

HOUSEHOLD CAPITAL STRUCTURE AND FINANCIAL RESILIENCE:
EVIDENCE FROM THE NETHERLANDS

by

DAVID ALLEN AMMERMAN

B.M., University of Cincinnati, 2006
M.B.A., Webster University, 2011

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

School of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2017

Abstract

Since 2008, the effects of the Great Recession have lingered in memory and in public discourse, and have underscored the need to better understand the determinants of financial resilience. Financial resilience refers to the household's ability to absorb and respond to financial shocks (MacKinnon & Derickson, 2013). A financial shock may be induced by a rapid decline in income or asset values, an increase in expenses, or some combination thereof. Solvency – the relationship between a household's assets and liabilities – is one aspect of financial resilience: maintaining a healthy debt ratio affords a household the opportunity to liquidate assets to meet debt obligations in response to a financial shock. Thus, the practical question which inspired this dissertation was “what is the right amount of debt for the household?” Within the personal finance and consumer economics literature, borrowing and saving – behaviors which influence household solvency – are conceptualized in part as functions of individual future orientation. The premise that resources are fungible, however, has led to the characterization of *concurrent* borrowing and saving as a behavioral anomaly. Corporate finance, by contrast, does not characterize this common practice as an anomaly, but suggests that concurrent borrowing and saving is, in part, a matter of balancing the costs and benefits of debt. However, theories of corporate finance cannot predict or explain how individual future orientation might influence a household's capital structure. Thus, this dissertation adds to the literature by exploring precisely this question: how does individual future orientation influence household capital structure? The present results suggest, in contrast to the existing body of research, that future orientation is positively associated with an individual's propensity to use leverage to finance investments; but that within a complex family resource management system, this individual propensity is moderated by the relative bargaining power of the other members of the household.

HOUSEHOLD CAPITAL STRUCTURE AND FINANCIAL RESILIENCE:
EVIDENCE FROM THE NETHERLANDS

by

DAVID ALLEN AMMERMAN

B.M., University of Cincinnati, 2006
M.B.A., Webster University, 2011

A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

School of Family Studies and Human Services
College of Human Ecology

KANSAS STATE UNIVERSITY
Manhattan, Kansas

2017

Approved by:

Major Professor
Maurice M. MacDonald, Ph.D.

Copyright

DAVID ALLEN AMMERMAN

2017

Abstract

Since 2008, the effects of the Great Recession have lingered in memory and in public discourse, and have underscored the need to better understand the determinants of financial resilience. Financial resilience refers to the household's ability to absorb and respond to financial shocks (MacKinnon & Derickson, 2013). A financial shock may be induced by a rapid decline in income or asset values, an increase in expenses, or some combination thereof. Solvency – the relationship between a household's assets and liabilities – is one aspect of financial resilience: maintaining a healthy debt ratio affords a household the opportunity to liquidate assets to meet debt obligations in response to a financial shock. Thus, the practical question which inspired this dissertation was “what is the right amount of debt for the household?” Within the personal finance and consumer economics literature, borrowing and saving – behaviors which influence household solvency – are conceptualized in part as functions of individual future orientation. The premise that resources are fungible, however, has led to the characterization of *concurrent* borrowing and saving as a behavioral anomaly. Corporate finance, by contrast, does not characterize this common practice as an anomaly, but suggests that concurrent borrowing and saving is, in part, a matter of balancing the costs and benefits of debt. However, theories of corporate finance cannot predict or explain how individual future orientation might influence a household's capital structure. Thus, this dissertation adds to the literature by exploring precisely this question: how does individual future orientation influence household capital structure? The present results suggest, in contrast to the existing body of research, that future orientation is positively associated with an individual's propensity to use leverage to finance investments; but that within a complex family resource management system, this individual propensity is moderated by the relative bargaining power of the other members of the household.

Table of Contents

List of Figures	viii
List of Tables	ix
Acknowledgements.....	x
Dedication.....	xii
Preface.....	xiii
Chapter 1 - Introduction.....	1
Financial Resilience and Research Purpose.....	4
Introduction to Household Capital Structure	5
Research Themes and Questions	6
Contribution to the Literature	9
Chapter 2 – Literature Review	12
Asset and Debt Accumulation	13
Household Capital Structure.....	14
Intertemporal Choice	18
Implications for Asset Allocation and Debt Structure.....	21
Economic Theory of Self-Control	27
Collective Financial Decision-Making.....	30
Governance and Capital Structure	35
Household Governance Framework	38
Summary.....	43
Chapter 3 – Methods.....	45
Survey Description	45
Part One	47
Sample Description.....	47
Empirical Models and Variable Measurement.....	48
Dependent Variables.....	50
Independent Variables	51
Analytical Methods.....	56
Part Two.....	58

Sample Description	58
Empirical Models and Variable Measurement.....	59
Analytical Methods	66
Chapter 4 – Results	69
Part One	69
Descriptive Statistics.....	69
Regression Analyses	71
Future Orientation and the Household Debt Ratio	71
Future Orientation and Household Asset Allocation	77
Future Orientation and Household Debt Structure	79
Part Two.....	82
Descriptive Statistics.....	82
Regression Analyses	86
Bargaining Power, Governance, and Household Capital Structure	86
Determinants of Household Governance	100
Chapter 5 – Discussion	103
Research Findings.....	103
The Unitary Model of Household Capital Structure.....	104
Household Capital Structure.....	104
Asset Allocation.....	107
Debt Structure	110
The Collective Model of Household Capital Structure.....	113
Bargaining Power and Household Capital Structure	113
Household Governance	118
Limitations	122
Implications for Future Research.....	124
Implications for Practice	128
Summary and Conclusions	130
References.....	135

List of Figures

Figure 2.1 The Doer, The Planner, and Intertemporal Choice.....	29
Figure 2.2 The Shopper, The Accountant, and Household Intertemporal Choice.....	40
Figure 2.3 Comprehensive Household Governance Framework	43
Figure 3.1 Simplified Collective Model of Household Capital Structure	61

List of Tables

Table 2.1 Cash Flows to Investors for Unlevered versus Levered Firm	15
Table 2.2 Returns on Equity for Unlevered versus Levered Firm	16
Table 4.1 Part One Subsample Descriptive Statistics ($n = 824$)	70
Table 4.2 Balance Sheet of Average Household in Part One Subsample ($n = 824$)	71
Table 4.3 Hierarchical Tobit Regression Predicting Household Debt Ratio ($n = 824$)	75
Table 4.4 Multinomial Logistic Regression Predicting Debt Ratio Categories ($n = 824$)	76
Table 4.5 Fractional Logistic Regression Predicting Cash to Total Assets ($n = 824$)	78
Table 4.6 Fractional Logistic Regression Predicting Mortgage Debt Ratio ($n = 824$)	80
Table 4.7 Part Two Subsample Individual Descriptive Statistics ($n = 412$)	84
Table 4.8 Part Two Subsample Household Characteristics ($n = 412$)	85
Table 4.9 Balance Sheet of Average Household in Part Two Subsample ($n = 412$)	86
Table 4.10 Numerical Example of Coefficient Interpretation with Interactions	88
Table 4.11 Bargaining Power Predicting Debt Ratio, Complete Sample ($n = 412$)	91
Table 4.12 Bargaining Power Predicting Debt Ratio, Homogeneous Future Orientation ($n = 215$)	92
Table 4.13 Bargaining Power Predicting Debt Ratio, Heterogeneous Future Orientation ($n = 197$)	93
Table 4.14 Governance Predicting Debt Ratio, Complete Sample ($n = 412$)	97
Table 4.15 Governance Predicting Debt Ratio, Homogeneous Future Orientation ($n = 215$)	98
Table 4.16 Governance Predicting Debt Ratio, Heterogeneous Future Orientation ($n = 197$)	99
Table 4.17 Multinomial Logistic Regression Predicting Management Roles ($n = 412$)	101
Table 4.18 Logistic Regression Predicting Use of Separate Accounts ($n = 412$)	102

Acknowledgements

I would like to acknowledge the faculty and staff of the Institute of Personal Financial Planning for all of their time and support, and my committee members for their mentorship and service. I especially want to thank my major professor, Dr. MacDonald, for the many hours he spent reading my materials, offering responsive and constructive feedback, and for helping me develop strategies to publish articles from this research. Simply stated, working with Dr. MacDonald has made me a deeper and more thorough thinker. Additionally, his support and encouragement have been vital for developing a relatively innovative approach – showcased in this dissertation – of adapting a corporate finance perspective to the household. Further, Dr. MacDonald has been an amazing collaborator on other related projects, and it is my sincere hope that our partnership will last for many years to come. I also want to recognize Dr. Britt, who served as my major professor during my first years in the doctoral program. During my first class with Dr. Britt, she impressed upon me and my fellow students the high level of quality and rigor that would be expected from us – standards which I expected and have adopted as my own. Additionally, I want to recognize and thank Dr. Britt for encouragement to finish this dissertation sooner rather than later; and for all of her time and support in helping me develop the finished product. There are few times in life when one is lucky enough to work with and be led by their ideal role models; but in this program, I have had that experience twice.

I would also like to thank my wife, friends, and family for their ongoing encouragement. My wife, Angela, has been especially encouraging and supportive as I have become somewhat of a “night owl” (e.g., I am currently writing this at about two o’clock in the morning) and maybe slightly more irritable, as I have continued working on this project and other educational adventures. None of this would be possible without her understanding and support. I also want to

recognize my friends and fellow cohort members: Sarah Asebedo, Jamie Lynn Byram, Joy Clady, Linda Leitz, Derek Tharp, Cametra Thompson, and Lloyd Zimmerman. In addition to working with a stellar faculty on a beautiful campus, spending the summers with this close group of people who shared my intellectual curiosity helped make my doctoral experience everything I hoped it would be. Being more of a corporate finance practitioner with experience in the governmental and non-profit sectors, the insights I gained from our lunch discussions, partnerships on projects, and class sessions were invaluable in helping me find the areas where my own unique experiences and insights could be brought to bear on important issues facing families and the profession of financial planning. Whatever future contributions I am able to make to the research and practice of financial planning, a substantial amount of the credit will belong to my classmates.

Dedication

This dissertation is dedicated to the critical thinkers and skeptics who have at any time wondered, “how much debt is really the right amount of debt?” – which is probably everyone. In particular, I would like to dedicate this dissertation to my college roommate and best friend, Jordan Witt.

Preface

I had originally decided not to include a preface because, quite frankly, it is optional and I saw little value in adding to my workload. In retrospect, that was a myopic decision. Fortunately, it seems that my inner planner has regained control (as will be explained later) now that I have nearly reached the end of this process; and I find myself now thinking about how this dissertation will be viewed or used in the future. This has led to a feeling that I should offer some personal background to the reader. What follows is a brief personal biography which I believe will enhance the reader's understanding of how this dissertation was developed.

I came to the field of personal financial planning research from a rather different path. As the son of two teachers, I grew-up in a household marked by a relatively high degree of money vigilance, which it seems I inherited. Toward the end of my investment in a music degree, I began to analyze my future earnings prospects and determined that a change in course was needed. I ultimately decided to pursue a career in the military, and after conducting rudimentary financial scenario analyses I decided to apply to the United States Marine Corps Officer Candidates School rather than enlist and join the band. After earning my commission, I had some initial difficulty in settling on an occupational specialty. It was actually my wife who helped me realize that I should pursue a career in finance, which had never before entered my imagination. I had developed a detailed multi-year monthly personal budget (which I still keep and maintain) which assisted me in paying bills, reconciling accounts, and tracking our household financial position against savings goals. One day, I was paying our credit card bill and was shocked to see new charges on our statement. When I (rhetorically) asked my wife how that had happened, she responded that I should “do the Marine Corps’ budget and leave her alone.” That seemed like a good idea.

I was assigned the military occupational specialty of 3404, Financial Management Officer, and assigned to the Second Marine Division as the Budget Officer in August 2007 (near the end of the fiscal year). The Marine Corps only offered its Financial Management Officers Course twice per year at that time, so I still had not completed any formal training in financial management. Yet, as the new Budget Officer, it fell to me to draft the Division's FY08 operating budget for approval by our Commanding General. I followed the same general approach to the Division's \$35 million annual operating budget as I had followed in developing my personal budget – I worked with subordinate unit Supply Officers to determine what their operating needs would be for the year (i.e., office supplies, fuel, travel, replacement parts – including things like tank engines – shipping and logistics, etc.) and consolidated this zero-based approach (which I did not know at the time was a zero-based approach) into a Division-level budget, by unit, by quarter. I then compared this to previous years' operating budgets which I had on file to make sure my numbers were reasonable compared to what previous Budget Officers had created (which they were). With a few minor adjustments, my budget was approved by my boss (the Deputy Comptroller, as the Comptroller and most of our staff were deployed to Iraq at the time) and by the Commanding General. This was a formative experience in shaping my view of finance as simply reflecting the resources required for operational activities.

I ultimately earned my master's in business administration in order to match my developing experience in financial management with the appropriate education. I had no idea at the time that this would awaken in me a love of learning, which eventually led me to doctoral studies. My favorite master's course was Managerial Economics, which I saw as holding the key for figuring out the "best" way to allocate resources. As I sought to quench my thirst for learning more about economics, I was exposed to behavioral economics and the idea that individuals

sometimes acted against their own self-interests. This validated my personal perception, which had been developing for a few years, that some of my colleagues in the military were making financial decisions that did not make sense.

I wanted to know more about how individuals made financial decisions. At the same time, I started to plan for my post-military career. I did not know anything about financial careers outside of the military, but personal financial planning seemed to be the perfect blend of mentoring others and financial management – the two aspects of my Marine Corps career that I enjoyed most. The doctoral program at Kansas State University seemed to be the perfect fit for me to make a transition to financial planning and satisfy my newfound curiosity in individual financial decision-making. I applied, and will be forever thankful that I was accepted to the program.

I resigned my commission from the Marine Corps three years earlier than originally planned in order to stay in the National Capitol Region and to provide my wife with some career stability. (Inasmuch as I have a positive opinion of what I can offer the financial planning community in terms of teaching and research, she is a true rising star in her field and I am deeply committed to and invested in her career.) Being somewhat more knowledgeable about the risks involved in a career in financial planning, and being very risk-averse when it comes to my personal income, I decided to pursue a (salaried) position as a business unit Administrator at a small for-profit company upon my exit from the Marine Corps. It was a great opportunity to see first-hand how a for-profit company worked from the inside; and to learn that managers do not make any better financial decisions simply by virtue of working at a for-profit.

After a year, I had the opportunity to take a financial management position with a large, well-established and well-respected non-profit company in Washington, DC. The job offered me

the opportunity to work with funding from virtually every government agency and several private foundations. But more importantly, it offered me the chance to learn that managers do not make any better financial decisions simply by virtue of working for a large, well-established, well-respected company; nor by virtue of being relatively highly educated, experienced, and well-paid. More than ever I wanted to know what forces shaped individual financial decision-making.

The combination of my experience in organizational settings (i.e., governmental, for-profit, and non-profit financial management) and my education in business has always shaped how I manage my own finances. I have always thought that if a practice or approach could maximize the wealth of Google's shareholders, then I could apply the same practice at home to maximize my own wealth. As such, it surprised me to (gradually) learn over the course of my doctoral studies that some see a gap between the research and practice of corporate finance and personal finance. This seemed most apparent to me in the area of using debt.

Debt seems to have a decidedly negative connotation within the personal finance literature; or at least in the popular literature. I have always found this curious and surprising because in my business education debt was never characterized as qualitatively good or bad. I was taught that debt is simply a tool that should be handled with knowledge and respect – like a chainsaw, or a chef's knife. As I learned more about debt from the personal finance and consumer economic perspectives, I started to sense that there was a gap in the understanding of how individuals and households should use debt compared to how corporate financial managers are taught to use debt. What I have attempted to do is to bridge this apparent gap between corporate finance and personal finance in order to advance our understanding of the possible benefits of financing investments with debt in the household context.

I would like to say that I was so thoughtful and intelligent as to have all of these ideas and realizations neatly organized into a deliberate research agenda from the very beginning of the dissertation process. But that was not the case. Developing this dissertation was actually a messy process of entertaining opaque feelings, developing concrete questions and ideas, and then pulling threads and peeling onions. In retrospect, I believe this dissertation was born out of a personal desire for intellectual consistency in the practice of finance across different domains – a desire which was not apparent to me until now, at the end of the process. It is my hope that future students and researchers will see this work as a step in that direction.

Finally, it is with an orientation to the future that I have written this dissertation in such a style so as to be intelligible and useful for anyone – from the lay person, to the student, to the experienced researcher – interested in understanding how individuals and families can and do use debt financing in a manner consistent with established theories of finance. If parts of this dissertation seem instructive in tone, that was done on purpose. As a work designed to fill a gap between two domains of finance, I have felt it necessary to include some rudimentary explanations and examples so that future students of personal finance can better understand the corporate perspective and vice versa. Lastly, it must be stated that the analyses undertaken in this dissertation are merely first steps, and implications for application and future research are outlined in the final chapter.

Chapter 1 - Introduction

Since the 1980s, economic losses due to natural catastrophes around the world (some insured and some not) have increased at a quickening pace (Kunreuther, Michel-Kerjan, & Pauly, 2013). The occurrence of several natural disasters during the early 21st century has energized governments and industry to create and bolster programs aimed at increasing preparedness and resilience. While these programs usually focus on non-financial aspects of sustainability, natural disasters are also typically accompanied by financial shocks which result from the destruction of assets and loss of income. Indeed, before the global economic crisis of 2008, environmental conservation received the greatest amount of attention in the sustainability and resilience literature (Ashford, Hall, & Ashford, 2012). Yet in the wake of the Great Recession, it has become evident that financial shocks are not solely dependent on weather and geology; they can also be man-made.

Deregulation of the U.S. banking industry during the 1980s gave rise to various financial innovations, poor lending practices, and flawed risk assessments which would ultimately jeopardize the U.S. financial system (MacKinnon & Derickson, 2013). During the same period, fundamental changes in global economic conditions were taking shape which would magnify the crisis (Stiglitz, 2010). The drive towards globalization influenced not only trade imbalances and offshoring of jobs, but also the integration of capital markets (Stiglitz, 2010).

The bursting of the dot-com bubble was, by many accounts, the prelude to the Great Recession (Stiglitz, 2010). The crash of technology and internet stocks impacted both institutional and individual investors around the world. The Dutch pension system was particularly vulnerable due to the high value of accumulated assets in private pensions relative to GDP (Høj, 2011).

