset Ownership</b>				
Financial	50%	59%	77%	66%
Non-Financial	73%	86%	94%	86%
<b>Net Worth (\$2004)</b>	21434	42394	84648	59228
	<i>10134</i>	<i>133018</i>	<i>276490</i>	<i>219080</i>
<b>Total Interviews (12 maximum)</b>	11.41	11.28	10.69	11.00
	<i>1.34</i>	<i>1.45</i>	<i>2.32</i>	<i>1.97</i>

**Table 4** Table 4 presents age trends in asset and liability holdings over the survey period (1985-2000). While home ownership rates show increases within age groups over period time—consistent with expanding access to homeownership through the 1990s—the remainder of the asset and liability holding rates show more variation *across* age groups than *within* age groups across time. Of course, heterogeneity within each age group remains, particularly with respect to income, education, and race. Table 4 **Table 4** shows that, on average, asset ownership increases across age groups, with especially large increases for home ownership and financial asset ownership. In contrast, there is significantly less variation in liability holdings by age.

**Table 4: Asset and Liability Holdings by Age Group, 1985-2000**

	<b>Age Group</b>					<b>Total</b>
	20-24	25-29	30-34	35-39	40-44	
<i>n</i>	16,549	38,690	32,185	18,634	4,502	110,560
<b>Asset Ownership</b>						
<i>Real Assets</i>						
Home	0.12	0.29	0.45	0.56	0.63	0.37
Vehicle	0.69	0.80	0.82	0.83	0.84	0.80
Business	0.04	0.07	0.10	0.10	0.10	0.08
Item/Collection Valued at \$500+	0.50	0.61	0.64	0.64	0.65	0.61
<i>Financial Assets</i>	0.58	0.64	0.69	0.73	0.76	0.67
<b>Liability Holdings</b>						
<i>Collateralized<sup>1</sup></i>						
Mortgage	0.84	0.89	0.89	0.88	0.86	0.88
Other Home-Secured Debt	0.05	0.06	0.05	0.06	0.06	0.06
Car Loan	0.51	0.54	0.50	0.51	0.52	0.52
Business Debt	0.50	0.58	0.56	0.54	0.53	0.56
<i>Non-Collateralized (NCNR)</i>	0.31	0.39	0.39	0.37	0.37	0.37

<sup>1</sup>Proportion of liability holdings for collateralized debt represents the proportion of asset owners who hold the corresponding asset-secured debt.

**Table 5** presents the mean and standard deviations of these asset and liability holdings by age group. In general, the mean value and the variation of all holdings, both assets and liabilities, increases across age groups. They also show more variation within age groups across time, due to period specific fluctuations in economic markets.

**Table 5: Mean Value and Standard Deviation (italicized) of Asset and Liability Holdings (\$2004) by Age Group, 1985-2000**

	<b>Age Group</b>					<b>Total</b>
	20-24	25-29	30-34	35-39	40-44	
<i>n</i>	<i>16,549</i>	<i>38,690</i>	<i>32,185</i>	<i>18,634</i>	<i>4,502</i>	<i>110,560</i>
<b>Asset Ownership</b>						
<i>Real Assets</i>						
Home	79548 <i>77481</i>	107228 <i>92671</i>	128314 <i>107971</i>	145909 <i>118572</i>	168475 <i>149257</i>	127315 <i>110859</i>
Vehicle	9268 <i>9464</i>	11531 <i>11378</i>	12829 <i>12624</i>	15443 <i>14682</i>	17389 <i>16230</i>	12560 <i>12579</i>
Business	129383 <i>320981</i>	150097 <i>331840</i>	200660 <i>476053</i>	242639 <i>5600933</i>	318642 <i>807060</i>	191654 <i>463228</i>
Item/Collection Valued at \$500+	6507 <i>13970</i>	9665 <i>16710</i>	12793 <i>21709</i>	17464 <i>30483</i>	23528 <i>41055</i>	12133 <i>22654</i>
<i>Financial Assets</i>						
	3055 <i>13441</i>	6806 <i>29754</i>	15099 <i>57003</i>	36469 <i>138701</i>	69844 <i>231510</i>	15386 <i>79703</i>
<b>Liability Holdings</b>						
<i>Collateralized</i>						
Mortgage	57173 <i>47603</i>	73372 <i>54558</i>	86227 <i>65369</i>	94670 <i>71438</i>	98824 <i>80401</i>	84213 <i>65401</i>
Other Home-Secured Debt	19481 <i>101262</i>	12901 <i>27921</i>	12815 <i>22118</i>	15151 <i>19987</i>	14697 <i>16461</i>	13882 <i>31183</i>
Car Loan	8379 <i>7344</i>	9713 <i>8246</i>	10513 <i>8865</i>	12200 <i>9883</i>	13055 <i>10661</i>	10346 <i>8825</i>
Business Debt	77391 <i>176239</i>	87352 <i>173767</i>	111616 <i>209923</i>	119833 <i>216806</i>	118582 <i>294992</i>	103073 <i>202222</i>
<i>Non-Collateralized (NCNR)</i>						
	6296 <i>11918</i>	7780 <i>15306</i>	8922 <i>16863</i>	10775 <i>21597</i>	12411 <i>25491</i>	8601 <i>17137</i>

Note: Values are only reported for those households with a specified asset or liability.

## 4. The Social Demography of Debt

Recent work examines patterns of asset holding, with specific attention to wealth disparities by race (e.g., Conley 1999; Shapiro 2004) and wealth accumulation among low and middle-income households (Carney and Gale 2001; Hogarth et al. 2005; Stegman, Freeman, and Paik 2007). The distribution of household debt holdings, especially credit card debt, has also received increased attention (cf. Bird et al. 1999; Mann 2009). In particular, research on the stratified use of higher cost financial services such as payday loans (Karger 2005; Li et al. 2009) and subprime mortgages (Calem, Gillen, and Wachter 2004) suggests disparities in access to affordable credit/debt. These disparities have long-term consequences for wealth-building and inequality that are compounded by wide differentials in debt literacy: those who are more likely to utilize high cost financial services are also more likely to lack understanding of concepts such as compounding interest (Lusardi and Tufano 2009). While this work illuminates broad trends in indebtedness, the majority of studies draw from cross-sectional data on households (Dynan and Kohn 2007; Kennickell 2006; Lyons 2003; Wolff 2007; Yilmazer and DeVaney 2005) and are unable to examine how debt varies within households over time and what factors influence this variation in a meaningful way.

Social heterogeneity (i.e., income, education, family structure, and race) influences the type of debt a household can access. These factors further structure the likelihood of experiencing life course events such as unemployment or divorce that may increase a household's demand, or need, for debt. Moreover, they shape the economic resources a household can draw upon to service its debt—whether these are income

streams or wealth stocks—as well as the literacy required to navigate an increasingly complex financial marketplace (Lusardi and Tufano 2009).

These patterns suggest wide variation in both (1) the structural underpinnings of the risk for household indebtedness—as it suggests households both need to have *access* to debt and *demand* for it to become indebted and (2) the meaning of debt across households—while debt may hinder wealth accumulation for some households, it may, in fact, facilitate long-term wealth gains for others. These issues have not received direct attention. Drawing on longitudinal data from the NLSY79, I examine patterns of non-collateralized, non-revolving debt holding over the early life course (ages 20-45). Specifically, I explore the association of sociodemographic covariates with the likelihood of reporting NCNR debt and the timing and duration of NCNR debt holding. In addition, I examine the extent to which life course events associated with increased demand for debt are unevenly distributed across race/ethnicity, as is the ability to access debt in the face of these demands. Last, I test whether the consequences of holding NCNR debt are the same across all households by examining the association between patterns of NCNR debt holding over 1985-2000 and net worth in 2000.

## ***4.1 Measures***

### **4.1.1 Outcome Variables**

*Non-collateralized, non-revolving (NCNR) Debt* is measured as a dichotomous state indicator (yes=1, no=0) and represents the respondent's answer to the question “Aside from any of the debts you have already mentioned, do you (and your spouse) now owe over \$500 to any stores, doctors, hospitals, banks, or anyone else, excluding 30-day

charge accounts?” This question followed questions about mortgages, other home-secured debt, vehicle loans, business debt, and student loans (only asked if respondent had been enrolled in school in the past year), so these types of debt are excluded from this category.

*Age of entry (onset)* is the respondent’s age during the wave of the first report of holding NCNR debt. A *spell* indicates continued occupation of the same state from wave to wave, meaning that the respondent reports having NCNR debt across multiple waves or reports having no debt for multiple waves. Gaps between interviews were treated as the end of a spell. *Duration* is the length of time (in years) that a respondent occupies a spell.

*Debt group* is a created variable that represents the household’s overall pattern of indebtedness; debt group does not vary by wave. This variable is constructed from the respondent’s pattern of responses to questions of indebtedness over all survey waves in which they were interviewed. Respondents who never report holding NCNR debt are classified as *Never Indebted*. All other respondents are coded as cycling: Respondents who report holding NCNR debt less than or equal to the number of times they report not holding debt were classified as *Low Cycling*, whereas respondents who report holding NCNR debt more than the times they report holding no debt were classified as *High Cycling*. Never indebted, low cycling, and high cycling are mutually exclusive, dichotomous indicators that summarize the household’s overall patterns of debt.

*Net worth* is a continuous variable measuring the difference between total assets and total liabilities. The value of total assets was calculated by adding the total estimated



value of the household's financial assets (stocks/bonds, cash accounts, savings accounts, IRAs/Keogh, 401K/403B, and CDs/other) and non-financial assets (home, car, business, and items or collections valued at more than \$500). Total liabilities were calculated by summing the total value of outstanding mortgages, vehicle loans, business debts, and non-collateralized, non-revolving debt. Respondents who reported "don't know" or refused to provide a value for an asset or liability were coded as missing on net worth (see **Appendix C** for an extended discussion of the decision not to use the NLSY79 imputed values for assets). This measure of net worth was logged in the modeling process to adjust for extreme values. For negative values, the absolute value of the net worth variable was logged and then multiplied by negative one.

#### **4.1.2 Explanatory variables**

In addition to the standard set of explanatory variables introduced in Chapter 3, a set of dichotomous indicators was constructed to capture whether the respondent ever experienced a life course event that might increase the risk of entering into debt. This set of dummy variables includes individual indicators for the following events: ever attending college, ever completing a college degree<sup>1</sup>, ever experiencing an unemployment spell, ever falling below the poverty line, ever getting divorced, ever having dependent children, and ever reporting a health limitation. Each indicator is coded 1 (yes) if the respondent ever reports an event in any wave between 1985 and 2000. A summary table

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<sup>1</sup> Respondents were coded as attending college if they reported completing 13 or more years of schooling (highest grade>12). Respondents were coded as receiving a college degree if they reported 16 or more years of schooling.

of these indicators is presented in **Table 6**Table 6. These descriptive statistics highlight patterns of advantage and disadvantage due to social heterogeneity and structural risk: a larger proportion of white respondents report receiving college degrees over this time period, while black and Hispanic respondents report higher levels of unemployment, poverty, and health limitations.

**Table 6: Proportion of Sample Experiencing Life Course Event**

<i>n</i>	Black	Hispanic	White	Total
<b>Events Ever Experienced<sup>1</sup></b>				
College Degree	0.14	0.13	0.27	0.21
Attended College	0.41	0.39	0.47	0.44
Unemployed	0.80	0.71	0.64	0.69
Poverty	0.63	0.53	0.36	0.46
Divorced	0.35	0.37	0.33	0.34
Have Kids	0.74	0.80	0.74	0.75
Health Limitation	0.28	0.26	0.21	0.24

<sup>1</sup>Whether the event is *ever experienced* between 1985 and 2000

## 4.2 Methods

First, I used *xtlogit* commands in Stata 9.2 SE to perform random-effects multilevel logistic regressions that modeled the likelihood that a household reported NCNR debt at a given interview. In this analysis, the probability of holding NCNR debt ( $\pi_{ij}$ ) of subject  $j$  at age  $t$  was modeled as:

$$\log[(\pi_{ij})/(1-\pi_{ij})] = \beta_1 + \beta_2x_{2ij} + \dots + \beta_nx_{nij}$$

In this equation  $\pi_{ij}$  is expected probability of reporting NCNR debt,  $\beta_1$  is the constant,  $\beta_2$  through  $\beta_n$  are regression coefficients for explanatory variables  $x_{2ij}$  through  $x_{nij}$ . These regressions adjust for the correlated error terms within households over time.

Next, I used time series commands (*tspell*) in Stata to identify age of entry into indebtedness and discrete spells of NCNR debt holding. Gaps between interviews (right-censoring) were treated as the end of a spell and subsequent reports of indebtedness were treated as the beginning of a new debt spell. The number of discrete spells was used to construct spell frequency (number of distinct spells) and the years in a given spell<sup>2</sup> indicated duration for periods of indebtedness.

Patterns of debt holding were used to identify *debt groups* based on the frequency of reporting debt (never indebted, low cycling, and high cycling). To examine the association between experiencing life course events that might increase the demand for debt and likelihood of indebtedness, logistic regressions were used to examine the correlates of debt group membership: likelihood of holding any debt (cycling high *or* cycling low) versus never holding debt; and likelihood of being high cycling versus low cycling.

Last, I use linear regression models to examine the consequences of debt group membership for net worth outcomes.

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<sup>2</sup> The spell duration was calculated as the age at the end of the spell (to the nearest month) minus the age at the beginning of the spell (to the nearest month) plus one. Because the exact beginning and end of the spell were unknown, measurements were treated as occurring mid-interval; a value of one was added to the (maxage – minage) calculation. Thus, a single report of NCNR debt in one wave, with no prior or subsequent reports, would have a duration of one year.

## **4.3 Results**

### **4.3.1 Likelihood of Holding NCNR Debt**

**Table 7** presents the results of unweighted multilevel logistic regressions that examine the association between a number of social and economic indicators and the likelihood of holding NCNR debt. Model 1 controls for age. Results are consistent with the LC-PI hypothesis's predictions regarding the effect of age; probability of reporting debt rises through the late 20s and early 30s and then begins to decline with older ages. Coefficients for age remain significant and in similar directions across all models. Although the age-debt relationship changes slightly across models, it remains consistent with the LC-PI predictions. The introduction of controls for race in Model 2 shows that black and Hispanic households are significantly less likely to report holding NCNR debt than white households.

With the introduction of variables for socioeconomic status and labor market experiences in Model 3, the differences between Hispanic and white households disappear. While controlling for socioeconomic status reduces the difference between blacks and whites, differences persist and blacks remain significantly less likely to report debt (OR=0.72). Socioeconomic variables show that higher educational attainment and earnings are associated with greater likelihood of holding NCNR debt, as are weeks worked in the past calendar year, while poverty status significantly reduces the likelihood of holding debt. This suggests that holding debt is also a function of access to credit—households with higher socioeconomic status are less credit constrained than households that experience poverty—although this also may indicate that the truncation level for the

question (set at \$500 or more for any individual debt) underestimates or excludes the debt holdings of poor households.

Although the introduction of family structure controls (Model 4) eliminates the effect of income, black households and households in poverty remain significantly less likely to report debt. Coefficients for family structure show that single respondents are less likely to hold debt compared to both married and divorced/separated respondents. The increased likelihood of holding debt associated with being married (OR=1.65) is consistent with work that finds that married households face fewer credit constraints (Jappelli 1990), which may make them more likely to hold debt because they have access to it. The increased likelihood of debt associated with being divorced is consistent with findings that divorce imposes high financial costs on individuals, decreasing net worth and making it more difficult to meet debt obligations (Lyons and Fisher 2006; Zagorsky 2005). Having dependent children also significantly increases the likelihood of debt. Finally, the increased likelihood of holding debt associated with being a female headed household may reflect gender disparities in income, wealth accumulation (Hao 1996), and household obligations (Grall 2002) that cause women to hold fewer financial resources to meet necessary household expenditures and increase demand for debt.

**Table 7: Multivariate, Multilevel Logistic Regressions Predicting Likelihood of Holding NCNR Debt, 1985-2000, Odds Ratios**

<i>n</i> = 85234	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
<b>Demographics</b>							
Age	1.36***	1.36***	1.31***	1.21***	1.21***	1.20***	1.10***
Age Squared	0.995***	0.995***	0.996***	0.997***	0.997***	0.997***	0.998***
Black		0.64***	0.72***	0.80***	0.80***	0.86***	0.86***
Hispanic		0.87**	0.98	1.00	1.00	1.03	1.04
White (ref)		--	--	--	--	--	--
<b>Socioeconomic Status</b>							
Highest Grade			1.08***	1.09***	1.09***	1.08***	1.08***
Log Equivalent HH Inc			1.03**	1.01	1.01	1.00	1.00
Weeks Worked Last Year			1.002**	1.003***	1.003***	1.003***	1.002***
Unemployed Spell Last Year			0.98	1.01	1.01	1.03	1.03
Below Poverty Line			0.72***	0.75***	0.75***	0.81***	0.81***
<b>Family Structure</b>							
Married				1.65***	1.65***	1.55***	1.55***
Divorced/Separated				1.32***	1.32***	1.30***	1.29***
Single (ref)				--	--	--	--
Have Kids				1.13***	1.14***	1.13***	1.13***
Female Head				1.07*	1.07*	1.09**	1.09**
<b>Health Limitations</b>							
Kind or Amount of Work					1.43***	1.44***	1.43***
<b>Asset Ownership</b>							
Financial						1.22***	1.23***
Non-financial						1.69***	1.67***
<b>Period</b>							
1985 (ref.)							--
1986							1.22***
1987							1.13**
1988							1.37***
1989							1.33***
1990							1.38***
1992							1.41***
1993							1.21**
1994							1.14
1996							1.07
1998							1.06
2000							1.26*
<i>rho</i>	0.322	0.3181	0.3069	0.2999	0.2985	0.2956	0.2966
<i>BIC</i>	104492	104356	103930	103545	103488	103212	103179

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

The inclusion of a control for health limitations (Model 5) does not alter the effects of the other variables. Health limitations simultaneously increase household costs through higher medical bills and reduced household income from work (see, for example, Johnson, Mermin, and Uccello 2006). Respondents who report experiencing any health problem that limits the kind or amount of work they can do are significantly more likely to report NCNR debt than respondents who do not have a health limitation (OR=1.43).

Introducing controls for asset ownership (Model 6) reduces the difference between black and white households (OR=0.86 from OR=0.80), although this difference remains highly significant. The difference between poor and non-poor households in likelihood of debt holding is similarly reduced (OR=0.81 instead of OR=0.75) but also remains significant. While initial black/white and poor/non-poor gaps are a function of lower income and fewer assets, they persist even when these differences are controlled, suggesting that these population subgroups face constrained access to credit instruments. The increased likelihood of reporting debt associated with holding either financial or non-financial assets further suggests the importance of considering credit constraints. Holding assets typically indicates that the household has relationships with financial institutions and with it access to multiple types of financial products.

Incorporating period effects in Model 7 shows that, relative to 1985, the likelihood of holding NCNR debt is higher in the late 1980s and early 1990s, not significantly different through the mid-1990s, and rises again in 2000. With the exception of age, the introduction of period does not alter the effects of other covariates. The effects of age remain consistent with the LC-PI hypothesis, but the effect size is

reduced, indicating that age was initially capturing period effects otherwise unmeasured. The period effects shown are broadly consistent with larger macroeconomic patterns of expanding access to credit throughout the 1980s and 1990s. Although the finding that households are not significantly more likely to report NCNR debt in the mid-1990s than in 1985 is initially surprising given macroeconomic trends in household debt through the 1990s, much of the aggregate debt trends during that time period were driven by larger mortgages and the growth of home equity loans.

#### **4.3.2 Patterns of Indebtedness**

While never holding NCNR debt may be beneficial for some households, debt may serve as a precursor to wealth accumulation for other households, making the timing of indebtedness consequential. Wealth cumulates over the life course; early entry into wealth-generating processes gives households advantages in asset accumulation. Delayed entry into indebtedness may indicate that a household faces difficulty gaining access to credit and may delay wealth-generating activities, placing these households at a long-term disadvantage compared to households with unconstrained credit access. The regression analysis documents clear racial differences in likelihood of reporting NCNR indebtedness and **Table 8** and **Table 9** show that both initial entry into indebtedness and patterns of indebtedness differ significantly across racial/ethnic groups. Specifically, black households have a higher average age at first entry (**Table 8**) and are significantly less likely to ever enter into indebtedness. **Table 9** shows that 19% of black households are never indebted compared to 12% of Hispanic and 12% of white households. These



findings are again consistent with literature that shows patterned disadvantage, with minority groups facing constrained access to financial institutions and credit instruments when compared to non-minorities (e.g., Jappelli 1990).

Examination of the number of debt spells experienced by households that have ever entered into NCNR debt reveals a slightly different picture. Hispanic households that enter into NCNR indebtedness exhibit, on average, more discrete spells of indebtedness than whites. The duration findings reveal that while white households have fewer discrete spells they have, on average, longer duration of indebtedness. In contrast, Hispanics experience more spells of indebtedness but shorter spell duration, while black households experience fewer spells with short durations. Black households also have the longest gaps between spells of indebtedness.

**Table 8: Onset, Spells, and Duration of NCNR Debt, Means and Standard Deviations**

	All	Black	Hispanic	White
<b>Age at First Entry</b> <sup>A, B, C</sup>	26.79	27.29	26.77	26.56
	3.92	4.13	3.98	3.76
<b>Total Debt Spells</b> <sup>A, B, C</sup>	1.97	1.90	2.14	1.95
	1.32	1.37	1.32	1.28
<b>Spell Duration (Years)</b>				
Indebted <sup>A, C</sup>	3.38	3.25	3.23	3.48
	2.32	2.28	2.28	2.33
No Debt <sup>A, B</sup>	4.63	4.96	4.46	4.50
	2.63	2.67	2.60	2.61

<sup>A, B, C</sup>Superscripts indicate results of ttests for mean differences between groups: A- blacks/whites significant at p<.001; B – blacks/Hispanics significant at p<.001; C – Hispanics/whites significant at p<.001

**Table 9** shows that the largest proportion of all households are low cycling, meaning that most households have NCNR debt at least once, but most do not report having debt in more than half of their interviews (high cycling). With only 23% of households classified as high cycling, blacks are significantly less likely than either Hispanics or whites to be high cycling. Hispanics are also significantly less likely than whites to be high cycling (27% versus 31%). The relatively high proportion of whites classified as high cycling reflects the longer debt durations of white households.

**Table 9: Proportion of Sample in Debt Group**

	All	Black	Hispanic	White
Never Indebted <sup>A, D</sup>	14%	19%	12%	12%
Low Cycling <sup>B, E</sup>	58%	58%	61%	56%
High Cycling <sup>A, C, E</sup>	28%	23%	27%	31%

<sup>A, B, C, D, E</sup>Superscripts indicate results of ttests for mean differences between groups: (A) blacks/whites significant at  $p < .001$ ; (B) blacks/Hispanics significant at  $p < .05$ ; (C) blacks/Hispanics significant at  $p < .01$ ; (D) blacks/Hispanics significant at  $p < .001$ ; (E) Hispanics/whites significant at  $p < .001$

Experiencing certain life course events increases the risk of entering into NCNR debt. However, just as the likelihood of experiencing specific events is not equivalent across social groupings (see **Table 6**) the consequences of experiencing these events also vary across groups. The associations between event experience and likelihood of being in a particular debt group are presented in **Table 10**. Based on the earlier racial differences in timing, duration, and likelihood of indebtedness, these models were run separately by race to examine possible differences between racial/ethnic groups in the relationship between life course events and NCNR debt.

The first three columns of **Table 10** represent the likelihood of having any debt (being either high cycling or low cycling) versus never having debt. In general, results are consistent with findings from initial logistic regressions: poverty decreases likelihood of ever having debt; high educational attainment, divorce, and having dependent children increase the likelihood of ever having debt. The large increase in odds of having any debt associated with ever attending college suggests that the measure of NCNR debt may be capturing student loans not reported in other portions of the NLSY79 questionnaire.<sup>3</sup> One notable difference is that ever experiencing an unemployment spell is associated with increased odds of ever having debt among whites, but is not significant for blacks or Hispanics. An interpretation of this difference is that white households might have greater access to credit instruments that allows them to take on debt in response to this life course shock while blacks and Hispanics have more limited access.

The last three columns of **Table 10** focus solely on households that have ever reported debt and show the likelihood of being high cycling instead of low cycling. Results show that ever attending college is associated with greater likelihood of being high cycling for all groups, further indicating that this variable may be capturing student loans or other student-related debt. Ever experiencing poverty is associated with lower likelihood of being high cycling for blacks and Hispanics, but not whites.

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<sup>3</sup> The question regarding educational loans is only asked if the respondents have enrolled in a college program since their last interview. Questions about the value of loans taken out for one's education are only asked beginning in 1985, when a large number of respondents who have attained a college degree are likely to have already completed higher education as they are 20-28 when this question first appears. Thus, the way in which educational loans are measured does not capture whether individuals who were previously enrolled in some form of college program are still paying off loans they received to finance that enrollment.

Unemployment spells, ever experiencing a health limitation, and having children are associated with higher likelihood of being high cycling for whites, but not for blacks and Hispanics, again suggesting that white households may be less credit constrained than minority households. Access to debt instruments to smooth consumption in times of need may make the consequences of these life course shocks less damaging, further advantaging white households.

**Table 10: Logistic Regressions (by Race/Ethnicity) Predicting Debt Group Membership, Odds Ratios**

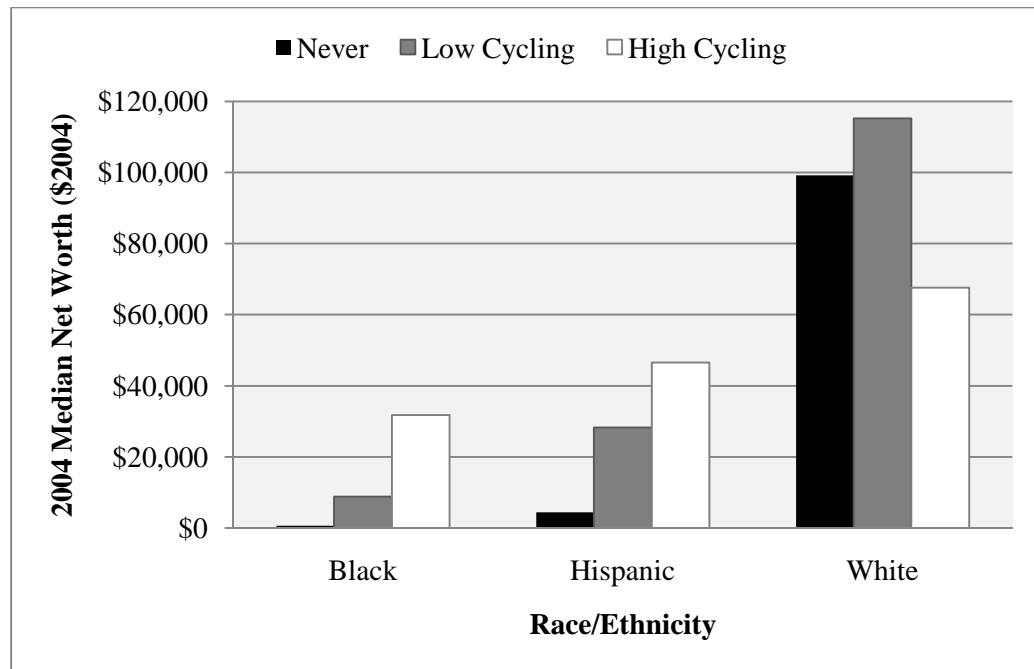
	Cycle (any) v. Never			High v. Low Cycling		
	<b>Black</b>	<b>Hispani</b>	<b>White</b>	<b>Black</b>	<b>Hispani</b>	<b>White</b>
<i>n</i>	2768	1735	5828	2230	1531	5124
<b>Events Ever Experienced</b>						
Attended College	2.46***	3.05***	1.71***	1.93***	1.87***	1.26***
Unemployment	1.09	1.10	1.47***	0.96	0.74*	1.14*
Poverty	0.42***	0.44***	0.71***	0.55***	0.63***	0.97
Divorce	1.51***	1.14	2.11***	1.11	1.35*	1.07
Have Children	2.00***	2.38***	2.09***	1.04	1.10	1.28***
Health Limitation	1.35**	1.10	1.45**	1.11	1.26	1.48***

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

### 4.3.3 Debt Group and Net Worth

Conventional wisdom suggests that the more NCNR debt a household has the less overall wealth it will generate. NCNR debt is not linked to a wealth generating investment and holding NCNR debt means that households have a debt that must be serviced, diverting income streams away from savings and investment opportunities and toward debt payments (also referred to as “crowding out”). Thus, it is expected that

households who report NCNR debt more frequently will show lower average levels of net worth. An examination of the median net worth of households in 2000 (**Figure 7**) shows nearly the expected pattern among white households: those who have never reported NCNR debt between 1985 and 2000 have high median net worth (\$99,169), low cycling households place the highest (\$115,185), and high cycling households are significantly lower (\$67,630). In contrast, black and Hispanic households show an opposite pattern: never indebted households have the lowest median net worth (\$658 for blacks, \$4,388 for Hispanics), low cycling households again have the middle value (\$8,806 for blacks, \$28,303 for Hispanics), and high cycling households have significantly higher median net worth (\$31,813 for blacks, \$46,529 for Hispanics).