The Dutch pension system is designed around three pillars: State-funded pensions, employer-sponsored pensions, and individual savings. State and employer-sponsored pensions are supposed to

provide a benefit approximately equal to 70% of an individual's final wages (de Boer, 2009). However, the sharp decline in portfolio values precipitated by the bursting of the dot-com bubble contributed to the Dutch pension fund solvency crisis in the early 2000s (Alessie, Van Rooij, & Lusardi, 2011). In response to the crisis, Dutch lawmakers changed the calculation of pension benefits from a percentage of career-final earnings to a percentage of career-average earnings. As a result, the average wage replacement ratio declined for most Dutch workers, and individual savings and investment became a more critical component of retirement planning. As in the United States, more of the responsibility for retirement preparedness shifted to the individual (Alessie et al., 2011).

Yet in the years leading up to the global financial crisis of 2008, Dutch workers reported thinking little about their retirement and were generally confident that they would receive a generous pension (Alessie et al., 2011). Individuals perceived future economic conditions as positive and personal savings were still considered a relatively unimportant part of retirement planning (Obstfeld & Rogoff, 2009). At the same time, banks and insurance companies around the globe increased their exposure to risky mortgage-backed securities.

When rates increased on variable rate mortgages, many U.S. homeowners were unable to afford their new monthly mortgage payments. As mortgage defaults increased, the U.S. housing market was flooded with excess supply, precipitating the bursting of the U.S. housing bubble. Many homeowners found themselves with negative home equity – some had taken second mortgages on their homes to finance consumption as wages failed to keep-up with inflation – and were not able to refinance their mortgages (de Boer, 2009; Stiglitz, 2010). Foreclosures increased dramatically, banks were forced to write-off billions in securities backed by sub-prime mortgages, and insurers who had issued credit default swaps against such securities found themselves obligated for losses they could

not cover (Verick & Islam, 2010). Banks were unable to lend to businesses and the financial crisis spread throughout the global economy (de Boer, 2009).

The response by governments and central banks was generally to infuse banks with capital in the hopes that doing so would unfreeze capital markets (Verick & Islam, 2010). In doing so, governments created conditions where long-term interest rates fell and the fair value of existing debt issues increased, as investors preferred the higher promised yields of previously issued debt (Kashyap, Rajan, & Stein, 2008). Thus, the solvency ratios of many pension funds declined below minimum required thresholds due to sharp reductions in the value of assets and increases in the value of pension liabilities (Høj, 2011). For the second time in a single decade, the retirement of pensioners was put in jeopardy.

While many researchers have highlighted the contributing role of poor lending practices to the Great Recession, others have emphasized the circumstances which led many individuals to engage in risky borrowing (Stiglitz, 2010). Research shows that between 2000 and 2011 consumption inequality declined while income inequality increased (Meyer & Sullivan, 2013). The general explanation for this observation has been that middle- and low-income households relied upon debt financing to sustain their consumption (Van Treeck & Sturn, 2012). Taken together, the evidence suggests that macroeconomic factors influenced household financial behaviors, that these behaviors (i.e., borrowing and lack of saving) have partially influenced the development of financial and economic crises, and have also made households vulnerable to financial shocks.

Thus, in the latter part of the 20th century the stage had been set for what would be one of the worst financial shocks in a generation. In the wake of the global financial crisis, U.S. households lost over 13 trillion dollars in wealth and the unemployment rate more than doubled between 2008 and 2009 (Dimitris, Dimitris, & Tullio, 2011). Unemployment increased dramatically in countries

belonging to the Organization for Economic Cooperation and Development (OECD); and labor force participation in the U.S. fell to its lowest level since the late 1970s (Hotchkiss & Rios-Avila, 2013; Verick & Islam, 2010). Many families looked at the market indexes as a barometer for future economic conditions and were left with negative expectations for the future and a reduced sense of well-being (Deaton, 2012).

Financial Resilience and Research Purpose

With the effects of the Great Recession lingering in recent memory, the overarching purpose of this dissertation is to explore the nature of household financial resilience. The concept of resilience refers to an economic entity's (be it an individual, a household, business, community, or government) relationship to stress, disruptions, and crises (MacKinnon & Derickson, 2013). Financial disruptions are characterized by an increase in expenses, or a decline in income or asset values. A household may be described as resilient when it exhibits the ability to absorb and recover from environmental shocks, typically through the "redeployment of assets" (MacKinnon & Derickson, 2013, p. 16). Maintaining financial slack (i.e., liquidity) is one method by which households can assure themselves of having sufficient resources for redeployment in the event of a financial shock (Brealey, Myers, & Allen, 2014). Indeed, it is common for financial planners to recommend that households maintain between three and six months-worth of expenses in monetary assets as an emergency fund (Grable, Klock, & Lytton, 2013).

Solvency is also an important characteristic of financial resilience because it affords a household the opportunity to liquidate assets in order to meet debt obligations. When the household has few debts relative to assets, it can theoretically liquidate some portion of assets to satisfy its debt and still retain sufficient resources to continue consumption and investment. Thus, solvency has traditionally been a primary objective of personal financial planning, and a debt ratio (i.e., total

liabilities divided by total assets) of 40% is generally considered an acceptable benchmark (Grable et al., 2013). Given that financing assets with debt (such as a home mortgage, which is a key area of household finance and investment) entails concurrent saving and borrowing, however, it seems best to explore the question of solvency within the framework of household capital structure.

Introduction to Household Capital Structure

Many of the studies which have explored factors related to solvency have focused on asset and debt accumulation; that is, saving and borrowing behaviors. Many of these have adopted a lifecycle perspective and posit that individuals engage in borrowing and saving in order to smooth consumption over their lifetime. Others have adopted behavioral frameworks to explain saving and borrowing as addictive or compulsive behaviors. These studies are premised on the common economic assumption that money is fungible over some time horizon. It is traditionally thought that individuals allocate resources over time so as to maximize utility through consumption.

Theoretically, individuals should prefer to either bring resources forward in time for more present-oriented consumption, or they should allocate present resources to future periods for later consumption; they should not be simultaneously present-oriented and future-oriented by borrowing and saving concurrently. However, individuals and households typically do engage in concurrent saving and borrowing (Spencer & Fan, 2002). For example, individuals may save for retirement or for an emergency fund while simultaneously borrowing to finance a home or automobile; or even using credit cards for present consumption.

Some researchers have attempted to overcome this challenge by exploring the determinants of net saving (i.e., net worth). The problem with such analyses is that net worth, in isolation, obscures how a household uses debt. This is easily demonstrated by the accounting equation: the total assets of any economic entity must equal the sum of total liabilities and total equity. For the household, equity

or net worth is simply the residual value derived by subtracted total liabilities from total assets. Assume, for example, that a household has accumulated \$1,000 in assets through precautionary saving and holds \$0 in debt: the household's net worth is \$1,000. A different household may hold \$2,000 in assets and \$1,000 in debt and also have a net worth of \$1,000. Both households exhibit the same net worth but use debt very differently. Thus, an analysis of net worth obscures differences in household debt policies.

A capital structure approach to household finance overcomes such limitations by rearranging the accounting equation: the variable under observation is not net worth, but the proportion of assets financed by debt. Capital structure is a fundamental concept in corporate finance and refers to the mix of debt and equity corporations use to finance their assets. The quintessential problem for corporate managers is determining the optimal amount of debt with which to finance assets (Brealey et al., 2014). Households must answer the same question: what is the optimal amount of debt relative to assets? As mentioned, a capital structure approach to household finance involves the analysis of household debt ratios. Consider again the households from the example above. For the first household, none of the assets were financed with debt; contrastingly, the second household financed 50% of its assets with debt. Thus, an analysis of debt ratios reveals household financing decisions in ways that net worth cannot, and a capital structure approach therefore provides a more accurate framework for exploring how households engage in concurrent saving and borrowing.

Research Themes and Questions

This dissertation has two themes. The first theme is household financial resilience. This theme is developed via an analysis of the influence of various different factors on household solvency and liquidity. Thus, the primary research questions are (a) how do households determine the quantity of debt used to finance assets, and (b) how do households allocate their assets and structure their debts

between short- and long-term maturities? In this way, solvency is treated as the characteristic of primary interest; and asset allocation and debt structure are treated as sub-components within the larger issue of capital structure.

Households which finance a relatively small proportion of their assets with debt exhibit lower debt ratios: they hold fewer debts relative to assets. By mathematical definition, such households are more solvent than those with high debt ratios, and may be considered relatively more financially resilient, *ceteris paribus*. As such, the study of household capital structure reveals a characteristic of household financial resilience. It should be noted, however, that a resilient capital structure does not necessarily imply a financially optimal capital structure. For example, the most resilient capital structure would be one in which assets are financed completely with equity (i.e., the household's retained earnings). However, this would require the household to forgo valuable tax shields from tax-deductible interest on (some) debt. Thus, households face a trade-off between the costs and benefits associated with pursuing the goal of financial resilience.

Policy makers have an interest in understanding factors which influence household capital structure in order to formulate incentives and programs for bolstering household financial resilience. As governments consider reductions in public benefits to address their sovereign debt, individuals and households may find themselves assuming an even greater share of the responsibility for their own economic well-being (Alessie et al., 2011; Ostry, Ghosh, & Espinoza, 2015). Additionally, financial planners and counselors are required to act "in a manner [they] believe to be in the best interest of the client" (Certified Financial Planner Board of Standards, 2008). As a result, practitioners also have an interest in understanding the determinants of household capital structure in order to help families and individuals develop the traits and habits conducive to building financial resilience.

Time preference is one personal factor which may influence household financing decisions. It is a psychological preference: the subjective valuation of costs and benefits based on when they occur in time, conceptualized in traditional models of intertemporal choice as the rate at which future utilities are discounted (Frederick, Loewenstein, & O'Donoghue, 2002). Research suggests that time preference influences both the accumulation of debts and assets (Henegar, Archuleta, Grable, Britt, Anderson, & Dale, 2013; Lusardi & Mitchell, 2006; Rha, Montalto, & Hanna, 2006). Theoretically, future-oriented individuals discount future costs and benefits at a lower rate than present-oriented individuals. It stands to reason, then, that time preference may influence household capital structure.

Given that assets and liabilities are classified on the household balance sheet according to when their economic benefits and costs are expected in time (i.e., current versus long-term), asset allocation and debt structure may also be viewed as intertemporal choices (Kieso, Weygandt, & Warfield, 2013). As such, it seems likely that time preference would influence the proportion of assets held in short-term, liquid accounts; and the proportion of total debt comprised of consumer debt (Angeletos, Laibson, Repetto, Tobacman, & Weinberg, 2001).

Finally, whereas many studies of household finance utilize a unitary model of decision-making (i.e., where a single individual makes the financial decisions for the household), it seems implausible that the capital structure of a multi-person household would be dictated by a single family member. Indeed, research suggests that most financial decisions, for both firms and households, are made within a human ecology (Charness & Sutter, 2012). Assuming that the members of a multi-person household do not have uniform utility functions, then it seems likely that households must have some mechanism for managing the divergent preferences of their members. That is, households may employ some form of household governance in order to moderate the influence that each member has in determining the household capital structure.

At this point, the secondary theme of this dissertation should be apparent: theories of corporate finance are adaptable to the household. Just as corporations engage in strategic behavior to manage scarce resources and achieve organizational objectives, so do households behave strategically to allocate scarce resources toward the achievement of family goals (Grable et al., 2013; Brealey et al., 2014). In treating the household as a unique type of utility-maximizing enterprise, research from the corporate finance domain is borrowed and leveraged to advance the understanding and practice of personal financial planning.

Contribution to the Literature

This dissertation is unique in several respects. Most notably, and perhaps controversially, theories of finance and governance are adapted from the corporate domain and applied to the household. In so doing, an innovative model of household financial decision-making is developed and tested. Given that the personal financial planning literature is rich in its treatment of the psychological and sociological determinants of family resource management and individual financial behavior, and that corporations are considered to maximize profits and not utility, it is natural to question whether this approach is appropriate and whether anything can be gained from it. In short: there is much to be learned by adapting theories of finance to the household.

In practice, households and businesses face the same fundamental question: how much debt should be used to finance assets? By its very nature, this question implies concurrent borrowing and saving: both assets and debts are accumulated. As discussed, however, this behavior is treated in the personal finance literature as a behavioral anomaly, usually attributed to mental accounting and lifecycle motivations, based on the premise that money is fungible and that individuals should not be simultaneously present-oriented and future-oriented (Campbell, Cocco, Gomes, & Maenhout, 2001; Shefrin & Thaler, 1988; Spencer & Fan, 2002). As such, it can be said of the personal finance

literature that “various models exist that predict or explain debt behavior or savings behavior although no current models exist to predict or explain simultaneous debt and savings behavior” (Spencer & Fan, 2002, p. 27). The paradigm in corporate finance is different in that the capital used to make investments (i.e., debt or equity) is considered separate from the investments themselves (i.e., assets). Thus, in the corporate finance and accounting literature concurrent borrowing and saving is not at all anomalous but a fundamental concept. Being a fundamental issue in corporate finance, the literature from this domain offers several theories to predict and explain why managers elect to simultaneously borrow and save to varying degrees (Brealey et al., 2014; Koller, Goedhart, & Wessels, 2015; Modigliani & Miller, 1958).

Since the corporate finance literature offers theoretical models and explanations for concurrent borrowing and saving whereas the personal finance literature treats this common practice as an anomaly, it stands to reason that if these theories could be adapted to the household (via the inclusion of personal factors and household traits which have been shown to influence household financial behavior) it would represent a significant step toward the development of a model which does “predict or explain simultaneous [household] debt and savings behavior” (Spencer & Fan, 2002, p. 27). That is precisely what this dissertation does. This dissertation treats practices such as financing a home with a mortgage, financing a car with a loan, or financing education with debt not as anomalous behaviors, but as the common financial management practices that they are. By adopting a well-established capital structure approach to finance within the household, with appropriate adaptations, the research presented within this dissertation offers new insights regarding the way households choose to finance investments and consumption – insights which will ultimately inform and refine the practice of personal financial planning in a manner consistent with the theory and practice of finance.

Second, this dissertation makes use of a data set rich with detailed information regarding household finances and individual psychological characteristics: *De Nederlandsche Bank* (DNB) Household Survey (DHS). The use of this data set, which is nationally representative of the Dutch speaking population in the Netherlands, provides an international perspective which extends the personal and behavioral finance literature beyond the borders of the United States, and paves the way for future international collaboration in the behavioral sciences; particularly with regard to economic behavior (Teppa & Vis, 2012).

Additionally, while the primary theme of this dissertation is household financial decision-making, researchers and practitioners of corporate finance may also find the results interesting. A growing body of evidence suggests that the personal characteristics of corporate executives influence firm policies and performance (Cain & McKeon, 2014). The approaches and results presented here may inform future research in the area of corporate finance, particularly with regard to the influence that corporate executives' time preference may have on a firm's target or long-run capital structure. Secondly, researchers may find the collective bargaining framework useful for exploring how corporate boards and executives collaborate within their unique ecology to ultimately determine the debt policy of the firm. Thus, because this dissertation borrows from various domains of finance and economics to develop an innovative model of household finance, the findings from this dissertation may be exported back to those domains. Indeed, the secondary theme of this dissertation was formulated specifically for this purpose.

Chapter 2 – Literature Review

All economic entities depend upon the intake and consumption of resources for survival. Unfortunately, scarcity requires individuals to make trade-offs between consumption choices. Further, because individuals have uncertain lifespans, which typically last longer than a single period, they must also make trade-offs in the timing of consumption. Simply stated, individuals must determine both which resources to use and when to use them. Within the classical economic framework, individuals manage these trade-offs by making decisions that maximize expected lifetime utility. Borrowing allows entities to bring consumption forward in time, but at a future cost. Investment in assets allows entities to delay consumption to the future, but at a present cost. The question of balancing future costs with future benefits to maximize utility is, by definition, the problem of intertemporal choice. It is also the implicit problem of capital structure: how should households balance future costs (i.e., debt) in relation to future benefits (i.e., assets)? Yet the intertemporal problem does not end with capital structure.

Households must also choose how to allocate their assets and debts between short- and long-term classes. The proportion of assets invested in short-term classes affects, of course, the liquidity of the household. Thus, household solvency and liquidity may be understood within the context of intertemporal choice, and may therefore be functions of individual time preference. Given that the purpose of this dissertation is to explore the determinants of household financial resilience, that solvency and liquidity are elements of financial resilience, and that household capital structure and portfolio allocation may be understood as outcomes of intertemporal choices, the following analysis examines the influence of individual time preference on household capital structure and the composition of asset and debt portfolios.

Asset and Debt Accumulation

Whereas household capital structure has received comparatively little attention, a large body of literature exists regarding the related behaviors of saving and credit use. Many of these studies have adopted a lifecycle perspective in which individuals attempt to smooth their consumption by borrowing during early life when income is low; and saving in mid-life when income is high in preparation for retirement. Empirical findings have not, however, been universally supportive of this perspective as a descriptive model (Winter, Schlafmann, & Rodepeter, 2012). Personal factors and financial management practices, including the adoption of longer planning horizons and use of heuristics, seem to explain savings behaviors better than lifecycle status (Winter et al., 2012). These findings provide initial evidence to support the notion that an individual's target debt ratio may be influenced by their intertemporal consumption preferences.

Some researchers have adopted behavioral frameworks to explore household saving and borrowing. Many of these studies model excessive consumer debt as a function of addictive or compulsive behavior (McCarthy, 2011). In a recent study of credit card use, for example, Henegar et al. (2013) found that individuals with greater self-control were less likely to own credit cards, and that an individual's impulsivity and their mother's present-orientation were both positively associated with revolving a balance. These findings suggest that intertemporal motivations influence household capital structure: individuals with relatively less self-control may adopt higher target debt ratios, which permits them to accumulate a higher level of debt.

On the asset side, some studies have modeled savings as a function of expected future utility relative to the loss of present utility (Finke & Huston, 2013). Results have indicated that future-orientation is a strong indicator of the propensity to save. Thus, some operationalized measures of time preference have been shown to influence the accumulation of both debts and assets. These findings are consistent with the present framework in which intertemporal motivations influence

concurrent saving and borrowing. Yet few studies have explored how individual time preference influences the accumulation of debts relative to the accumulation assets; or rather, household capital structure as measured by the debt ratio.