**Figure 7: Median Net Worth in 2000 by Race/Ethnicity and Debt Group (\$2004)**

**Table 11** shows regression analyses predicting net worth in 2000 (logged values) by sociodemographic variables and debt group membership; these models were run separately by race. Model 1 controls for age and debt group membership. Results for both blacks and Hispanics show that ever indebted households (both high cycling and low cycling) have significantly higher net worth in 2000 compared to households that never reported debt. In contrast, high cycling white households have significantly less net worth in 2000 compared to the never indebted, while low cycling households are not significantly different. Introducing controls for human capital and socioeconomic status causes these differences to disappear. Controlling for socioeconomic status, both high cycling and low cycling black and Hispanic households have net worth levels that are not significantly different than never indebted households. The effect of being high cycling on net worth for white households becomes even more pronounced with the addition of controls for socioeconomic status.

These results allow interpretation of the initially counterintuitive relationship between debt group and net worth for blacks and Hispanics. Having debt is indicative of having access to financial institutions and credit instruments. While it is not the case that holding non-collateralized debt is wealth-generating for individuals and households, being able to utilize NCNR debt when necessary (e.g., to take out college loans or smooth consumption during unemployment) suggests that these households are able to participate in financial markets more broadly. For minority individuals and households, reporting debt may be a proxy for access to and knowledge of a myriad of financial instruments.

Blacks and Hispanics who are never indebted may have low net worth because they are effectively excluded from using credit and debt as a means toward wealth-building.

**Table 11: OLS Regression Predicting Net Worth (logged) in 2000**

	Model 1			Model 2		
	Black	Hispanic	White	Black	Hispanic	White
<i>n</i>	1347	923	2508	1347	923	2508
<b>Age</b>	0.856	0.025	2.097	0.727	0.778	2.696
<b>Age Squared</b>	-0.011	0.001	-0.025	-0.009	-0.009	-0.033
<b>Debt Group</b>						
Cycle, High	2.277***	2.668***	-1.257**	-0.620	0.233	-1.679***
Cycle, Low	1.560***	2.057**	0.23	-0.001	0.441	-0.162
Never Indebted (ref.)	--	--	--	--	--	--
<b>Socioeconomic Status</b>						
Highest Grade Completed				0.433***	0.065	0.256***
Log Equivalent Household Income				0.251**	0.282**	0.446***
Weeks Worked Last Year				0.046***	0.028**	0.011
Unemployed Past Year				-1.557***	-1.939**	-2.522***
Below Poverty Line				-2.596***	-4.230***	-2.840***
<i>Constant</i>	-11.348	4.079	-32.780	-16.059	-11.676	-52.457
<i>R-squared</i>	0.015	0.018	0.0219	0.249	0.238	0.165

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

#### **4.4 Discussion**

Results from the logistic regressions show that the likelihood of holding NCNR debt increases with age until a certain point and then begins to decline, a curvilinear pattern consistent with the life cycle patterns of indebtedness suggested by the LC-PI hypothesis. Results also show that unexpected life course shocks such as divorce and health limitations increase the likelihood of indebtedness. Once this is broken down by

race, however, with a focus on households ever experiencing certain events, there are distinct differences in who can access debt to buffer life course shocks and who cannot.

Occupying positions of structural disadvantage—being black, being in poverty—decreases the likelihood of holding debt, while having advantages—higher education, being married, holding assets—increases the likelihood of holding debt, indicating the continued importance of access and credit constraints. These findings challenge conventional wisdom that suggests that non-collateralized debt (that is, non-asset-generating debt) is carried predominantly by the disadvantaged and illuminates the value of exploring household heterogeneity and the impact of life course risks over time. The patterns uncovered in these analyses also reveal a complex picture of the meaning of household debt. Debt is comprised of several components: access to credit, interaction with financial institutions, and the ability to borrow money in times of need – all elements that may help to improve a household’s overall financial wealth over the life course. Yet non-collateralized debt also means that money is going toward non-asset-building debt that, over the long-term, may reduce overall net worth. The extent to which a debt is beneficial or detrimental to the overall economic well-being of a household varies across household contexts and may differ based on the timing and duration of indebtedness. Additionally, the meaning of debt is not static; as markets shift over time, the meaning of a specific debt for a household may also change.

Analysis reveals that both initial entry into indebtedness and patterns of indebtedness differ significantly across racial/ethnic groups. Black households in particular show patterns of indebtedness that are consistent with constrained financial



access: they have a higher average age at first entry and are significantly less likely to ever enter into indebtedness, even after controlling for socioeconomic status. Compared to white households, black households are at a significant wealth disadvantage. If access to debt serves as a step toward wealth accumulation for some households, these patterns suggest that delayed access to credit may further disadvantage black households.

Explorations of the relationship between debt and net worth indicate that merely reporting debt is not inherently detrimental to overall financial well-being and highlights the importance of considering debt separately from net worth. For minorities in particular, being able to have debt may be indicative of having access to financial institutions and credit instruments. The positive association between holding debt and net worth for black and Hispanic households reflects heterogeneity within these groups with respect to structural advantages primarily driven by social class differences. If access to debt helps to smooth income when households are faced with unexpected shocks—divorce, health limitations, unemployment—then minority households lacking access to debt may have to make do with less because they cannot turn to credit instruments. This may cause them to face additional shocks—eviction, delinquency and default on bills—which in turn may affect access to credit/debt and further limit their capacity for wealth-building.

#### ***4.5 Conclusion***

Proper interpretation of and response to aggregate trends in household indebtedness require greater understanding of the variation of debt across and within households and the meaning of debt for households across the life course. These

analyses are strongly suggestive of how structural position influences patterns of indebtedness and the consequences of these debt patterns. Social location influences the risk of experiencing events that increase demand for debt as well as the ability. Furthermore, it shapes access to resources such as debt that might mitigate the consequences of such events. Most importantly, findings suggest that household debt is neither universally beneficial nor universally harmful, and the consequences of the same debt may vary across households and within households over time.

## **5. Demand and Access: Interrelationships between Debts and Assets**

In the face of life course shocks or consumption needs, households may face the choice of consuming from their liquid assets or taking on debt; however the ability to make this choice is not distributed evenly across households (cf. Sullivan 2008). Research that examines assets and liabilities separately emphasizes the importance of treating them as distinct from one another. Johnson and Li (2008) find that examining their sample according to a joint consideration of liquid assets and debt burden yields different conclusions regarding borrowing constraints (i.e., constrained access) than using liquid assets or debt burden in isolation. In related research, Yilmazer and DeVaney (2005), find that financial assets reduce the likelihood of holding certain types of debt while non-financial assets increase the likelihood of holding these types of debt. These findings are broadly consistent with the proposed conceptual model of indebtedness and the results from Chapter 4 that indicate that non-collateralized debt is determined by both *demand* and *access*. Financial assets may reduce the demand a household has for debt, as they may possess sufficient funds to meet their consumption needs, while holding both financial and non-financial assets indicates that households are already participants in financial markets and have access to financial institutions and credit instruments.

To the extent that financial asset ownership and holding non-collateralized, non-revolving debt (as captured in the NLSY79) indicate participation in financial institutions more broadly, both may be considered indicators of economic well-being. We can consider households with no financial assets and no non-collateralized debt to be the

most disadvantaged, as they have the most limited participation in financial markets. Households with no liquid assets but some debt may be more advantaged, as they have greater participation with financial institutions and may be able to access debt to facilitate income smoothing in times of need. Among households with liquid assets, it is difficult to determine a priori whether those with non-collateralized debt or those without are more “advantaged.” Some prior research suggests that households with greater levels of financial assets are more likely to hold non-collateralized debt (Kim and DeVaney 2001, although this focused specifically on credit cards), while other research finds no effect of financial asset holdings on non-collateralized debt (Yilmazer and DeVaney 2005). Ultimately, unmeasured variation in household consumption preferences, attitudes toward credit and debt, and time horizon for saving/spending may be more determinative of non-collateralized debt patterns for those households who have the ability to choose between dissaving and taking on debt.

To better understand the meanings of debt for a household and better explain household economic behavior, I turn now to a joint examination of non-collateralized debt and liquid asset holdings.

## **5.1 Measures**

### **5.1.1 Outcome Variables**

*No money*<sup>1</sup> is a dichotomous indicator of whether a household has any financial assets. Households are coded 1 (no liquid assets) if they do not report ownership of any type of financial asset; they are coded 0 if they report any financial asset ownership.

*Non-collateralized, non-revolving (NCNR) Debt* is measured as a dichotomous state indicator (yes=1, no=0) and represents the respondent's answer to the question "Aside from any of the debts you have already mentioned, do you (and your spouse) now owe over \$500 to any stores, doctors, hospitals, banks, or anyone else, excluding 30-day charge accounts?" This question followed questions about mortgages, other home-secured debt, vehicle loans, business debt, and student loans (only asked if respondent had been enrolled in school in the past year), so these types of debt are excluded from this category.

### **5.1.2 Explanatory Variables**

For this analysis, I constructed more detailed indicators of both financial and non-financial assets. *Total liquid assets* is a continuous measure of the sum of the household's financial asset holdings (cash accounts, stocks/bonds, IRAs/Keoghs, tax deferred accounts, and CDs). *Total real assets* is a continuous measure of the total value

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<sup>1</sup> Households identified as having no financial assets are predominantly unbanked. That is, most of them do not report holding any account, leaving them unaffiliated with mainstream financial institutions. A very small number report holding a given financial asset, but estimate its value at zero dollars. An exploration of the asset holdings of these households shows that they often cycle between very low levels of financial asset holding and no asset holding (e.g., zero in 1986, \$70 in 1987, and zero again in 1988).

of a household's non-financial assets and represents the sum of the respondent's estimated market value of their home, vehicles, businesses, and assets and collections valued at greater than \$500. *Total collateralized debts* is a continuous measure of the total value of a household's secured debts and represents the sum of the respondent's estimated mortgages, other home-secured debt, car loans, and business debts. *Total non-collateralized debt* is a continuous measure of the total value of the household's non-collateralized, non-revolving (NCNR) debt. Respondents who did not own a specific asset were assigned a value of 0 for both that asset value and the value of that asset-secured liability. Respondents who did not know the value of their asset or liability or refused to answer were coded as missing.

## 5.2 Methods

Using *xtlogit* commands in Stata 9.2 SE, I employ random-effects multilevel logistic regressions to first model the probability that a household reports holding no financial assets in a given wave. The likelihood of subject  $j$  reporting "no money" ( $\pi_{ij}$ ) at age  $t$  is modeled as:

$$\log[(\pi_{ij})/(1-\pi_{ij})] = \beta_1 + \beta_2 x_{2ij} + \dots + \beta_n x_{nij}$$

In this equation  $\pi_{ij}$  is expected probability of reporting no financial asset holdings,  $\beta_1$  is the constant,  $\beta_2$  through  $\beta_n$  are regression coefficients for explanatory variables  $x_{2ij}$  through  $x_{nij}$ . These regressions adjust for the correlated error terms within households over time.

Next, I split the sample into households with financial assets and those without, and use multilevel logistic regressions to model the probability of reporting NCNR debt within each of these households.

### ***5.3 Results***

#### **5.3.1 NCNR Debt and Financial Asset Holdings: Highlighting (Dis)advantage**

Descriptive statistics presented in **Table 12** indicate that the ownership of financial assets more clearly indicates (dis)advantage than whether the household has non-collateralized debt. Compared to households without financial assets, households with financial assets are more educated, work more, earn more money, are less likely to be unemployed or in poverty, and are more likely to own an array of non-financial assets such as homes, cars, and individual assets valued at \$500 or more. They also have a smaller proportion of minority respondents and a greater proportion of married respondents. Overall, these descriptive statistics are consistent with patterns of stratification and inequality that structure economic well-being throughout the life course. Among households with financial assets, there are few readily discernible differences between those with non-collateralized debt and those without—a higher proportion of indebted households are married and have children and they report lower levels of both total real assets and total liquid assets and higher levels of secured debt.

While descriptive statistics suggest that there are few distinguishing characteristics between NCNR debt-holding households and those without NCNR debt among households with liquid assets, there are more clearly defined differences among households with no liquid assets. For households with no liquid assets, descriptive

patterns are consistent with the story of access and exclusion indicated by results in Chapter 4. A greater proportion of debt holders are white, non-poor, and married, and, compared to the non-indebted, those with NCNR debt report higher average income, more weeks worked per calendar year, and higher average real assets. These patterns suggest that different processes may affect the likelihood of holding non-collateralized debt depending on whether one holds financial assets.



**Table 12: Sociodemographic Characteristics by Liquid Assets and Non-Collateralized Debt Holdings, 1985-2000**

	No Liquid Assets		Liquid Assets		Total
	No Debt	Debt	No Debt	Debt	
<i>n</i>	26650	11054	38752	27770	104226
<b>Age</b>	29.51	29.84	30.41	30.49	30.14
	5.04	4.78	5.13	4.83	5.01
<b>Race</b>					
Black	46%	33%	20%	20%	28%
Hispanic	22%	21%	15%	17%	18%
White	32%	46%	64%	63%	54%
<b>Highest Grade (yrs)</b>	11.47	11.91	13.35	13.56	12.77
	2.08	2.16	2.29	2.34	2.41
<b>Income (\$2004)</b>	25385	30398	65625	63644	52336
	45558	46117	117416	114655	100379
<b>Weeks Worked Last CY</b>	28.49	32.69	42.24	42.54	37.78
	22.28	20.98	17.41	16.98	20.03
<b>Unemployed</b>	34%	32%	15%	14%	21%
<b>Below Poverty Line</b>	44%	32%	7%	6%	18%
<b>Family Size</b>	3.46	3.40	3.00	3.05	3.18
	2.01	1.81	1.57	1.53	1.72
<b>Marital Status</b>					
Married	28%	43%	55%	62%	49%
Divorced/Separated	21%	22%	12%	11%	15%
Single	51%	34%	33%	27%	36%
<b>Female Head</b>	28%	24%	17%	16%	20%
<b>Have Kids</b>	50%	60%	50%	56%	53%
<b>Health Limitation</b>	6%	8%	3%	5%	5%
<b>Assets</b>					
Own Home	15%	23%	46%	44%	35%
Own Vehicle	53%	72%	89%	91%	78%
Own Business	2%	4%	11%	11%	8%
Own Other Asset or Collection					
\$500+	31%	47%	70%	76%	59%
<b>Total Real Assets (\$2004)</b>	18226	28517	106282	93561	72384
	78149	77105	227434	189487	180582
<b>Total Collateralized Debt (\$2004)</b>	6937	15263	48856	50858	34325
	34117	40400	80309	80443	69896
<b>Total Liquid Assets (\$2004)</b>			28302	17807	15267
			108494	80877	79173
<b>Total Non-Collateralized Debt (\$2004)</b>		7770		8753	8478
		16304		16908	16747

Examining the patterns of NCNR debt and liquid asset holdings by age group (**Table 13**) reveals both persistent disadvantage for a large proportion of the sample and patterns consistent with the life-cycle/permanent income hypothesis. Although the proportion of households that prior analysis suggests are most disadvantaged (those lacking both liquid assets and NCNR debt) declines with age, a pattern consistent with the LC-PI hypothesis, a fifth of respondents still fall into this group in the highest age category. This suggests that while some respondents are initially in this category because they have not yet begun a household of their own—i.e., those respondents who are in college in their early 20s and are supported by their parents still—and subsequently exit to other categories as they save and take on debt, a large proportion remain relative non-participants in mainstream financial markets. Consistent with the LC-PI hypothesis, the proportion of respondents with liquid assets and no NCNR debt holdings increases with age.

**Table 13: Distribution of NCNR Debt and Liquid Asset Holdings by Age Group**

	Age Group				
	20-24	25-29	30-34	35-39	40-44
No Debt, No Money	32%	26%	24%	22%	20%
Debt, No Money	10%	12%	11%	9%	9%
Debt, Money	20%	28%	28%	28%	28%
No Debt, Money	36%	35%	38%	41%	42%

### 5.3.2 Likelihood of Reporting No Financial Assets

Turning now to multivariate analyses, **Table 14** presents the results of unweighted multilevel logistic regressions that examine the association between a number of social

and economic indicators and the likelihood of reporting no financial assets. Both likelihood ratio tests for model fit and BIC statistics revealed that including an indicator for any health limitation (limitation on the kind or amount of work) did not improve model fit and this was dropped from the modeling process.

Model 1 controls for age. Results are consistent with predictions from the LC-PI hypothesis: the likelihood of reporting no financial assets decreases significantly with age (OR=0.82), although these effects are not consistent across the models. Model 2 controls for age and race. While the age patterns do not change, the results show that minority households are significantly more likely to report no financial assets than white households, consistent with well-documented racial disparities in wealth ownership (e.g., Chiteji and Hamilton 2002; Conley 1999). The odds that a black household has no liquid assets are nearly 8 times those of white households, and Hispanic households experience a more than four-fold increase in the odds of holding no liquid assets compared to whites.

**Table 14: Multivariate, Multilevel Logistic Regressions Predicting Likelihood of Having No Financial Assets (No Money), 1985-2000, Odds Ratios**

<i>n</i> = 83181	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Demographics</b>						
Age	0.82***	0.82***	0.97	1.03	1.07**	0.94
Age Squared	1.002***	1.002***	1.00	0.999**	0.999***	1.001*
Black		8.16***	4.13***	3.50***	3.03***	3.07***
Hispanic		4.46***	2.24***	2.17***	2.06***	2.10***
White (ref)		--	--	--	--	--
<b>Socioeconomic Status</b>						
Highest Grade Completed			0.66***	0.65***	0.67***	0.66***
Log Equivalent HH Inc			0.80***	0.82***	0.83***	0.83***
Weeks Worked Last Year			0.99***	0.99***	0.99***	0.99***
Unemployed Spell Last Year			1.45***	1.41***	1.40***	1.41***
Below Poverty Line			2.33***	2.08***	1.95***	1.95***

**Table 14, continued**

<b>Family Structure</b>						
Married				0.49***	0.56***	0.55***
Divorced/Separated				1.13**	1.21***	1.21***
Single (ref)				--	--	--
Have Kids				1.09**	1.15***	1.16***
Female Head				1.05	0.97	0.97
<b>Asset Ownership</b>						
Non-financial					0.28***	0.27***
<b>Period</b>						
1985 (ref.)						--
1986						1.05
1987						1.15**
1988						2.37***
1989						0.91
1990						0.92
1992						0.94
1993						1.03
1994						0.94
1996						0.88
1998						0.68**
2000						0.59***
<i>rho</i>	0.6426	0.6064	0.4031	0.3902	0.3744	0.3807
<i>BIC</i>	78973	77657	71770	71091	70111	69594

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

With the introduction of controls for socioeconomic status and labor market experiences in Model 3, the differences between black and Hispanic and white households are reduced, but disparities remain large and significant (odds ratios of 4.13 and 2.24, respectively). Highest grade completed, log equivalent household income, and weeks worked last calendar year are associated with significantly lower likelihood of reporting no financial assets. These results underscore the importance of having both earnings potential and income to facilitate asset accumulation. Both an unemployment spell in the past year and reporting household income that falls below the poverty line are

significantly associated with an increased likelihood of reporting no financial assets. This could be due to two factors. First, those households most likely to experience an unemployment spell or fall below the poverty line may be more concentrated in low-paying, low benefit jobs (lacking income to accrue financial assets). Second, for households with financial assets at low levels, experiencing an unemployment spell or falling below the poverty line may deplete those financial assets entirely.

The addition of controls for household composition (Model 4) shows that, compared to single households, married households are much less likely to report no financial assets (OR=0.49), while divorced/separated households are more likely to hold no financial assets (OR=1.13). These results are consistent with prior literature that finds that married households are generally wealthier than other households due to asset-pooling and economies of scale (Zagorsky 2005). In contrast, separation and divorce impose increased costs and often cause a household to draw down savings to meet financial expenditures. Households with children are also more likely to report no financial assets (OR=1.09), perhaps due to the increased financial cost of having children.<sup>2</sup>

The inclusion of a control for holding non-money (real) assets in Model 5 does not significantly alter the effects of the other variables (with the exception of age and age-squared, which do not exert consistent effects throughout the models). Households

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<sup>2</sup> These households are still relatively young (late 30s/early 40s in 2000) and may be in the early stages of family formation.

with non-money assets are significantly less likely to report no financial assets (OR=0.28), a finding consistent with patterns of exclusion and access.

In the final model (Model 6), dummy variables for period are included. With the exception of the non-significant effects of age, the effects of the other covariates remain the same: blacks and Hispanics are significantly more likely to report no financial assets than whites, divorced/separated households and households with children are more likely to have no financial assets, and households experiencing an unemployment spell or falling below the poverty line are significantly more likely to have no financial assets. In contrast, higher education, higher income, more weeks worked in the past year, and being married are associated with significantly decreased likelihood of reporting no liquid asset holdings. For most years, the likelihood of reporting no financial assets is not significantly different than the reference year of 1985. Compared to 1985, the likelihood that households have no liquid assets is significantly higher in 1987 and 1988 and significantly lower in 1998 and 2000. The sharp increase in probability of no liquid assets in the late 1980s may be effects felt from the savings and loan crises experienced near that time period, while the decreased likelihood of having no financial assets in later years is consistent with patterns of account holding documented by Hogarth et al. (2005) and may reflect economic and public policy changes that expanded access to financial services.

Comparing the effects of socioeconomic covariates on the likelihood of holding non-collateralized, non-revolving debt (**Table 7**) to their effects on the likelihood of holding no liquid assets in **Table 15** shows distinct patterns consistent with prior findings

and theory on access and demand (note that the table only includes covariates that were significant in the full logit models for *both* NCNR debt and no financial assets). Those who are most disadvantaged—black households and those in poverty—are more likely to have no liquid assets and less likely to hold NCNR debt, patterns consistent with constrained access to credit and financial markets. In contrast, indicators of advantage such as education, weeks worked in the past year, being married, and holding non-money (real) assets are negatively associated with holding no liquid assets and positively associated with the likelihood of holding NCNR debt. Not only do these households have financial assets that might generate wealth and buffer them when faced with economic shocks, they have access to debt and credit instruments that allow them to smooth consumption when desired. Period is also associated with reduced likelihood of reporting no financial assets and increased likelihood of holding NCNR debt, consistent with patterns of expanding access to financial markets. Last, being divorced/separated and having kids are both positively associated with the likelihood of having no financial assets and the likelihood of holding NCNR debt. Both divorce/separation and having children increase financial costs, indicating that these households may spend all income without saving any or dissave prior liquid assets while taking on non-collateralized debt to meet higher expenses. Additionally, neither divorce/separation nor having children are anticipated to reduce access to credit to the same magnitude that they are anticipated to increase demands for debt.

**Table 15: Covariates Associated with Likelihood of Holding No Financial Assets and Holding Debt**

	<i>Likelihood of Holding No Liquid Assets</i>	
<i>Likelihood of Holding NCNR Debt</i>	<b>Negative</b>	<b>Positive</b>
<b>Negative</b>		Black Below Poverty Line
<b>Positive</b>	Highest Grade Weeks Worked Last Calendar Year Non-Financial (Real) Asset Ownership Period	Divorced/Separated Have Kids

Note: Only showing covariates significant in both full logistic regressions

### 5.3.3 Interrelationships between Assets and Debts

These results suggest that the process of indebtedness may differ depending on whether the household has financial assets or not. **Table 16** presents results from unweighted models estimating the likelihood of reporting NCNR debt with a full set of socioeconomic covariates. The first column presents the results from the full sample (initially presented in **Table 7**) and includes dummy variables for the ownership of both financial and non-financial assets. The second column shows results from households with no liquid assets. The third column presents results from households with liquid assets. Last, the fourth column presents results from a second model for households with liquid assets and includes a measure of total liquid assets (logged in the modeling process). While the effects of covariates are similar across models, there are also some clear differences, suggesting that the results from the full sample obscure differences within asset-stratified subgroups.



Multiple similarities exist in the effects of covariates on the likelihood of holding NCNR debt for no asset households and the asset-holding households. Both show curvilinear effects of age consistent with the LC-PI hypothesis. Highest grade is associated with increased likelihood of holding NCNR debt, potentially because this is capturing unpaid college loans not measured elsewhere in the survey (an implication of Chapter 4) or because higher education may increase general creditworthiness and access to debt. Weeks worked in the past calendar year are also significantly associated with increased likelihood of holding debt (OR=1.003 for no asset households and 1.002 for asset-holding households), an indicator that regular or consistent employment may improve creditworthiness (cf. Mann 2008). For both sets of households, falling below the poverty line significantly reduces the likelihood of being indebted. This may be, in part, because poverty status hinders credit access, but also because falling below the federally defined poverty line allows households to qualify for some benefits that may keep them from needing NCNR debt—food stamps, Medicaid—that are unavailable to households above the poverty line.

**Table 16: Multivariate, Multilevel Logistic Regressions Predicting Likelihood of Holding NCNR Debt by Liquid Asset Holdings, Odds Ratios, 1985-2000**

	Full Sample	No Liquid Assets	Liquid Assets	Liquid Assets (model 2)
<i>n</i>	85234	25554	55255	55255
<b>Demographics</b>				
Age	1.10***	1.17**	1.09**	1.11**
Age Squared	0.998***	0.997**	0.998**	0.998***
Black	0.86***	0.54***	1.07	0.99
Hispanic	1.04	0.71***	1.18***	1.14**
White (ref)		--	--	--

**Table 16, continued**

<b>Socioeconomic Status</b>				
Highest Grade Completed	1.08***	1.13***	1.07***	1.11***
Log Equivalent HH Inc	1.00	1.03**	0.96**	1.01
Weeks Worked Last Year	1.002***	1.003*	1.002**	1.002*
Unemployed Spell Last Year	1.03	1.15***	0.98	0.93*
Below Poverty Line	0.81***	0.83***	0.77***	0.77***
<b>Family Structure</b>				
Married	1.55***	1.79***	1.52***	1.61***
Divorced/Separated	1.29***	1.39***	1.23***	1.20***
Single (ref)		--	--	--
Have Kids	1.13***	1.27***	1.12***	1.10**
Female Head	1.09**	1.07	1.12**	1.05
<b>Health Limitations</b>				
Kind or Amount of Work	1.43***	1.46***	1.40***	1.36***
<b>Asset Ownership</b>				
Non-financial	1.23***	1.70***	1.36***	1.45***
Financial	1.67***			
Total Liquid Assets (logged)				0.85***
<b>Period</b>				
1985 (ref.)	--	--	--	--
1986	1.22***	1.14	1.24***	1.25***
1987	1.13**	1.15	1.13*	1.18**
1988	1.37***	1.43***	1.33***	1.37***
1989	1.33***	1.26*	1.38***	1.43***
1990	1.38***	1.33**	1.42***	1.47***
1992	1.41***	1.35**	1.45***	1.53***
1993	1.21**	1.19	1.21*	1.30**
1994	1.14	1.06	1.18	1.28**
1996	1.07	1.12	1.08	1.22*
1998	1.06	1.17	1.07	1.27*
2000	1.26*	1.50*	1.28*	1.56***
<i>rho</i>	0.2966	0.3256	0.2941	0.2764
<i>BIC</i>	103179	28593	70004	69476

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

Married households in both samples are more likely to hold NCNR debt than single households, consistent with findings that married households have greater access to credit than other household types (cf. Japelli 1990). Consistent with higher financial demands increasing the likelihood that a household will hold debt, divorced/separated

households (compared to single households), households with children, and the report of a health limitation on the kind or amount of work are all associated with greater likelihood of holding NCNR debt. Last, non-financial asset ownership is associated with greater likelihood of debt holding for both groups, again suggesting that holding liabilities may be one of many indicators of participation in financial markets more broadly.

While there are many similarities, there also exist clear differences between the two subgroups, particularly with respect to race. Among households with no liquid assets, black and Hispanic households are significantly less likely to report NCNR debt compared to whites (OR=.54 and OR=.71, respectively). In contrast, among households with liquid assets, blacks are not significantly different than whites, while Hispanics are more likely to report NCNR debt than whites (OR=1.18 or 1.14, depending on model specification). This is consistent with findings in other literature that blacks do not differ from whites in their demand for credit, but that they are more likely to be credit constrained (Crook 2001).

Turning to economic indicators, results show that log equivalent income is positively associated with the likelihood of reporting NCNR debt among households with no liquid assets (OR=1.03), but negatively associated with the likelihood of reporting debt among households with liquid assets (OR=.96). This suggests that income may be a proxy for creditworthiness/access (as an indicator of future potential earnings) among no asset households, while it may be a proxy for savings among asset-holding households. This inclination is supported by the results for asset-holding households in the second

model specification: the effect of income on the likelihood of holding NCNR debt becomes insignificant with the inclusion of total liquid assets (OR=.85), suggesting that these households may choose to dissave rather than take on debt. For no asset households, experiencing an unemployment spell in the past year increases the likelihood of reporting NCNR debt (OR=1.15), while asset-holding households that experience an unemployment spell are less likely to report debt (OR=.93, fourth column). This further suggests that households with liquid assets dissave in the face of unexpected shocks, while households without that option are more likely to take on debt if they are able to obtain it. Last, female head significantly increases the likelihood of reporting NCNR debt among households with liquid assets (OR=1.12 in column 3), but this may be due to wealth disparities between female headed households and married or male-headed households as the effect of female head is insignificant in the model specification that includes total liquid assets.

#### ***5.4 Discussion***

Social location, as captured by race/ethnicity, socioeconomic status, and household composition, strongly influences patterns of wealth accumulation and exposure to life course risks. Households who are most traditionally disadvantaged—blacks and Hispanics, the unemployed, those below poverty—are significantly less likely to have financial assets than their more advantaged counterparts and may be more likely to experience negative life events that increase demand for debt (see **Table 6**). In the face of increased financial demands, these households do not have the option to choose between dissaving from assets and taking on debt. Moreover, lacking financial assets

may increase the cost of debt or exacerbate the already constrained access experienced by these households (e.g. Crook 2001; Sullivan 2008). Among households with no financial assets, those who are more advantaged—white, higher education, higher income—are more likely to hold NCNR debt, suggesting that they may have better access to debt in times of need.

Analysis of households with financial assets suggests that households with sufficient financial assets choose to dissave from these assets rather than take on debt (column 4, **Table 16**). Certain indicators of social location point to the continued role of access in structuring indebtedness. Weeks worked, being married, and holding non-financial assets remain associated with increased likelihood of holding NCNR debt, while falling below the poverty line in the prior year is associated with significantly reduced likelihood of reporting debt. Across all households, both those with and without financial assets, indicators of increased demand—divorce/separation, dependent children, health limitation—are associated with increased likelihood of holding debt.

## ***5.5 Conclusion***

Examining the interrelationship between assets and debts reveals both similarities and differences. Sociodemographic correlates of demand and access continue to influence the likelihood of reporting NCNR debt. To the extent that holding financial assets is an indicator of access to financial institutions, analysis indicates that other variables correlated with access (specifically, being black and household income) are no longer significant predictors of holding debt. Of most concern to those interested in long-term economic well-being, however, is that households who are most likely to experience

negative life events are less likely to have financial assets with which to buffer these events and also experience constrained access to debt instruments. These patterns suggest that these households may face difficulty meeting financial demands and further underscore the tenuous economic well-being of the disadvantaged.

## 6. Debt Burden

The sociodemographic covariates that predict the likelihood of holding non-collateralized debt are not the same factors that predict the level of debt one holds, suggesting that there may be distinct processes influencing having a debt and the size of that debt. Yilmazer and DeVaney (2005) note that household characteristics are more determinative of the likelihood of holding credit card or installment debt than they are the level of those debts held by a household. Using the 1998 Survey of Consumer Finances to examine the determinants of having a credit card balance and the size of that balance, Kim and DeVaney (2001) find that “the factors that are statistically significant [for level of credit card balances] are not the same as those in the first stage [having a credit card balance]” (74). Mann’s (2008) analysis of credit card balance holding and levels in the 2004 SCF yields similar results.

Johnson and Li (2008) identify two key constraints influencing household debt burdens: 1) borrowing constraints (*access*), in which households lack easy access to credit, and 2) liquidity constraints (*demand*), in which households have low levels of liquid assets and require debt to meet consumption and expenditure needs. Positions of structural advantage provide greater access to debt and credit instruments; among households with access, demand for greater debt is less influenced by these factors. In some cases, factors that increase access, such as liquid assets, may decrease the demand a household has for debt, as they are able to draw on their existing wealth stocks rather than taking on debt (cf. Duca and Whitesell 1995). Kim and DeVaney (2001), for example, find that the higher the respondent’s credit limit, the lower the likelihood that

they are revolving credit users, patterns consistent with privilege and advantage structuring both access and demand.

The previous chapters focused on whether or not a household holds NCNR debt. I now turn to an exploration of the level and burden of non-collateralized, non-revolving household debt among indebted households.

### ***6.1 Outcome Variables***

Debt burden is commonly constructed as a ratio of the total household debt to yearly household income, typically referred to as debt service ratios (Dynan and Kohn 2007). While there is no universally used measure of debt burden, most indicators incorporate some comparison of the level of debts to the household's ability to meet debt obligations by drawing from income flows or wealth stocks (Betti et al. 2007). The analysis is limited to those households reporting NCNR debt holdings. I explore variation in the amount of non-collateralized, non-revolving debt held by indebted households by examining three separate measures of debt burden:

- *Total NCNR debt* is a continuous measure of the reported value of all non-collateralized, non-revolving debts held by the household (minimum level \$500).
- *Debt-to-income ratio*<sup>1</sup> is the ratio of total NCNR debt divided by total household income from all sources. Households that reported zero income from all 19 potential income sources (n=222) were excluded from the analysis.

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<sup>1</sup> Standard debt service ratios measure the total minimum required debt payments (both principal and interest) and divide by after-tax income (see Dynan et al. 2003 for extended discussion on traditional debt service ratios). Due to the level of detail required for this calculation, I am unable to calculate the standard



- *Debt-to-money ratio* is the ratio of total NCNR debt divided by total financial assets. Households with zero financial asset holdings (n=7683) were excluded from the analysis.<sup>2</sup>

All values were logged in the modeling process to adjust for skewed distributions. See **Appendix D** for transformation comparisons.

Each measure reveals a different picture of inequality. Raw values tell us the general level of indebtedness, yet they fail to illuminate the financial situation of the household and mask heterogeneity in household ability to repay outstanding debts.<sup>3</sup> In contrast, high debt service ratios are associated with negative financial outcomes such as insolvency, negative net worth, delinquency and repayment problems, and constrained access to credit (cf. Johnson and Li 2008). Additionally, recent research on the

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debt service ratio with my data. The ratios I construct are indicators of *gross debt burden*, as they measure gross outstanding debt to gross family income (or liquid assets). This makes comparisons to other calculations of debt burden (i.e., in the SCF) impossible, but still allows us to distinguish households with potential payment difficulties.

<sup>2</sup>Debt-to-income and debt-to-money ratios were initially constructed by dividing total debts by [total income plus one] and [total financial assets plus one], respectively, in order to retain households that report zero income or zero financial asset holdings. For these households, the logged ratios are equivalent their logged total NCNR debt holdings. Retaining these households in the analysis results in a less clear interpretation of the estimates, as the extreme values on the outcome variable cause many sociodemographic coefficients to be significant (and have larger effects) because they are associated with no income or no financial assets, not necessarily greater debt burdens. The difficulty in retaining the truly zero income or asset households in the ratio analysis is especially apparent in the bimodal distribution of the debt-to-money ratios shown in **Appendix D** (Figure 9a). **Appendix E** discusses the impact that including or excluding these respondents from the analysis has on the estimation results.

<sup>3</sup> Research by Duca and Whitesell (1995) and Kim and DeVaney (2001), for example, finds that higher income households and households with higher real assets tend to hold more credit card debt. This is due, in part, to access (higher income households have higher credit limits and can therefore borrow more) and is also consistent with broader patterns predicted by the life-cycle permanent income hypothesis: higher income/asset households anticipate greater life time earnings and are more comfortable taking out higher levels of debt now that they believe they can repay later.

consequences of household indebtedness suggests that the debt-to-assets ratio has stronger predictive power on the likelihood of missing a debt payment than the debt-to-income ratio (Dyner and Kohn 2007: 25). Debt burden is typically greater among the less affluent (Mann 2008). While debt service ratios provide a useful tool for identifying potentially problematically indebted households, there is no consensus at which level the debt service ratio becomes problematic.

## **6.2 Methods**

Using *xtreg* commands in Stata 9.2 SE, I performed random-effects GLS regressions to model the level of debt ( $y_{ij}$ ) of subject  $j$  at age  $t$  as:

$$y_{ij} = \beta_1 + \beta_2 x_{2tj} + \dots + \beta_n x_{ntj} + \xi_{tj}$$

In this equation  $y_{ij}$  is the natural log of total NCNR debt, debt-to-income ratio, or debt-to-money ratio,  $\beta_1$  is the constant,  $\beta_2$  through  $\beta_n$  are regression coefficients for explanatory variables  $x_{2tj}$  through  $x_{ntj}$ , and  $\xi_{tj}$  is the combined residual. Multilevel regressions adjust for the correlated error terms associated with repeated observations of the same household over time. Pooling the data allowed estimation of the potential life-cycle effects of age and period effects that reflected shifting institutional arrangements and regulation of financial markets.

## **6.3 Results**

### **6.3.1 Total NCNR Debt**

Table 17 **Table 17** presents results for unweighted multivariate, multilevel linear regressions predicting the logged level of total NCNR debt among indebted households. Model 1 includes effects of age alone and Model 2 introduces controls for race. While these models suggest that debt increases linearly with age, these findings do not hold across model specifications. When the model is alternatively specified with logged total financial assets instead of a dummy variable for financial asset ownership, the age coefficients are significant and consistent with a curvilinear effect predicted by the life cycle permanent income hypothesis, although the remainder of the coefficients are unaffected. The results of this model and alternative specifications are presented in **Appendix E.**<sup>4</sup>

Results from Model 2 reveal that minority households report significantly lower levels of indebtedness: exponentiation of the coefficients shows that, compared to white households, black households report levels of debt 24% lower, while levels of debt reported by Hispanic households is nearly 19% lower.<sup>5</sup> Although the difference in debt level between minority and white households is reduced with the introduction of controls for socioeconomic status in Model 3, black and Hispanic households continue to report

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<sup>4</sup> Alternative model specifications explored in **Appendix E** include estimating the full models for total NCNR debt and debt-to-income ratio with the logged value of total financial assets instead of a dummy variable indicating whether or not the household has any financial assets. This results in a loss of approximately 1,500 cases. For both total NCNR debt and debt-to-income ratio, the direction, magnitude, and significance of effects are generally consistent between the two models, suggesting that having *any* financial assets may be more critical than the value of the assets (the sole exception is the coefficient for the effect of health limitations on total NCNR debt). The models presented here use the dummy variable for financial asset ownership because it allows retention of a larger number of households in the analysis. Additional models in **Appendix E** check for sensitivity of results by excluding observations with extreme level-1 or level-2 residuals; exclusion of these potential outliers does not significantly alter the findings.

<sup>5</sup> In semi-logarithmic models, the percentage difference associated with dummy variables (i.e., being a member of a given group vs. the omitted reference group) is equal to  $100*[\exp(\beta_1)-1]$  (Hardy 1993: 58).

significantly less total NCNR debt (22% and 13% less, respectively). These results are consistent with minority households' experiences of constrained access, in which they may receive less debt/credit than they demand (cf. Crook 2001). While most of the socioeconomic variables are not significant, each additional year of schooling is associated with a nearly 9% increase in debt level, further suggesting that the variable for NCNR debt is capturing school loans not measured elsewhere in the survey. The effects of these sociodemographic coefficients—race and education—remain significant across all models.

Model 4 introduces controls for family structure. Married households report significantly higher total NCNR debt levels, a finding consistent with both the greater demand for and access to credit instruments associated with being married. In contrast, the presence of children and being a female headed household are associated with significantly lower levels of debt holdings. These findings are consistent with potentially constrained access to credit due to higher resource demands and fewer household earners.

Limitation on the kind or amount of work a respondent can do, introduced in Model 5, does not alter the effects of the other covariates. This variable is expected to reflect an increased demand for debt and is associated with significantly higher household debt levels. While the introduction of controls for financial and non-financial asset holdings in Model 6 reduces the significance of the health limitation ( $p=0.051$ ), the

experience of a health limitation continues to be associated with a significant increase in total NCNR debt in the full model (Model 7).<sup>6</sup>

Ownership of both financial and non-financial assets (Model 6) is associated with significantly lower debt levels. These results suggest that households may consume from these wealth stocks rather than take on non-collateralized, non-revolving debt.

Last, the controls for period effects introduced in Model 7 show that debt levels increase across period. These results are consistent with both the expanding *access* to credit and debt through deregulation of financial markets and increasing *demand* for debt caused by growing labor market instability and the devolution of risk.

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<sup>6</sup> Limitations on the kind or amount of work a respondent can do are associated with significantly higher household debt levels when the model includes a dummy variable for ownership of financial assets, but this effect becomes non-significant when the model is instead estimated with a logged measure of total financial assets (see **Appendix E** for results). This suggests that the level of assets plays a role in whether a household takes on debt when faced with income limiting/expense generating events such as health limitations; those households that are able to dissave from liquid assets may choose to do so instead of incurring debt.

**Table 17: Multivariate, Multilevel Linear Regressions Predicting (Logged)  
Level of NCNR Debt Among Indebted, 1985-2000**

<i>n</i> = 32183	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	0.042*	0.043*	0.018	0.016	0.016	0.018	0.028
Age Squared	-0.0002	-0.0002	0.0001	0.0001	0.0001	0.0001	-0.0004
Black		-0.275***	-0.250***	-.214***	-0.214***	-0.224***	-0.226***
Hispanic		-0.208***	-0.138***	-0.129***	-0.128***	-0.132***	-0.134***
White (ref)		--	--	--	--	--	--
<b>Socioeconomic Status</b>							
Highest Grade Completed			0.086***	0.086***	0.086***	0.089***	0.089***
Log Equivalent HH Inc			0.008	0.0005	0.0007	0.003	0.005
Weeks Worked Last Year			-0.004	-0.0003	-0.0002	-0.00004	-0.0001
Unemployed Spell Last Year			-0.002	-0.0015	-0.001	-0.007	-0.004
Below Poverty Line			-0.008	0.022	0.022	0.004	0.004
<b>Family Structure</b>							
Married				0.117***	0.117***	0.130***	0.135***
Divorced/Separated				0.029	0.028	0.031	0.034
Single (ref)				--	--	--	--
Have Kids				-0.103***	-0.101***	-0.100***	-0.099***
Female Head				-0.094***	-0.094***	-0.097***	-0.095***
<b>Health Limitations</b>							
Kind or Amount of Work					0.053*	0.051	0.053*
<b>Asset Ownership</b>							
Financial						-0.049**	-0.051**
Non-financial						-0.119***	-0.122***
<b>Period</b>							
1985 (ref.)							--
1986							0.066**
1987							0.130***
1988							0.084**
1989							0.116***
1990							0.138***
1992							0.122**
1993							0.143***
1994							0.172***
1996							0.292***
1998							0.338***
2000							0.347***
<i>Constant</i>	7.233***	7.309***	6.544***	6.629***	6.617***	6.665***	6.635***
<i>R-Squared</i>							
Within	0.0242	0.0242	0.0269	0.0296	0.0295	0.0300	0.0316
Between	0.0006	0.0178	0.0714	0.0773	0.0777	0.0797	0.0820
Overall	0.0093	0.0202	0.0583	0.0622	0.0624	0.0636	0.0656

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

### 6.3.2 Debt-to-Income Ratio

Raw values tell us the absolute level of indebtedness, yet they fail to illuminate the financial situation of the household and mask heterogeneity in household ability to repay outstanding debts. Analysis of the gross NCNR debt-to-income ratio provides a better understanding of relative levels of indebtedness; **Table 18** presents results from multivariate, multilevel regressions predicting the logged debt-to-income ratio among indebted households.

Model 1 controls for age only. The coefficients indicate that debt-to-income ratios decline significantly with age, a finding consistent with the life-cycle/permanent-income hypothesis. While the results for age remain significant with the introduction of race in Model 2 and socioeconomic covariates in Model 3, they are not significant across the remainder of the models. Even after controlling for socioeconomic status, both black and Hispanic households have significantly lower debt-to-income ratios than white households, again suggesting that they may be experiencing constrained access to credit.

Unlike the analysis of total NCNR debt (**Table 17**), in which only highest grade attained was significantly associated with debt levels, all of the socioeconomic status covariates introduced in Model 3 are significantly associated with the debt-to-income ratio. Highest grade is associated with higher debt-to-income ratio—with ~3% increase in debt-to-income ratio for each additional year of schooling—a finding again consistent with this variable capturing long-term educational loans. Each additional week worked in the past year is associated with a 0.3% reduction in the debt-to-income ratio; more weeks worked is associated with higher household income, thus significantly reducing

their relative debt burden. In contrast, experiencing an unemployment spell in the past year and the subsequent income loss is associated with an 11% increase in debt burden. Most significantly, falling below the poverty line is associated with tremendous increase in debt-to-income ratios. Households below the poverty line report debt-to-income ratios 390% higher on average than households not in poverty. While being below the poverty line did not exert significant effects on the absolute level of debt (**Table 17**, analysis of a relative measure of indebtedness shows that these households are at a significant disadvantage: they owe much more relative to their level of income than more advantaged households, meaning that their ability to save, budget for basic expenses, and weather additional economic crises is significantly curtailed. Introduction of controls for family structure, asset ownership, and period slightly modify the covariates for socioeconomic status but do not alter the overall findings.

Model 4 introduces controls for family structure. While married households reported significantly higher raw debt levels (**Table 17**), using a relative measure of debt burden shows that they carry significantly lower levels of debt. Although divorced/separated households were not significantly different from single households in the analysis of debt alone, they report debt-to-income ratios that are 9% higher on average. Last, having children and being a female headed household are both associated with significantly lower debt-to-income ratios (approximately 11% and 9% lower, respectively), findings that may be interpreted as potentially constrained access to credit, similar to the interpretation of the coefficients for black and Hispanic.



**Table 18: Multivariate, Multilevel Linear Regressions Predicting (Logged) Gross NCNR Debt to Income Ratio among Indebted (excluding those with Zero Income), 1985-2000**

<i>n</i> = 32142	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	-0.094***	-0.094***	-0.052***	-0.009	-0.008	-0.008	0.019
Age Squared	0.001***	0.001***	0.001***	0.0003	0.0003	0.0003	-0.0004
Black		0.029	-0.114***	-0.165***	-0.165***	-0.186***	-0.188***
Hispanic		-0.084**	-0.128***	-0.130***	-0.129***	-0.140***	-0.142***
White (ref)		--	--	--	--	--	--
<b>Socioeconomic Status</b>							
Highest Grade Completed			0.035***	0.027***	0.028***	0.035***	0.036***
Weeks Worked Last Year			-0.003***	-0.005***	-0.005***	-0.004***	-0.004***
Unemployed Spell Last Year			0.105***	0.076***	0.077***	0.062**	0.065***
Below Poverty Line			1.362***	1.291***	1.290***	1.243***	1.240***
<b>Family Structure</b>							
Married				-0.333***	-0.333***	-0.309***	-0.304***
Divorced/Separated				0.084**	0.083**	0.083**	0.086**
Single (ref)				--	--	--	--
Have Kids				-0.113***	-0.111***	-0.113***	-0.113***
Female Head				-0.094***	-0.094***	-0.098***	-0.095***
<b>Health Limitations</b>							
Kind or Amount of Work					0.112***	0.108***	0.111***
<b>Asset Ownership</b>							
Financial						-0.157***	-0.159***
Non-financial						-0.135***	-0.138***
<b>Period</b>							
1985 (ref.)							--
1986							0.051
1987							0.117***
1988							0.071*
1989							0.070*
1990							0.135***
1992							0.063
1993							0.142**
1994							0.172***
1996							0.304***
1998							0.341***
2000							0.373***
<i>Constant</i>	-0.800**	-0.788**	-1.981***	-2.292***	-2.314***	-2.207***	-2.445***
<i>R-Squared</i>							
Within	0.0010	0.0010	0.0851	0.0951	0.0950	0.0957	0.0974
Between	0.0036	0.0041	0.1909	0.2232	0.2244	0.2319	0.2343
Overall	0.0012	0.0020	0.1313	0.1547	0.1555	0.1602	0.1623

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

Health limitations on the kind or amount of work the respondent does are introduced in Model 5. Having a health limitation is associated with significantly higher debt-to-income ratios (~11.8% increase compared to households in which the respondent does not report a health limitation). This result is not surprising as health limitations increase costs (i.e., demand) while reducing the ability to earn income. The introduction of this control does not significantly alter the effects of other coefficients.

Model 6 introduces controls for financial and non-financial ownership. Both types of asset ownership are associated with significantly lower debt-to-income ratios, a finding again suggestive that asset-holding households may be able to meet expenditures by drawing from current liquid stocks or by taking out asset-secured debt (e.g., home equity loans). Controls for period introduced in Model 7 do not alter the prior findings and show steadily rising gross debt-to-income ratios throughout the late 1990s. These findings are consistent with aggregate trends in consumer financial obligations ratios and debt-service-ratios over this time period (cf. Dynan et al. 2003; **Figure 1**).

### **6.3.3 Debt-to-Money Ratio**

Last, **Table 19** presents results of multivariate, multilevel linear regressions predicting the logged values of debt-to-money ratios among indebted households with positive values of total financial assets. Model 1 controls for age only. Results indicate that debt-to-money ratios are lowered by 10%, on average, with each year of age, a finding consistent with the life-cycle/permanent-income model of declining debt and rising wealth across the life course. Age is negatively associated with debt burden until period effects are introduced in Model 7 (age may still matter, overall, but the households

are relatively young and the period effects of the 1990s appear to be more important than the life cycle effects of age).

**Table 19: Multivariate, Multilevel Linear Regressions Predicting (Logged) Gross Debt to Assets Ratio Among the Indebted (Excluding those with Zero Financial Assets), 1985-2000**

<i>n</i> =22920	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age	-0.100***	-0.101***	-0.15	0.029	0.029	0.039	-0.041
Age Squared	-0.0003	-0.0003	-0.001**	-0.002***	-0.002***	-0.002***	-0.0002
Black		0.438***	0.311***	0.219***	0.219***	0.202***	0.206***
Hispanic		0.164**	0.009	-0.002	-0.002	-0.007	0.003
White (ref)		--	--	--	--	--	
<b>Socioeconomic Status</b>							
Highest Grade Completed			-0.110***	-0.122***	-0.121***	-0.120***	-0.120***
Log Equivalent HH Inc			-0.412***	-0.378***	-0.378***	-0.374***	-0.375***
Weeks Worked Last Year			0.002*	0.0003	0.0005	0.001	0.001
Unemployed Spell Last Year			0.358***	0.336***	0.337***	0.332***	0.331***
Below Poverty Line			0.009	-0.055	-0.056	-0.077	-0.072
<b>Family Structure</b>							
Married				-0.272***	-0.273***	-0.248***	-0.254***
Divorced/Separated				0.155**	0.155**	0.173**	0.172**
Single (ref)				--	--	--	
Have Kids				0.0003	0.004	0.010	0.009
Female Head				0.348***	0.348***	0.334***	0.329***
<b>Health Limitations</b>							
Kind or Amount of Work					0.150*	0.151*	0.148*
<b>Asset Ownership</b>							
Non-financial						-0.550***	-0.549***
<b>Period</b>							
1985 (ref.)							
1986							0.033
1987							-0.155**
1988							-0.870
1989							-0.660
1990							-0.045
1992							-0.239**
1993							-0.226*
1994							-0.377***
1996							-0.416***
1998							-0.693***
2000							-0.831***
<i>Constant</i>	3.864***	3.770***	7.769***	7.046***	7.016***	7.328***	8.049***
<i>R-Squared</i>							
Within	0.1099	0.1099	0.1137	0.123	0.1227	0.1229	0.1257
Between	0.0254	0.0332	0.1637	0.1761	0.1777	0.1836	0.1882
Overall	0.0537	0.0578	0.1359	0.1477	0.1483	0.1511	0.1546

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

Model 2 introduces controls for race. Unlike total debts and debt-to-income measures, for which black and Hispanic households reported significantly lower debt burdens, results indicate that black and Hispanic households have significantly higher debt burdens when the debt-to-money measure is employed. These patterns reflect racial disparities in wealth accumulation.