Household Capital Structure

Capital structure refers to the mix of debt and equity economic entities use to finance their assets. Most research in this area has come from the corporate finance domain. Generally, researchers have investigated the nature and determinants of corporate capital structure with an interest in calculating the optimal (i.e., value-maximizing) mix of debt and equity financing. Modern scholarship on capital structure is thought to have originated with Modigliani and Miller's (1958) seminal work on the subject. Modigliani and Miller (1958) demonstrated that under certain conditions, firm value is independent of financing. If capital markets are perfect, where firms and investors can borrow and lend at the risk-free rate, and assuming that there are no costs of financial distress and no taxes, then firm value is independent of financing. Under such conditions, increasing debt provides no tax shield but also does not increase the cost of financial distress. As a result, operating cash flows (and the riskiness of those cash flows) do not change with an increase in debt. Therefore, because the cash flows from assets do not change, the market value of the firm will be the same with or without leverage, assuming perfect capital markets (see Brealey et al., 2014 for further explanations and examples). This realization provides a basic premise from which the influence of taxes and market efficiency on firm value can be better understood.

Of course, Modigliani and Miller (1958) did not author their seminal work at a time when there were no corporate income taxes. Indeed, the only things that are certain in life are death and taxes. The key implication of their work, therefore, is that tax shields *do* have value. Tax shields result from tax-deductible interest on borrowed capital. When a firm can reduce its tax burden by

deducting interest on debt, the result is an increase in operating cash flows that can be paid to investors (i.e., both lenders and shareholders). A short example (assuming there are no fixed assets so that the treatment of depreciation can be ignored) is provided in Table 2.1. Assume that the abbreviated financial data shown are for the same company so that the riskiness of operations may be considered equal. In the unlevered condition, the firm has no debt in the capital structure and so it has no interest expense. The only investors in this condition are the shareholders, and they have a claim on net income (which has been equated to the cash flow to equity for simplicity). If the firm adds leverage (i.e., debt) to its capital structure, then the investors are comprised of both shareholders (who provided the equity financing) and lenders (who provided the debt financing). Lenders earn their returns in the form of interest; shareholders continue to own a claim on the residual cash flows of the firm. While paying interest to lenders decreases the net income and cash flows available to shareholders, the tax-deductibility of interest results in an overall increase in the cash flow from available to all investors. It is this increase in total cash flow to investors that may be considered to increase firm value.

Table 2.1 Cash Flows to Investors for Unlevered versus Levered Firm

	<u>Unlevered</u>	<u>Levered</u>
Earnings before interest and taxes (EBIT)	\$100	\$100
Interest expense		10
Earnings before taxes (EBT)	100	90
Taxes, at 40% of EBT	40	36
Net income	<u>60</u>	<u>54</u>
Cash flows available to investors	\$60	\$64

Focusing on the equity position provides yet another way to think about and analyze the effects of leverage. Building on the above example, assume that both the unlevered firm and the

levered firm hold \$1,000 in assets. Further assume that the levered firm has financed a portion of its assets with a \$200 note. Under these conditions the unlevered firm realizes a return on equity of 6.00% while the levered firm realizes a return on equity of 6.75% as shown in Table 2.2. In essence, the levered firm can control the same quantity of assets using less invested equity. This demonstrates the magnifying effect of financial leverage which is well understood in the practice of finance (Brealey et al., 2014).

Table 2.2 Returns on Equity for Unlevered versus Levered Firm

	<u>Unlevered</u>	<u>Levered</u>
Assets	\$1,000	\$1,000
Debt	0	200
Equity	1000	800
Net income	60	54
Return on assets	6.00%	5.40%
Return on equity	6.00%	6.75%

Given the positive influence of tax shields on firm value and returns on equity, it may be natural to assume that firms could maximize their value by financing their assets completely with debt. There are two main reasons why this is not the case. First, when the firm is completely financed with debt it is technically bankrupt and the debt-holders become, by definition, the new shareholders (Brealey et al., 2014). Second, increasing debt reduces financial flexibility and increases the risk of financial distress (Koller et al., 2015). Consequently, investors require additional returns in order to compensate for this additional risk. This increases the cost of capital (i.e., the discount rate used to value investments) which has the effect of reducing value. The implication is that the optimal capital structure which minimizes the cost of capital and maximizes firm value exists somewhere between a

debt-to-value ratio of 0 and 1. The challenge for researchers in corporate finance has been modeling the costs of financial distress. Consequently, rather than concentrating on capital structure optimization, practitioners of corporate finance have typically been advised to determine an “effective capital structure” and focus on value creation via returns on invested capital and revenue growth (Koller et al., 2015, p. 657).

Several theories persist as to how corporate managers structure the firm’s capital. The tradeoff theory of capital structure specifies that firms choose an optimal debt ratio by weighing the tax advantages of debt against the costs of financial distress (Cunha, Lambrecht, & Pawlina, 2006; Myers, 1984). The pecking order theory of capital structure introduces an element of psychology and supposes that, due to information asymmetries and signaling concerns, management may prefer internal financing (from retained earnings) over external financing; and debt financing over new equity issues (Cunha et al., 2006). Agency theory further introduces psychological factors by recognizing the independence of utility curves between the psychological organisms which constitute the corporate entity (Jensen & Meckling, 1976). The relationship between principals and their agents and creditors, and the costs to align their utility curves, influences the amount of debt and equity principals choose to issue.

While distinctly different from publicly traded corporations, households do share some of the same capital structure considerations. Within the domain of personal financial planning, creditors and household members have a claim on the assets and income of the household. Interest on some types of household debt (e.g., home mortgages and student loans) is tax deductible, providing the household with the opportunity to employ tax shields via financing investment with borrowed money. Of course, increased household debt also reduces financial flexibility and increases the probably of

financial distress for the household just as it does the firm. Thus, the question of finding an optimal or even effective capital structure is just as pertinent for households as it is for corporations.

In one of the few studies to apply theories of corporate finance to the household, Cunha et al. (2006) found that the tradeoff model of capital structure best explained the capital structure choices of Dutch households. Results were consistent with previous findings that income, household size, and education influence household debt levels; but also suggested that households behave as though they have a target debt ratio and employ an adjustment process to achieve the optimal level of debt. While the study provided some initial evidence that theories of corporate finance may be adaptable to the household, it was limited by the omission of an operationalized measure of time preference. This is a significant limitation because, unlike corporate managers who discount cash flows by the firm's weighted average cost of capital, households are thought to discount future utility by their subjective rate of time preference. It remains unclear as to how time preference might influence the household capital structure.

Intertemporal Choice

The discounted utility model was proposed by Samuelson (1937) as a general model of intertemporal choice. According to the model, intertemporal utility, V , is a function of instantaneous utility from consumption, $u(c_{t+k})$, at time $t+k$, and a discount factor, $D(k)$ as indicated in Equation 2.1, subject to constraints (Frederick et al., 2002).

$$V(c_t, \dots, c_T) = \sum_{k=0}^{T-t} D(k) u(c_{t+k}) \quad \text{where} \quad D(k) = \left(\frac{1}{1+p}\right)^k \quad (2.1)$$

The discount function mirrors the calculation for compounding interest, except that the individual's rate of time preference, p , substitutes for the interest rate. (Incidentally, this discount function has also been adopted by various lifecycle models.) According to this model, an individual's target debt ratio will reflect a constant rate of time preference.

Several studies have attempted to calculate individuals' personal discount rates. Empirical field studies have often relied upon the assumption of revealed preferences in observed purchase and savings behaviors (Hausman, 1979). One of the problems with this approach, however, is that the observed behavior is a function of costs as well as preferences. Theoretically, perfectly efficient capital markets allow the individual to borrow and save so that their marginal rate of time preference becomes equal to the interest rate at which the individual can borrow and save (Loewenstein & Thaler, 1989). Under these conditions, observed purchases and saving theoretically reveal more about an individual's cost of capital than their rate of time preference making it difficult to isolate the effects of time preference from observed purchase and savings behavior (Loewenstein, 1987).

Experimental methods of eliciting time preference have arisen in response to the challenges of isolating revealed time preferences. Respondents are typically presented with some hypothetical choice between a small reward in the present period and a certain, larger reward in some future period (Meier & Sprenger, 2015). Some variations on this theme include changing the amount of time between rewards; changing the magnitude of rewards; framing the choice as one between present or delayed costs; and using actual instead of hypothetical payoffs (Hardisty, Thompson, Krantz, & Weber, 2013b).

Both field and experimental methods have yielded interesting results. Computed discount rates are often very high (Loewenstein & Thaler, 1989). But anomalies not predicted by the discounted utility model have also been found; non-constant or time inconsistent discounting in particular (Frederick et al., 2002). Initially, observations suggested that "the discount applied to a future utility should depend on the time-distance from the present date;" and time inconsistency was thought of as a periodic re-evaluation of the original consumption plan (Strozz, 1956, p. 165). Conceptually, time inconsistency suggests that the difference between today and tomorrow is greater

than the difference between a year from now and a year plus a day (Thaler, 1981, p. 205). Hyperbolic discounting was proposed as a model of intertemporal choice to better fit these observations, as it produces short-term discount rates that are higher than long-term rates (Laibson, 1997). Several studies have yielded evidence in support of hyperbolic discounted utility models (Blackburn & El-Deredy, 2013; Thaler, 1981). Other anomalies have also been observed for which hyperbolic discounting models lose predictive and explanatory power (Hardisty, Appelt, & Weber, 2013a). Specifically, empirical evidence from the domain of behavioral economics suggests that the sign and magnitude of an economic transaction or event influence an individual's effective discount rate.

A magnitude effect refers to the influence that the size of a financial event or transaction has on individual financial decision-making. For example, evidence suggests that individuals generally discount small gains at a higher rate than large gains (Hardisty et al., 2013a). Sign effects refer to the direction of financial events (i.e., a gains or a losses). Most studies of intertemporal choice have been framed within the context of gains, and it has only been within the past decade that researchers have begun to explore the nature of intertemporal choice for losses (Hardisty et al., 2013a).

In the earliest choice experiments, participants were offered sets of choices that did not allow for negative discounting of losses. Recent empirical evidence suggests that intertemporal choice involves a complex interaction between sign, magnitude, and other factors (Hardisty et al., 2013a). Individuals appear to discount small gains at higher rates than large gains; but discount small losses at lower (even negative) rates than large losses. Contrary to the standard economic framework in which individuals should prefer to delay losses, it seems that individuals may actually prefer, in general, to realize (some) losses sooner rather than later.

A possible explanation for these observations is that individuals have a general degree of present bias which motivates them to resolve gains and losses immediately (Hardisty et al., 2013a).

When the magnitude of the event is small, this degree of present bias is the dominant factor in making a decision: individuals prefer to realize a small gain now (which manifests as a high discount rate) and resolve a small loss now (which manifests as a low or even negative discount rate). As the magnitude of the event increases, other considerations (e.g., uncertainty and resource slack) become more important and have a moderating effect on the degree to which decisions are based on present bias (Hardisty et al., 2013a). Individuals appear to delay the realization of large gains and the resolution of large losses to future time periods, which results in the appearance of individuals discounting large gains at lower rates and discounting large losses at higher rates. These findings may have implications for household capital structure, including asset allocation and debt structure.

Implications for Asset Allocation and Debt Structure

Assets are investments by definition, and asset allocation (i.e., the mix of assets in which an economic entity has invested) is often framed in terms of risk and reward (Brealey et al., 2014). Modern portfolio theory has been used to describe how investors should allocate their assets so as to maximize expected returns per unit of risk (Jacobs, Müller, & Weber, 2014). Generally, the theory specifies an optimization problem in which individuals vary the weights of different (uncorrelated) assets in order to achieve a target rate of return while minimizing portfolio variance (Brealey et al., 2014; Cai, Shi, Ni, & Pan, 2013). Over time, the theory has been modified and extended to include multiple periods and liquidity constraints (Lagerwall, 2011). The approach remains somewhat limited in its application to the household, however, because researchers often omit informational constraints, transaction costs, liquidity, and personal preferences (i.e., factors which may influence the utility one derives from a given allocation) from their specifications of the utility function. Thus, for all the normative power of modern portfolio theory, it generally lacks the ability to predict and explain how small investors actually allocate their assets.

There is theoretical and empirical evidence which suggests that household asset allocation may be influenced by individual future orientation. From a financial accounting perspective, assets and liabilities are classified on the balance sheet according to when their economic benefits and costs are expected in time (Kieso et al., 2013). It is well established in the literature that individuals engage in their own form of accounting: mental accounting. Like financial accounting, mental accounting involves the measurement (i.e., valuation) of economic events over a period of time (Thaler, 1999). Given that time preference has been shown to influence individual valuations of economic choices, as discussed earlier in this chapter, it stands to reason that asset allocation and debt structure (specifically debt maturity structure) would be influenced by individual time preferences. That is, the decision to invest in a long-term asset or to finance an investment with a long-term mortgage would depend on the discount rate applied to future periods; and the culmination of these decisions may be observed on the household balance sheet. The same concept would also apply to investment and financing decisions regarding human capital. Theoretically, if the household's intangible assets, such as human capital, could be reliably measured then these investments would also appear on the household balance sheet. Unfortunately, individual lifetime earnings are difficult to predict and value, and therefore cannot be reliably measured for inclusion on the balance sheet. However, this dissertation does control for human capital by categorically measuring educational attainment.

The lifecycle hypothesis is one intertemporal framework which has been used to describe how households might allocate their resources to different asset classes based on their position in the lifecycle. According to theoretical predictions, individuals consider their expected labor income an implicitly risk-free asset and choose to allocate a majority of non-retirement assets to risky securities (Campbell et al., 2001). As the value of risky investments in retirement and non-retirement accounts

increases in mid-life, individuals begin to shift their asset allocation to risk-free assets. After retirement, individuals first consume their most liquid assets (i.e., cash) and as a result the proportion of wealth held in risky assets increases. While lifecycle models have gradually been extended to include housing wealth and restricted access to tax-deferred accounts, empirical evidence has been inconsistent with their theoretical predictions (Auger, Devinney, Dowling, Eckert, & Lin, 2012; Marekwica, Schaefer, & Sebastian, 2013; Poterba & Samwick, 2001). Individuals generally appear to hold a small proportion of assets in liquid asset classes until they near retirement age, at which time the proportion of liquid assets increases slightly before declining again in late life.

Some researchers have proposed hyperbolic consumption models in order to better explain empirical observations. As mentioned previously, hyperbolic discounting has been used to model time-inconsistent preferences (i.e., self-control problems) wherein short-term discount rates are higher than long-term rates (Laibson, 1997). Within this framework, households allocate their long-term savings to illiquid assets in order to constrain myopic consumption in future periods. Further, because a majority of wealth is held in illiquid assets, households finance present consumption with consumer debt (Angeletos et al., 2001). Hyperbolic discounting cannot explain magnitude and sign effects which have been observed empirically and which may influence household asset allocation and debt structure (Hardisty et al., 2013a).

Given that assets represent future economic benefits, then individuals may frame asset classes in terms of expected economic gains. If so, then the magnitude of the gains expected from a given asset class may influence the degree of patience accorded to the decision to invest in that asset class; and this may consequently influence the composition of the asset portfolio. Consider an individual who is given some amount of cash that they can either consume today, or keep invested in cash via a savings account for some small expected return. If individuals are generally less patient when

considering small gains, then the individual in question would be expected to act impatiently and consume a majority of this cash today and perhaps invest some small portion of it in a savings account. By comparison, if the individual is given a choice between consumption today or investing in financial securities with a larger expected return, all else equal, then the individual should behave somewhat more patiently and invest a relatively greater proportion in securities. In this way, the magnitude of expected returns associated with each asset class should influence decisions such that individuals appear to have a general preference for allocating assets to investments with larger expected returns, all else equal. Individuals should exhibit a general preference for allocating a small proportion of total assets to cash, and allocating greater proportions to financial assets (with higher expected financial returns) and tangible assets (with higher expected utilities). Indeed this is what has been observed empirically (Auger et al., 2012; Laibson, 1997; Marekwica et al., 2013; Poterba & Samwick, 2001).

The corresponding allocative concept for liabilities is debt structure, which refers to the mix of debt instruments included in the capital structure. Debt structure is often treated as a focus area within the capital structure literature; and much of the research in this area relates to the debt held by publicly traded corporations, possibly because these economic entities have considerable flexibility in how they can borrow capital (e.g., bank debt, secured mortgages, unsecured bonds, and convertible securities, among others). Debt structure can vary across several characteristics, including the source of debt, maturity structure, currency mix, and contractual terms (e.g., fixed or floating rate debt, covenants, and conversion terms; Servaes, Tufano, Ballingall, Crockett, & Heine, 2006).

Diamond (1991) proposed a theory of debt structure wherein the credit history of a firm drives the choice between bank debt and borrowing from capital markets (i.e., bond sales). Within this framework young firms with little or no credit history must borrow from banks, which are in a

relatively better position (compared to bond holders) to monitor borrower performance and compliance with covenants. As firms establish a positive credit history they gain greater access to direct lenders via capital markets, and different debt instruments are resultantly added to the debt structure. Bolton and Freixas (2000) proposed a similar framework (which also explains why banks are motivated to securitize their debt securities), but emphasized the possibility that young or poorly rated firms choose to borrow predominantly from banks because the formation of personal lending relationships increases the probability that banks would restructure the firm's loan in the event of financial distress. Empirical evidence has generally supported the predictions of these frameworks: firms with a credit rating of A or above appear to finance their assets predominantly with equity and unsecured debt; and the capital structure of firms becomes progressively more diversified as credit ratings decline (Rauh & Sufi, 2010). Similarly, the debt structures of A-rated firms appear to be comprised mostly of unsecured debt, but other modes of borrowing are used (e.g., bank debt and subordinated bonds) as credit ratings decline.

Like corporations, households also have choices (albeit more limited) for borrowing capital in order to finance investment and consumption. Households can obtain loans with different rate and maturity structures, and with different collateral requirements. Despite such similarities, theories of debt structure have generally not been applied to the household; perhaps because they are largely silent regarding the influence of personal factors on financial decision-making. The few studies which have explored the composition of household debt portfolios have generally analyzed the influence of tax incentives on consumer and mortgage borrowing (Jappelli & Pistaferri, 2002). An additional study, which could be considered to bridge the corporate finance and personal finance domains, modeled the likelihood of business-owning households borrowing from various different lenders as a function of borrowers' personal factors (including age, gender, educational attainment

and marital status, among others; Haynes & Avery, 1996). Results showed that business-owning households were more likely than non-business-owning households to borrow from a variety of sources, consistent with theoretical predictions and other empirical findings. This study was still limited, however, by its omission of individual financial preferences from the empirical model (among some other limitations).