While the differences between Hispanic and white households become insignificant with the introduction of controls for socioeconomic status in Model 3, black households continue to report significantly higher debt burdens than white households ( $100 * [\exp(0.311) - 1] = 36.47$  or 36% higher debt burdens). These results are consistent with wealth accumulation literature that finds persistent black-white wealth gaps, even among comparably situated households. Indicators of socioeconomic advantage such as education and income are associated with greater average wealth accumulation and correspond to significantly lower debt-to-money ratios. Each additional year of school is associated with an 11% reduction in debt burden, while a one percent increase in household equivalized income is associated with a 41% reduction in the debt-to-money ratio. Households that report an unemployment spell in the past year have debt-to-money ratios 43% higher than households that do not experience an unemployment spell, perhaps driven by the corresponding pressures unemployment may exert on a household to both dissave from financial assets and take out debt to meet expenses. Poverty status is not significant in these models, although this may be a result of the reduced number of

households in poverty due to limiting the sample to households with positive financial assets.<sup>7</sup>

The effects of the sociodemographic covariates remain significant with the introduction of controls for family structure in Model 4, although the size of the effects is slightly reduced. In particular, although the disparity remains large and significant, the differences between black and white households shrink, reflecting racial differences in household structure that contribute to the large disadvantage of black households. Just as higher education and income are indicators of structural advantages and are associated with better access to credit and higher levels of wealth accumulation, so, too, is marital status. Married households report debt-to-money ratios that are, on average, 24% lower than single households, while divorced/separated households report average ratios that are 17% higher than single households and significantly higher than their married counterparts. While female head corresponds to lower debt burden when examining both raw debt burden and debt-to-income ratios, female headed households report debt-to-money ratios 42% higher than either married/cohabiting or male-headed households, reflecting gender disparities in wealth accumulation.

Health limitations on the kind or amount of work, introduced in Model 5, are associated with significant increases in the debt-to-money burden. Health limitations

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<sup>7</sup> Limiting the analysis to only households with positive values of financial assets dramatically reduces the number of observations of households that fell below the poverty line. Among all households with NCNR debt levels and non-missing information, n=3,485 or 11.39% of 30,603 total observations fall below the poverty line. When the sample is limited to only those households with NCNR debt levels, non-zero financial assets, and non-missing information, the number of households below the poverty line is n=1,212 or 5.29% of 22,920 observations.

increase debt burden regardless of the specification of the outcome variable. They may impede a household from accumulating financial assets via the reduction of income or through increased expenditures that cause dissaving.

Introduction of an indicator for non-financial asset ownership in Model 6 shows that households with real asset holdings report significantly lower debt-to-money ratios. While non-financial asset ownership was associated with reduced raw debt level and lower debt burden as measured by debt-to-income ratios, the reduction of debt burden is even greater when the analysis is focused on debt-to-money ratios. This most likely reflects two related factors: 1) households with non-financial assets are much more likely to hold financial assets as well (as indicated by results in Chapter 5), and are therefore more likely to have a larger stock of financial assets that may either reduce their demand for debt or reduce the burden of that debt; 2) real asset ownership provides collateral to access alternative forms of debt, and these households may choose to take on collateralized debt rather than non-collateralized debt.

Last, controls for period effects are introduced in Model 7. In contrast to the models for total NCNR debt and debt-to-income ratio, period is associated with decreasing debt-to-money ratios. This does not mean, however, that overall debt burdens were declining, as results from **Table 17** and **Table 18** clearly indicate otherwise. Rather, it indicates that the denominator of the debt-to-money ratio—total financial assets—saw large growth over this time period due to rising stock market values through the mid to late 1990s.

## **6.4 Discussion**

Explorations of debt burden through analysis of raw NCNR debt levels, debt-to-income ratios, and debt-to money-ratios highlight the cross-cutting and complicated patterns of stratification and inequality rooted in various sources: the labor market, discrimination, intergenerational transmission of wealth, access to financial markets, and financial product segmentation. Compared to absolute measures of debt burden, ratios that capture debt burden relative to income and wealth better illuminate cumulative (dis)advantage. A side-by-side comparison of the model results are presented in **Table 20**. The table also includes results from equations that estimated the total value of financial assets (logged in the modeling process) among both the full sample and only those households with NCNR debt to highlight differences between predicting wealth and predicting debt.

Predicting absolute level of debt (logged total NCNR debt) shows that many of the traditional socioeconomic variables—many of which were significant predictors of access to debt—are not significant predictors of absolute debt level: income, weeks worked in the past calendar year, experiencing an unemployment spell, and falling below the poverty line are not associated with total NCNR debt. The socioeconomic covariates generally exert significant effects in the expected direction, however, when the analysis turns to relative measures of indebtedness: gross debt-to-income and debt-to-money ratios. An examination of the debt-to-money ratio reveals that positions of structural advantage—education, income, weeks worked in the past year, being married, and holding non-financial assets—are associated with significantly lower debt burden, while

**Table 20: Comparing Estimates Across Measures of Debt Burden**

	Debt Burden (Among Indebted)			Asset Level	
	Log Total NCNR Debt	Log Debt-to-Income Ratio (Excluding Zero Income)	Log Debt-to-Money Ratio (Excluding Zero Assets)	All Households	Only Indebted Households
<i>n</i>	32183	32142	22920	80830	31162
Age	0.028	0.019	-0.041	0.106**	0.053
Age Squared	-0.0004	-0.0004	-0.0002	-0.001*	-0.0004
Black	-0.226***	-0.188***	0.206***	-1.516***	-0.974***
Hispanic	-0.134***	-0.142***	0.003	-0.906***	-0.581***
White (ref)	--	--	--	--	--
<b>Socioeconomic Status</b>					
Highest Grade Completed	0.089***	0.036***	-0.120***	0.502***	0.471***
Log Equivalent HH Inc	0.005		-0.375***	0.216***	0.378***
Weeks Worked Last Year	-0.0001	-0.004***	0.001	0.006***	0.007***
Unemployed Spell Last Year	-0.004	0.065***	0.331***	-0.461***	-0.641***
Below Poverty Line	0.004	1.240***	-0.072	-0.770***	-0.707***
<b>Family Structure</b>					
Married	0.135***	-0.304***	-0.254***	0.791***	0.835***
Divorced/Separated	0.034	0.086**	0.172**	-0.306***	-0.279***
Single (ref)	--	--	--	--	--
Have Kids	-0.099***	-0.113***	0.009	-0.124***	-0.235***
Female Head	-0.095***	-0.095***	0.329***	-0.220***	-0.246***
<b>Health Limitations</b>					
Kind or Amount of Work	0.053*	0.111***	0.148*	-0.231***	-0.208**
<b>Asset Ownership</b>					
Financial	-0.051**	-0.159***			
Non-financial	-0.122***	-0.138***	-0.549***	1.147***	1.231***
<b>Period</b>					
1985 (ref.)	--	--	--	--	--
1986	0.066**	0.051	0.033	0.003	0.016
1987	0.130***	0.117***	-0.155**	0.100*	0.080
1988	0.084**	0.071*	-0.87	-0.647***	-0.817***
1989	0.116***	0.070*	-0.66	0.229***	0.194*
1990	0.138***	0.135***	-0.045	0.201**	0.186
1992	0.122**	0.063	-0.239**	0.244**	0.324**
1993	0.143***	0.142**	-0.226*	0.218*	0.290*
1994	0.172***	0.172***	-0.377***	0.382***	0.622***
1996	0.292***	0.304***	-0.416***	0.584***	0.741***
1998	0.338***	0.341***	-0.693***	0.995***	1.260***
2000	0.347***	0.373***	-0.831***	1.201***	1.431***
<i>Constant</i>	6.635***	-2.445***	8.049***	-6.390**	-6.825***
<i>R-Squared</i>					
Within	0.0316	0.0974	0.1257	0.1187	0.1203
Between	0.0820	0.2343	0.1882	0.5596	0.4393
Overall	0.0656	0.1623	0.1546	0.3893	0.3233

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001



positions of disadvantage—being black, unemployed in the past year, divorced/separated, being a female headed household, and having a health limitation—are associated with significantly higher debt burdens. In large part, these results are driven by the disparities in total financial assets highlighted in the far right-hand columns of **Table 20**. These results highlight broader patterns of structural and institutional (dis)advantage that influence access to credit, demand for debt, and the ability to repay debts incurred.

Here it is also important to note that current sociological and economic literature has significantly more knowledge regarding the predictors of income and assets than it does debt. The overall r-squared for the full model of total NCNR debt is only 0.0656, while the r-squared values for the debt-to-income ratio, the debt-to-money ratio, and total financial assets are 0.1623, 0.1546, and 0.3893 (0.3233 among indebted households), respectively. The higher r-squared values for debt-to-income and debt-to-asset ratios are driven by the ability to predict the denominator (income or assets) with the standard set of sociodemographic covariates.

Additionally, there is more consistency in the predictors of asset ownership/asset levels than there is for debt ownership/debt levels. For assets, the same variables that increased the likelihood of reporting no liquid assets in Chapter 5 (e.g., divorce/separation) are typically associated with lower levels of liquid assets<sup>8</sup> and there are strong, predictable effects of socioeconomic status. In contrast, variables that predict the likelihood of holding NCNR debt do not necessarily predict the levels of indebtedness

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<sup>8</sup> Having children is an exception to this pattern.

(see Kim and DeVaney 2001 for another empirical example of this). Furthermore, the variables that play the largest role in predicting total NCNR debt are predominantly not economic variables.<sup>9</sup> Rather, indicators of social location and disadvantage—race, household composition, and health status—are most important, and the direction of the coefficients for race and female head are again consistent with constrained access to credit. The negative effects of holding non-money (real) and liquid assets on the level of household indebtedness are consistent with the ability of these households to dissave or take out collateralized debt rather than take on unsecured debts.

While the decreased likelihood of holding NCNR debt (Chapter 3 and Chapter 4) and the lower levels of total NCNR debt and debt-to-income ratio for black households are consistent with patterns of constrained access to credit, it may also be that kin networks provide some of the financial support these households need when faced with life course shocks. Using data from the Panel Study of Income Dynamics, recent work by Chiteji and Hamilton (2002) suggests that a moderate portion of the black-white wealth gap among middle-class black and white respondents can be explained by the presence of impoverished and disadvantaged extended family. These results suggest that a larger proportion of middle-class black household's excess income is diverted to support less well off family members, leaving them less money to invest in long-term savings. If black households lose wealth by supporting extended family, the corollary may be true: black households in financial need may be less likely to take on debt

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<sup>9</sup> While highest grade obtained is associated with significantly higher debt levels, this is consistent with the other indications that the measure of NCNR debt is actually capturing education loans not elsewhere measured in the survey.

because they may be more likely to receive support from extended kin networks.

Although this may explain a portion of the racial disparity in both debt and wealth, it is important to recognize that multiple factors influence these broader patterns.

## ***6.5 Conclusion***

The preceding analysis shows that many of the standard coefficients included in models of net worth are significant predictors of liquid asset levels but not significant predictors of the level of non-collateralized, non-revolving debt.<sup>10</sup> While models are better able to predict relative debt burden, such as debt-to-income or debt-to-money ratios, this is predominantly because we know much more about the correlates of income and wealth. Ultimately, while debt and assets each have distinct underlying processes, suggesting that indicators of net worth fail to capture some of this variation and heterogeneity, it is also difficult to understand debt without understanding broader patterns of wealth accumulation. Wealth holdings, and the underlying income streams that allow for wealth accumulation, facilitate access to credit when it is desired and buffer demands for debt in the face of shocks to economic well-being. This suggests that while standard sociodemographic covariates may predict the ability of households to obtain access to debt, the level of debt a household takes on may be less influenced by these covariates. Instead, variation in debt burden may be better understood by heterogeneity in non-economic indicators not included in this survey such as attitudes and preferences, risk tolerance, and time horizon.

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<sup>10</sup> Analysis of the Survey of Consumer Finance data (e.g., Kim and DeVaney 2001) points to similar findings for non-collateralized, revolving debt (credit cards).

## **7. Trajectories of Debt Burden and Associated Economic Consequences**

Variation in levels of non-collateralized debt may be due, in part, to heterogeneity in preferences and attitudes (Canner and Cynrak 1986; Chien and DeVaney 2001; Livingstone and Lunt 1992) and other (usually) unobserved factors. These preferences and attitudes are not distributed equally across the population, however, and vary significantly by sociodemographic characteristics (e.g. Eymann, Börsch-Supan, and Euwals 2002). Moreover, differential exposure to life course risks by social location and the varying consequences of these risks further point to heterogeneity in patterns of indebtedness.

It is critical to consider long-term patterns of indebtedness, as they may indicate households in financial distress. Chronic over-indebtedness is associated with a host of negative economic outcomes. Using the 1983 Survey of Consumer Finances (SCF), Sullivan and Fisher (1988) find that the debt-to-income ratio is a significant predictor of the likelihood of delayed or missed bill payments. Black and Morgan (1999) similarly find it is a significant predictor of delinquency risk in the 1995 SCF. In related research, Sullivan, Warren, and Westbrook (1989) find high consumer debt-to-income ratios among recently bankrupt households.

For many households, their debt position is highly volatile; they may show spikes in indebtedness in one year, followed by relatively low levels at subsequent time points (Godwin 1997; Lupton and Stafford 2000). In households for whom high debt burdens are singular events, these temporary high levels of indebtedness do not raise concern for

long-term financial outcomes. Some households, however, show patterns of chronic indebtedness that place them at increased risk for the negative financial outcomes indicated above. Using the Panel Study of Income Dynamics, Lupton and Stafford (2000) find high mobility between non-collateralized debt quintiles for high-net worth households. In contrast, they find persistently high debt and low wealth for a majority of the low-net worth households with high non-collateralized debt holdings, again highlighting the importance of considering debts and assets in tandem.

Analysis in the preceding chapters underscores observed heterogeneity inherent in the process of indebtedness and the meaning of indebtedness for individual households. Chapter 4 points specifically to racial disparities in life course events and their association with patterns of indebtedness (i.e., not indebted, low cycling, and high cycling). More importantly, the racial differences in the association between debt group membership and net worth outcomes suggests that patterns of non-collateralized debt holding do not have the same meaning for all households. Results from Chapter 5 indicate the continued importance of social location in structuring access to and demand for non-collateralized debt, pointing to the need to consider debts and assets concurrently to better understand household economic well-being. Last, the inability of traditional models to explain significant variation in debt level and burden in Chapter 6 suggests that debt burden may be better understood by heterogeneity in non-economic indicators not captured in the NLSY79 such as financial literacy and risk tolerance.

These multiple sources of heterogeneity suggest that standard estimation techniques that employ a single model to estimate the entire population are inadequate for

understanding patterns of indebtedness. There may be distinct subgroups that behave in systematically different ways. To examine systematic, persistent, unobserved heterogeneity, I turn now to latent class regression models to estimate the early life course trajectories of debt burden for the NLSY79 cohort. Subsequently, I employ logistic regressions to explore the relationship between predicted debt trajectory and negative financial outcomes.

## ***7.1 Data and Measures***

For this analysis, I use data from all households who report holding non-collateralized, non-revolving debt *at least once* between 1985 and 2000. My analysis sample excludes observations with any missing data, yielding a sample of 9,024 unique households with 70,116 total observations over the 12 interviews.

### **7.1.1 Trajectories of Indebtedness**

The outcome variable in this analysis is a repeated measure of gross *debt-to-income ratio*, total non-collateralized, non-revolving debt divided by total household income from all sources. Households that report no NCNR debt in a survey year have a value of 0.

To test theories of differential access to credit instruments, I include two measures associated with exclusion from mainstream financial markets. I include a measure of *race/ethnicity* that indicates whether the respondent is black, Hispanic, or white. I also include a measure of whether the household was *always insolvent* (1=yes, 0=no), that is,

they reported zero financial asset holdings over all possible interviews between 1985 and 2000.

*Onset of indebtedness* is the respondent's age, in years, during the wave of the first report of holding NCNR debt. This may capture differential access, in that households that experience greater credit constraints may have delayed onset of indebtedness (as suggested by patterns in Chapter 4). Alternatively, it may capture unobserved heterogeneity in demand for debt and attitudes toward borrowing.

Observed measures expected to affect access to and demand for non-collateralized debt include socioeconomic status, household composition, health limitations, and asset ownership. All of these variables are time-varying and are included as predictors of the debt-to-income ratio in the trajectory model. Given the complex interrelationships of social heterogeneity and patterned disadvantage on access and demand, it is anticipated that these predictors may exert varying effects across trajectories.

### **7.1.2 Negative Financial Outcomes**

The NLSY79 implemented a detailed asset and liability module in 2004. I draw upon three indicators of financial difficulty to explore household experiences with negative financial outcomes.

*Missed Payment* is a dummy variable coded one if the respondent answers yes to the question “In the last 5 years, have you completely missed a payment or been at least 2 months late in paying any of your bills?”

*Ever Bankrupt* is a dummy variable coded one if the respondent answers yes to the question “Have you [or spouse/partner] ever declared bankruptcy?”

*Credit Constraint* is a dummy variable that captures whether the household experienced constrained creditor perceived credit constraints. Respondents were first asked: “Have you [or spouse/partner’s name] applied for any type of credit or loan (since you declared bankruptcy [if bankrupt] or within the last 5 years)?” If they responded “yes,” they were asked “In the past 5 years, has a lender or a creditor turned down your [or spouse/partner’s] request for credit or not given you as much credit as you applied for?” If “no” to the initial question, they were asked “In the past 5 years, have you [or spouse/partner] thought about applying for credit, but changed your mind because you thought you might be turned down?” A response of “yes” to either of the follow-up questions [denied credit or chose not to apply do to perceived likelihood of denial] was coded one for *credit constraint*.

In addition, a set of dichotomous indicators was constructed to capture whether the respondent ever experienced a life course event that might increase the risk of entering into debt and the likelihood of experiencing negative financial outcomes. This set of dummy variables includes individual indicators for the following events: ever completing a college degree (16+ years of schooling), ever experiencing an unemployment spell, ever falling below the poverty line, ever getting divorced, ever having dependent children, and ever reporting a health limitation. Each indicator is



coded one (yes) if the respondent ever reports an event in any wave between 1985 and 2004<sup>11</sup>.

## 7.2 Methods

### 7.2.1 Debt-to-Income Trajectories

Household debt is a function of observable characteristics and hidden household-level heterogeneity in exposure to risk and attitudes and preferences toward consumption savings that might affect the propensity to need or desire debt. Latent class models are able to address issues of persistent unobserved heterogeneity (Nagin and Land 1993). Latent class regression models allow for repeated measurements across cases and allow for the incorporation of both time invariant and time varying covariates. Importantly, the nonparametric models relax the assumptions about random effects, making them less computationally intensive (Vermunt 2003).

In the latent regression model, the debt-to-income ratio of household  $i$  at time  $t$  is denoted by  $y_{it}$  (Vermunt and Magidson 2005).  $T_i$  indicates the number of observations per household, allowing for unequal observations across households ( $T_i$  ranges from 3-12 in the NLSY79 data).

$$f(\mathbf{y}_i | \mathbf{z}_i^{cov}, \mathbf{z}_t^{pred}) = \sum_{x=1}^K P(x | \mathbf{z}_i^{cov}) \prod_{t=1}^{T_i} f(\mathbf{y}_{it} | \mathbf{x} \mathbf{z}_{it}^{pred})$$

Stable covariates ( $\mathbf{z}_i^{cov}$ )—race, always insolvent, and age of onset—predict membership in latent class  $x$ . I included these covariates because they are associated with unobserved

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<sup>11</sup> 1991 and 2002 are excluded from the analysis due to the lack of the assets and liability module in those waves.

heterogeneity in access to credit (race, chronic insolvency, and age of onset) and attitudes and preferences influencing demands for debt (age of onset). Variation in the outcome variable (*debt-to-income ratio*) is influenced by time-varying predictor variables ( $z_{it}^{pred}$ )—such as socioeconomic status, household composition, health limitations, and asset holdings associated with increased/decreased demand for NCNR debt—with effects specific to each latent class  $x$

Comparing various fit statistics, such as the log-likelihood and the Bayes Information Criterion (BIC), indicated that a model with 4 latent classes provided the best fit and substantive meaning to the NLSY79 data. The results of this model are presented below.

### **7.2.2 Negative Financial Outcomes**

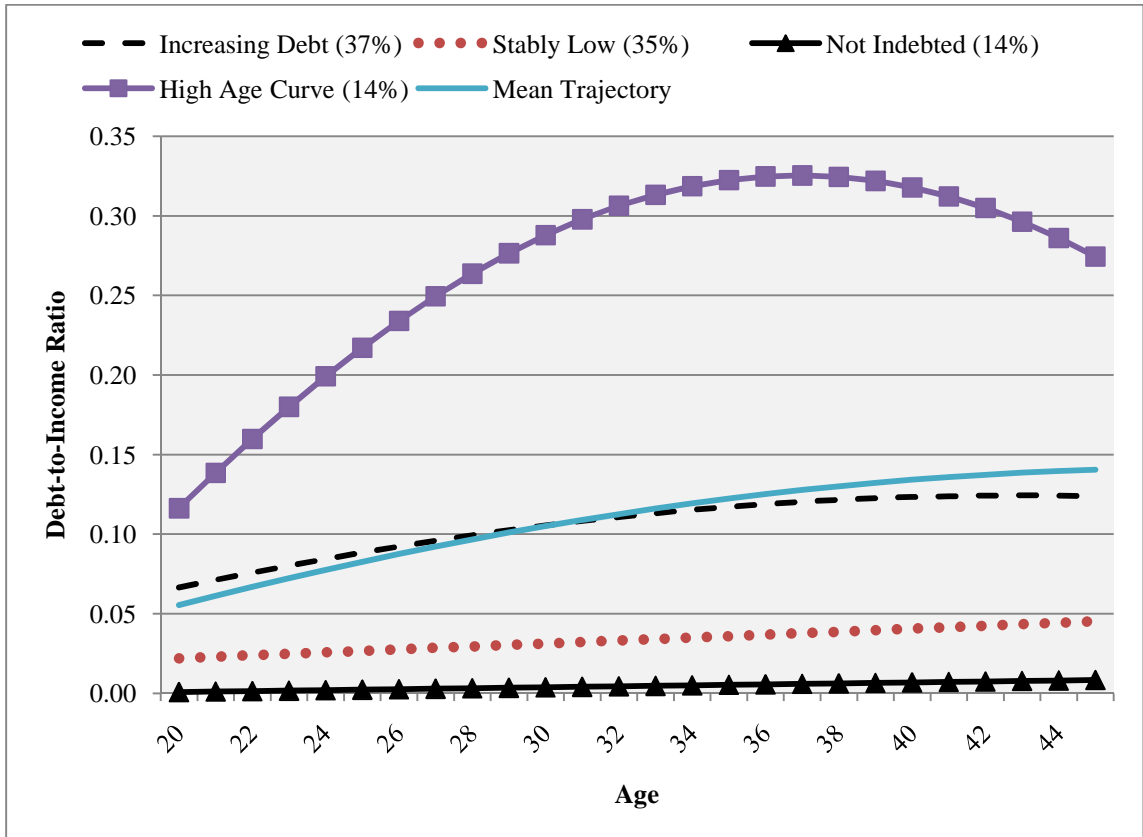
Following estimation of the latent class regression models, I used Bayes' theorem (Vermunt and Magidson 2005) to assign respondents to the latent class in which they had the greatest posterior probability. Predicted latent trajectory membership was operationalized via dummy indicators and then used in logistic regressions to predict the likelihood of experiencing one of three negative financial events: credit constraints, bankruptcy, or missed payment.

## **7.3 Results**

### **7.3.1 Debt-to-Income Trajectories**

**Figure 8** shows the mean trajectory of household indebtedness for the full sample as well as the 4 distinct trajectories identified by the latent class model. While the mean

trajectory depicts increasing debt burden with age, the patterns among the subgroups underscore the importance of identifying heterogeneity in patterns of indebtedness. The largest proportion of the sample (37%) falls into the “increasing debt” trajectory, which shows steadily increasing debt burden across age similar to the mean trajectory.



**Figure 8: Predicted Debt-to-Income Ratio, by Latent Trajectory: NLSY79, 1985-2000**

A similarly large proportion of the sample (35%) falls into the “stably low” trajectory, with low levels of indebtedness that do not vary systematically with age. Fourteen percent (14%) of the sample falls into the “Not Indebted” trajectory; these households have little to no debt burden, suggesting that they may report NCNR debt once or twice, but not systematically enough to become truly indebted. The “high age curve” trajectory,

which holds 14% of the sample, shows a curvilinear pattern of indebtedness: debt-to-income ratios increase steadily from age 20 to the late 30s, and then begin to decline. This age-graded curve of debt burden is consistent with the general patterns of indebtedness suggested by the life-cycle/permanent income hypothesis.

**Table 21** presents descriptive statistics for sociodemographic characteristics and key components of the outcome variable. There are significant differences across trajectories, pointing to the complex interrelationship of access and demand. Descriptive statistics for the stably low trajectory, for example, suggest that its members may have increased access to credit instruments—on average, they work more weeks per year, experience lower rates of insolvency, have a larger percentage of married households, and a higher proportion hold non-financial assets. At the same time, they may have decreased demand for debt, as they are less likely to report unemployment, poverty, and health limitations, while holding greater financial assets with which to buffer potential negative life course events. Furthermore, their higher average income suggests that the non-collateralized debt these households do acquire may be less burdensome.

**Table 21: Descriptive Statistics with Means and Standard Deviations (*italicized*) by Latent Debt Trajectory: National Longitudinal Survey of Youth 1979, 1985-2000**

	Not Indebted	Stably Low	Increasing	High Age Curve
N	1,300	3,168	3,345	1,211
<b>Debt (\$2004)</b>	263 ***	1232 ***	3971	11880 ***
	<i>3736</i>	<i>2595</i>	<i>7822</i>	<i>25956</i>
<b>Income (\$2004)</b>	51024 ***	52313 ***	45941	40251 ***
	<i>36165</i>	<i>38679</i>	<i>40709</i>	<i>40018</i>
<b>Race</b>				
Black	0.29 ***	0.24	0.24	0.20 ***
Hispanic	0.16 ***	0.20 ***	0.18	0.14 ***
White	0.55 ***	0.56 ***	0.58	0.66 ***
<b>Always Insolvent</b>	0.07 ***	0.03 ***	0.04	0.07 ***
<b>Onset of Indebtedness (Age)</b>	30.28 ***	27.09 ***	25.68	25.52 ***
	<i>3.08</i>	<i>3.78</i>	<i>4.72</i>	<i>3.17</i>
<b>Age</b>	30.14	30.34 ***	30.15	30.01 *
	<i>5.02</i>	<i>5.01</i>	<i>5.01</i>	<i>5.07</i>
<b>Weeks Worked</b>	38.66 ***	41.65 ***	40.41	37.89 ***
	<i>18.49</i>	<i>17.87</i>	<i>19.82</i>	<i>19.27</i>
<b>Unemployed</b>	0.21 *	0.17 ***	0.19	0.24 ***
<b>Below Poverty Line</b>	0.17 ***	0.11 ***	0.14	0.23 ***
<b>Highest Grade</b>	12.74 ***	12.99	12.99	13.55 ***
	<i>2.29</i>	<i>2.30</i>	<i>2.29</i>	<i>2.79</i>
<b>Marital Status</b>				
Single	0.36 ***	0.28 ***	0.31	0.38 ***
Divorced/Separated	0.12 ***	0.14 ***	0.15	0.18 ***
Married	0.52 ***	0.59 ***	0.54	0.44 ***
<b>Have Kids</b>	0.51 ***	0.58 **	0.57	0.49 ***
<b>Health Limitations</b>	0.05	0.04 ***	0.05	0.07 ***
<b>Log Total Financial Assets (\$2004)</b>	5.82 ***	6.20 ***	5.53	5.09 ***
	<i>3.99</i>	<i>4.03</i>	<i>4.38</i>	<i>4.16</i>
<b>Non-Financial Assets</b>	0.86 ***	0.93 ***	0.92	0.87 ***

Asterisks indicate that trajectory means are statistically significantly different from the means of the Increasing trajectory at the .05 (\*), .01 (\*\*), or .001 (\*\*\*) level of significance

In contrast, descriptive statistics for the high age curve trajectory indicate a greater proportion of households experience life events such as unemployment, poverty,

divorce, and health limitations that may increase demand for debt. These households also have, on average, fewer financial assets with which to buffer these events. However, the not indebted trajectory also has a higher proportion of households reporting certain negative events—namely unemployment and poverty—but report relatively little non-collateralized debt. This suggests that these households may experience constraints on access that limit their non-collateralized debt holdings. There are some indicators that high age curve households are better able to access credit in order to meet their demands for debt: compared to other trajectories, they have a higher proportion of white, non-Hispanic households and have significantly higher levels of education; these differences are even more apparent when contrasted against the not indebted group.

Turning now to the latent class regression analysis, **Table 22** presents the results from nonparametric hierarchical models estimating debt-to-income trajectories among ever indebted households as a function of socioeconomic status, household composition, health limitations, and wealth holdings. These results highlight both latent and trajectory-specific influences among households that contribute to the varying patterns of indebtedness shown in **Figure 8**.

The first panel of **Table 22** (*Predictors of Debt Trajectory Membership*) presents estimated coefficients from a logit model that tests whether indicators of constrained access to credit and potential unobserved heterogeneity in demand for debt (race, chronic insolvency, and onset of indebtedness) predict membership in one of the four trajectories. Similar to a standard logit model, large, positive, statistically significant coefficients indicate increased likelihood of membership in a given trajectory. Black households are

most likely to be classified in the not indebted trajectory, while Hispanic households are most likely to be classified as stably low. White households are most likely to belong to the high age curve trajectory, but are also very likely to be classified as stably low. Exponentiating the parameter estimates for two clusters and computing the ratio between them provides odds ratios. For example, always insolvent households are 77% more likely than non-chronically insolvent households to belong to the high age curve trajectory than the not indebted trajectory [ $\exp(.2738)/\exp(.0710)=1.77$ ]. However, always insolvent households are also 44% more likely than non-chronically insolvent households to be classified as not indebted than be classified in the stably low trajectory, suggesting that access may prevent some chronically insolvent households from taking on debt, while those households with access accumulate large burdens due to increased demand. Last, older age of onset is associated with increased likelihood of being classified as either not indebted or stably low and decreased likelihood of being classified in the increasing debt or high age curve trajectories. These patterns point to differentiation in access and demand associated with varying trajectories of indebtedness.

The lower portion of **Table 22** adds predictor variables of debt-to-income level to examine heterogeneity within and across debt trajectories. The Wald statistic in the far right hand column indicates whether the difference in the parameter estimates is statistically significant across trajectories. All of the predictor variables are significantly different across the four identified trajectories; their patterns suggest that heterogeneity in debt burden is in part explained by whether one is not indebted because of lack of access to credit or low demand for debt. For example, holding non-financial assets may

**Table 22: Parameter Estimates from Nonparametric Hierarchical Model Predicting Logged Debt-to-Income Ratio among Ever Indebted Households: NLSY79, 1985-2000**

<i>n=9,024</i> <i>(70,116 observations)</i>	Not Indebted	Stably Low	Increasing Debt	High Age Curve	Wald <i>p</i> Value
<i>Predictors of Debt Trajectory Membership</i>					
<b>Intercept</b>	-5.3502***	-0.2542	3.0772***	2.5273***	
<b>Race</b>					
Black	0.1108**	-0.0294	0.0136	-0.0950*	
Hispanic	-0.0688	0.1346***	0.0282	-0.0940*	
White	-0.0420	0.1052***	-0.0418	0.1189***	
<b>Always Insolvent</b>	0.0710	-0.2959***	-0.0489	0.2738***	
<b>Onset of Indebtedness (Age)</b>	0.1790***	0.0217***	-0.0949***	-0.1058***	
<i>Predictors of Debt-to-Income Level</i>					
<b>Intercept</b>	-0.0052	0.0038	-0.0677*	-0.5360**	0.0014
<b>Age</b>	0.0003	0.0009	0.0086***	0.0443***	3.10E-08
<b>Age Squared</b>	.	.	-0.0001***	-0.0006***	5.00E-07
<b>Weeks Worked</b>	.	.	.	-0.0022***	4.10E-10
<b>Unemployed</b>	-0.0001	-0.0008	0.0044***	-0.0226**	1.90E-06
<b>Below Poverty Line</b>	-0.0006***	-0.0033***	0.0144***	0.2113***	5.30E-188
<b>Education</b>	.	0.0002	0.0030***	0.0210***	1.10E-30
<b>Marital Status</b>					3.40E-05
Single	-0.0001	-0.0014**	-0.0056***	-0.0228*	
Divorced/Separated	-0.0005**	0.0002	0.0049**	0.0255*	
Married	0.0006***	0.0012**	0.0007	-0.0027	
<b>Have Kids</b>	0.0002	0.0009**	-0.0018	-0.0533***	7.70E-16
<b>Health Limitations</b>	0.0002	0.0006	0.0095***	0.0123	1.40E-05
<b>Log Total Financial Assets</b>	.	-0.0003***	-0.0017***	-0.0025	4.80E-14
<b>Non-Financial Assets</b>	0.0002	0.0024***	0.0108***	0.0203*	2.40E-12
Log-Likelihood	74213				
BIC	-147780				

p-values: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$



facilitate access as it represents a source of credit and may be an indicator of participation in financial markets more broadly. Non-financial asset holding is associated with increased debt burden for households in all trajectories except for those in the not indebted trajectory. In contrast, financial assets provide a pool of liquid resources from which households can draw in times of need, potentially reducing demand for non-collateralized debt. Higher financial assets are associated with significantly lower debt burden for households in the stably low and increasing debt trajectories.

Among the two lowest debt trajectories—the not indebted trajectory and the stably low trajectory—few predictor variables have significant effects on the household’s estimated debt burden. More significantly, those predictors that do have effects may be indicators of decreased or increased access: falling below the poverty line is associated with lower debt-to-income ratios, while being married is associated with higher predicted debt burdens for both the not indebted and stably low trajectories. In contrast, for the two higher debt trajectories (whose households clearly have some access to debt), more of the predictor variables significantly influence debt burden. For both the increasing debt trajectory and the high age curve trajectory, age exerts curvilinear effects, consistent with the LC-PI hypothesis that, with unconstrained access, debt occurs early in the life course and reduces over time. Moreover, many of the variables associated with increased demand for debt are associated with increased debt burden: falling below the poverty line, being divorced/separated, and having higher education (school loans) increase debt burden for households in both the increasing debt and high age curve trajectories. Similarly, experiencing an unemployment spell and having health limitations are

associated with increased debt burden for households in the increasing debt trajectory.<sup>12</sup> These results underscore heterogeneity in access and demand for debt, and the differing effects of predictor variables across groups highlight the varying consequences of exposure to life course risks.

### 7.3.2 Negative Financial Outcomes

Patterns of chronic indebtedness may place households at increased risk of experiencing negative financial outcomes such as delinquency, credit constraints, and bankruptcy. **Table 23** presents results from logistic regressions estimating the likelihood of being denied for credit (or choosing not to apply for credit due to perceived likelihood of denial), ever declaring bankruptcy, and ever missing a bill payment. Consistent with prior work on the negative consequences of high debt-service-ratios (e.g., Black and Morgan 1999; Sullivan and Fisher 1988), households in the not indebted trajectory and the stably low trajectory are significantly less likely to report negative financial outcomes in later life than households in the increasing debt and high age curve trajectories. These findings hold even with controls for differential exposure to negative life course events (see **Appendix F, Table F-2**). Members of the high age curve trajectory do not differ from households in the increasing debt trajectory in their likelihood to report credit constraints or difficulty paying bills. However, they are significantly more likely to have

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<sup>12</sup> Johnson and Li (2008) note that while high debt burden indicates a household had access to credit/debt in the past, it does not guarantee access in the future; debt burdens that are too high may even constrain access. It is possible that some high age curve trajectory households may have maximized their access and are bumping up against credit constraints, making it more difficult to tap into debt in times of need. A formal test of this would require a more detailed data set with smaller intervals.

ever declared bankruptcy, which may be the most serious of the potential negative financial outcomes as it has long-term consequences for asset-building (assets are used to repay creditors) and ability to access future lines of credit.

**Table 23: Logistic Regressions Estimating Negative Financial Outcomes in 2004, Odds Ratios**

	Denied/ Not Apply for Credit	Ever Bankrupt	Miss Payment
<i>n</i>	6434	6445	6427
<b>Debt-to-Income Trajectory</b>			
Not Indebted	0.58***	0.40***	0.48***
Stably Low	0.64***	0.61***	0.79**
Increasing (ref)	--	--	--
High Age Curve	1.002	1.25*	1.09
<b>Life Course Events Ever Experienced</b>			
Below Poverty Line	1.40**	0.86*	1.36***
Unemployment Spell	1.42***	1.29**	1.40***
Health Limitation	1.33***	1.18*	1.49***
Divorce	1.43***	1.62***	1.32***
College Degree	0.54***	0.54***	0.55***
Have Kids		1.69***	
<i>Log Likelihood</i>	-3080.46	-2615.12	-3251.28
<i>Pseudo R-Squared</i>	0.0478	0.0481	0.0456
<i>BIC</i>	6231.07	5309.18	6572.71

p-values: \*p<.05; \*\*p<.01; \*\*\*p<.001

Examining the impact of selected life course events reveals effects generally in the anticipated direction. Life course events that impose cost burdens and may cause households to have difficulty meeting expenses—falling below the poverty line, experiencing an unemployment spell or health limitation, getting divorced, and having kids—are significantly associated with increased likelihood of negative financial

outcomes. In contrast, ever obtaining a college degree is associated with significantly decreased likelihood of ever being credit constrained, declaring bankruptcy, or missing or being late on a bill payment. This may reflect the increased financial literacy associated with higher educational attainment (cf., Lusardi and Mitchell 2005).

Black and Hispanic households are more likely than white households to be classified in the trajectories associated with decreased risk for negative financial outcomes (not indebted and stably low, respectively). However, compared to white households, black and Hispanic households are more likely to experience certain life course events that increase the likelihood of negative financial outcomes: unemployment, poverty, and health limitations (see **Table 6**). In addition, they are significantly less likely to ever obtain a college degree. These patterns of disadvantage result in overall higher rates of negative financial outcomes for minority households when compared to white households.<sup>13</sup>

It is important to note that there are hints at even more heterogeneity than this analysis explicitly reports. For example, both ever being poor and ever receiving a college degree are associated with increased likelihood of membership in the high age trajectory (see multinomial logit model in **Appendix F, Table F-1**). Being in the high age curve trajectory is associated with higher likelihood of all negative financial

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<sup>13</sup> For the full sample of ever indebted households, black households have the highest proportion of households reporting negative financial outcomes; Hispanic households also report higher rates of negative outcomes than white households. 28% of black households report credit constraints, compared to 22% of Hispanic and 15% of white households. For bankruptcy, 17% of black households report ever declaring bankruptcy while 14.5% of Hispanic and 14.3% of white households do. Last, 31% of black households report missing a payment in the past 5 years while 22% of Hispanic and 17% of white households report missed payments.

outcomes such as being credit constrained, declaring bankruptcy, or missing a payment. For two of these, credit constraints and missing a payment, ever being poor further increases the likelihood of reporting a negative event; in contrast, ever receiving a college degree reduces the likelihood of ever experiencing these events. This suggests that there may be two distinct clusters of households within the high age curve trajectory: 1) those whose debt is primarily related to higher education and are relatively unencumbered by their debt burden and 2) those whose debt is related to income inadequacy and face significant economic consequences of their debt burden, with the potential for long-term reduction in well-being (e.g., physical and psychological stress, impaired credit).

#### ***7.4 Discussion and Conclusions***

The preceding analyses further highlight variation in the process and meaning of indebtedness for individual households. Analysis of negative financial outcomes points to the importance of identifying variation in long-term patterns of indebtedness.

Occasional reports of non-collateralized, non-revolving debt do not raise concern for a household's financial well-being. Results from logistic regressions suggest that even chronic indebtedness is not problematic, as long as the debt burden remains stably low. In contrast, chronic, high debt burdens significantly increase the likelihood of reporting credit constraints, bankruptcy, and delinquency on bill payments.

The complex patterns of indebtedness identified in the latent trajectory models result from the interplay between access and demand. This is best highlighted by the always insolvent households. These households are most likely to be classified in the

extreme trajectories (not indebted and high age curve), indicating that they are likely to experience constrained access, but, if they do have access, their demand is higher due to a total lack of financial assets.

While heterogeneity in unobserved access to and demand for debt influences life course trajectories of indebtedness, these trajectories are differentially shaped by sociodemographic predictor variables also associated with access and demand. Though standard economic models of consumption and saving such as the life cycle-permanent income hypothesis propose an age-graded cycle of debt and wealth, age is only significant for two trajectories: increasing debt and high age curve. This pattern further suggests that economic theories of indebtedness capture only certain, standard life cycle processes. With the de-standardization of the life course, increasing risk and instability, and constrained credit markets, traditional age-graded curves of wealth and debt may hold true for only a portion of the population.

## 8. Discussion and Conclusions

Non-collateralized household debt is nuanced and contextually contingent. Findings provide support for the three specific mechanisms proposed to understand differentiation in patterns of indebtedness—institutional context, social heterogeneity, and patterned disadvantage or structural risk (see **Figure 6**). Heterogeneous patterns of indebtedness are shaped by access to credit (influenced by institutional configurations and SES) and demand for debt (affected by life course events and ability to draw from income/wealth). The influence of deregulated financial markets that expanded access to credit and other financial institutions is reflected in the increasing likelihood of reporting debt (Chapter 4) and holding financial assets (Chapter 5) and increasing debt levels (Chapter 6) across time. Analysis in Chapter 4 highlights the influence of social location on likelihood of reporting debt. Results point specifically to racial disparities in life course events (patterned disadvantage) and consequences of these life events for indebtedness that are also patterned by race. More importantly, the differences in the association between patterns of indebtedness and financial outcomes highlighted in Chapter 4 and Chapter 7 suggest that patterns of non-collateralized debt holding do not have the same meaning for all households.

Household debt has typically appeared in sociological research as a component of net worth. By studying debt as a unique indicator of inequality, this study adds sociological explanation to a social process that has been previously ignored and under-theorized. Situating debt in a framework of access and demand shaped by institutions, social heterogeneity, and differentially experienced life course events, findings

underscore the structural basis for household indebtedness and the varying life course consequences of indebtedness. While results in Chapter 7 indicate that the life-cycle/permanent-income hypothesis predicts behavior for a portion of the sample, it does less well at explaining non-traditional trajectories of indebtedness that may become more common as the life course is increasingly destandardized and deinstitutionalized. Disaggregating components of net worth and studying them in tandem—as done in Chapter 5 with non-collateralized debt and liquid assets—facilitates nuanced understanding of household economic well-being. Additionally, analysis indicates that standard models of income and wealth may not directly transfer to the study of indebtedness. The inability of traditional models to explain significant variation in debt level and burden in Chapter 6 suggests debt burden may be better understood by heterogeneity in non-economic indicators not captured in the NLSY79 such as financial literacy and risk tolerance.

Understanding how households utilize non-collateralized debt has important implications for studies of stratification and inequality. In the absence of sufficient income and assets, the ability to draw upon debt to meet financial demands (i.e., smooth consumption) suggests improved well-being. The inability to smooth consumption in times of need implies increased risk, insecurity, instability and stress. Access to debt does not guarantee economic well-being, however. Results from Chapter 7 show that households with consistently high debt burdens are more likely to report negative financial outcomes, even after controlling for differential experiences with negative life events. In addition, holding non-collateralized debt at burdensome levels may cause



decreased physical and mental well-being (e.g., Del-Rio and Young 2005), potentially exacerbating its negative economic effects.

### ***8.1 Policy Implications***

These findings have specific implications for policy, although these implications differ depending upon whether the patterns are driven by access or demand.

To the extent that unconstrained access to debt instruments allows households, particularly low- and middle-income households, to better manage financial demands (cf. Mann 2008), it is important to further reduce limitations on access. Physical infrastructure may be important, as certain neighborhoods, especially those with concentrations of poor and minority households, lack ready access to mainstream financial institutions. In addition, key drivers in improved access are legislation and policies aimed at reducing discrimination in lending. This is particularly important in combating predatory lending practices that create a two-tiered credit market. Higher priced loans strip equity from already disadvantaged households, reducing their ability to meet debt obligations and build wealth.

It is also important to consider that the lower likelihood of reporting debt for disadvantaged households may not solely reflect constrained access. These patterns may, in part, reflect a mistrust of financial institutions (potentially rooted in historical patterns of disadvantage and constrained access). They may also reflect the high cost of interacting with mainstream financial institutions; that is, the fees of maintaining an account (e.g. minimum balance, monthly maintenance) exceed the perceived benefits of that account (Barr 2004; Hogarth et al. 2005). To the extent that participation in

mainstream financial institutions is a step toward building credit, which may be a critical step toward wealth accumulation (and subsequent intergenerational transmission of wealth), reducing barriers to participation in mainstream financial institutions and establishing low cost banking services merit specific attention by policymakers.

In contrast, high household levels of non-collateralized debt may be driven by greater demands for debt. Low levels of liquid assets, higher likelihood of experiencing life course shocks, and changing institutional arrangements that shift costs to individuals all contribute to increased debt burdens. Recent analysis of the Survey of Consumer Finances by Chiteji (2007), notes that the debt profiles of young adults (age 25-34) have not changed substantially when one examines debt holdings in 1963, 1983, and 2001. However, aggregate trends over this time period document growing bankruptcy rates and increasing debt burdens (Brown and Burhouse 2005; Dynan et al. 2003). This suggests that the negative outcomes may not be due to debt itself, but a shift in the institutions surrounding debt (e.g. changes in the terms of debt, such as credit cards) coupled with increased instability, rising costs of living, and increasing inequality that make the consequences of being indebted more contingent and possibly damaging. These patterns point to the importance of policies that mitigate the effects of negative life course events, such as social insurance programs for poverty and unemployment.

## ***8.2 Limitations***

While analyses consistently show the importance of disadvantaged structural position for debt patterns, particularly with respect to race, there are some limitations to the study. The NCNR debt question only reports whether a household has any *one* debt

worth \$500 or more, underestimating true debt levels. This \$500 level may exclude certain households from ever entering into NCNR debt in the survey, especially poor and minority households. These households may have multiple debts with values less than \$500, but this is not captured in the survey instrument. Examination of the NLSY79's expanded asset and liability module in 2004 suggests that 5-6% of households (or more) may be excluded from analysis due to this truncation level (see **Appendix B** for extended discussion). Households with non-collateralized debt holdings less than \$500 have a higher proportion of black households, lower average income and education, fewer married households, and more divorced and female headed households than those households that owe \$500 or more, indicating that the \$500 limit on NCNR debt between 1985 and 2000 systematically excludes certain households from being ever indebted.

Additionally, it is unclear what debts are actually included in the NCNR category. The question is worded so it should not capture credit card debt (“excluding 30 day charge accounts”) but there is no way to verify whether respondents excluded credit card debt from their answers. Analysis of the 2004 NLSY79 (see **Appendix B**) indicates that a large proportion of households included credit card debt in their responses, but many did not. Given the survey structure, it is impossible to discern which households reported only non-collateralized, non-revolving debts. The possible effects of this are limited, however, because the question wording was consistent over the 12 interview periods and any individual errors in answering the question are hopefully relatively constant over time.

This inability to discern the component parts of the household's non-collateralized debts is yet another source of hidden heterogeneity. It is difficult to estimate the household's "true" debt burden because the data lack specific details of the outstanding loans such as the interest rates and minimum payments. There are a wide variety of loan types (e.g., installment loans, outstanding medical bills, payday loans), and within each one there is the potential for even greater differentiation, especially with respect to financial instruments such as credit cards. Additionally, there is no information on why the debt was incurred or to whom it is owed, making it impossible to discern whether households report recurrent debt because they are cycling between new debts or because they are unable to pay old debts. The need for more research on the component parts of household indebtedness is fundamental to understanding participation in and the consequences of stratified financial systems (e.g., tiered credit markets of risk-based pricing: prime v. subprime). While other large datasets provide some of this information (cf. Consumer Expenditure Survey), it may be impossible to obtain this level of detail through survey methods alone, pointing to the need to utilize multiple methods to fully understand household indebtedness.

### ***8.3 Future Research***

Like all research projects, the preceding results answer some questions and raise new ones. Some of these are broad, theoretical questions. For example, the importance of technology in financial markets raises multiple questions, such as: how do socio-legal institutions interested in guaranteeing welfare and economic well-being address the rapid changes in financial markets and products brought about by technology? While

technology such as automatic credit scoring allowed for greater diffusion of financial goods, it has also made them more complicated. Given the unequal distribution of technological knowledge, what are the implications of technology's integration into financial markets for long-term inequality (with respect to individuals/household's ability to successfully navigate the financial marketplace)?

Other directions for future research are more easily pursued. Findings in Chapter 5 point to different processes of indebtedness depending on whether a household has liquid financial assets. However, it is difficult to hypothesize about what will happen with respect to debt for households that have liquid assets, in part due to unobserved heterogeneity in attitudes, preferences, and financial literacy. Do these households avoid debt because they pay from savings? Or do they take on debt because they can pay it back more readily? Are there asset levels at which one strategy is pursued over the other, and do these levels vary systematically by sociodemographic characteristics? These questions deserve more attention.

While latent trajectory analysis in Chapter 7 identifies heterogeneity in patterns of indebtedness, it only hints at the relationship between life course events and fluctuations in the debt-to-income ratio. When households experience life course events that increase costs and decrease income—such as health limitations, unemployment, and divorce—what happens to their debt-to-income ratio? If fluctuations in debt-to-income ratio occur, are they driven primarily by *income instability* or *increasing costs*? Though these questions are beyond the scope of the current project, I hope to explore them in future work.

## Appendix A. NLSY79 Asset and Liability Module Details

Form	Question Wording	Years
<i>Assets</i>		
Home	"Is this (house/apartment) owned or being bought by you (or your husband/wife)?" If yes, "About how much do you think this property would sell for on today's market?"	1985-1990, 1992-1994, 1996, 1998, 2000, 2004
Vehicle <sup>‡</sup>	"Do you (and your spouse) own anything on wheels, including cars, motorcycles, trucks, a motor home or trailer?" If yes, "How much would this (these) vehicle(s) sell for on today's market?"	1985-1990, 1992-1994, 1996, 1998, 2000
Financial		
<i>Cash Accounts*</i>	<b>From 1985-1987:</b> "Do you (and your spouse) have any money in savings or checking accounts, savings and loan companies, money market funds, credit unions, U.S. savings bonds, individual retirement accounts (IRA or Keogh), or certificates of deposit, common stock, stock options, bonds, mutual funds, rights to an estate or investment trust, or personal loans to others or mortgages you hold (money owed to you by other people)?" <b>From 1988-1993:</b> "Do you (or your husband/wife) have any cash you keep in a safe place at home or elsewhere, any money in savings or checking accounts, money market funds, credit unions, U.S. savings bonds, individual retirement accounts (IRA or Keogh), certificates of deposit, personal loans to others, or mortgages you hold (money owed to you by other people)?" <b>From 1994-2000:</b> "Do you or (spouse/partner) have any money in savings or checking accounts, money market funds, credit unions, U.S. savings bonds?" If yes, "How much altogether?"	1985-1990, 1992-1994, 1996, 1998, 2000
<i>Stocks/Bonds*</i>	"[Not counting any individual retirement accounts (IRA or Keogh) you have already told me about] do you (or your husband/wife) have any common stock, preferred stock, stock options, corporate or government bonds, or mutual funds?" If yes, "Altogether, what is the current market value of these stocks, bonds, or mutual funds that you (or your husband/wife) have invested in?"	1988-1990, 1992-1994, 1996, 1998, 2000
<i>IRAs/Keogh*</i>	"Do you (or spouse/partner) have any money in individual retirement accounts (IRAs or Keogh)?" If yes, "How much altogether?"	1994, 1996, 1998, 2000

401Ks*	"Do you (or spouse/partner) have any money in tax deferred plans, such as 401K or a 403B plan or other pre-tax annuities?" If yes, "How much altogether?"	1994, 1996, 1998, 2000
CDs, other*	"Do you (or spouse/partner) have any money in certificates of deposit, personal loans to others, or mortgages you hold?" If yes, "How much altogether?"	1994, 1996, 1998, 2000
Estate/Trust	"Do you (or your husband/wife) have any rights to an estate or an investment trust?" If yes, "What is the total value of the estate or the investment trust that you (or your husband/wife) will receive?"	1988- 1990, 1992- 1994, 1996, 1998, 2000
Other*‡	"Aside from the things we've already talked about, do you (or your husband/wife) own any other items each worth more than \$500? For example, a piece of furniture, appliance, boat, jewelry, stereo system, a valuable collection for investment purposes, etc." If yes, "What is their total market value, rounding to the nearest hundred dollars?"	1985- 1990, 1992- 1994, 1996, 1998, 2000
Business	"Do you (or your husband/wife) own or have an investment in a farm operation, a business or professional practice, or any other real estate, (not counting the property on which you are living)?" If yes, "What is the total market of all the (real estate) (assets in the business, including tools and equipment) (farm operation, including value of land, buildings, house, and the equipment, livestock, stored crops, and other assets)? (If Farm:) Do not include crops held under commodity credit loans"	1985- 1990, 1992- 1994, 1996, 1998, 2000, 2004
<b>Liabilities</b>		
Home-Secured	If yes to home ownership, "About how much do you (and your husband/wife) owe on this property for mortgages, back taxes, home improvement loans, etc?"	1985- 1990, 1992- 1994, 1996, 1998, 2000, 2004
Other Home-Secured	If yes to home ownership, "How much other debt do you have on this property, such as assessments, home repair bills, etc?"	1985- 1990, 1992- 1994, 1996, 1998, 2000, 2004

Vehicle-Secured <sup>‡</sup>	If yes to vehicle ownership, "Do you (or your husband/wife) owe any money on (this/these) vehicle(s)?" If yes, "How much altogether?"	1985-1990, 1992-1994, 1996, 1998, 2000
Business-Secured	If yes to business ownership, "What is the total amount of debts or liabilities you (or your husband/wife) owe on this operation or property? Include any unpaid mortgages. (Do not include any commodity credit loans.)"	1985-1990, 1992-1994, 1996, 1998, 2000, 2004
Other <sup>‡</sup>	"(Aside from any debts you have already mentioned,) do you (or your husband/wife) now owe over \$500 to any stores, doctors, hospitals, banks, or anyone else, excluding 30-day charge accounts?" If yes, "Rounding to the nearest hundred dollars, how much do you owe altogether?"	1985-1990, 1992-1994, 1996, 1998, 2000

\* Indicates that similar data are available in the 2004 questionnaire, but have been disaggregated (e.g., stocks and bonds receive separate attention). ‡ Indicates that the 2004 question wording changed in a way to make the variables non-comparable over time: 2004 disaggregated non-collateralized debts into 3 separate questions that do not correspond directly to the question asked between 1985-2000 (see **Appendix B**), the truncation level for other assets and other liabilities was raised from \$500 to \$1000, and the questions regarding vehicles include respondents currently leasing.



## Appendix B. Deconstructing NCNR Debt

It is unclear what debts are actually included in the NCNR category. The question is worded so it should not capture credit card debt (“excluding 30 day charge accounts”) but there is no way to verify whether respondents excluded credit card debt from their answers. The possible effects of this are limited, however, because the question wording was consistent over the 12 interview periods and any individual errors in answering the question are hopefully relatively constant over time. While the NLSY79 incorporated an expanded assets and liabilities section in 2004 that did disaggregate some of the non-collateralized debt components, the questions were not worded in a manner that facilitated imputation for the 1985-2000 waves. Comparisons of the multiple measures are broadly illustrative of the components of NCNR debt.