Considering that individuals generally have choices regarding the total cost of borrowing and the period over which debt can be repaid (for example, choosing between a 15-year fixed-rate mortgage with a low interest rate and a 30-year fixed rate mortgage with a somewhat higher rate), household debt structure can be viewed through the lens of intertemporal choice. Given that liabilities represent future economic costs, individuals may frame debt classes in terms of expected losses. If so, then the magnitude of the loss expected from a given debt class may influence the degree of patience accorded to decisions when considering borrowing and repayment of debt within that class; and this may in turn influence the overall composition of structure of the debt portfolio (Hardisty et al., 2013a). Consider an individual who holds both a mortgage and a (comparatively lower) balance on a credit card. The mortgage represents a significant large future cost due to the resources that have to be given up in order to repay the loan, whereas the credit card balance is a much smaller future cost. Even though the actual cost of borrowing (i.e., the interest rate) from a line of credit may be much higher, the resources that have to be given up (i.e., the future economic cost to the individual) are likely not as great as what would be required to repay the mortgage; and as such the credit card balance may be considered a smaller loss. Empirical evidence suggests that the individual will make decisions that are relatively more present-biased when considering borrowing from and repayment of their credit card because it is a relatively smaller loss. As such, the individual would exhibit a propensity to repay their credit card early or keep a low balance (so as to resolve the liability)

whereas they would not attempt to repay the mortgage as early because it represents a larger loss and other considerations moderate the motivation to resolve the liability immediately. The magnitude of the expected loss associated with each debt class should influence financing decisions such that individuals appear to have a general preference for large long-term debt contracts (i.e., mortgages) and for maintaining low balances of consumer liabilities, all else equal. Of all capital raised from borrowing, individuals should appear to borrow a small proportion from credit lines and a much larger proportion via mortgages and non-consumer loans.

Thus, when considered as a whole, the research suggests that investment choice and debt structure are functions of expected returns, relative risk aversion, time preference, repayment terms, and other factors which influence how asset and debt classes are framed. A question which remains unanswered, however, is how household asset allocation and debt structure vary with future orientation. If it is generally present bias that motivates asset allocation and debt structure decisions, then individuals with a stronger degree of present bias should be expected to hold asset and debt portfolios which differ from those of more future oriented individuals.

Economic Theory of Self-Control

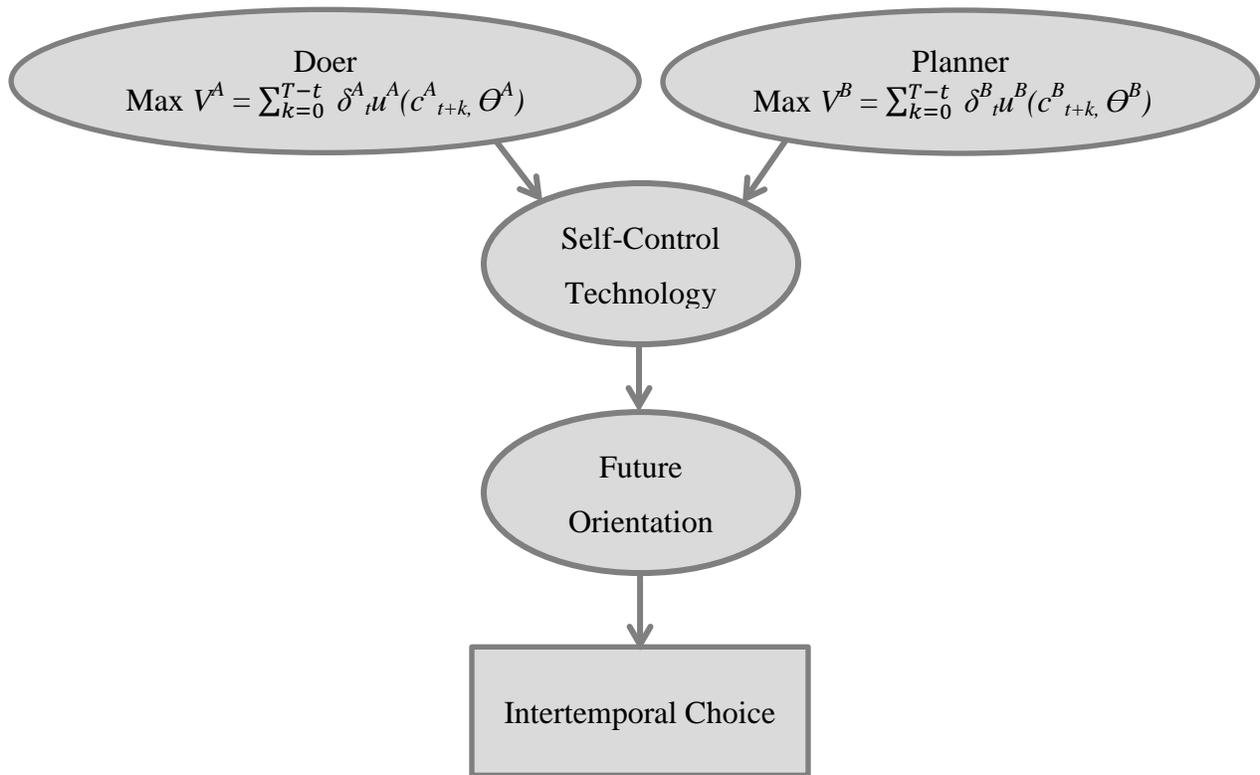
The economic theory of self-control is a behavioral theory of intertemporal choice which offers a psychological explanation for the types of anomalies which have been observed in empirical studies (Thaler & Shefrin, 1981). The theory is an adaptation of agency theory and models the individual as an organization. Intertemporal choice in discrete time is a function of conflict between two selves: a myopic “doer” and a farsighted “planner.” Theoretically, both the doer A and the planner B maximize lifetime utility V^i , where $i \in \{A, B\}$, subject to a budget constraint. Lifetime utility for both is a function of consumption c_t , time preference δ^i , and other preference parameters θ^i . (Notation is abused for presentation purposes, and δ^i here denotes the time preference of

individual i rather than the discount factor.) The doer is perfectly present-oriented, however, such that all future utility is completely discounted. The doer accordingly prefers to maximize present utility. Because $\delta^A < \delta^B$, the planner prefers to maximize intertemporal utility. This relationship is demonstrated in Figure 2.1. Conflict arises between the doer and the planner due to inconsistent utility functions. Unbounded, the doer would maximize present utility by consuming lifetime income in the current period. Consequently, the planner must employ some “psychic technology” to modify doer preferences or the budget constraint in order to maximize lifetime utility (Thaler & Shefrin, 1981, p. 395). The planner will expend effort on self-control technologies until the marginal cost of control equals the marginal benefit in increased lifetime utility. The product of this latent optimization is an effective rate of time preference, which influences an individual’s observable intertemporal choices.

Within the context of capital structure, an individual’s debt ratio is the result of the equilibrium of conflicting intertemporal motivations and will vary dependent on the amount of control the planner can apply. Theoretically, the effective rate of time preference is higher for individuals who use less self-control. With few constraints, the doer wields greater influence over intertemporal choice, which results in relatively present-oriented choices. Such individuals may be observed to accumulate debt against lifetime income and to consume assets, all in order to maximize utility (in the present). The result is a comparatively high debt ratio for present-oriented individuals. Conversely, individuals who exercise greater self-control make more future-oriented decisions. These individuals accumulate assets and use debt financing prudently for investment and consumption in order to maximize lifetime utility (including future periods), and consequently have relatively lower debt ratios.

H₁: Individual future-orientation is negatively associated with the observed debt ratio.

Figure 2.1 The Doer, The Planner, and Intertemporal Choice



Within the context of asset allocation, the liquidity of an individual's asset portfolio will vary with their degree of future orientation. Theoretically, present-oriented individuals who use relatively little self-control place few constraints on their internal doer, which leads to greater consumption and little investment in long-term assets in order to maximize utility in the present. The result is a comparatively low level of total assets with a high degree of liquidity, as most assets are held in cash or equivalents which can be more readily consumed. Conversely, individuals who utilize more self-control make more future-oriented decisions. These individuals derive comparatively more utility from future periods, and as such, they allocate a greater portion of assets to long-term investments which results in a higher level of total assets with a lower degree of liquidity.

H₂: Individual future-orientation is negatively associated with the proportion of total assets held in cash and equivalents.

Within the context of debt structure, the observations of Hardisty et al. (2013a) coupled with the economic theory of self-control suggest that the proportion of total debt which is borrowed via small contracts (e.g., lines of credit) will vary with the degree of future-orientation. Theoretically, present-oriented individuals attempt to resolve liabilities immediately, which ultimately leads them to avoid mortgage financing. By comparison, individuals who exercise greater self-control are able to make more future-oriented decisions which reduces the drive to resolve liabilities immediately, leading to a greater acceptance of mortgage debt. Thus, individuals with greater levels of future orientation are likely to report debt structures characterized by a greater proportion of debt held in mortgages.

H₃: Individual future orientation is positively associated with the proportion of mortgage debt that comprises total liabilities.

Collective Financial Decision-Making

Up to this point, and consistent with a large proportion of the literature, the discussion of household finance has been framed within the context of a unitary model. The unitary model of the household assumes that household financial behavior can be modeled by a single “well behaved utility function” (Bourguignon, Browning, & Chiappori, 2008, p. 503). In practice, unitary models typically measure financial data at the household level and personal factors at the individual level. For methodological ease, perhaps, it is often assumed that the head of the household or the financial respondent controls the finances of the household and that the financial position of the household is a function of this individual’s personal factors. For all its methodological simplicity, however, the unitary model is inherently limited in its applicability to multi-person households.

Individuals utilize a complex system of personal values and managerial behavior to allocate resources to needs and goals; and the complexity of family resource management is compounded by the addition of multiple individuals to the family system (Deacon & Firebaugh, 1988). Within the context of intertemporal choice, families face tremendous complexity in making collective intertemporal choices which satisfy all members of the household (Thaler & Shefrin, 1981). Researchers have commonly used a collective bargaining framework to model intra-household financial decisions (Britt, Huston, & Durband, 2010). Within this framework, goods can be public (i.e., for household consumption) or private (i.e., for personal consumption); individual spouses act so as to maximize their own utility; intra-household allocations are Pareto efficient (i.e., it is impossible to make one spouse better off without making the other spouse worse off); and binding agreements can be reached without transaction costs (Castilla, 2014). The household utility function (U^{HH}) in a collective bargaining system is weighted sum of each member's utility, commonly modeled as shown in Equation 2.2 (Britt et al., 2010).

$$U^{HH} = \mu u^A(V^A) + (1-\mu)u^B(V^B) \quad (2.2)$$

Each spouse A and B maximizes their utility u derived from a combination of private and public consumption V subject to personal preferences and the collective budget constraint. The bargaining power of spouse A is μ such that $\mu \in [0, 1]$ and the bargaining power of spouse B is equal to $(1 - \mu)$. Spousal bargaining power represents the percentage of total control each spouse is able to exercise over intra-household resource allocation. Bargaining power is dependent upon each spouse's ability to threaten the other with an undesired outcome, and the outcome the spouses face if they fail to reach an agreement (Pollak, 2007). In the divorce-threat class of bargaining games, power is function of each spouse's competitiveness on the marriage market. Theoretically, income, education, and age are

all factors which may influence each spouse's wellbeing after divorce, and thus influence bargaining power (Kenney, 2006; Britt et al., 2010).

Empirical evidence has generally supported the collective bargaining model of intra-household allocations in a single period (Britt et al., 2010; Schaner, 2015). Francois, Helene, and Astrid (2009) found evidence of both cooperative and strategic behavior between spouses in a nonrandom sample of French heterosexual couples. Participants participated in five experiments in order to explore cooperative behavior between strangers and spouses in different information conditions; as well as a survey to explore the influence of demographic and psychological characteristics on cooperative behavior. Generally, the results suggested that when spouses communicate, "behavior is honest and spouses show a strong preference for either an efficient outcome or equal outcome" (Francois et al., 2009, p. 17).

While evidence suggests that couples may, under certain conditions, cooperate to achieve efficient outcomes, more recent studies have tested the assumptions of the collective bargaining model of the household. Evidence suggests that couples may, at times, engage in opportunistic behavior (Francois et al., 2009). Jackson and Yariv (2011) examined the preference aggregation assumptions of the collective bargaining model, and demonstrated that "any time-consistent aggregation rule that satisfies [the restriction of Pareto efficiency] must be dictatorial, i.e., it must track the preferences of only one of the group's members" (p. 3). Therefore, heterogeneity in time preference within a society necessarily implies that there must be a trade-off between time-consistency, Pareto efficiency, and non-dictatorial decision-making.

Schaner (2015) followed a similar theoretical method to demonstrate that while households may allocate resources efficiently in a single time period, differences in time preference between spouses makes it difficult for households to achieve efficient intertemporal allocations. The

theoretical predictions of a collective intertemporal choice model were tested experimentally in a sample comprised of couples from Western Province, Kenya. Consistent with theoretical predictions and prior studies, strategic behavior via use of separate accounts increased with preference heterogeneity between spouses (Schaner, 2015). The results suggested that patient spouses utilized private accounts to withhold funds from their less-patient partners; even when a joint account offered a higher return.

Theoretical work suggests that households can only achieve efficient intertemporal allocations when all members of the household have the same preferences, or when household decisions are dictated by a single member (Jackson & Yariv, 2011; Schaner, 2015). It seems unlikely that any two individuals would have equivalent preferences; however it is plausible that household financial decisions could be dictated by a single partner. Historically, as viewed from within the feminist philosophical perspective, men controlled household resource allocations via centralized control, separate accounts, and an allowance system (Kenney, 2006). Kenney suggested that intra-household control, accounting and allocative systems have evolved over time in response to demands for gender equality. Households developed the use of pooled accounts, but men continued to dominate financial decision-making. Women began keeping their own accounts in order to increase their bargaining power over household resources. Thus, a combination of physical control mechanisms (i.e., the degree to which resources are separated) and management roles (i.e., the degree to spouses jointly or separately make allocative decisions) constitute a typology of intra-household governance (Kenney, 2006).

Other studies which have examined household financial management roles have typically done so within frameworks adapted from the corporate literature (i.e., agency theory; Bertaut, Haliassos, & Reiter, 2008). Within the corporate context, collective decision-making has been

explored through the lens of organizational behavior and leadership orientation. Generally, firms with high Power Distance (i.e., separation between managers and employees in decision-making authority) tend to be characterized by centralized management structures and dictatorial decision-making processes. Consistent with the theoretical predictions of collective intertemporal utility models, evidence suggests that firms with well-defined and enforced manager-subordinate relationships negatively influence the leverage ratio, all else equal (Lam, Zhang, & Lee, 2013). Within a behaviorally-informed interpretation of the collective model of intertemporal utility, organizational norms characterized by high Power Distance allow managers to make comparatively efficient allocations via dictatorial control.

Even when presented with the opportunity, not all managers exercise authoritarian decision-making. Within a delegation framework, the degree to which managers retain decision authority is a function of information needs and search costs (Graham, Harvey, & Puri, 2015). When managers have an informational advantage (e.g., the manager feels confident in their personal knowledge and ability to make a decision in a given policy area) they are less likely to delegate. Conversely, when managers require additional information to make a decision (such as in large or complex organizations where information is widely dispersed) they must incur search costs to obtain the information directly, and it may be more beneficial to delegate to subordinate managers with the requisite knowledge.

Graham et al. (2015) conducted one of the few empirical studies to explore collective aspects of decision-making within the corporate setting utilizing a sample drawn from chief executive officers (CEOs) and chief financial officers (CFOs) of companies in the United States, Asia, and Europe. The results were consistent with the predictions of the theory of delegation: personal characteristics, decision area (as a proxy for self-efficacy) both influenced the degree to which

authority was delegated. The researchers also found that managers employed various decision rules for the delegation of capital and authority, including some which emphasized the subjective reputation (i.e., social capital) of subordinate managers (Oh & Bush, 2014). The determination of policies and procedures for delegating authority to agents is typically the subject of governance.

Governance and Capital Structure

Governance broadly refers to the policies and procedures which regulate an economic entity's consumption of resources. All entities are subject to some form of governance, from entrepreneurs who are subject to debt covenants, to publicly traded corporations which are subject to the oversight of shareholders via a board of directors. The majority of governance research has focused on the publicly traded corporation (Greenwood & Empson, 2003). Within the corporate context, governance mechanisms are implemented in order to provide confidence to external suppliers of capital, who wish to be assured of a return on their investment (Lampel, Bhalla, & Jha, 2014).

Agency theory remains one of the dominant theories of corporate governance and has important implications for capital structure (Jensen & Meckling, 1976; Raelin & Bondy, 2013). Principals (i.e., owners) demand a return on investment and agents (i.e., managers) theoretically meet this demand by maximizing profits. The principal-agent problem naturally arises, however, due to the fact that owners and managers are unlikely to have uniform utility functions. Agents with dissimilar preferences may be motivated to act in their own interests rather than in the interests of principals. The prescribed solution to this problem typically entails some modification of agents' preferences via incentives and controls in order to align the utility curves of agents with those of principals (Shleifer & Vishny, 1997).

Various governance mechanisms, including the very structure of the organization, may be used in order to align the incentives of agents with those of principals. Hierarchical structures, power

concentration, formalization, financial incentives, and performance monitoring are examples of governance mechanisms which are meant to prevent agents from appropriating firm resources (Andrews, 2010). Internal controls, for example, are meant to discourage and prevent agents from stealing firm resources to maximize their own utility. The firm's capital structure not only reflects the agency costs principals are willing to incur, but may also serve as a governance mechanism itself.

In a wholly-owned firm, the owner-manager makes decisions which maximize his utility. As additional capital is acquired through the sale of equity, the owner-manager's claims to firm assets and future profits is reduced; and the more likely it becomes that the owner-manager will appropriate firm resources to maximize his own utility at the expense of external equity-holders. Consequently, external shareholders become more willing to incur monitoring costs (e.g., auditing, formal control systems, budget encumbrances, and incentive structures) payable from the firm's wealth in order to limit the degree to which the owner-manager can act in his own self-interest (Jensen & Meckling, 1976). This is the agency cost of equity.

The agency costs of debt include the incentive effects of leverage, monitoring costs of lenders, and bankruptcy costs (Jensen & Meckling, 1978). The incentive effect refers to the phenomenon that large corporations are not financed exclusively with debt because such an arrangement would result in a moral hazard: the owner-manager would have an incentive to accept undue risks. In such a situation, the owner-manager realizes the majority of benefits from a risky venture. If it fails, the creditor may realize a substantial loss. Thus, not only do creditors limit the amount they are willing to lend, but they may also impose limitations on borrowers in order to protect their investment. The costs of writing, monitoring, and enforcing such covenants constitute the monitoring costs of debt, which are born by the borrower to the extent that such costs are incorporated into the price of debt.

Given a situation where an owner-manager has determined that external capital is required, an increase in debt financing reduces the amount of capital required from external equity, and thus reduces the agency costs of equity. Each unit increase of debt also increases the agency costs of debt. Thus, agency theory predicts that principals finance operations and investment with a combination of equity and debt in order to minimize agency costs (Jensen & Meckling, 1978). Despite its prominence, agency theory has faced considerable scrutiny over the past several years (Zeitoun, Osterloh, & Frey, 2014).

Some have suggested that agency theory is limited in its applicability to entities which lack clear distinctions between ownership and control (Cunha et al., 2006). Professional partnerships, nonprofit organizations, and households are some economic entities characterized by ambiguous distinctions between principals and agents (Greenwood & Empson, 2003; Van Puyvelde, Caers, Du Bois, & Jegers, 2012; Lampel et al., 2014). Partnerships are comprised of multiple owner-managers in which principals function as agents of the other principals. Internal monitoring costs are incurred as each principal would like to be assured that the other partners act in accordance with agreed-upon objectives (Greenwood & Empson, 2003). The close proximity of a small group of partners reduces agency costs and results in greater efficiency compared to large partnerships and publicly-traded corporations with dispersed ownership. Empirical research is needed to test this theoretical assertion. Employee-owned businesses are characterized by similarly ambiguous principal-agent relationships, and research suggests that employee-owned businesses in which employees participate in decision-making experience better performance than non-employee-owned business (Lampel et al., 2014).

Other researchers have asserted that agency theory implies that principals and agents have inherently conflicting goals, which may not necessarily be the case (Van Puyvelde et al., 2012). Stakeholder and stewardship theories have been suggested as a supplements in order to explain

managerial decision-making in cases where, perhaps due to self-selection (such as when volunteering for a non-profit organization), agents are actually motivated to act in the interest of principals. In cases where principals (e.g., a non-profit board of directors) anticipate that agents will act in the interests of the organization, principals are expected to accept only a low amount of internal agency costs – the benefits simply will not outweigh the costs (Van Puyvelde et al., 2012). Additional empirical evidence is needed to test this assertion.

Evidence suggests that internal social capital may also influence collaborative governance and financial performance. Oh and Bush (2014) proposed a framework for dynamic collaborative governance “in which forms of social capital have a cyclical and snowballing effect on initiating, facilitating, and developing collaborative governance” (p. 9). The structural, cognitive, and relational dimensions of social capital develop through three-phase process. For example, trust develops into cultural norms and shared values through a process of building reciprocity and shared understandings (Oh & Bush, 2014). Within a principal-agent framework social capital reduces the need for monitoring, which allows managers to reallocate resources to more productive activities. Consistent with this framework, Andrews (2010) found that shared values and trust between organizational members positively influenced organizational performance in a sample of English local-level governments. Financial performance was not objectively tested in the study, however, and so research is still needed to test the influence of social capital on capital structure within a collaborative decision-making framework.

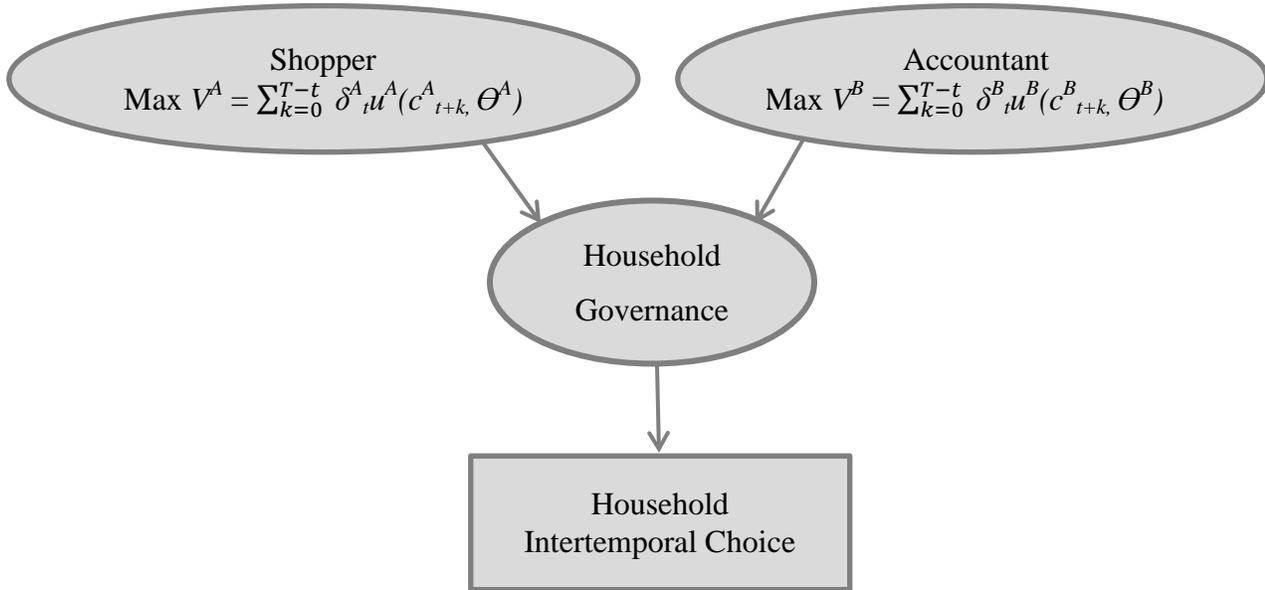
Household Governance Framework

While households lack the complexity of external equity financing which characterizes publicly traded corporations, they may be marked by similar agency problems typical of other non-public entities (e.g., professional partnerships, employee-owned businesses, and non-profit

organizations; Greenwood & Empson, 2003; Jackson & Yariv, 2011; Van Puyvelde et al., 2012; Lampel et al., 2014). Agency theory has been adapted by some researchers in order to explain the influence of divergent interests on household financial behaviors. Within one adaptation, which is analogous to the economic theory of self-control, a two-person household is comprised of a farsighted “accountant” and a myopic “shopper” (Thaler & Shefrin, 1981; Bertaut et al., 2008). Within this framework, household member i , where $i \in \{A, B\}$, acts so as to maximize their own intertemporal utility V^i from lifetime consumption $\sum_{k=0}^{T-t} c^i_{t+k}$ subject to their personal discount factor δ^i , other personal preferences θ^i , and budget constraints.

The household’s intertemporal choice in discrete time is a function of household members’ preferences. While the shopper-accountant model was originally conceived with the form that $\delta^A < \delta^B$, it is potentially more instructive to first consider the case where spousal time preferences are relatively homogeneous, if not equal. Two present-oriented spouses will each prefer to bring resources forward in time via borrowing, whereas two future-oriented spouses will prefer to save resources for future periods. Likewise, two spouses with relatively moderate patience would be expected to agree on a combination of saving and borrowing. When spouses exert equal influence on intertemporal choice, the household debt ratio is likely to be negatively influenced by household future-orientation (i.e., the sum of spousal future-orientation; Jackson & Yariv, 2011).

Figure 2.2 The Shopper, The Accountant, and Household Intertemporal Choice



Evidence suggests that spousal preferences are rarely given equal weight in decision-making (Britt et al., 2010; Castilla, 2014; Kenney, 2006); instead, each spouse’s ability to influence household financial outcomes is dependent on their share of bargaining power (Pollak, 2007). When bargaining power is unequal, one spouse can threaten more severe consequences against the other in order to wield greater influence over collective decisions. Thus, the household debt ratio is likely to reflect the preferences of the spouse with the most bargaining power.

H₄: The bargaining power of the shopper moderates the influence of the accountant’s future-orientation on the household debt ratio.

It is also unlikely that spousal preferences are completely homogenous – one is likely to be at least somewhat more patient than the other. Within the present framework, an unbounded shopper would generally prefer to maximize utility V^A by consuming resources in the present and would incur debt in order to move resources forward in time. Conversely, an unbounded accountant would prefer to delay consumption to future periods and would minimize debt (to reduce future fixed expenses)

and engage in saving and investment. In such cases, individual spouses may benefit from collaborative and/or strategic behavior in order to modify the preferences or budget constraint of their partner (Thaler & Shefrin, 1981; Shleifer & Vishny, 1997; Francois et al., 2009). The mechanisms by which members assure themselves that resources will not be appropriated by their partner (beyond some acceptable degree of risk) constitute household governance.

Evidence suggests that the principal elements of a household governance structure are the household accounting and management systems (Kenney, 2006; Schaner, 2015). Keeping separate accounts enables household members to withhold resources from the control of their partner. Similarly, centralized management enables one spouse to monitor the financial behavior of their partner. More specifically, centralized governance theoretically reduces the influence of the weaker spouse and strengthens the influence of the dominant spouse. Thus, governance mechanisms moderate each spouse's ability to act in accordance with their own preferences to the detriment of their partner.

H₅: Centralized governance moderates the influence the accountant's future-orientation on the household debt ratio.

H₆: Keeping separate accounts moderates the influence of each the accountant's future-orientation on the household debt ratio.

Bargaining power is likely to influence household governance. All else equal, spouses with greater bargaining power are likely to prefer retaining centralized control over resources in order to monitor their partner. Both the dominant and less dominant spouse are likely to prefer the use of separate accounts in order to withhold resources from each other. Conversely, when spouses have equal bargaining power they are more likely to retain control over their own finances; and more

likely to keep resources pooled. Heterogeneity in bargaining power is likely to increase centralized household governance and use of separate accounts.

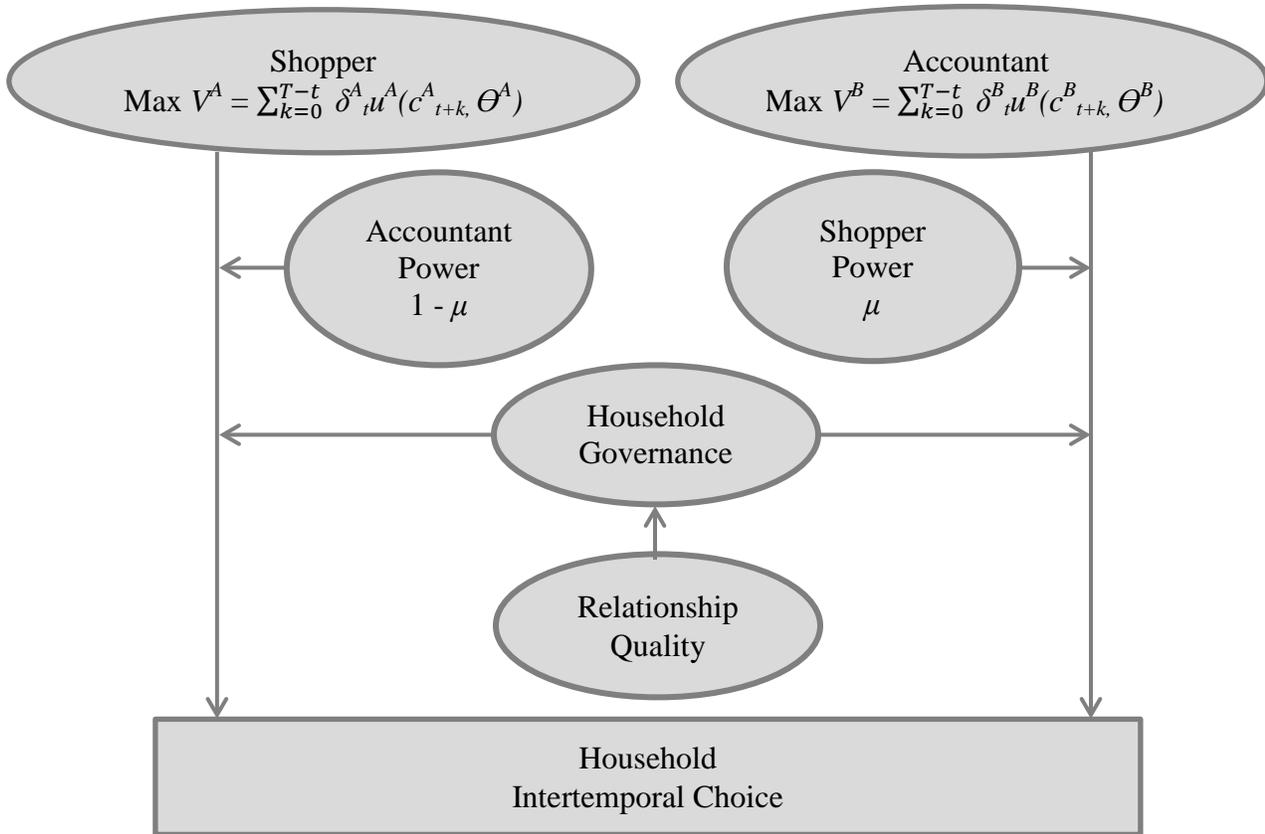
Within the classical economic framework, each spouse will expend effort on monitoring their partner or diverting resources to themselves until the marginal costs equal the marginal benefits (Schaner, 2015). When spousal time preferences are homogeneous, intertemporal incentives are well aligned. In such cases, each spouse would realize few benefits from expending effort on monitoring their partner's financial behavior; or from keeping separate accounts. As the heterogeneity in spousal time preferences increases, however, so do the benefits of centralized governance (by the dominant spouse) and separate accounting. For example, holding bargaining power constant, an increase in the shopper's present-orientation increases the likelihood household will finance consumption with debt (Jackson & Yariv, 2011). Both spouses would then prefer to keep and manage separate accounts in order to have some assurance of being able to maximize their individual utility (Kenney, 2006; Schaner, 2015).

Empirical evidence from both the household and corporate literature suggests that information sharing and collaboration improve performance (Francois et al., 2009; Lampel et al., 2014). Theoretically, positive interpersonal relationships and engagement in the decision-making process influence the development of trust and shared social norms (Lampel et al., 2014). In effect, positive relationships and trust harmonize preferential differences between spouses. When spouses collaboratively make financial decisions, are committed to the agreement, and have confidence that their partner will abide by the agreement, the benefits of monitoring and keeping separate accounts are greatly reduced. As relationship quality improves, the need for keeping separate accounts and for managing resources separately is diminished.

H₇: Relationship quality reduces the likelihood of centralized governance.

H₈: Relationship quality reduces the likelihood of keeping separate accounts.

Figure 2.3 Comprehensive Household Governance Framework



Summary

Households depend on the allocation of limited resources for survival. Resilience is required to absorb financial shocks and adapt to volatile economic conditions (O'Neill & Xiao, 2011). Solvency is one component of resilience and a product of household capital structure. While several studies have explored factors related to saving and consumption behavior, few have explored household finances through the lens of capital structure. An inherent limitation when applying theories of corporate finance to the household is that the corporation, inasmuch as it is treated as a legal person, is not considered to behave according to a utility function. As a result, the corporate literature is largely silent regarding the influence of personal preferences and perceptions on financial

decision-making. Evidence from the microeconomic and personal financial planning domains suggests, however, that household capital structure is the product of intertemporal choices which result from cognitive processes. The application of self-control technologies produce some level of individual time preference (i.e., present-orientation or future-orientation) which influences the ratio of total debt to total assets, the choice of which assets in which to invest, and the choice of financing. Evidence suggests that households comprised of multiple individuals employ various mechanisms to aid collective decision-making; and that the structure and effectiveness of these governance mechanisms are influenced by the household governance environment.

Chapter 3 – Methods

The complex nature of the analyses undertaken in this dissertation required that the study be organized in two parts. The first part assumed a unitary model of the household as a first step toward exploring the influence of individual future orientation on household capital structure. The second part assumed a collective model of the household in order to explore the influence of individual preferences on household capital structure when the household is comprised of two individuals.

Survey Description

This dissertation utilized samples extracted from the 22nd wave of the *De Nederlandsche Bank* (DNB) Household Survey (DHS). The DHS is a longitudinal panel study which has been administered by CentERdata annually since 1993 via the internet. The DHS is designed to be a nationally representative survey of the Dutch-speaking population in the Netherlands. A brief note is warranted regarding the reason a Dutch data set was chosen for this research. The research questions formulated for this dissertation required the availability of detailed household financial data including the composition of assets and liabilities. Additionally, a psychometrically-validated measure of future orientation was desired – not simply proxy questions such as the degree to which an individual smokes or engages in other types of supposedly short-sighted behaviors. Finally, analyses of the research questions in Part Two of this dissertation required complete individual responses for multiple members within each household. After reviewing several data sets, principally of households from the United States, it was determined that the DHS best met the requirements for the present analyses. This, of course, limits the generalizability of the present findings to the Dutch-speaking population in the Netherlands; but it also creates an opportunity for future cross-cultural comparisons between the way Dutch and U.S. households vary in their propensities to use financial leverage.

The demographic characteristics of the DHS panel generally conform to the official population statistics reported by CBS with some exceptions (Teppa & Vis, 2012). Working in collaboration with Statistics Netherlands (CBS), the initial respondents were selected via random digit dialing. At the time, approximately 99% of Dutch households had a fixed phone line. Contact persons were sent to the homes of respondents, conducted an initial survey of household characteristics, and asked respondents if they would like to participate in a longitudinal study. If respondents refused to participate, the contact person was instructed to visit the neighboring household and repeat the same procedure (i.e., random walk method; Teppa & Vis, 2012). Responses for agreeing households were stored in a master database from which the first panel was selected.

Participants in the first wave were provided with the technology required (i.e., a basic computer and modem) to complete the survey and transmit their responses to a central computer terminal located at the University of Amsterdam. All members of the household over the age of 16 responded to a series of questionnaires. Novel incentives are offered to encourage continued participation in the survey. Respondents earn CentERpoints based on the number of completed questionnaires and continuation in the panel. Every three months, CentERpoints may be paid to the participant in cash, or donated to a charity or state lottery of the participant's choice. Over time, some households have attrited from the study and new households with the same characteristics (e.g., region, age, household composition, urbanization, and household income) have been randomly sampled from the master database for inclusion in the study. An analysis of the number and characteristics of the households that have attrited from the study was outside the scope of this dissertation; however, several studies have documented the attrition of hundreds of households from the study within a short period of time (e.g., see Van der Crujisen, de Haan, & Jansen, 2016). Teppa and Vis (2012) completed the most comprehensive analysis and discussion of DHS methods and

sample characteristics, and reported that only 1.4% of the 2009 panel (i.e., 26 households) was comprised of original study participants from 1990 (the researchers included the predecessor to the present DHS in their analysis of the data set).