From 1985 to 2000, the only question on the survey<sup>30</sup> that measured non-collateralized debt was “*Aside from any debts you have already mentioned, do you (and your spouse) now owe over \$500 to any stores, doctors, hospitals, banks, or anyone else, excluding 30-day charge accounts?*” (If “yes,” “*How much altogether?*”). This question specifically asked respondents to exclude 30-day charge accounts (i.e., credit cards) and had a \$500 minimum for any one debt, suggesting that it might exclude some households with positive, but low, debt holdings.

In 2004, the asset and liability module was expanded. Questions regarding assets and liabilities were asked in greater detail, allowing for analysis of 5 specific types of

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<sup>30</sup> Respondents that had attended school in the prior year were asked about school loans, but they were not asked about these loans in subsequent years.

non-collateralized debt detailed below (presented in the order in which they appeared on the survey):

1) Credit card debt:

*“Do you [or spouse/partner] have any credit cards or owe any money on any credit card accounts, such as Visa, American Express or credit cards for specific stores, such as department stores or gas stations?”*

*If “yes”: “After the most recent payment, roughly what was the balance still owed on all of these accounts together? If you paid off all of these accounts, please report \$0.”*

2) Outstanding student loans:

*“Are you [or spouse/partner] responsible for making payments on any student loans that you had for your own [or spouse/partner’s] education?”*

*If “yes”: “About how much do you [or spouse/partner] owe on all of these student loans?”*

3) Outstanding student loans for children’s education:

*If report biological, adopted, or step-children: “Are you [or spouse/partner] responsible for making payments on any student loans for your (child/children)? Please only include loans that have been made in your [or spouse/partner’s] name for your (child/children)’s education. [Note: Only include student loans from the government and not withdrawals against other types of loans, even if the withdrawal is used for educational purposes.]”*

*If “yes”: “About how much do you owe on student loans for your (child/children) that you [or spouse/partner] are primarily responsible for?”*

4) Money owed to businesses:

*“(Aside from the accounts we talked about), do you [or spouse/partner] currently owe money to any other businesses, such as stores, doctor’s offices, hospitals, or banks? Please include any installment plans, rent-to-own accounts, or any other business that you owe money to.”*

*If “yes”: “After the most recent payments were made on these accounts, what was the balance still owed?”*

5) Any other debts greater than \$1000:

*“Aside from the items that we talked about, do you [or spouse/partner] owe \$1000 or more to any person, institution, or company?”*

*If “yes”: “What is the total amount of debt that you [or spouse/partner] owe to these accounts, rounded to the nearest thousand dollars?”*

These questions specifically identify non-collateralized, revolving debt, as well as loans made for education. In addition, they explicitly direct respondents to include debts such as rent-to-own accounts. With the exception of “other debts,” they do not place a minimum value for the debt. Another significant difference is that they ask respondents to report the amount owed “*after the most recent payments,*” a specification that was not made in the prior surveys.

To try to better understand what is captured in the non-collateralized debt measure used between 1985 and 2000, as well as the number of households excluded due to the \$500 truncation level, I construct two indicators of liability holdings for each of the five debts listed above. The first indicates that the household has the debt referenced by the question; the second indicates that they owe \$500 or more (a “strict” definition of that liability, consistent with the question wording from the prior survey years). For credit cards, I take this one step further and construct three indicators: one for whether they hold credit cards, one for whether they owe *any* money on credit cards (balance greater than 0 after last payment), and a final “strict” indicator for if they owe \$500 or more on credit cards following their last payment.

**Table B-1. Liability Holdings in National Longitudinal Survey of Youth 1979, 2004**

	2004												
	NCNR Debt (2000)	Credit Cards			Student Loans		Children's Student Loans		Money to Businesses		Other Debts >\$1000	Any Non-Collateralized Debt	
		Hold Credit Cards	Owe Money (>\$0)	Owe \$500+	Owe Any	Owe \$500+	Owe Any	Owe \$500+	Owe Any	Owe \$500+		Owe Any	Owe \$500+
<b>Proportion Holding Debt</b>	37.4%	59.7%	45.6%	40.5%	7.9%	7.5%	3.4%	3.2%	17.4%	13.2%	5.1%	59.0%	53.4%
<b>Value of Holdings (\$2004)</b>													
Median	4936		2000	4000	8000	9000	8000	8000	1400	2700	5000	800	5000
Mean	12204		4839	6864	15261	16135	10379	11209	8145	10888	16672	6450	12064
<i>St. Dev.</i>	25832		7668	8367	22177	22501	10485	10466	26487	30246	38449	18378	23782

Across the 12 waves in which the NLSY79 asks about non-collateralized, non-revolving (NCNR) debt between 1985 to 2000, the average proportion of households reporting non-collateralized debt holdings is 37.3%. As indicated by **Table B-1**, the 2000 survey has a similar proportion of households (37.4%) reporting NCNR debt holdings. In 2004, the proportion of households reporting any non-collateralized debt holdings (far right hand columns) was significantly higher: 59%. Limiting the definition of indebted households to those who report owing \$500 or more for *at least one* of the 5 subcomponents reduces the proportion of households reporting non-collateralized debt to 53.4%, but this proportion remains substantially higher than the proportion of households reporting NCNR debt in prior survey years. While the proportion may differ, the mean, median, and standard deviation for NCNR debt in 2000 are very similar to the value of all non-collateralized debts (with at least one \$500+) in 2004, suggesting some similarity in what they are capturing.

Breaking the 2004 non-collateralized debt holdings into its component parts, **Table B-1** shows that the most common non-collateralized debt is credit card debt (i.e., revolving debt), with 59.7% of all households owning credit cards and 45.6% of all households (79% of credit card owning households) reporting that they will continue to owe money on their credit cards after their next payment. Even with the \$500 restriction, 40.5% of all households (70% of credit card owning households) report outstanding credit card balances. Non-revolving debts for non-educational purposes owed to other businesses are the second most common type of debt reported by households in 2004: 17.4% of all households report any money owed to other businesses. This proportion shrinks to 13.2% with the \$500 restriction. Student loans and student loans for children

are held by a small proportion of all households—7.9% and 3.4%, respectively—but represent large outstanding debts with median values of \$8000 and mean values well above \$10,000. Placing the \$500 restriction on student loans does little to change the proportion of households reporting these debts—7.5% continue to report student loans for self or spouse/partner and 3.2% for children—further reflecting the large value of educational loans. Last, only 5.1% of all households report owing \$1000 or more to any person, institution, or company not covered by the preceding questions (the notable category not covered by the preceding questions is money owed to other persons such as friends and relatives).

**Table B-2** presents the number of distinct liabilities held by households in the 2004 NLSY79. No household reports holding all 5 non-collateralized debts, and very few hold 3 or four. Depending on whether debts are measured at any level or at a strict \$500 cutoff, 40-46% of households have zero debts, 40-43% report one debt, and 11-14% report 2 debts.

**Table B-2. Number of Liabilities Held**

# of Liabilities	Any Level (>\$0)	Strict Level (\$500+)
<b>0</b>	40.5%	46.3%
<b>1</b>	43.1%	40.8%
<b>2</b>	13.9%	11.2%
<b>3</b>	2.3%	1.6%
<b>4</b>	0.2%	0.1%

*n=7,025*

**Table B-3** presents the proportion of all 2004 liabilities accounted for by each of the component parts (aggregate statistics). Due to the small effects of liability holdings less than \$500 on the aggregate value of debt holdings, these proportions are similar

whether the liabilities are measured as *any* outstanding debt or \$500 or more of debt outstanding. Credit cards represent the bulk of outstanding non-collateralized debt (43.3%), followed by money to other businesses (21.7%), and student loans (18.4%). While a small proportion of households (5.1%) reported debts over \$1000, they comprise 12.3% of all outstanding debts. Student loans for children’s education make up the smallest portion (4.3%) of non-collateralized debts.

**Table B-3. Proportion of Total Non-Collateralized Debts**

<b>Liability</b>	<b>% of Total NC Debts</b>
Credit Cards	43.3%
Student Loans	18.4%
Children's Student Loans	4.3%
Money to Businesses	21.7%
Other Debts >\$1000	12.3%

Clearly, no one of the five liabilities captured in 2004 accurately reflects the NCNR debt measure utilized from 1985 to 2000. Moreover, the measure of any non-collateralized debt in 2004 provides a larger estimate of the proportion of households with non-collateralized debt, regardless of whether the \$500 limitation is in place. Using all of the “strict” indicators for 2004 (those with \$500 minimums) and excluding credit cards to best replicate the question wording in prior years, I constructed an indicator for NCNR debt in 2004. The proportion of households with any non-collateralized, non-revolving debt worth \$500 or more in 2004 is only 22.9%. Removing the \$500 limitation yields 26.3% of households with NCNR debt holdings. Both of these numbers are significantly lower than the 37.3% average reporting of NCNR debt between 1985 and 2000. Assuming that 2000 and 2004 are roughly equivalent (for comparison, the

aggregate value of NCNR debt in 1998 was \$32.1 million in \$2004), the values in **Table B-4** suggest that about one quarter to one third of NCNR debt (as captured from 1985 to 2000) is comprised of outstanding credit card debt. If accurate, this is still less than half of total credit card debts outstanding. These findings suggest that the NCNR debt measure employed throughout the dissertation is not solely “non-revolving” and also captures a significant amount of revolving debt (i.e., credit card debt). But, a significant amount of credit card debt goes unreported in these years, as well.

**Table B-4. Aggregate Value of NLSY79 Non-Collateralized Debts, in Millions (\$2004)**

NCNR, 2000	2004 Debts		
	NCNR	Credit Card	All Non-Collateralized
\$33.5	\$25.5	\$19.7	\$45.3

**Table B-5** presents results from multivariate logistic regressions predicting the likelihood of holding specific non-collateralized debts in 2004. With the exception of age (due to the single cross-section) and health limitations (due to question changes in 2004 that limit availability), the models include the sociodemographic predictor variables associated with social heterogeneity and patterned disadvantage that are employed in analysis throughout the dissertation. There are distinct patterns for each of the five non-collateralized debts available in 2004. Some of the estimated effects are similar to those estimated for NCNR debt from 1985 to 2000, while others are different, highlighting the importance of disaggregating the components of liability holdings when it is possible. The coefficients that most consistently resemble those for the pooled multilevel, multivariate logistic regressions predicting likelihood of NCNR debt holding between



1985 and 2000 (see Chapter 4, Table 4.2) are the coefficients for holding and owing money on credit cards in 2004. These results further suggest that the measure of NCNR debt used in earlier waves is capturing both revolving *and* non-revolving non-collateralized debts.

**Table B-5. Logistic Regressions Predicting Likelihood of Non-Collateralized Debt Holding, 2004, Odds Ratios**

<i>n</i>	Credit Cards			Student Loans		Children's Student Loans		Money to Businesses		Other Debts >\$1000	Any Non-Collateralized Debt	
	Hold Credit Cards	Owe Money (>\$0)	Owe \$500+	Owe Any	Owe \$500+	Owe Any	Owe \$500+	Owe Any	Owe \$500+		Owe Any	Owe \$500+
	5737	5600	5600	5746	5746	4904	4904	5740	5740	5744	5569	5569
<b>Demographics</b>												
Black	0.42***	0.75***	0.74***	1.50***	1.63***	1.61*	1.63*	1.12	0.99	1.14	0.93	0.90
Hispanic	0.98	1.32**	1.31**	1.49**	1.55**	1.49*	1.40	0.88	0.85	0.98	1.27**	1.24**
White (ref)	--	--	--	--	--	--	--	--	--	--	--	--
<b>Socioeconomic Status</b>												
Highest Grade Completed	1.19***	1.03*	1.04**	1.33***	1.34***	0.97	0.98	0.92***	0.93***	1.01	1.02	1.04***
Log Equivalent HH Inc	1.19***	1.04	1.06	0.88**	0.89**	1.27	1.24	0.91**	0.94*	0.99	0.99	1.01
Weeks Worked Last Year	1.004	1.01***	1.01***	1.01*	1.01*	1.01*	1.01	1.00	1.00	1.00	1.01**	1.01**
Unemployed Spell Last Year	0.83	0.90	0.89	1.71**	1.75**	1.33	1.27	1.38**	1.38*	1.87**	1.27*	1.28*
Below Poverty Line	0.69*	0.57***	0.64**	0.62	0.60	1.29	1.32	0.68*	0.89	0.9	0.68**	0.82
<b>Family Structure</b>												
Married	1.81***	1.60***	1.67***	1.11	1.08	2.69*	2.59*	1.24	1.46*	1.55	1.56***	1.69***
Divorced/Separated	0.82	0.92	1.03	1.27	1.25	1.37	1.35	1.26*	1.21	1.68*	1.09	1.14
Single (ref)	--	--	--	--	--	--	--	--	--	--	--	--
Have Kids	1.00	1.02	1.06	1.01	1.01			1.08	1.02	0.78	1.07	1.09
Female Head	1.54***	1.65***	1.43***	1.31	1.38	2.57**	2.72**	1.72***	1.77***	1.16	1.94***	1.69***
<b>Asset Ownership</b>												
Financial	4.11***	3.18***	2.90***	0.89	0.88	2.96**	3.30**	1.02	0.94	1.01	2.21***	2.00***
Non-financial	2.42***	2.60***	2.14***	1.56	1.55	2.58	2.48	1.49*	1.48*	1.18	2.19***	1.81***
<i>Log Likelihood</i>	-2915	-3487.4	-3491.2	-1483.1	-1421.5	-736.1	695.21	-2628.1	-2220.9	1124.1	-3462.8	-3609.5
<i>Pseudo R-squared</i>	0.2244	0.1015	0.0915	0.0760	0.0790	0.0378	0.0369	0.0214	0.0168	0.0111	0.0611	0.0538

The preceding analysis indicates that the non-collateralized, non-revolving debt measure employed throughout the dissertation is capturing both revolving and non-revolving debts, with little ability to identify which households are including revolving debts in their response to the survey. An additional limitation of the NCNR debt measure employed between 1985 and 2000 was its minimum value of \$500. Households with individual debts below \$500 were automatically excluded from being “indebted,” potentially providing underestimates of the true level of household indebtedness, particularly among low-income or credit constrained households. The additional detail in the 2004 survey does allow some examination of which households report debts below the \$500 minimum.

I focus here on credit card debts, money owed to businesses, and all non-collateralized debts because these lose the most respondents when the focus shifts from *any* outstanding debt to *\$500 or more* outstanding. **Table B-6** presents descriptive statistics for sociodemographic variables by three categories within each of these debts: 1) those that do not hold debt (for credit cards this is broken down into two categories – non credit card holders and credit card holders who do not carry a balance, i.e., non-revolvers); 2) those that have some debt but less than \$500; 3) those with \$500 or more of the specified debt. In general, those that hold some debts (either less or more than \$500) are distinct from those without the specific debt. This is particularly the case for credit cards. Compared to households with a balance, households without a credit card are more disadvantaged on a number of indicators—e.g., lower average household income, fewer households with financial assets. In contrast, households that have credit cards but do not owe a balance (non-revolvers) show significant advantages—much higher average

income, higher proportion of married households, and lower proportion of female headed households. Examining the differences between households that hold the specified non-collateralized debt, those that owe less than \$500 have a higher proportion of black households, lower average income and education, fewer married households, and more divorced and female headed households than those that owe \$500 or more. This indicates that the \$500 limit on NCNR debt between 1985 and 2000 systematically excludes certain households from ever being indebted. However, fewer than 400 households in 2004 (~5.6% of the total sample) report non-collateralized debt at levels lower than \$500, suggesting that this affects a relatively small portion of the total sample (assuming the likelihood of reporting non-collateralized debt holdings less than \$500 did not change dramatically between 1985 and 2004, an assumption that may not be valid).

**Table B-6. Descriptive Statistics by Select Liability Holdings, 2004**

	Full Sample, 2004	CREDIT CARDS				MONEY TO OTHER BUSINESSES			ANY OF THE 5 DEBTS IN 2004		
		Do not own	Own Credit Cards			Do not owe	Owe Money		Do not hold any	Owe Debt	
			No balance (non-revolvers)	Balance <\$500	Balance \$500+		Owe less than <\$500	Owe \$500+		Owe individual debts <\$500	Owe \$500+
<i>n</i>	7484	2985	860	356	2863	6124	314	977	2865	393	3726
<b>Age</b>	43.15	43.02	43.26	43.24	43.20	43.14	43.36	43.14	43.19	43.43	43.29
<b>Race/Ethnicity</b>											
Black	31%	46%	10%	28%	21%	30%	41%	32%	37%	33%	25%
Hispanic	19%	20%	13%	18%	21%	20%	18%	18%	18%	19%	20%
White	50%	34%	77%	54%	58%	50%	40%	50%	45%	49%	55%
<b>Socioeconomic Status</b>											
Highest Grade	13.24	12.30	14.72	13.15	13.73	13.32	12.81	12.87	12.84	12.83	13.55
Income (\$2004)	65090	39397	109064	55135	77453	68519	42617	52290	60178	48419	70435
Weeks Worked	40.26	34.52	42.83	43.49	44.72	40.53	41.27	38.62	36.33	41.76	42.91
Unemployment Spell	10%	15%	6%	7%	6%	9%	12%	13%	12%	9%	8%
Below Poverty Line	14%	30%	2%	6%	4%	14%	13%	16%	23%	10%	8%
<b>Household Composition</b>											
Married	59%	41%	77%	60%	71%	60%	46%	57%	50%	52%	65%
Divorced/Separated	23%	32%	12%	21%	18%	22%	33%	27%	26%	27%	21%
Single	18%	27%	11%	19%	11%	18%	20%	16%	24%	21%	13%
Have Kids	64%	56%	69%	64%	71%	64%	63%	65%	58%	61%	69%
Female Head	19%	26%	9%	22%	15%	17%	28%	24%	19%	25%	18%
<b>Asset Ownership</b>											
Financial	83%	63%	98%	92%	94%	83%	81%	79%	71%	86%	89%
Non-Financial	92%	82%	99%	98%	98%	92%	93%	93%	85%	96%	96%

## Appendix C. Constructing Total Liquid Assets

The NLSY79 asked increasingly detailed questions about the financial holdings of respondents as the survey continued.

The initial question posed to respondents was:

*“Do you (and your spouse) have any money in savings or checking accounts, savings and loan companies, money market funds, credit unions, U.S. savings bonds, individual retirement accounts (IRA or Keogh), or certificates of deposit, common stock, stock options, bonds, mutual funds, rights to an estate or investment trust, or personal loans to others or mortgages you hold (money owed to you by other people)?”* (Money Assets)

In 1988, this was expanded into two separate questions:

*“Do you or your husband/wife have any cash you keep in a safe place at home or elsewhere, any money in savings or checking accounts, money market funds, credit unions, U.S. savings bonds, individual retirement accounts (IRA or Keogh), certificates of deposit, personal loans to others or mortgages you hold (money owed to you by other people)?”* (Money Assets)

*“[Not counting any individual retirement accounts [IRA or Keogh] you may have already told me about] Do you (or your husband/wife) have any common stock, preferred stock, stock options, corporate or government bonds, or mutual funds?”* (Stocks/Bonds)

In 1994, this question was expanded again to cover 5 separate types of financial accounts:

*“Do you or your spouse/partner have any money in savings or checking accounts, money market funds, credit unions, U.S. savings bonds?”* (Money Assets)

*“[Not counting any individual retirement accounts [IRA or Keogh] you may have already told me about] Do you (or your husband/wife) have any common stock, preferred stock, stock options, corporate or government bonds, or mutual funds?”* (Stocks/Bonds)

*“Do you or spouse/partner have any money in certificates of deposit, personal loans to others, or mortgages you hold?”* (CDs)

*“Do you (or spouse/partner) have any money in individual retirement accounts (IRAs or Keogh)?...Please think ONLY about these types of savings for this question, and DO NOT REPORT any savings already reported” (Retirement Accounts)*

*“Do you or spouse/partner have any money in tax deferred plans, such as 401K or 403B plan or other pre-tax annuities?” (Tax Deferred Accounts)*

**Table C-1. Financial Asset Holding by Wave, 1985-2000**

<b>Wave</b>	<b>Own Money Assets</b>	<b>Stocks/Bonds</b>	<b>CDs</b>	<b>Retirement Accounts</b>	<b>Tax Deferred Accounts</b>
<b>1985</b>	60.6%	.	.	.	.
<b>1986</b>	62.4%	.	.	.	.
<b>1987</b>	62.9%	.	.	.	.
<b>1988</b>	54.4%	13.9%	.	.	.
<b>1989</b>	66.9%	ess a	.	.	.
<b>1990</b>	67.7%	14.5%	.	.	.
<b>1991</b>	.	.	.	.	.
<b>1992</b>	66.5%	15.5%	.	.	.
<b>1993</b>	65.6%	17.1%	.	.	.
<b>1994</b>	66.6%	15.0%	4.0%	15.4%	23.8%
<b>1996</b>	67.1%	16.8%	5.5%	18.2%	28.7%
<b>1998</b>	68.9%	18.5%	6.0%	21.3%	35.5%
<b>2000</b>	70.3%	20.5%	5.8%	23.1%	40.9%
<b>Total</b>	64.7%	16.1%	5.3%	19.4%	32.0%

To create the **total money** variable (*tmoney*), I summed the inflation-adjusted values (2004 dollars) of all possible financial assets. I used the survey-created variables recodes which pre-cleaned the variables for unusual responses. Respondents who did not report owning a given financial asset were assigned a value of 0 for that asset.

**Table C-2. Value of Total Financial Assets by Wave (\$2004), 1985-2000**

Wave	N	Mean	SD	Percentile				
				50th	75th	90th	95th	99th
1985	10627	4022		220	1756	7024	14048	152022
1986	10407	4355	14925	345	2586	8620	17240	122642
1987	10143	5801	19931	499	3326	12639	24945	166079
1988	10005	6050	25098	160	3194	12776	23955	133873
1989	10024	9700	52583	762	4569	16753	31983	148241
1990	9918	9669	35838	723	5780	21675	37570	173576
1992	8490	12095	47671	808	7403	26920	49802	192501
1993	8311	13037	45481	784	7973	28754	56201	212943
1994	7766	16647	51693	1020	11985	40163	75862	239156
1996	7515	26106	94375	1445	15652	60200	113176	361869
1998	6924	40281	147234	2318	25498	93879	179645	527754
2000	like	62689	221565	4004	39492	136028	285220	863339
<i>Total</i>	<i>106647</i>	<i>15233</i>	<i>79574</i>	<i>673</i>	<i>6344</i>	<i>26920</i>	<i>60561</i>	<i>237790</i>

While the expanded questionnaire provides better detail on the financial portfolios of respondents, it increases the amount of non-response, especially for assets such as stocks/bonds and retirement accounts. Respondents typically know whether they own a type of asset, but many respondents give “don’t know” responses for the value of that asset (see NLSY79 user's guide section on item nonresponse for more detailed information <http://www.nlsinfo.org/nlsy79/docs/79html/79text/ch5.htm>). In an attempt to retain the most information possible, I explored using the survey-created imputed variables for each asset value to construct **imputed total money** (*tmoneyi*).

The NLSY79 uses 2 imputation processes for dealing with missing variables on the asset and liability indicators:



- 1) Linear interpolation – if a respondent reported a CD value of \$5,000 in 1996, no response in 1998, and \$7,000 in 2000, they would be assigned an estimated value of \$6,000 for 1998
- 2) Linear regression – when data was missing at the end point, OLS regression was used to estimate the missing values.

Imputed values for money accounts (*money assets*) were not available in 1986 (wave 8).

Thus, the values used for this wave are drawn from the non-imputed, recoded question.

After creating this variable, it became apparent that there were more people with imputed values than there were respondents to questions. To fix this, I set the value for *tmoneyi* to missing if they were coded as any type of nonresponse to a question that asked about ownership of a given asset (i.e., *ownMA* [own money assets] - yes/no "do you have a savings account"). Nearly 3,000 observations were recoded to missing.

From STATA output:

```
. replace tmoneyi=. if ownMA>.
(2818 real changes made, 2818 to missing)

. replace tmoneyi=. if ownSB>1 & wave>9
(140 real changes made, 140 to missing)

. replace tmoneyi=. if ownCD>1 & wave>15
(43 real changes made, 43 to missing)

. replace tmoneyi=. if ownTD>1 & wave>15
(126 real changes made, 126 to missing)

. replace tmoneyi=. if ownRA>1 & wave>15
(50 real changes made, 50 to missing)
```

**Table C-3. Value of Imputed Total Financial Assets by Wave(\$2004), 1985-2000**

Wave	N	Mean	SD	Percentile				
				50th	75th	90th	95th	99th
<b>1985</b>	10795	4070	49171	220	1756	14048	45656	152022
<b>1986</b>	10407	4355	14925	345	2586	17240	122642	122642
<b>1987</b>	10442	5895	27105	564	3326	24945	82319	166079
<b>1988</b>	10359	6305	37721	260	3194	24354	92626	133873
<b>1989</b>	10512	9501	87262	762	5026	33506	114225	148241
<b>1990</b>	10350	9998	95189	723	5780	39015	124270	173576
<b>1992</b>	8942	12804	79996	942	8076	51148	154790	192501
<b>1993</b>	8946	13835	63300	915	9149	58815	176445	212943
<b>1994</b>	8560	17201	64270	1275	12750	76500	229500	239156
<b>1996</b>	8404	26606	122966	1806	17458	114380	343140	361869
<b>1998</b>	8125	40544	221788	3477	26657	173850	535458	527754
<b>2000</b>	7764	61848	284105	5485	43880	262183	778870	863339
<i>Total</i>	<i>113606</i>	<i>16180</i>	<i>116218</i>	<i>768</i>	<i>6896</i>	<i>63845</i>	<i>242108</i>	<i>237790</i>

Using the imputed values retains a larger proportion of the cases, particularly in later years (compare the sample size in column 2 of **Table C-2** to column 2 of **Table C-3**). In 1985, for example, *tmoney* has 10,627 observations while *tmoneyi* has 10,795, indicating a loss of only ~2% of cases. In contrast, the proportion of cases with missing values due to “don’t know” responses is nearly 9% in 1994 (n=7766 for *tmoney* v. n=8560 for *tmoneyi*), and reaches more than 16% in 2000 (n=6517 v. n=7764).

Though the use of the imputed values improves sample size, some issues remain with the use of the imputed measures. A large number of respondents have different amounts for their initial response (drawn from the pre-cleaned measure) and their imputed values. Additionally, the extreme values of total financial assets change

dramatically, with the maximum value jumping from 4 million in the non-imputed data (*tmoney*) to multiple values above 10 million when using the imputed data (*tmoneyi*). While this may more accurately reflect some people, there are dozens of respondents whose *tmoney* values and *tmoneyi* values differ by a factor of 2 or greater. Because it is unclear how and why the choice to assign a new value to respondents with valid initial responses was done, I chose to limit the data I used to the pre-cleaned responses from individuals who stated that they *did* know the value of a specified asset and used *tmoney* in subsequent analysis. This approach is consistent with the manner in which the NLSY constructed the net family income variable: there was no imputation procedure used to construct net income; respondents who gave a response of "don't know/refuse/missing" on *any* of the 19 income components were coded as "don't know/refuse/missing" for the total net family income variable. This is discussed in more detail in section 4.22 (Income) of the NLSY79 User's Guide (<http://www.nlsinfo.org/nlsy79/docs/79html/79text/income.htm>). Ultimately, this suggests that the sample is limited to those respondents who are most knowledgeable about their financial situation.<sup>1</sup>

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<sup>1</sup> A cursory analysis with chi-square and *t*-tests reveals that those most likely to be missing on income or on total financial assets are distinct from those who are not missing: more educated, higher income respondents are more frequently missing on total financial assets. This may be because they have more financial asset holdings and do not know the value of all of their assets.