Changes in technology and fixed phone penetration rates have necessitated changes in methods. New recruits are selected from a random national sample of private postal addresses. Those with associated fixed phone numbers were contacted by phone; those without were contacted by mail. Additionally, the central terminal was moved to the University of Tilburg. Otherwise, the original methods described above have remained generally unchanged. The 22nd wave of the DHS consisted of six questionnaires, and data was collected from 5,120 individuals over the age of 16 within 2,072 households between April and December 2014. The questionnaires included items regarding the general information of the household, occupation and employment, housing and mortgages, health and income, assets and liabilities, and economic and psychological concepts. The assets and liabilities questionnaire collected detailed information on respondents' financial position. For example, respondents were asked to indicate the value of 27 different asset accounts ranging in liquidity from checking accounts to business equity.

Part One

Sample Description

The first analyses of this dissertation utilized a subsample of household financial respondents extracted from the 22nd wave of the *De Nederlandsche Bank* (DNB) Household Survey (DHS). Observations were limited to the financial respondent for each household, consistent with the assumptions of the unitary model of the household, resulting in a sample of $n = 2,072$ household financial respondents. Listwise deletion was used to omit incomplete observations (i.e., those with missing responses to any of the independent variables under observation). This resulted in a sample

of $n = 1,309$ financial respondents that had completed all the items measured in this study. The distribution of household debt ratios was then analyzed and extreme observations (i.e., those in the top 5th percentile) were omitted, resulting in a sample of $n = 1,244$ household financial respondents (Cunha et al., 2006)¹. Standard diagnostic tests were then conducted to identify and remove outliers in order help satisfy the distributional assumptions required by the analytical techniques used in this part of the dissertation (Regression with SAS, 2015). The final sample was comprised of $n = 824$ individual household financial respondents.

Empirical Models and Variable Measurement

The first analysis of part one explored the influence of individual future orientation on household capital structure as indicated by the debt ratio. Within a unitary model of the household, the debt ratio of household j is a function of the household financial respondent's i future orientation and various other personal and household factors which have been shown to influence both saving and borrowing. This empirical model is formally stated in Equation 3.1. The term $\mathbf{X}_{i,j}$ is a vector of control variables for demographic and economic characteristics.

¹ Post-hoc analyses were completed to analyze the impact of following this procedure to omit extreme observations. The first empirical model was tested with the full sample of $n = 1,309$ respondents, and again omitting the top percentile for a sample of $n = 1,296$ respondents. In both cases, OLS regression results – Tobit regression could not be used due to significant heteroscedasticity – indicated that the model explained little of the observed variance in the household debt ratio. When the model was tested with the sample of $n = 1,244$ respondents from omitting the top 5th percentile of observations in the household debt ratio, OLS regression results indicated that errors were still heteroscedastic, but the model showed greatly improved fit $R^2 = .52$, $F(28, 1,215) = 48.28$, $p < .001$, and future orientation had a small positive influence on the debt ratio $b = .002$, $t(1,215) = 2.61$, $p < .01$.

$$Debt\ ratio_j = \alpha_i + \beta_1 future\ orientation_i + \beta_n X_{i,j} + \varepsilon_j \quad (3.1)$$

where $X_{i,j} = (risk\ tolerance, future\ expectations, lifecycle\ status, sex, marital\ status, education, financial\ knowledge, household\ size, household\ income, household\ net\ worth, asset\ tangibility)$

The relationship between future orientation and the proportion of household financial assets held in cash was explored using the full multivariate model shown in Equation 3.2. The variable *cash ratio_j* is the ratio of cash and equivalents divided by total financial assets reported by household *j*. The term $Z_{i,j}$ is a vector of control variables for demographic and economic characteristics which is equivalent to $X_{i,j}$ except for the omission of asset tangibility. Asset tangibility was omitted from the model to avoid predicting a share of the asset portfolio with another share of the asset portfolio.

$$Cash\ ratio_j = \alpha + \beta_2 future\ orientation_i + \beta_n Z_{i,j} + \varepsilon_i \quad (3.2)$$

where $Z_{i,j} = (risk\ tolerance, future\ expectations, lifecycle\ status, sex, marital\ status, education, financial\ knowledge, household\ size, household\ income, household\ net\ worth)$

The relationship between future orientation and the proportion of total household debt obtained via mortgage contracts was explored using the full multivariate model shown in Equation 3.3. The variable *mortgage debt ratio_j* is the ratio of mortgage and non-consumer debt divided by total debt reported by household *j*.

$$Mortgage\ debt\ ratio_j = \alpha + \beta_3 future\ orientation_i + \beta_n X_{i,j} + \varepsilon_i \quad (3.3)$$

The vector $X_{i,j}$ was used in this empirical model in order to control for the influence of asset tangibility on the mortgage debt ratio, given that such assets may be seen as a substantial source of collateral. The method for measuring each of these factors is discussed in the following subsections.

Dependent Variables

The debt ratio represents the proportion of balance sheet assets (which does not include a value for the intangible asset of human capital) financed with debt, and was calculated by dividing total household liabilities by total household assets. The DHS collected individual-level data from each member of the household, necessitating the construction of household-level financial data. This was accomplished by summing all intra-household responses for each financial item. The underlying assumption within the unitary model of the household is that household financial decisions are made by a single household financial respondent, such that household-level financial characteristics are a function of the individual household financial respondent's personal preferences and other characteristics. The value of total household assets was measured as the continuous sum of 27 household-level asset categories. The value of total household liabilities was measured as the continuous sum of 10 household-level liability categories. Missing observations for asset and liability categories were interpreted as €0 observations. Additionally, when calculating the debt ratio €0.01 was added to total assets in order to prevent undefined calculations (which could result from having a 0 in the denominator), and €0.01 was also added to total liabilities to keep the accounting equation in balance.

The cash ratio was calculated by dividing cash and equivalents by the value of total assets. Cash and equivalents were calculated as the sum of each household's positive balance in checking accounts (negative balances were treated as a liability), balances in savings accounts, and balances in deposit books. The mortgage debt ratio was calculated by dividing mortgage debt by the value of total debt. Mortgage debt was calculated as the sum of mortgages on real estate, other (non-consumer) loans, and study loans.

Independent Variables

Future-orientation was measured by an adaptation of the consideration of future consequences (CFC) scale (Webley & Nyhus, 2006). In the DHS version of the scale, respondents were asked to indicate the degree to which they agree with 12 statements regarding their disposition toward thinking about future consequences on a scale from 1 (extremely uncharacteristic) to 7 (extremely characteristic). Responses to the 12 items were added to form a summative scale measured continuously. Respondents completed the measure during only one year of their participation in the study. In cases where respondents did not complete the measurement during their participation in the 22nd wave of the study, their responses from a previous wave were used, if available. The Cronbach's alpha for the scale was $\alpha = .74$.

Risk tolerance and attitude towards saving have also been shown to influence intertemporal choices. Respondents were asked to indicate their agreement with six statements regarding their attitudes toward risk in a financial context on a scale from 1 (extremely uncharacteristic) to 7 (extremely characteristic; Kapteyn & Teppa, 2011). The Cronbach's alpha for the scale in this sample was $\alpha = .64$, indicating a relatively low level of internal consistency. A decision-maker's economic expectations for the future may also influence the degree to which they believe it makes sense to borrow or save. Respondents' future expectations were measured by a single item which asked respondents to predict their household economic situation in five years on a scale from 1 (much worse) to 5 (much better).

Lifecycle status was measured by two variables: the age of the respondent and their employment status. The age of each respondent was calculated by subtracting their reported birth year from the year in which the wave was administered (i.e., 2014). Only respondents age 16 and over were included in the sample, and age was measured categorically with six categories. The reference group was formed by respondents age 16 to 34, and other categories were formed in 10-

year intervals. The sixth category included all respondents age 75 and above. Employment status was measured by a single dichotomous variable to indicate whether or not respondents were actively employed; and unemployed individuals formed the reference group.

Sex was measured as a dichotomous variable (i.e., male or female) and females formed the reference group. Marital status was measured categorically. Respondents who report being either married or in a registered partnership formed the first group. A registered partnership in the Netherlands is a legal arrangement which confers upon the parties of the partnership many of the same benefits as marriage, with fewer administrative requirements, the possibility for different treatment of property rights, and generally fewer requirements for dissolution compared to divorce (Den Haag, 2016; Goosens, 2016). Those who reported living with a partner but not married formed the second group. The final category was formed by respondents who reported being single, divorced from spouse, widowed, or never married. These respondents were grouped into one category of single respondents in order to control for the different levels of efficiency in household production that married, cohabitating and single households may enjoy. Single respondents formed the reference group.

Household size has been shown to influence capital structure, but has received different treatment in the literature. In the corporate literature firm size is measured by the logarithm of total assets, whereas in the personal finance literature size is measured by the number of individuals within the household (Cunha et al., 2006). In this dissertation, household size was measured using the number of household members. This was done to remain consistent with the existing personal finance literature and to avoid potential multicollinearity with other financial independent variables. The DHS asks respondents to report the number of household members, from 0 to 9 or more, and is treated as a continuous variable.

Education represents an intangible asset not listed on the balance sheet, but nonetheless affects a respondent's earning capacity in the labor market; and may also influence the household's capital requirements. The DHS measured educational attainment with nine categories. It was necessary in the present study to collapse some of these categories due to insufficient observations for some categories. Thus, in the present study educational attainment was measured categorically with three categories: up to secondary education, up to vocational college, and up to university education. Respondents who completed up to a university education formed the reference group. Subjective financial knowledge was measured by a single item which asked respondents to rate their knowledge with respect to financial matters on a scale from 1 (not knowledgeable) to 4 (very knowledgeable), and was treated as a continuous variable.

Prior research has demonstrated that it is important to control for income and net worth when using financial ratios in econometric models (Garrett, 2012). Using a sample of 29,496 Korean households extracted from the 1996 National Survey of Family Income and Expenditures in Korea, Moon, Yuh, and Hanna (2002) showed that income positively influenced whether or not Korean households met solvency ratio guidelines, and that the relationship was nonlinear. This suggests that it is important to control for the influence of household income on the household capital structure. Additionally, Bieker (2011) found that income and net worth were uncorrelated with the household debt ratio, suggesting that this financial ratio is "different from and independent of the level of household income and wealth" (p. 13). Indeed, this difference was discussed and demonstrated in mathematical terms previously in this dissertation. This suggests that it is necessary to control for net worth when modeling the debt ratio, otherwise regression results may be subject to unobserved bias

(Garrett, 2012). Controlling for net worth essentially holds the household accounting equation constant which enables specific and meaningful interpretation and discussion of the results.²

Household net income is analogous to the gross revenue earned by a firm, and households with more income may be better positioned to finance investment and consumption with internal financing rather than through borrowing. The DHS calculates net income at the individual level based on reported individual gross income, tax deductions and tax credits, and other economic transactions such as parental support given or received. Household net income was calculated during data preparation as the sum of net income for all members of the household, resulting in a continuous measure of household net income. Household net income was then measured categorically by four categories: households with income from €0 to €10,000; those with income from €10,001 to €30,000; those with income from €30,001 to €50,000; and households with income greater than €50,000.

The accounting equation specifies that net worth or household equity is the residual value of assets after all liabilities have been satisfied, and represents the household's ownership interest in the assets. As with net income, households with relatively more equity may be better positioned to finance investment or consumption with retained earnings (i.e., household equity) rather than with debt. It is worth noting briefly that although both the household debt ratio and net worth may be computed from assets and liabilities, they are distinctly different financial constructs. This is easily demonstrated mathematically. Assume, for example, that a household has accumulated \$1,000 in assets through precautionary saving and holds \$0 in debt: the household's net worth is \$1,000. A

² Post-hoc analyses were completed by stratifying the sample into net worth terciles and testing the first empirical model, without net worth, using OLS regression. Future orientation was not statistically significant in these analyses, but results suggested that the explanatory power of the model varied with net worth. The model had the greatest explanatory power within the first stratum with the lowest net worth, $R^2 = .94$, $F(17, 254) = 259.90$, $p < .001$, but explained little of the variance in observed household debt ratios within the stratum of high net worth households, $R^2 = .10$, $F(17, 262) = 2.92$, $p < .001$.

different household may hold \$2,000 in assets and \$1,000 in debt and accordingly also have a net worth of \$1,000. Both households exhibit the same net worth but use debt very differently: the former exhibits a debt ratio of 0 and the latter a debt ratio of 0.5. When the debt ratio is modeled without controlling for net worth, it is not possible to accurately interpret estimated beta coefficients: a positive coefficient could suggest that a household adds debt to the capital structure per unit of assets; but could also indicate an increase to both debt and assets. It is because there are multiple ways to change the debt ratio that a control must be included in order to facilitate a specific and accurate interpretation of regression results. Previous studies have used net worth as a control variable when modeling the debt ratio, which was the method adopted for the present study. Net worth was first measured continuously by subtracting total liabilities from total assets. Next, net worth was measured categorically by quartile in order to mitigate the challenges of dealing with observations of negative net worth and bimodal distributions. The lowest quartile of net worth was used as the reference group.

Previous studies have shown that it is important to control for asset tangibility when modeling the household debt ratio (Cunha et al., 2006). Individuals may choose to finance tangible assets with debt expecting that the increased risk of financial distress could be offset, to a degree, by the expected liquidation value of the assets in tangible asset markets (Myers, 1984). As such, individuals who weight their total asset portfolio with a relatively greater proportion of investment in fixed assets may be more disposed to utilize financial leverage. It is therefore important to control for this motivation to use leverage when analyzing the influence of future orientation as a motivation to use leverage. Asset tangibility was first measured as the continuous proportion of fixed assets which comprise total assets, ranging from 0 to 1. Quartiles of the asset tangibility ratio were then calculated in order to measure asset tangibility categorically, and the lowest quartile was used as the reference group.

Analytical Methods

The dependent variable for the first analysis was the household debt ratio, which was measured continuously. Despite the prevalent use of ordinary least squares (OLS) regression to model continuous dependent variables, some researchers have recently called its use into question when applied to financial ratios. This is because financial ratios are typically bounded at one or more points, and as such, the use of OLS regression can produce biased estimates of beta coefficients as errors are clustered around the bounded values (Ramalho & da Silva, 2013). Tobit regression was developed as a method of modeling a continuous dependent variable with censored values, and some researchers have employed this method when modeling financial ratios (Cuha et al., 2006). However, the use of Tobit regression requires a nuanced interpretation which has not often been made apparent by researchers in its application to financial ratios. When modeling the debt ratio y of household j , Tobit regression assumes that the debt ratio is indicative of an underlying latent variable y_j^* which takes observable values as shown in Equation 3.4 (Tobin, 1958).

$$y_j = \begin{cases} y_j^* & \text{if } y_j^* > 0 \\ 0 & \text{if } y_j^* \leq 0 \end{cases} \quad (3.4)$$

Tobit regression uses the maximum likelihood method to estimate the influence of each independent variable on the latent variable y_j^* , not on the observable debt ratio y_j . Given the precedent set by the current literature, the empirical model shown in Equation 3.1 was modeled using Tobit regression, but care was given to interpret the results in a manner consistent with this analytical method. The latent variable underlying the observed debt ratio could be thought of as a tolerance for the risk of insolvency (since the risk of insolvency increase as the debt ratio increases), or as the propensity to use leverage. The results of this dissertation are discussed in terms of the latter. Additionally, a hierarchical approach was used – beginning with personal factors, adding demographic and lifestyle variables, and then adding financial variables – in order to better observe

the incremental improvements in model fit from controlling for different influences on the household debt ratio, as documented in the literature.

The dependent variable for the second analysis was the continuous ratio of cash and equivalents divided by total assets, bounded between 0 and 1. The ratio of cash and equivalents to total assets was first modeled using OLS regression. Diagnostic tests indicated that the residuals exhibited left-skewness and failed to meet the assumption of normality. These findings were consistent with expectations and supported the use of fractional logistic regression to analyze the model (Liu & Xin, 2014). Fractional logistic regression is a preferred analytical method when modeling bounded proportions because parameters are estimated using a quasi-maximum likelihood method, which does not make the same distributional assumptions as OLS regression. Models estimated using this method take the form shown in Equation 3.5.

$$E(\text{Cash ratio}_i | \mathbf{z}) = \alpha + \beta_2 \text{future orientation}_i + \beta_n \mathbf{Z}_{i,j} + \varepsilon_i \quad (3.5)$$

An abbreviated model including only future orientation and personal factors was estimated first. Demographic and lifecycle characteristics were added next, followed by an estimation of the full model including financial characteristics.

The dependent variable for the third analysis was the continuous ratio of mortgage and non-consumer debt divided by total debt, bounded between 0 and 1. As discussed above, fractional logistic regression is the appropriate analytical method for modeling bounded proportions (Liu & Xin, 2014). Accordingly, the empirical model shown in Equation 3.3 was estimated using the form shown in Equation 3.6.

$$E(\text{mortgage debt ratio}_i | \mathbf{z}) = \alpha + \beta_3 \text{future orientation}_i + \beta_n \mathbf{X}_{i,j} + \varepsilon_i \quad (3.6)$$

As with the previous analyses, an abbreviated model including only future orientation and personal factors was estimated first, followed by a model with demographic and lifecycle characteristics, followed finally by the addition of financial characteristics.

Part Two

Sample Description

This second set of analyses utilized a subsample of couples (married or cohabitating) extracted from the 22nd wave of *De Nederlandsche Bank* (DNB) Household Survey (DHS). In total, $n = 2,072$ households were surveyed as part of the 22nd wave. The sample was then limited to households which reported that a partner was present in the household, resulting in a sample of $n = 1,490$ households. Couples were comprised of the head of household and their partner (Greenwood & Empson, 2003; Van Puyvelde et al., 2012). Next, descriptive analyses were conducted in order to identify the accountant and shopper within each household, consistent with the theoretical approach used for the following analyses.

The process for identifying the household accountants and shoppers was complex. First, observations for each head of household were extracted from the original data file, and the suffix *A* was added to each variable within this new data file. Next, a separate data file for the spouse or partner of each household was created, and the suffix *B* was added to each variable within this data file. The two files were then merged with the original data file (without suffixes attached to each variable) by household identifier in order to create a household-level data set which contained individual responses from both the heads of each household and their spouse or partner. The future-orientation of both household members was then measured using a modified version of the consideration of future consequences (CFC) scale (Webley & Nyhus, 2006). The future-orientation scores of each member within the household were then compared to each other. Following a similar

procedure as that outlined above, separate data files were then created for the shoppers (i.e., individuals with the lowest future-orientation score within their household) and the accountants (i.e., individuals with the highest future-orientation score within their household). In cases where spouses had equal future orientation scores, it was assumed that the head of household was the accountant. The suffixes *L* and *H* were added to the responses for each shopper and accountant respectively; and these data files were merged with the original data file to create a single household-level data set with individual responses from each household shopper and accountant. The data files were visually inspected at each step to ensure there were no errors in labeling the responses as described above.

In cases where only one individual from the household completed the CFC scale, their responses were labeled with an *H* (indicating that they were the accountant) by definition. As such, it was necessary to perform an additional analysis and limit the sample to only households where both members of the household completed the CFC scale. This resulted in a sample of $n = 464$ households. As in Part One of this dissertation, the distribution of household debt ratios was then analyzed and extreme observations (i.e., those in the top 5th percentile) were omitted, resulting in a sample of $n = 459$ households (Cunha et al., 2006). Finally, listwise deletion was used to omit households with incomplete responses to variables under observation, resulting in a final study sample of $n = 412$ households with complete responses for both members of the couple.

Empirical Models and Variable Measurement

The first analysis of part two explored the relationships between the accountant's future orientation, spousal bargaining power, and the household debt ratio. The first research objective was to assess the influence of the accountant's individual future orientation on the household debt ratio, controlling for other factors which have been shown to influence household solvency. An adaptation of the collective theoretical model was constructed to simplify the development of testable empirical

models. This adaptation is shown in Figure 3.1. The corresponding econometric model is shown in Equation 3.7.

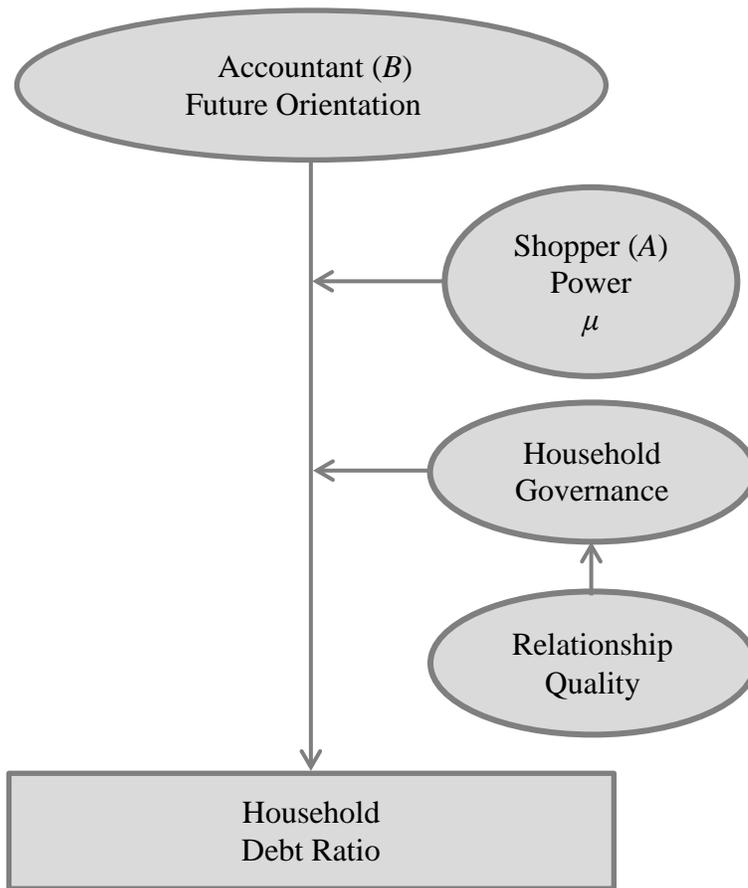
$$Debt\ ratio_j = \beta_1 future\ orientation^B + \beta_2 bargaining\ power_j + \beta_3 net\ worth_j + \beta_4 net\ income_j + \beta_5 asset\ tangibility_j + \varepsilon_j \quad (3.7)$$

Next, the interaction terms for spousal bargaining power categories and the accountant's future orientation were added to the model, as shown in Equation 3.8, in order to test for moderating effects.

$$Debt\ ratio_j = \beta_6 future\ orientation^B + \beta_7 bargaining\ power_j + \beta_8 net\ worth_j + \beta_9 net\ income_j + \beta_{10} asset\ tangibility_j + \beta_{11} bargaining\ power_j \times future\ orientation^B + \varepsilon_j \quad (3.8)$$

Bargaining power was measured by three variables following methods similar to Britt et al. (2010): age, education, and individual income. Age was first measured continuously by subtracting each respondent's reported birth year from 2014, the year the survey was conducted. Three categories for spousal differences in age were then created: each spouse within six years of age, shopper was six or more years older than accountant, and accountant was six or more years older than shopper. Educational attainment for each respondent was first measured by ordinal categories from 1 (up to primary education) to 4 (college education). Three categories for spousal differences in educational attainment were then created: each spouse had the same level of education, shopper had higher level of education, and accountant had higher level of education.

Figure 3.1 Simplified Collective Model of Household Capital Structure



As discussed, the DHS calculated a measure of net income for each individual based on reported gross income, tax deductions and tax credits, and other economic transactions such as parental support given or received. As such, it is possible in some cases for the calculated net income to be a negative number. When one spouse reported negative net income, by mathematical definition their partner must have reported net income greater than 100% of the total household income. (For example, if one spouse reported -€2,000 in net income and their partner reported €102,000, then total household income is €100,000 with one spouse contributing -2% of net income and the other contributing 102% of net income.) A continuous proportion of household net income contributed by each spouse was then calculated by dividing the net income reported for the shopper and accountant

respectively by total household net income. Differences in spousal net income were measured categorically by creating three categories: both the shopper and accountant contribute between 40% and 60% of total net income, the shopper contributes 60% or more of total net income, and the accountant contributes 60% or more of total net income.

Next, the sample was stratified into two groups according to intra-household differences in future orientation. The first stratum was comprised of households which exhibited average or below differences in future orientation between spouses. (In this study the term spouse is used interchangeably with partner or member, and does not refer to marital status.) The second stratum was comprised of households with above average differences in spousal future orientation. The empirical models shown in Equations 3.7 and 3.8 were then tested separately for each stratum.

The next analyses examined the relationships the accountant's future orientation, household governance mechanisms, and the household debt ratio. This was accomplished by first modeling the household debt ratio as a function of the accountant's future orientation, as shown in shown in Equation 3.9.

$$\begin{aligned} \text{Debt ratio}_j = & \beta_{12} \text{future orientation}^B + \beta_{13} \text{governance}_j + \beta_{14} \text{net worth}_j + B_{15} \text{net income}_j + \\ & \beta_{16} \text{asset tangibility}_j + \varepsilon_j \end{aligned} \quad (3.9)$$

Next, the interaction terms for governance mechanism categories and the accountant's future orientation were added to the model, as shown in Equation 3.10, in order to test for moderating effects.

$$\begin{aligned} \text{Debt ratio}_j = & \beta_{17} \text{future orientation}^B + \beta_{18} \text{governance}_j + \beta_{19} \text{net worth}_j + B_{20} \text{net income}_j + \\ & B_{21} \text{asset tangibility}_j + \beta_{22} \text{governance}_j \times \text{future orientation}^B + \varepsilon_j \end{aligned} \quad (3.10)$$

Finally, the empirical models shown in Equations 3.9 and 3.10 were tested separately for both strata of spousal differences in future orientation.

The next set of analyses examined the determinants of household governance mechanisms. This was accomplished in part by modeling the probability that household j would adopt management structure G as a function of differences in bargaining power μ between members i and p ; differences in financial knowledge ζ ; and the quality of intra-household relationships λ , as shown in Equation 3.11.

$$\Pr(G_j = k) = \alpha + \beta_{23} |\mu^i - \mu^p| + \beta_{24} |\zeta^i - \zeta^p| + \beta_{25} \lambda_j + \varepsilon_j \quad (3.11)$$

where $k \in \{1, 2, 3\}$

Household management structure was measured categorically by a single variable which asked each respondent to indicate how the finances were managed in their household. Each respondent could indicate one of the following methods of management: (a) I always leave it to my partner to decide on financial matters, (b) my partner has more influence than me on financial decisions, (c) my partner and I have equal influence on financial decisions, (d) I have more influence on financial decisions than my partner does, or (e) my partner always leaves the financial decisions to me. The responses from each spouse were paired within each household to create three categories representing the management structure of the household: the accountant was dominant in decision-making, the shopper was dominant in decision-making, or decisions were made equally. In cases where only one spouse answered the question, his or her response was used to represent the management structure of the household. In some cases, respondents answered inconsistently with their partner, such as both indicating that their partner made the household financial decisions; or both indicating that they were dominant in making the financial decisions. In these instances, it was assumed that if neither household member monitored financial decisions, or that if both members monitored financial decisions, then each partner had an approximately equal opportunity to appropriate resources for themselves. Households with such responses were accordingly classified as having a management

structure of equal control over decision-making. Interaction terms were calculated by multiplying each bargaining power and management structure category by the accountant's future orientation.

Differences in subjective financial knowledge between spouses were also measured in order to control for the possibility that authority over financial decision-making might be allocated based on context-specific knowledge. Subjective financial knowledge was reported by each individual and was measured on a scale from 1 (not knowledgeable) to 4 (very knowledgeable). As with the measures of bargaining power, differences in spousal financial knowledge were measured categorically by creating three groups: the shopper and accountant reported the same financial knowledge, the shopper reported greater financial knowledge, and the accountant reported greater financial knowledge.

The quality of household relationships was measured by a single variable which asked each respondent to characterize their relationship on a scale from 1 (very good relationships between members of the household) to 5 (very bad relationships between members of the household). Responses to this item were reverse coded so that higher scores indicated more positive assessments of the intra-household relationships. The responses from some spouses differed from that of their partners. It was assumed that the quality of household relationships was only as good as the lowest score reported, and accordingly used the lower score reported by the two spouses as the measure of household relationship quality. For example, if one spouse answered that the quality of relationships was very good but their partner answered that they were very bad, then this was interpreted and recorded as an observation that the quality of relationships was very bad.

In addition to modeling the household management structure, the likelihood that household j would use separate accounts, S , to manage their finances was modeled as a function of heterogeneity in future orientation δ between spouses i and p ; differences in spousal bargaining power μ ; combined

financial knowledge ψ ; quality of intra-household relationships λ ; and combined attitudes toward saving φ , as shown in Equation 3.12.

$$\Pr(S_j = 1) = \alpha + \beta_{26} |\delta^i - \delta^p| + \beta_{27} |\mu^i - \mu^p| + \beta_{28} \psi + \beta_{29} \lambda_j + \beta_{30} \varphi + \varepsilon_j \quad (3.12)$$

where $\psi = \zeta^i + \zeta^p$

Use of separate accounts was measured by a single item which asked individuals to indicate whether they set money aside for particular purposes by using separate bank accounts, jars or envelopes, or some other method. Respondents could indicate that they used one of these methods of separating funds, or that they did not use such a system. The responses from each household member were used to create a dichotomous indicator that the household employed a system of separate accounts. If either partner answered that they used one of the systems mentioned for separating funds, this was considered an observation that the household used separate accounts. If both partners answered that they did not use separate accounts, this was considered an observation that the household did not use separate accounts.

Future orientation was again measured by the modified CFC scale found in the DHS. Respondents were asked to indicate their agreement with 12 statements regarding their disposition toward thinking about future consequences on a scale from 1 (extremely uncharacteristic) to 7 (extremely characteristic). Responses to the 12 items were added to form a summative scale measured continuously for both shoppers and accountants. The Cronbach's alpha for the scale was $\alpha = .74$ for both shoppers and accountants, indicating an acceptable level of internal consistency. Heterogeneity in spousal future orientation was measured continuously by subtracting the future orientation score of the shopper from that of the accountant.

Spousal bargaining power was measured by the same variables and in the same manner as discussed for the first analysis. Combined financial knowledge, rather than heterogeneity in financial

knowledge, was used in the second empirical model. This was done to control for the influence that aggregate financial sophistication might have on the household-level behavior of using separate accounts. Specifically, it seems plausible that if both spouses have a high level of financial knowledge that both spouses would also feel more comfortable using a complex accounting system, thereby making their household more likely to respond that they use a system of multiple accounts to manage their finances. As discussed previously, the subjective financial knowledge of each spouse was measured separately on a scale from 1 (not knowledgeable) to 4 (very knowledgeable). These scores were then summed to create a measure of aggregate household subjective financial knowledge from 2 (both partners not knowledgeable) to 8 (both partners very knowledgeable).

The quality of household relationships was measured the same way as for the first analysis. Finally, a measure of combined spousal attitudes toward saving was included as a control variable principally because the use of separate accounts was framed in terms of meeting specific savings goals rather than in terms of general financial management. Each partner's attitude toward savings was measured by a single item which asked respondents if they thought that it made sense to save money given current economic conditions. Each spouse could answer on a scale from 1 (yes, certainly) to 4 (certainly not). Responses were reverse coded so that scores increased with more positive attitudes toward saving. The responses from each partner were then summed to create an aggregate measure of household attitude towards saving measured on a scale from 2 (both partners think it does not make sense to save) to 8 (both member do think it makes sense to save).

Analytical Methods

Within the first six analyses of Part Two, the dependent variable in each empirical model was the household debt ratio, which was measured continuously. Ordinary least squares (OLS) regression was used to analyze each model, although researchers have recently called the use of OLS regression

into question when modeling financial ratios. Financial ratios are typically bounded at one or more points, and as such, the use of OLS regression can produce biased estimates of beta coefficients as errors are clustered around the bounded values (Ramalho & da Silva, 2013). Tobit regression was developed as a method of modeling a continuous dependent variable with censored values, and some researchers have employed this method when modeling financial ratios (Cuha et al., 2006). A limitation of Tobit regression, however, is that its estimation of beta coefficients and standard errors is sensitive to non-constant and non-normally distributed residuals. The residuals of each model were tested at each step following the procedures outlined by Cameron and Trivedi (2009). Analyses suggested that residuals of the empirical models were marked by heteroscedasticity. In such cases, a common approach is to estimate a two-part model in which probit regression models the probability of the dependent variable being censored (in this case, the probability of having a debt ratio of 0); and OLS regression is used to model the continuous, observable responses (Cameron & Trivedi, 2009).

Within the subsample extracted for analyses in Part Two, no households reported a debt ratio of 0. As such, only the second part of a two-part model was tested, and OLS regression was used to model the observable debt ratios reported by each household for each empirical model. The White test was used to analyze the residuals for each empirical model, and results again suggested that residuals were marked by heteroscedasticity. The asymptotic covariance matrix was accordingly used to calculate standard errors more robust to the violation of the assumption of homoscedasticity (Regression with SAS, 2016).

The final two analyses in Part Two modeled the household management structure and the use of separate accounts. As discussed, the household management structure was measured categorically. Accordingly, multinomial logistic regression was used to analyze the likelihood that a household chose one management structure over another. Households who indicated that they shared equally in

the management of household finances were used as the reference group. Finally, the use of separate accounts was modeled as a dichotomous dependent variable, and logistic regression was used to analyze the likelihood that households reported using a system of multiple accounts.

Chapter 4 – Results

Part One

Descriptive Statistics

Descriptive statistics for the subsample of household financial respondents are shown in Table 4.1. The average age of household financial respondents was 55.36 years old ($SD = 15.90$), and those between the ages of 65 and 74 comprised the largest single age group ($n = 197$). Approximately 63% of respondents reported being married, 10% were in cohabitating relationships, and 27% were single. In terms of size, households ranged from 1 to 6 members, and the average household was comprised of 2.24 members. About 55% of respondents were male, and slightly more than half were employed at the time of they completed the survey. Approximately 37% of respondents reported completing no more than secondary-level education, 46% of respondents reported having completed vocational education, and 17% completed college-level education.

The mean future orientation was 50.79 ($SD = 9.18$) on a summative scale from 12 to 84. The average respondent reported a slightly negative outlook ($M = 2.98$, $SD = 0.75$, where 3 indicated that the respondent expected the household economic condition to be about the same in the next five years) toward their household finances. Respondents also indicated a generally low level of risk tolerance on average ($M = 2.38$, $SD = 0.87$), where the highest observed level of risk tolerance was 5.86 on a scale from 1 (low) to 7 (high).

The net income of the average household was €21,824 ($SD = 21,276$). The DHS calculates net income based on reported gross income, tax deductions and tax credits, and other income items such as alimony paid or received. As such, it is possible in some cases for calculated net income to be a negative number. The mean debt ratio was 0.26 ($SD = 0.34$), indicating a relatively low level of leverage on average. Additionally, the average household reported holding approximately 48% of

their debt obligations in mortgage and non-consumer debt; and reported holding about 25% of their total assets in cash and equivalents.

Table 4.1 Part One Subsample Descriptive Statistics ($n = 824$)

	<i>n</i>	Min	Mean	Max	<i>SD</i>
Debt ratio	824	0.00	0.26	1.24	0.34
Ratio of mortgage debt to total debt	824	0.00	0.48	1.00	0.50
Ratio of cash and equivalents to total assets	824	0.00	0.25	1.00	0.31
Future orientation	824	21.00	50.79	82.00	9.18
Risk tolerance	824	0.86	2.38	5.86	0.87
Attitude toward saving					
Does not make sense to save	133	0.00	0.16	1.00	0.37
Might make sense to save	274	0.00	0.33	1.00	0.47
Makes sense to save	408	0.00	0.50	1.00	0.50
Economic expectations	824	1.00	2.98	5.00	0.75
Looking for new job	824	0.00	0.13	1.00	0.34
Employed	824	0.00	0.53	1.00	0.50
Male	824	0.00	0.55	1.00	0.50
Age	824	23.00	55.36	89.00	15.90
Marital status					
Single	219	0.00	0.27	1.00	0.44
Cohabiting	84	0.00	0.10	1.00	0.30
Married	521	0.00	0.63	1.00	0.48
Financial knowledge	824	1.00	2.15	4.00	0.73
Education					
Up to secondary education	305	0.00	0.37	1.00	0.48
Vocational education	382	0.00	0.46	1.00	0.50
College education	137	0.00	0.17	1.00	0.37
Number of people in household	824	1.00	2.24	6.00	1.13
Net income	824	-€1,680.00	€1,824.05	€30,532.03	€21,275.57
Net income categories					
up to €10,000	284	0.00	0.34	1.00	0.48
€10,001 to €30,000	277	0.00	0.34	1.00	0.47
€30,001 to €50,000	207	0.00	0.25	1.00	0.43
Over €50,000	56	0.00	0.07	1.00	0.25
Asset tangibility ratio	824	0.00	0.66	1.00	0.35

The balance sheet for the average household is shown in Table 4.2. The average household reported having approximately €3,160 in cash and equivalents (e.g., amounts in checking accounts, savings accounts, and deposit books). Households owed about €100 in payables (i.e., overdrawn accounts) and carried an additional €62 in consumer debt, on average. The majority of debt held by the average household was in mortgages, and the majority of assets was held in fixed assets. The average net worth reported was about €99,808 and ranged from -€7,715 to €5,605,903.