## Appendix D. Transformation of the Outcome Variable (Debt Burden, Chapter 6)

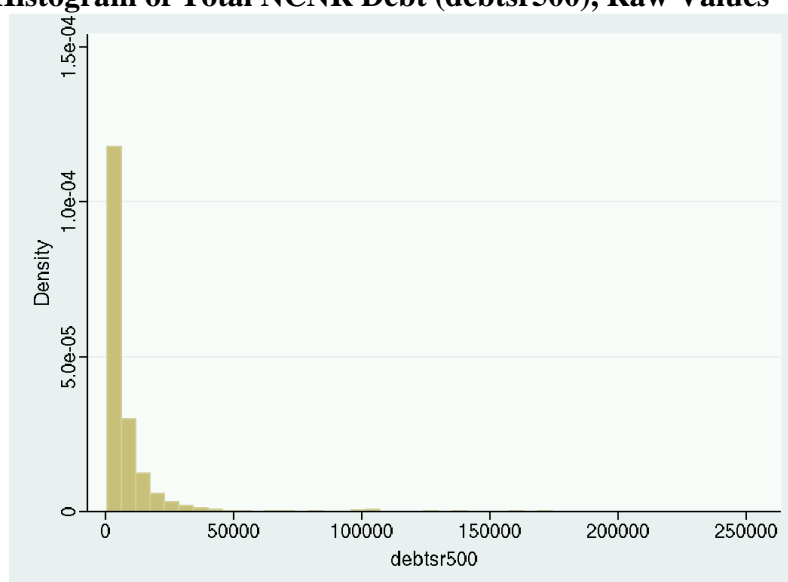
All three outcome variables analyzed in Chapter 6 were extremely right-skewed, requiring transformation prior to the estimation of regression models. For each variable, I present histograms of the raw variable prior to transformation, the results from the *gladder* command in Stata (a graphical representation of the potential transformations), and a histogram of the log transformed variable.

**Table D-1** presents descriptive statistics for the outcome variables. Total level of NCNR debt, the debt-to-income ratio, and the debt-to-money ratio all have medians substantially lower than their means (\$3808 vs. \$8582 for total level of debt; 0.1005 vs. 121 for debt-to-income ratio; and 4.9858 vs. 27.740 for the debt-to-money ratio) and large standard deviations (\$17091 for total debt, 3032 for debt-to-income, and 9370 for debt-to-money), indicating that they are strongly right skewed. For the debt-to-income and debt-to-money ratios this is, in part, due to high debt levels reported by households with little to no income or financial wealth. Excluding those households that report zero income or zero financial assets significantly reduces the skew, especially for the debt-to-income ratio, but does not eliminate it. Exclusion of households with zero reported income results in a median of 0.1000, a mean of 0.5475, and a standard deviation of 9.677 for the debt-to-income ratio, while excluding households with no financial assets yields a median of 1.4999, a mean of 27.74, and a standard deviation of 211 for the debt-to-money ratio.

**Table D-1. Descriptive Statistics of Raw Outcome Variables**

	Total NCNR Debt	Debt-to- Income Ratio	Debt-to- Income Ratio (if income>0)	Debt-to- Money Ratio	Debt-to- Money Ratio (if Money>0)
<i>n</i>	41308	35511	35238	38632	27783
Min	549	0.0005	0.0005	0.0004	0.0004
Max	258600	173042	1032	258600	10917
Mean	8582	121	0.5475	2214	27.740
Standard Deviation	17091	3032	9.6770	9370	211
<b>Percentile</b>					
25th	1724	0.0458	0.4545	0.6665	0.3720
50th	3808	0.1005	0.1000	4.9858	1.4999
75th	8428	0.2419	0.2353	1066.1	6.9543
95th	27414	1.1912	1.0101	9978	79.522
99th	102198	22.4034	4.5595	32304	507.48

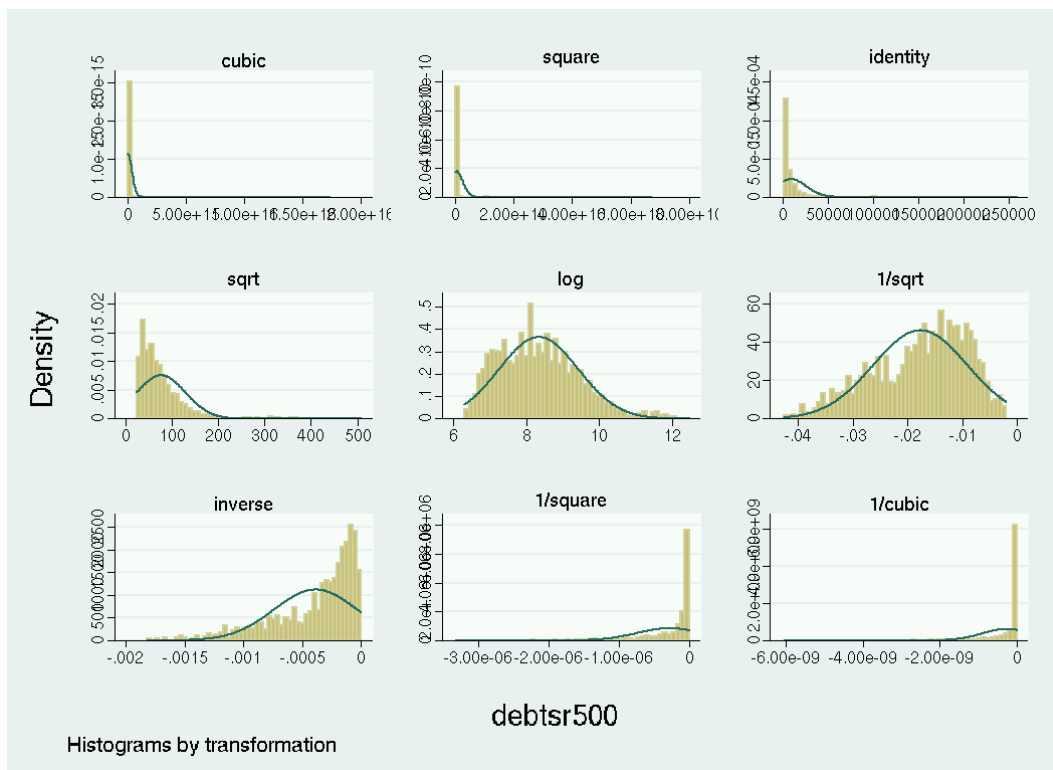
**Figure D-1. Histogram of Total NCNR Debt (debtsr500), Raw Values**



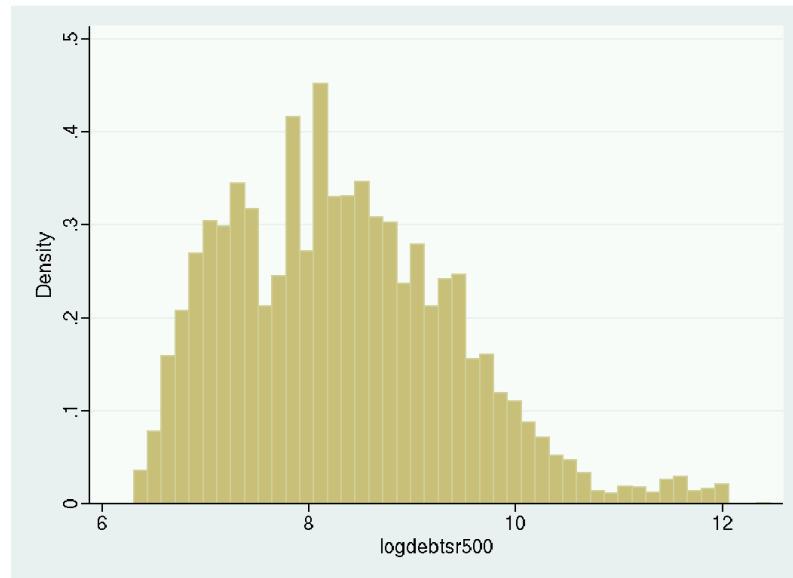
The strong right skew of the raw values of total NCNR debt (debtsr500) is evident in the histogram (**Figure D-1**). Most households cluster at the low end, with very few responses above \$30,000. Figure 2 presents the histograms by transformation. Both the

log transformation and the histogram of 1/sqrt most closely approximate the normal distribution; I chose the log transformation due to greater ease of interpretation of estimation coefficients. The histogram of logged total debts is presented in **Figure D-3**; it remains right-skewed, but the skew is significantly reduced.

**Figure D-2. GLADDER Transformation of debtsr500**

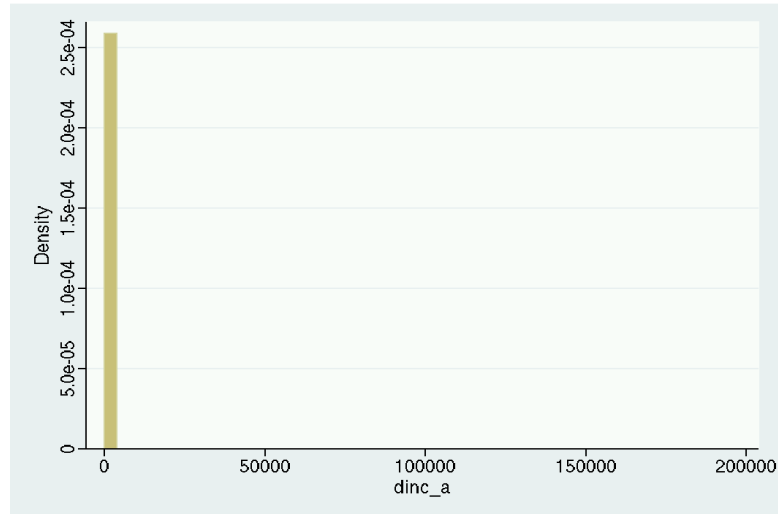


**Figure D-3. Histogram of Logged Total NCNR Debt (logdebtsr500)**

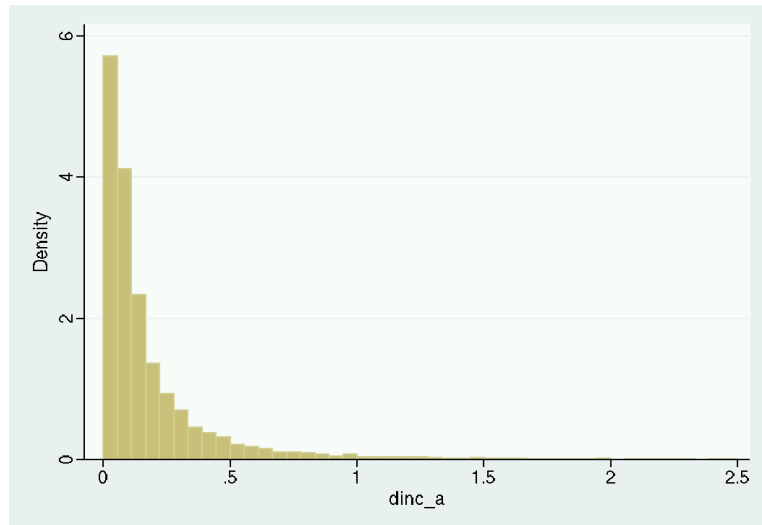


An initial look at the distribution of the raw values of the debt-to-income ratio (**Figure D-4**) reveals very little information: nearly all the values are near zero, and the few extremes cause the scale of the graph to obscure the distribution. Limiting the graph to only those values less than 2.5 (**Figure D-4a**) again reveals a strongly right skewed distribution; here the majority of values are less than one.

**Figure D-4. Histogram of Debt-to-Income Ratio (dinc\_a), Raw Values**



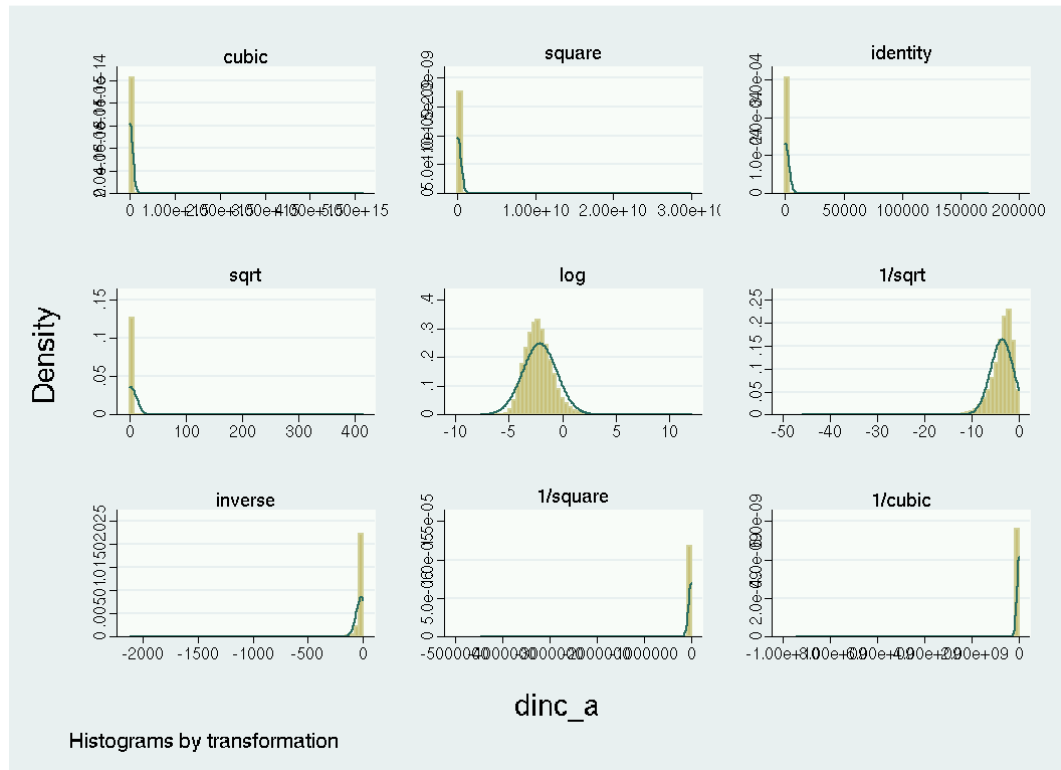
**Figure D-4a. Histogram of Debt-to-Income Ratio (dinc\_a) if less than 2.5, raw values**



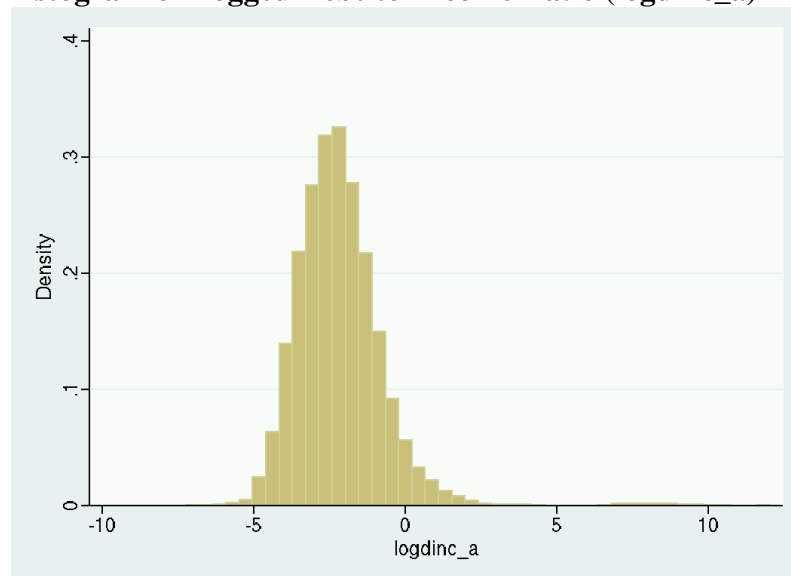
**Figure 5** shows the results of various transformations of the debt-to-income ratio. Again, the log transformation and the 1/sqrt transformation most closely approximate the normal distribution. **Figure 6** presents the graph of the log transformed debt-to-income ratio; it is nearly perfectly normally distributed.



**Figure D-5. GLADDER Transformation of Debt-to-Income Ratio**

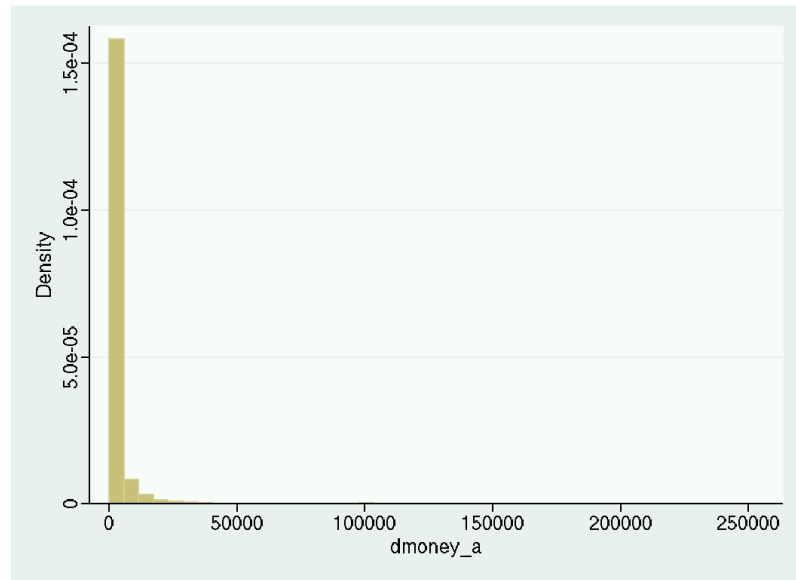


**Figure D-6. Histogram of Logged Debt-to-Income Ratio (logdinc\_a)**

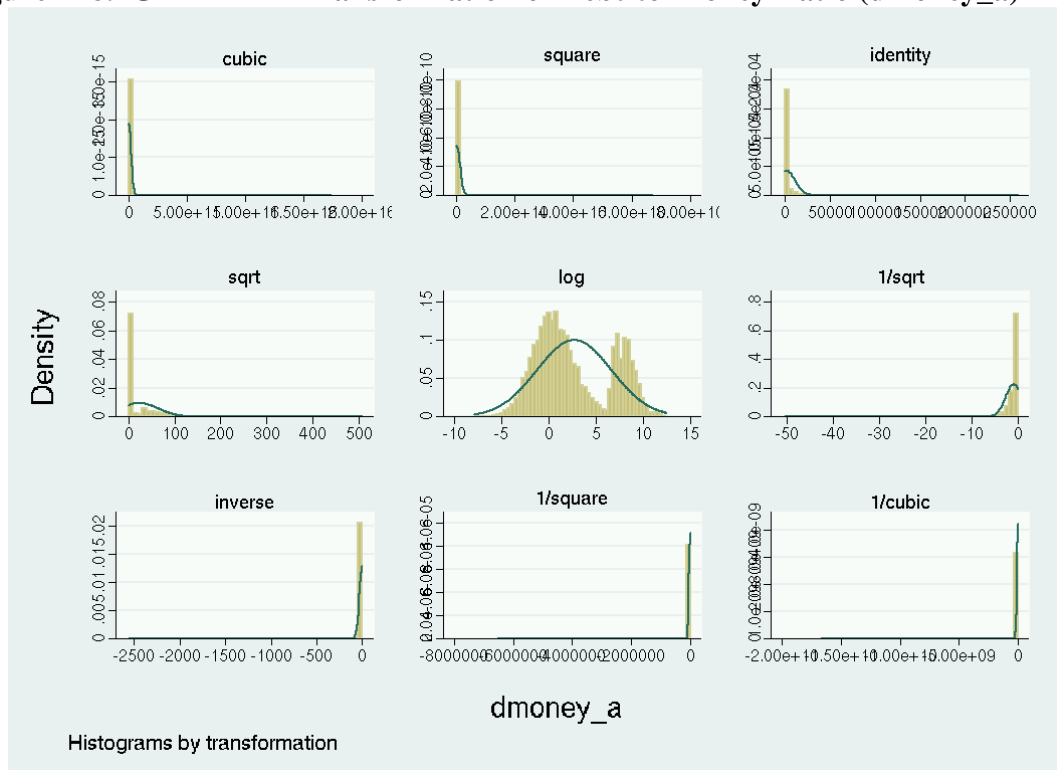


**Figure D-7** presents the histogram of the raw debt-to-money distribution; again, there is an extreme right skew. Like the debt-to-income ratio, a large number of values fall below one. However, given the large number of households with no or very few financial assets, there are also many large values for the debt-to-money ratio. While the log transformation is better than the others at approximating a normal distribution (**Figure D-8**), there are clearly two underlying distributions: one for those with liquid assets and one for those with zero liquid assets (essentially just the logged value of debt for these households). A closer look at this distribution is provided in **Figure D-9a**. Breaking this distribution out into its two component parts, we can see that the distribution of logged debt-to-money ratios is nearly perfectly normal among households with financial asset holdings (**Figure D-9b**). Turning to **Figure D-9c**, the histogram of logged debt-to-money among households with no financial assets (debt divided by [total financial assets plus one], the same value as logged total debt) shows that this distribution remains right-skewed but is approximately normal, much like the distribution of logged total NCNR debt for all households (**Figure D-3**).

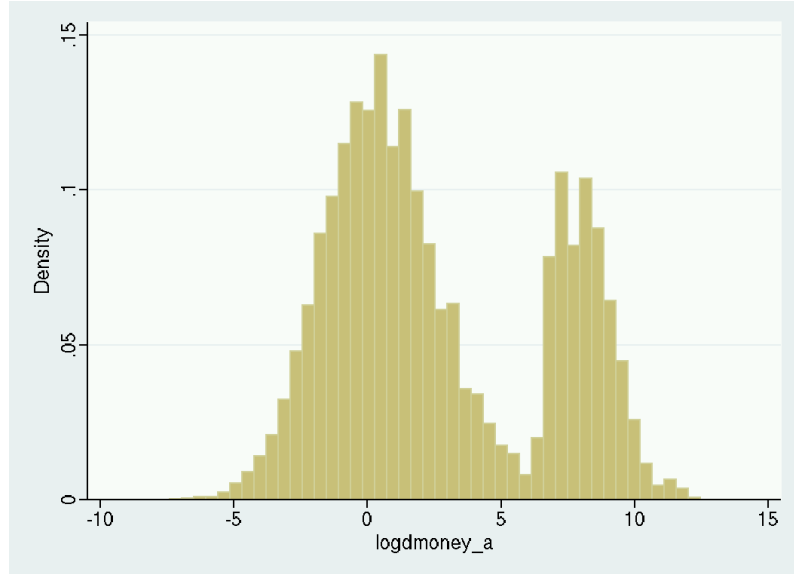
**Figure D-7. Histogram of Debt-to-Money Ratio (dmoney\_a), Raw Values**



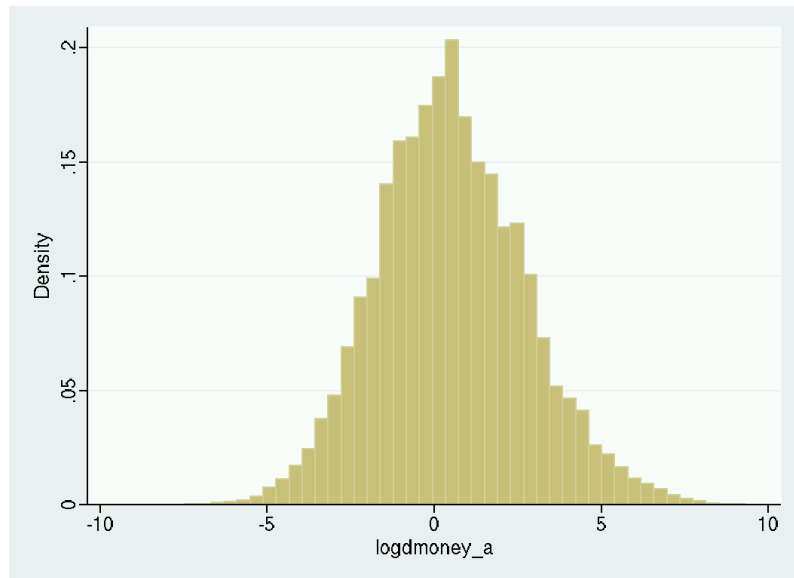
**Figure D-8. GLADDER Transformation of Debt-to-Money Ratio (dmoney\_a)**



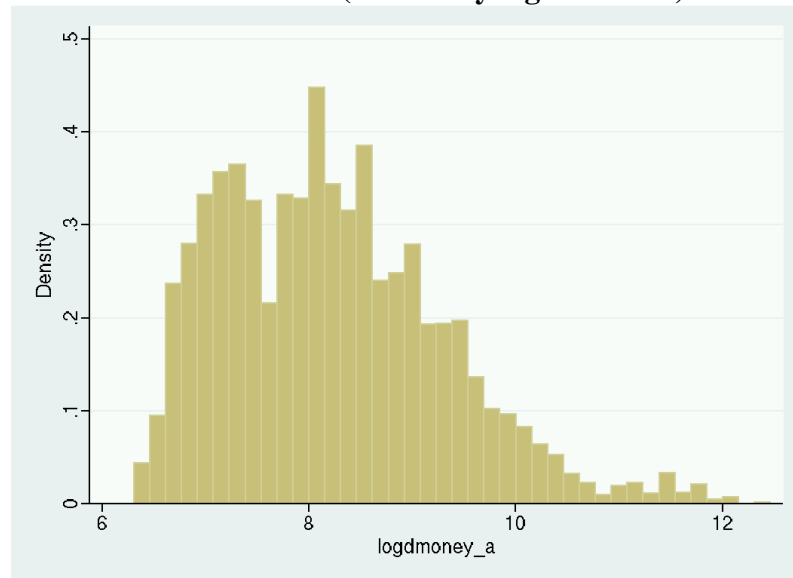
**Figure D-9a. Histogram of Logged Debt-to-Money Ratio (logdmoney\_a)**



**Figure D-9b. Histogram of Logged Debt-to-Money Ratio (logdmoney\_a) among Households with Positive Financial Assets**



**Figure D-9c. Histogram of Logged Debt-to-Money Ratio (logdmoney\_a) among Households with No Financial Assets (essentially logdebtsr500)**



These transformations significantly reduce the skew and much more closely approximate a normal distribution for the outcome variables. These descriptive statistics are presented in **Table D-2**. The mean of logged total NCNR debt is 8.333 vs. a median of 8.245. For logged debt-to-income ratio the mean is -2.125 and the median is -2.298 (-2.208 and -2.303 among households with positive values for income). The logged debt-to-money ratio remains strongly skewed (mean of 2.679 and median of 1.607 among all households), but this is significantly reduced when the focus is limited to those households with non-zero financial assets.

**Table D-2. Descriptive Statistics of Log Transformed Outcome Variables**

	Total NCNR Debt	Debt-to- Income Ratio	Debt-to- Income Ratio (if income>0)	Debt-to- Money Ratio	Debt-to- Money Ratio (if Money>0)
<i>n</i>	41308	35511	35238	38632	27783
Min	6.307	-7.657	-7.657	-7.847	-7.847
Max	12.463	12.061	6.939	12.463	9.298
Mean	8.333	-2.125	-2.208	2.679	0.514
Standard Deviation	1.092	1.609	1.302	3.990	2.231
<b>Percentile</b>					
25th	7.452	-3.084	-3.091	-0.406	-0.989
50th	8.245	-2.298	-2.303	1.607	0.405
75th	9.039	-1.419	-1.447	6.672	1.939
95th	10.219	0.175	0.010	9.208	4.376
99th	11.535	3.109	1.517	10.383	6.229

## Appendix E. Testing Model Specification and Sensitivity of Estimates (Chapter 6)

### E.1 Model Specification

The multilevel model underlying the regression analysis in chapter 6 proposes that the level of debt ( $y_{tj}$ ) of subject  $j$  at age  $t$  is modeled as:

$$y_{tj} = \beta_1 + \beta_2 x_{2tj} + \dots + \beta_n x_{ntj} + \xi_{tj}$$

In this equation  $\beta_1$  is the constant,  $\beta_2$  through  $\beta_n$  are regression coefficients for explanatory variables  $x_{2tj}$  through  $x_{ntj}$ , and  $\xi_{tj}$  is the combined residual.  $\xi_{tj}$  is comprised of the following:

$$\xi_{tj} = \varepsilon_{tj} + \zeta_j$$

$\varepsilon_{tj}$  is the measurement error of subject  $j$  at time  $t$  (level-1 residual), while  $\zeta_j$  is the difference between the overall mean and subject  $j$ 's mean measurement (level-2 residual) (Rabe-Hesketh and Skrondal 2005). A key assumption of the multilevel linear model is *normality*: both level-1 and level-2 residuals are independent and normally distributed. Another assumption of the multilevel linear model is *homoscedasticity*, or equal variances for level-1 and level-2 residuals at each value of every level-1 and level-2 predictor, respectively (Singer and Willett 2003).

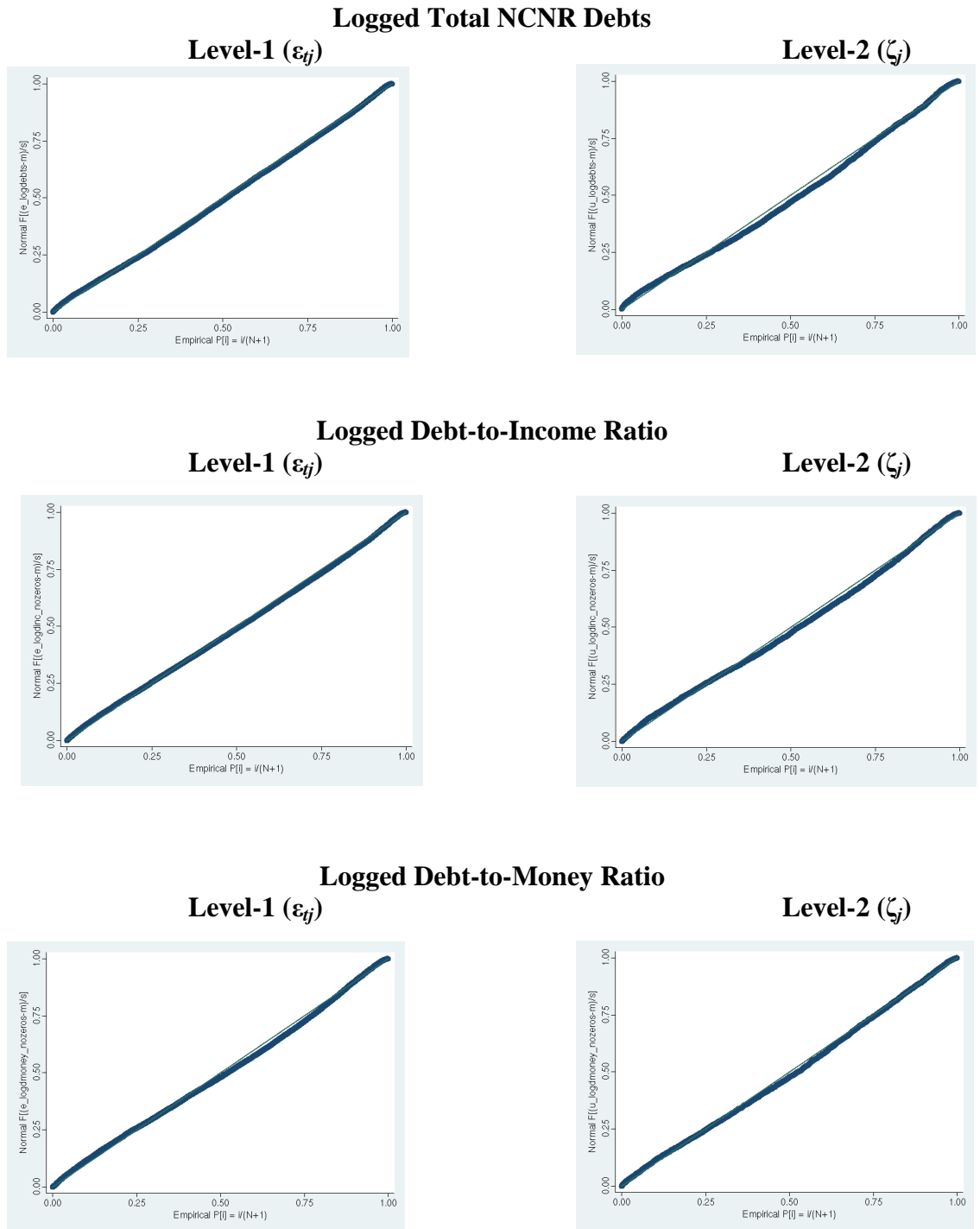
The first assumption examined is *normality* of the level-1 and level-2 residuals for models estimating logged total NCNR debts, logged debt-to-income ratio, and logged debt-to-money ratio. To examine this assumption, I produced normal probability plots, in

which the values of the level-1 or level-2 residuals are plotted against their normal scores. If the normality assumption is true, then the plot will form a straight line; deviations from a linear plot indicate non-normality. As shown in **Figure E-1**, there are few deviations from linearity, suggesting the normality assumption is not violated in any of the models.

To examine second assumption of *homoscedasticity*, I produced plots of the standardized level-1 residuals against selected level-1 predictors: age and weeks worked past calendar year (**Figure E-2**). In general, the level-1 residuals have approximately equal range and variability across age for total debts, debt-to-income, and debt-to-money ratio. Looking at weeks worked last calendar year, the residual range appears much larger at zero and 52, particularly for debt-to-income and debt-to-money residuals, although this may be due to significant clustering on these values in the data. **Figure E-3** presents plots of standardized level-2 residuals against race, a level-2 predictor. White households (race=3) exhibit slightly larger range compared to the black and Hispanic households, but this does not appear extreme enough to be worrisome. Overall results suggest that the assumptions of the model are not violated.



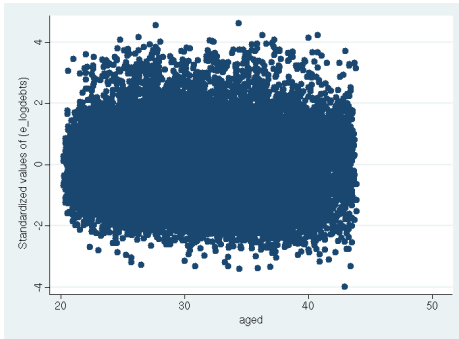
**Figure E-1. Normal Probability Plots of  $\varepsilon_{ij}$  and  $\zeta_j$**



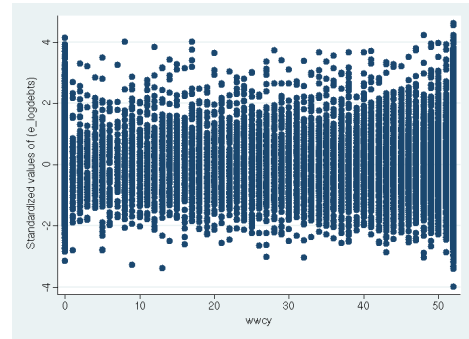
**Figure E-2. Standardized Level-1 Residuals ( $\epsilon_{ij}$ ) vs. Select Level-1 Predictors**

**Logged Total NCNR Debts**

$\epsilon_{ij}$  vs. Age

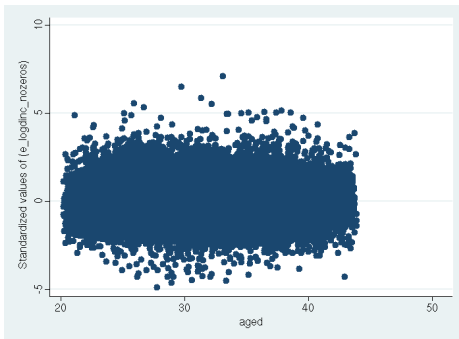


$\epsilon_{ij}$  vs. Weeks Worked

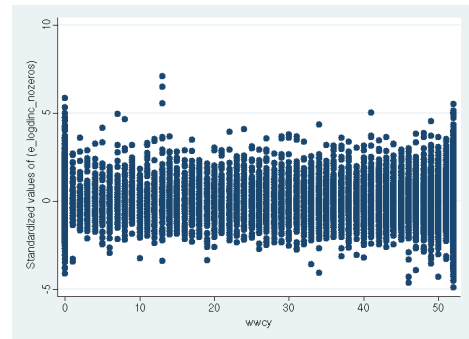


**Logged Debt-to-Income Ratio**

$\epsilon_{ij}$  vs. Age

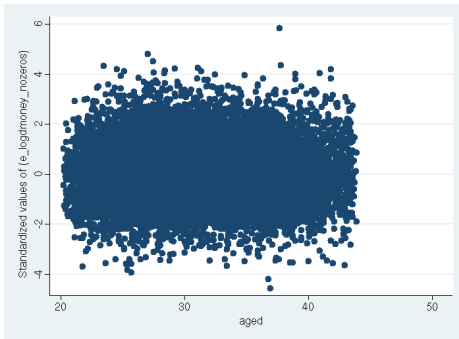


$\epsilon_{ij}$  vs. Weeks Worked

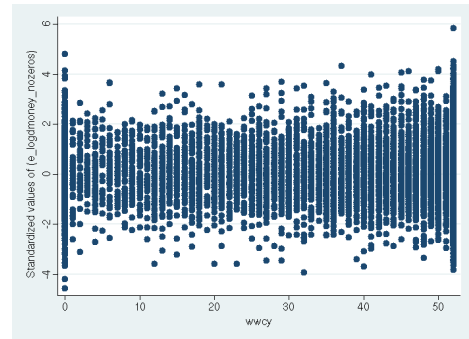


**Logged Debt-to-Money Ratio**

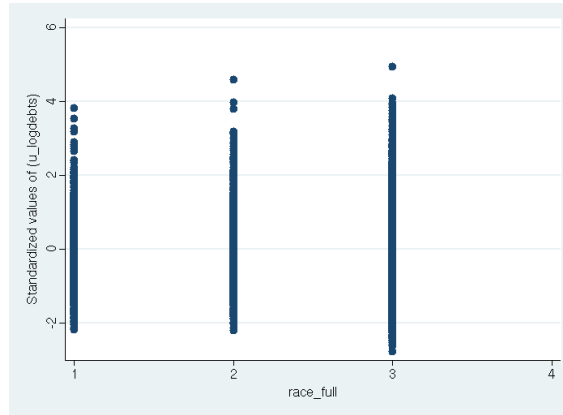
$\epsilon_{ij}$  vs. Age



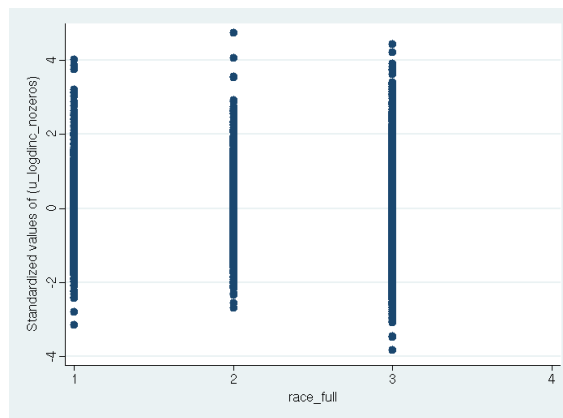
$\epsilon_{ij}$  vs. Weeks Worked



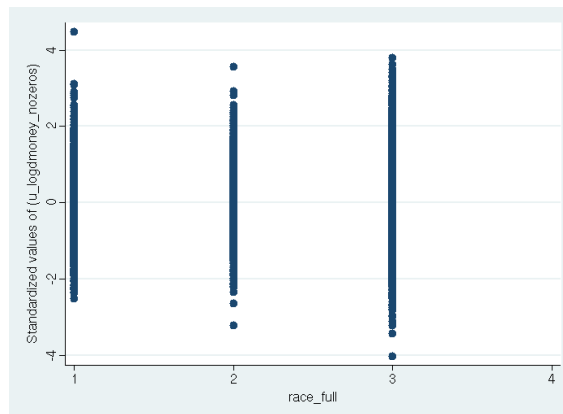
**Figure E-3. Standardized Level-2 Residuals ( $\zeta_j$ ) vs. Race  
Logged Total NCNR Debts**



**Logged Debt-to-Income Ratio**



**Logged Debt-to-Money Ratio**



## *E.2 Sensitivity of Model Estimates*

**Tables E-1, E-2, and E-3** present results from alternative model specifications for logged total NCNR debts, logged debt-to-income ratio, and logged debt-to-money ratio, respectively, to test the sensitivity of the model estimates. For total debts and the debt-to-income ratio, I estimated models using the value of logged total financial assets instead of a dummy variable for financial asset ownership. For debt-to-income and debt-to-asset ratios, I compared models that retained households with zero income and zero assets to the models I reported in the main chapter. For all three outcome variables, I compared the reported estimates to models that excluded potentially extreme observations. To do this I limited my analysis to cases with absolute values of standardized level-1 and level-2 residuals below or equal to 2.0. (I realize that this is a strict definition of a potential outlier).

**Table E-1** presents results for the sensitivity checks on logged total NCNR debt. The first column presents the results for all indebted households and includes a dummy for financial asset ownership; the second column includes a continuous measure of logged total financial assets (reducing the total estimation sample due to “don’t knows” for asset values); the third column excludes observations with extreme residuals. The estimates show little variation across models. Limitations on the kind or amount of work a respondent can do are associated with significantly higher household debt levels when the model includes a dummy variable for ownership of financial assets, but this effect becomes non-significant when the model is instead estimated with a logged measure of

total financial assets. This suggests that the level of assets plays a role in whether a household takes on debt when faced with income limiting/expense generating events such as health limitations; those households that are able to dissave from liquid assets may choose to do so instead of incurring debt. Additionally, age is significant and curvilinear (consistent with the LC-PI hypothesis) in the model with logged total financial assets and insignificant in the model with the dummy variable, but this most likely related to life cycle effects on asset accumulation.

**Table E-2** presents results for the sensitivity checks for logged debt-to-income ratio. The first column estimates the model on the entire sample of indebted households, including those that report zero income. The second column presents the estimates included in Chapter 6 and excludes those with zero income. A continuous variable of logged total financial assets is substituted for the dummy variable for financial asset ownership in the third column of the table and the fourth column excludes observations with extreme residuals. In general, the estimates are consistent across all model specifications, with one or two exceptions. Most notably, the coefficient for poverty is much higher when the model does not exclude households with zero income, primarily because these households fall below the poverty line and have extreme values on the debt-to-income ratio due to their denominator of 1, which inflates the effect of poverty status on debt burden.

Last, **Table E-3** presents results for logged debt-to-money ratio. This outcome variable presented the most difficulties for estimation, as approximately a quarter of the

households that reported positive values for total NCNR debt also reported zero financial asset holdings. The first column reports the estimates of the logged debt-to-money ratio for the entire sample (total debts/[total money plus one]). Here much of the significance of the coefficients is due to their association with process of wealth accumulation, as they reflect very clearly the patterns observed in the logistic regression predicting likelihood of reporting no financial assets presented in **Chapter 5**. Last, for households with no financial assets, their logged debt-to-money ratio has the same value as their logged total NCNR debt. Limiting the analysis to debt level among households with no financial assets (the fourth column of **Table E-3**) shows coefficients that are very similar to the coefficients predicting logged total NCNR debt among the full sample of indebted households (the fifth column).

**Table E-1. Multivariate, Multilevel Linear Regressions Predicting (Logged) Level of NCNR Debt Among the Indebted (1985-2000), Robustness Checks**

	<b>Full Sample</b>	<b>Full Sample w/Log Fin. Assets</b>	<b>Excluding Extreme Residuals</b>
<i>n</i>	<i>32183</i>	<i>30603</i>	<i>29551</i>
Age	0.028	0.042*	0.002
Age Squared	-0.0004	-0.0006*	0.00003
Black	-0.226***	-0.230***	-0.228***
Hispanic	-0.134***	-0.141**	-0.123***
White (ref)	--	--	--
<b>Socioeconomic Status</b>			
Highest Grade Completed	0.089***	0.091***	0.087***
Log Equivalent HH Inc	0.005	0.005	0.008
Weeks Worked Last Year	-0.0001	-0.0002	0.001
Unemployed Spell Last Year	-0.004	0.00006	0.018
Below Poverty Line	0.004	0.0006	-0.012
<b>Family Structure</b>			
Married	0.135***	0.138***	0.128***
Divorced/Separated	0.034	0.033	0.018
Single (ref)	--	--	--
Have Kids	-0.099***	-0.098***	-0.082***

**Table E-1, continued**

	Female Head	-0.095***	-0.102***	-0.068***
<b>Health Limitations</b>				
	Kind or Amount of Work	0.053*	0.040	0.037
<b>Asset Ownership</b>				
	Financial	-0.051**		-0.046**
	Log Financial Assets		-0.007***	
	Non-financial	-0.122***	-0.120***	-0.119***
<b>Period</b>				
	1985 (ref.)	--	--	--
	1986	0.066**	0.069**	0.073**
	1987	0.130***	0.132***	0.132***
	1988	0.084**	0.091**	0.102***
	1989	0.116***	0.114***	0.126***
	1990	0.138***	0.142***	0.135***
	1992	0.122**	0.128**	0.132***
	1993	0.143***	0.156***	0.191***
	1994	0.172***	0.185***	0.210***
	1996	0.292***	0.317***	0.326***
	1998	0.338***	0.370***	0.377***
	2000	0.347***	0.397***	0.399***
	<i>Constant</i>	6.635***	6.400***	6.882***
	<i>R-Squared</i>			
	Within	0.0316	0.0325	0.0462
	Between	0.0820	0.0831	0.0983
	Overall	0.0656	0.0679	0.0849

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

**Table E-2. Multivariate, Multilevel Linear Regressions Predicting (Logged) Ratio of NCNR Debt to Income Among the Indebted (1985-2000), Robustness Checks**

	Full Sample	Excluding Zero Income	Excluding Zero Income (w/Logtmoney)	Excluding Zero Income & Extreme Residuals
<i>n</i>	32364	32142	30565	29302
Age	0.068**	0.019	0.037	-0.007
Age Squared	-0.001**	-0.0004	-0.001*	-0.00003
Black	-0.178***	-0.188***	-0.215***	-0.176***
Hispanic	-0.120***	-0.142***	-0.160***	-0.142***
White (ref)	--	--	--	--
<b>Socioeconomic Status</b>				
Highest Grade Completed	0.034***	0.036***	0.051***	0.029***
Weeks Worked Last Year	-0.009***	-0.004***	-0.004***	-0.003***
Unemployed Spell Last Year	-0.041	0.065***	0.055**	0.089***
Below Poverty Line	1.805***	1.24***	1.205***	1.049***

**Table E-2, continued**

<b>Family Structure</b>				
Married	-0.364***	-0.304***	-0.271***	-0.313***
Divorced/Separated	0.036	0.086**	0.082**	0.066**
Single (ref)	--	--	--	--
Have Kids	-0.220***	-0.113***	-0.121***	-0.086***
Female Head	-0.207***	-0.095***	-0.114***	-0.093***
<b>Health Limitations</b>				
Kind or Amount of Work	0.099**	0.111***	0.090**	0.092***
<b>Asset Ownership</b>				
Financial	-0.145***	-0.159***		-0.164***
Log Financial Assets			-0.040***	
Non-financial	-0.275***	-0.138***	-0.113***	-0.143***
<b>Period</b>				
1985 (ref.)	--	--	--	--
1986	0.022	0.051	0.057*	0.048
1987	0.126***	0.117***	0.123***	0.119***
1988	0.088*	0.071*	0.065*	0.089**
1989	0.069	0.070*	0.074*	0.115***
1990	0.165***	0.135***	0.146***	0.131***
1992	0.050	0.063	0.076	0.132***
1993	0.117*	0.142**	0.163***	0.179***
1994	0.169**	0.172***	0.206***	0.204***
1996	0.362***	0.304***	0.353***	0.331***
1998	0.432***	0.341***	0.407***	0.365***
2000	0.468***	0.373***	0.462***	0.385***
<i>Constant</i>	-2.833***	-2.445***	-2.852***	-2.065***
<b>R-Squared</b>				
Within	0.1418	0.0974	.1006	0.1070
Between	0.2931	0.2343	.2495	0.2488
Overall	0.2118	0.1623	.1761	0.1783

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001



**Table E-3. Multivariate, Multilevel Linear Regressions Predicting (Logged) Ratio of NCNR Debt to Money Among the Indebted (1985-2000), Robustness Checks**

	<b>ALL (Debts/Total Money Plus One)</b>	<b>Excluding No Financial Asset HH</b>	<b>Excluding No Financial Assets and Extreme Residuals</b>	<b>HH with No Financial Assets</b>	<b>Log Total NCNR Debt (Full Sample)</b>
<i>n</i>	30603	22920	20886	7683	32183
Age	-0.007	-0.041	-0.046	0.037	0.028
Age Squared	-0.0003	-0.0002	-0.0003	-0.0001	-0.0004
Black	0.731***	0.206***	0.229***	-0.301***	-0.226***
Hispanic	0.429***	0.003	0.032	-0.235***	-0.134***
White (ref)	--	--	--	--	--
<b>Socioeconomic Status</b>					
Highest Grade Completed	-0.378***	-0.120***	-0.111***	0.079***	0.089***
Log Equivalent HH Inc	-0.379***	-0.375***	-0.467***	-0.007	0.005
Weeks Worked Last Year	-0.007***	0.001	0.001	0.0002	-0.0001
Unemployed Spell Last Year	0.681***	0.331***	0.304***	0.007	-0.004
<Poverty Line	0.736***	-0.072	-0.170**	-0.057	0.004
<b>Family Structure</b>					
Married	-0.706***	-0.254***	-0.201***	0.082*	0.135***
Divorced/Separated	0.312***	0.172**	0.180***	-0.018	0.034
Single (ref)	--	--	--	--	--
Have Kids	0.150**	0.009	-0.034	-0.065*	-0.099***
Female Head	0.154*	0.329***	0.356***	-0.112**	-0.095***
<b>Health Limitations</b>					
Kind or Amount of Work	0.281**	0.148*	0.096	0.117**	0.053*
<b>Asset Ownership</b>					
Financial					-0.051**
Non-financial	-1.373***	-0.549***	-0.500***	-0.093**	-0.122***
<b>Period</b>					
1985 (ref.)	--	--	--		--
1986	0.058	0.033	-0.008		0.066**
1987	0.062	-0.155**	-0.161**		0.130***
1988	0.938***	-0.87	-0.117*		0.084**
1989	-0.080	-0.66	-0.076		0.116***
1990	-0.040	-0.045	-0.070		0.138***
1992	-0.194	-0.239**	-0.225**		0.122**
1993	-0.139	-0.226*	-0.243**		0.143***
1994	-0.453**	-0.377***	-0.383***		0.172***

**Table E-3,  
continued**

1996	-0.417*	-0.416***	-0.400***		0.292***
1998	-0.888***	-0.693***	-0.645***		0.338***
2000	-1.030***	-0.831***	-0.776***		0.347***
<i>Constant</i>	<i>13.157***</i>	<i>8.049***</i>	<i>8.920***</i>	<i>6.599***</i>	<i>6.635***</i>
<i>R-Squared</i>					
Within	0.0835	0.1257	0.2028	0.0317	0.0316
Between	0.3797	0.1882	0.2248	0.0699	0.0820
Overall	0.2588	0.1546	0.2128	0.0631	0.0656

p-values: \* p< .05; \*\* p< .01; \*\*\* p< .001

## Appendix F. Additional Models and Descriptive Statistics for Latent Trajectory Analysis

Table F-1. Multinomial Logit Predicting Latent Trajectory Membership<sup>1</sup>, Odds Ratios

	Not Indebted	Stably Low	High Age Curve
<b>Race</b>			
Black	1.06	1.08	0.55***
Hispanic	0.90	1.27**	0.67**
White (ref.)	--	--	--
<b>Always Insolvent</b>	1.20	0.69*	1.38*
<b>Onset of Indebtedness</b>	1.36***	1.14***	0.99
<b>Life Course Events Ever Experienced<sup>2</sup></b>			
College Degree	0.64***	0.86*	2.07***
Below Poverty Line	0.75**	0.72***	3.09***
Unemployed	0.92	0.89	1.01
Divorced	0.63***	0.86*	0.97
Health Limitation	0.69***	0.74***	1.27**
Dependent Children	0.82*	1.05	0.79*

p-values: \*p<.05; \*\*p<.01; \*\*\*p<.001

<sup>1</sup>Increasing trajectory is the reference category. <sup>2</sup>In any of the 12 interviews between 1985 and 2000

The associations between variables expected to capture unobserved access and demand—race, chronic insolvency, and onset of indebtedness—and observed demand—experiencing life course events that reduce income, increase costs, or do both simultaneously (e.g., health limitations)—all fall in the generally expected directions. With the exception of unemployment and having children, experiencing life course events that increase financial demands are associated with decreased likelihood of falling

into one of the two low-debt trajectories and increased likelihood of being in the highest debt trajectory (relative to the likelihood of being in the increasing debt trajectory).

**Table F-2. Proportion of Sample Experiencing Select Events by Latent Debt Trajectory**

	<b>Debt-to-Income Latent Trajectory</b>			
	Not Indebted	Stably Low	Increasing	High Age Curve
<b>Life Course Events Ever Experienced<sup>1</sup></b>				
Below Poverty Line	0.45	0.35***	0.45	0.70***
Unemployment Spell	0.63**	0.62***	0.69	0.75***
Health Limitation	0.19***	0.18***	0.25	0.31***
Divorce	0.34***	0.37***	0.43	0.43
College Degree	0.18**	0.23	0.22	0.32***
Have Kids	0.77***	0.83	0.83	0.78**
<b>Negative Financial Outcomes, 2004</b>				
Credit Constrained	0.15***	0.16***	0.24	0.25
Ever Bankrupt	0.08***	0.12***	0.19	0.21
Missed Payment	0.14***	0.20***	0.25	0.28†

Asterisks indicate that two-tailed t-tests show that trajectory means are statistically significantly different from the means of the Increasing trajectory at the .10 (†), .05 (\*), .01 (\*\*), or .001 (\*\*\*) level of significance

<sup>1</sup>If the HH *ever* experienced the event in the analysis waves between 1985 and 2004.

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## **Biography**

Rebecca Marie Tippett was born April 30, 1982 in Tunkhannock, Pennsylvania. In May 2004, she graduated *summa cum laude* and Phi Beta Kappa from The Ohio State University with dual Bachelor of Arts degrees in Sociology and Political Science. In 2006, she received a Canadian Studies fellowship and the Social Science Research Council's Dissertation Proposal Development Fellowship to pursue the research project that eventually became her dissertation. Throughout her graduate career, Rebecca has been generously funded by the National Institute on Aging Training Grant for the Pre-Doctoral Study of Aging (#5T32-AG-000139-20). Her collaborative research with Jessica Sautter and Phillip Morgan on internet dating is forthcoming in *Social Science Quarterly*. In January 2010, Rebecca joined the Weldon Cooper Center for Public Service at the University of Virginia as a research faculty member.