Table 4.2 Balance Sheet of Average Household in Part One Subsample ($n = 824$)

	Min	Mean	Max	SD
Current assets				
Cash and equivalents	€0.00	€33,160.23	€632,879.00	€58,094.96
Non-current assets				
Certificates of deposit	0.00	310.75	57,750.00	3,143.92
Notes receivable	0.00	2,561.51	300,000.00	17,613.73
Financial assets	0.00	17,450.60	787,988.94	64,793.09
Business interests	0.00	4,720.13	2,000,000.00	71,151.96
Fixed assets	0.00	204,225.06	4,058,724.81	261,091.43
Total assets	0.00	262,117.53	6,285,902.74	338,255.72
Liabilities				
Accounts payable	0.00	110.32	50,000.00	2,005.23
Consumer debt	0.00	662.37	116,573.91	6,033.68
Mortgage debt	0.00	61,536.26	680,000.00	97,487.99
Total liabilities	0.00	62,308.95	721,100.00	98,255.01
Household equity	-97,715.00	199,808.58	5,605,902.74	306,157.72
Total liabilities and equity	0.00	262,117.53	6,285,902.74	338,255.72

Regression Analyses

Future Orientation and the Household Debt Ratio

The results of the Tobit regression are shown in Table 4.3. Model 1 shows the relationship between behavioral factors (i.e., future-orientation, risk tolerance, attitudes toward saving, and economic expectations) and the latent variable underlying the observed household debt ratio, which

was interpreted as the propensity to use financial leverage. Model fit was assessed by calculating the predicted values of the debt ratio for each model, and analyzing the correlation between the predicted and observed values (SAS Data Analysis Examples, 2016). The squared multiple correlation for Model 1 suggests that values of the household debt ratio predicted by only behavioral factors share approximately 8.8% of their variance with the observed values of the household debt ratio (Regression with SAS, 2015). Model 2 added control variables for demographic characteristics which have been shown to influence household saving and borrowing; and the higher squared multiple correlation suggests a better model fit when controlling for demographic and lifecycle factors. Model 3 was the full specification of the empirical model shown in Equation 3.1 and added control variables for household financial characteristics. As expected, the full model exhibited the greatest explanatory power as exhibited by the squared multiple correlation.

Contrary to the present alternative hypothesis, future orientation had a small positive influence on the propensity to use financial leverage as indicated by the observed household debt ratio. When only behavioral factors were included in the model, a one-unit increase in future orientation was associated with a .003 unit increase in the latent propensity to use financial leverage. Interestingly, when demographic and lifecycle factors were introduced into the model future orientation no longer had a statistically significant influence on the propensity to use financial leverage. This changed, however, when controlling for demographic and financial characteristic in Model 3, which had the greatest level of explanatory power. The results of the complete model indicate that a one-unit increase in future orientation was associated with a .001 unit increase in the propensity to use leverage. Future orientation was the only behavioral factor shown to have an influence on the propensity to use leverage when controlling for demographic and economic factors.

Age generally had a negative influence on the latent propensity to use financial leverage. Results from the full model suggest that there was not a significant difference between respondents younger than 55 years of age. However, respondents age 55 and older had a lower propensity to use leverage which generally appeared to increase with age. Sex was also statistically significant, with males exhibiting a greater propensity to use leverage than females. Being a male respondent was associated with a .039 unit increase in the propensity to use leverage, all else equal. Educational attainment also appeared to have a positive relationship with the latent propensity to use financial leverage. There was no statistical difference between respondents with up to a vocational college education and those with up to a college degree. However, having only up to a secondary level education was associated with a .029 unit decrease in the propensity to use leverage relative to those with up to a college education.

Household net income had a positive influence on the propensity to use leverage. Based on previous studies which have supported a pecking order model of household capital structure, it was initially suspected that households with greater net income would choose to finance investment with from retained earnings (i.e., saved income) rather than from debt, which would suggest a negative relationship between net income and the household debt ratio (Cunha et al., 2006). The present results suggest, however, that households view their net income in terms of debt coverage, and that additional increments of net income allow households to engage in additional incremental borrowing.

Asset tangibility had a positive influence on the latent propensity to use financial leverage, as expected. Relative to respondents in the first quartile of asset tangibility, being in the fourth quartile was associated with a .402 unit increase in the underlying propensity to lever. Finally, net worth was included as a control variable and was negatively associated with a latent propensity to use leverage,

as expected. An increase in net worth indicates an increase in residual assets which by definition decreases the debt ratio.

As a post hoc test for robustness, debt ratio quartiles were calculated and a multinomial logistic regression was conducted to model the likelihood of a household reporting a debt ratio within each quartile, relative to the lowest debt ratio quartile. As discussed, the modeling financial variables is inherently problematic due to violations of the assumptions undergirding OLS and Tobit regression analyses. Multinomial logistic regression was chosen as the method for a post hoc test because it uses the maximum likelihood method of estimation and does not make the same distributional assumptions as OLS or Tobit regression, thus making it robust to errors. For this post hoc analysis net income, asset tangibility, and net worth were measured continuously in order to reduce the complexity of interpreting the regression results.

Household net income was measured using the log of net income, asset tangibility using the unmodified asset tangibility ratio (discussed previously), and net worth using the log of modified net worth. Modified net worth was calculated by adding the absolute value of the lowest (i.e., negative) observed value of net worth plus €1 to all observations of net worth. This was done to ensure that all observations of modified net worth would be greater than 0, allowing for the calculation of its log. The results of this analysis are reported in Table 4.4 and were generally consistent with the findings discussed above; although they suggest a more nuanced relationship between future orientation and the propensity to use leverage. Specifically, an increase in future orientation was associated with a decreased likelihood of reporting a debt ratio in the second quartile relative to the first quartile. Conversely, an increase in future orientation was also associated with an increased likelihood of reporting a debt ratio in the highest quartile relative to the first quartile.

Table 4.3 Hierarchical Tobit Regression Predicting Household Debt Ratio ($n = 824$)

Variable	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
Intercept	-0.327***	0.081	0.170	0.110	0.002	0.110
Future orientation	0.003**	0.001	0.000	0.001	0.001**	0.001
Risk tolerance	0.030**	0.013	0.005	0.013	0.007	0.013
Attitude toward saving (vs. does not make sense)						
Might make sense to save	0.016	0.034	0.010	0.032	-0.004	0.032
Makes sense to save	0.013	0.032	-0.014	0.031	0.004	0.031
Economic expectations	0.115***	0.015	0.040**	0.016	-0.001	0.016
Looking for new job			0.059*	0.034	-0.009	0.034
Employed			0.049*	0.030	0.001	0.030
Male			0.088***	0.023	0.039***	0.023
Age (vs. 16 to 34)						
35 to 44			-0.049	0.039	0.003	0.039
45 to 54			-0.227***	0.045	-0.018	0.045
55 to 64			-0.215***	0.044	-0.068***	0.044
65 to 74			-0.233***	0.051	-0.076***	0.051
75 and over			-0.281***	0.057	-0.073***	0.057
Marital status (vs. single)						
Married			-0.057*	0.032	-0.009	0.032
Cohabiting			0.014	0.042	-0.004	0.042
Financial knowledge			0.007	0.015	0.0112*	0.015
Education (vs. college education)						
Up to secondary education			-0.017	0.034	-0.029**	0.034
Vocational education			-0.040	0.031	-0.016	0.031
Number of people in household			0.032**	0.014	0.001	0.014
Net income (vs. less than €10,001)						
€10,001 to €30,000					0.002	0.010
€30,001 to €50,000					0.086***	0.011
Over €50,000					0.175***	0.018
Asset tangibility (vs. first quartile)						
Second quartile					0.290***	0.014
Third quartile					0.338***	0.014
Fourth quartile					0.402***	0.018
Net worth (vs. first quartile)						
Second quartile					-0.561***	0.020
Third quartile					-0.528***	0.017
Fourth quartile					-0.788***	0.018
R^2	8.79%		22.78%		89.30%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.4 Multinomial Logistic Regression Predicting Debt Ratio Categories ($n = 824$)

Variable	Second quartile vs. first quartile		Third quartile vs. first quartile		Fourth quartile vs. first quartile	
	β	SE	β	SE	β	SE
Intercept	276.389***	65.796	132.526***	41.156	1616.015***	167.825
Future orientation	-0.029**	0.013	0.002	0.013	0.037*	0.020
Risk tolerance	0.004	0.143	0.045	0.133	0.140	0.203
Attitude toward saving (vs. does not make sense)						
Might make sense to save	0.267	0.337	0.025	0.319	-0.433	0.492
Makes sense to save	0.240	0.321	0.206	0.312	0.039	0.468
Economic expectations	-0.016	0.178	0.196	0.181	0.252	0.253
Looking for new job	0.307	0.415	-0.211	0.464	0.433	0.513
Employed	-0.459	0.318	-0.169	0.303	0.258	0.478
Male	-0.568**	0.246	0.655***	0.253	0.750**	0.362
Age (vs. 16 to 34)						
35 to 44	-1.052*	0.546	-0.102	0.635	0.375	0.681
45 to 54	-1.210**	0.578	-0.112	0.654	-0.549	0.774
55 to 64	-1.178**	0.571	-0.391	0.646	-1.904**	0.783
65 to 74	-1.058*	0.621	-0.840	0.703	-1.348	0.881
75 and over	-1.883***	0.673	-1.106	0.746	-2.148**	1.043
Marital status (vs. single)						
Married	-0.440	0.352	-0.414	0.349	-0.075	0.525
Cohabiting	-0.635	0.516	-0.422	0.535	-0.207	0.679
Financial knowledge	0.336*	0.174	0.254	0.164	0.381*	0.230
Education (vs. college education)						
Up to secondary education	0.349	0.402	-0.649*	0.386	-1.639***	0.565
Vocational education	0.312	0.383	-0.498	0.366	-1.754***	0.528
Number of people in household	0.161	0.178	0.144	0.082	0.090	0.227
Log net income	0.007	0.081	0.144*	0.082	0.636***	0.135
Asset tangibility ratio	-1.012*	0.409	3.911***	0.480	9.939***	0.894
Log net worth	-17.797***	4.300	-8.897***	2.695	-105.961***	10.971

* $p < .1$. ** $p < .05$. *** $p < .01$.

Future Orientation and Household Asset Allocation

Results of the fractional logistic regression analyses predicting the proportion of total assets held in cash are shown in Table 4.5. Model 1 is an abbreviated model which includes only personal factors; Model 2 adds variables to control for household demographic characteristics; and Model 3 is the full multivariate model specified in Equation 3.2. Model fit was assessed by analyzing the squared multiple correlation for each model (SAS Data Analysis Examples, 2016). The squared multiple correlation for the full model (i.e., Model 3) was $R^2 = .47, p < .001$, indicating that the predicted values of the cash ratio share about 47% of their variance with the observed values of the cash-to-total assets ratio.

The present results do not support the alternative hypothesis that future orientation is negatively associated with the proportion of total assets held in cash. Rather, the present results suggest that future orientation has no influence on the cash-to-total assets ratio. The present results also suggest that the proportion of total assets held in cash first declines with age, but then increases in retirement years. The statistical significance of age disappears, however, when controlling for net income and net worth. Further, net income appeared to have no influence on the proportion of total assets allocated to cash while net worth appeared to have a generally positive influence on cash-holding. Specifically, however, individuals who reported net worth in the second quartile also reported holding the most cash relative to those in other net worth quartiles. Those in the third quartile also held a larger proportion of total assets in cash than those in the first quartile, but not as much as those in the second quartile. Finally, there was no difference in the proportion of total assets held in cash between individuals in the first and fourth net worth quartiles.

Table 4.5 Fractional Logistic Regression Predicting Cash to Total Assets ($n = 824$)

	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
Intercept	0.238	0.414	2.183***	0.606	-1.362**	0.643
Future orientation	-0.005	0.006	-0.008	0.007	0.008	0.006
Risk tolerance	-0.179**	0.069	-0.165**	0.072	-0.172**	0.070
Attitude toward saving (vs. does not make sense)						
Might make sense to save	-0.195	0.175	-0.161	0.175	-0.147	0.169
Makes sense to save	0.025	0.164	0.061	0.167	0.126	0.161
Economic outlook	-0.197**	0.080	-0.291***	0.087	-0.200**	0.084
Looking for new job			0.173	0.182	0.323*	0.180
Employed			-0.375**	0.166	-0.142	0.158
Male			-0.218*	0.125	0.014	0.122
Age (vs. 16 to 34)						
35 to 44			-0.415**	0.210	-0.174	0.210
45 to 54			-0.416*	0.242	0.020	0.243
55 to 64			-1.101***	0.248	-0.357	0.248
65 to 74			-0.944***	0.277	-0.126	0.278
75 and over			-0.734**	0.308	0.246	0.309
Marital status (vs. single)						
Married			0.007	0.177	0.206	0.173
Cohabiting			-0.176	0.235	0.042	0.229
Financial knowledge			0.001	0.084	0.024	0.083
Educational (vs. college education)						
Up to secondary education			-0.240	0.182	-0.400**	0.178
Vocational education			-0.441***	0.167	-0.529***	0.165
Number of people in household			-0.169**	0.081	-0.144*	0.078
Net income (vs. less than €10,001)						
€10,001 to €30,000					0.166	0.134
€30,001 to €50,000					0.130	0.160
Over €50,000					-0.197	0.295
Net worth (vs. first quartile)						
Second quartile					3.018***	0.272
Third quartile					1.101***	0.276
Fourth quartile					0.457	0.290
R^2	2.28%		7.32%		47.30%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Consistent with other expectations, risk tolerance was negatively associated with the proportion of total assets allocated to cash. Individuals with more positive expectations for future economic conditions allocated a smaller proportion of total assets to cash. Conversely,

individuals who reported that they were looking for a job held more in cash than those who were not looking for a new job, all else equal. Clear differences were observed in the level of educational attainment and the proportion of assets allocated to cash. Individuals who reported completing only up to secondary education held less cash than those with up to a university-level education; however, those with a vocational education held an even smaller proportion of assets in cash compared to those with a university-level education.

Future Orientation and Household Debt Structure

Results of the fractional logistic regression analyses predicting the proportion of debt comprised of mortgage and non-consumer debt are shown in Table 4.6. Similar to the previous analyses, Model 1 is an abbreviated model which includes only personal factors; Model 2 adds variables to control for household demographic characteristics; and Model 3 is the full multivariate model specified in Equation 3.3. As with the previous analyses, model fit was assessed by analyzing the squared multiple correlation for each model (SAS Data Analysis Examples, 2016). The squared multiple correlation for Model 1 was $R^2 = .02, p < .001$, indicating that the predicted values of the cash ratio share about 1.70% of their variance with the observed values of the cash ratio. The squared multiple correlation for Model 2 was $R^2 = .06, p < .001$, and that for Model 3 was $R^2 = .54, p < .001$, again indicating a successively better model fit when including demographic and financial characteristics.

Table 4.6 Fractional Logistic Regression Predicting Mortgage Debt Ratio ($n = 824$)

	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
Intercept	-1.665***	0.507	-2.204***	0.772	-5.848***	1.276
Future orientation	0.007	0.008	-0.003	0.009	0.002	0.013
Risk tolerance	0.114	0.083	-0.026	0.090	0.070	0.131
Attitude toward saving (vs. does not make sense)						
Might make sense to save	0.211	0.211	0.231	0.221	0.030	0.320
Makes sense to save	0.173	0.201	0.222	0.213	0.076	0.312
Economic outlook	0.267***	0.097	0.256**	0.111	0.253	0.169
Looking for new job			0.238	0.235	0.369	0.370
Employed			0.277	0.208	-0.109	0.311
Male			0.592***	0.158	0.517**	0.238
Age (vs. 16 to 34)						
35 to 44			0.363	0.268	-0.313	0.427
45 to 54			0.225	0.314	-0.593	0.527
55 to 64			0.482	0.307	-0.905*	0.516
65 to 74			0.399	0.355	-1.206**	0.585
75 and over			0.164	0.403	-1.451**	0.647
Marital status (vs. single)						
Married			0.083	0.226	-0.173	0.333
Cohabiting			-0.206	0.295	-0.581	0.457
Financial knowledge			0.280***	0.107	0.469***	0.160
Educational (vs. college education)						
Up to secondary education			-0.283	0.236	-0.502	0.364
Vocational education			-0.157	0.216	-0.300	0.338
Number of people in household			0.039	0.098	-0.073	0.154
Net income (vs. less than €10,001)						
€10,001 to €30,000					0.441*	0.261
€30,001 to €50,000					0.989***	0.292
Over €50,000					3.565***	0.721
Asset tangibility (vs. first quartile)						
Second quartile					4.001***	0.415
Third quartile					4.897***	0.442
Fourth quartile					3.150***	0.516
Net worth (vs. first quartile)						
Second quartile					0.760	0.607
Third quartile					2.811***	0.488
Fourth quartile					0.388	0.487
R^2	1.70%		6.43%		53.60%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

The present results do not support the alternative hypothesis that future orientation is positively associated with the ratio of mortgage and non-consumer debt to total debt. Interestingly, male respondents reported debt structures characterized by a higher proportion of debt derived from mortgages and non-consumer borrowing. Financial knowledge was also positively associated with mortgage debt, and this relationship was more pronounced when controlling for the financial characteristics of the household. Net income was positively associated with mortgage borrowing, with those in the highest net income category reporting much higher mortgage debt ratios relative to those in the lowest net income category. Asset tangibility appeared to have a generally positive but potentially curvilinear relationship with the proportion of total debt comprised of mortgage and non-consumer debt. Respondents in the second quartile of asset tangibility reported higher proportions of mortgage debt relative to those in the first quartile; and those in the third quartile reported even greater mortgage borrowing. However, while respondents with the highest degree of concentration in tangible assets reported borrowing a greater proportion of debt via mortgages relative to those with the first quartile of asset tangibility, the proportion of mortgage debt was not as great as those in the second and third quartiles. Similarly, there appeared to be no difference in the debt structure of respondents in the first, second and fourth net worth quartiles. However, those in the third net worth quartile reported holding a greater proportion of mortgage and non-consumer debt.

Age appeared to have a generally negative relationship the ratio of mortgage debt to total debt. When controlling for financial characteristics, there appears to be no difference in the relative amount of mortgage borrowing between respondents in age groups from 16 to 54. However, respondents in the progressively older age groups reported successively smaller proportions of mortgage and non-consumer borrowing.

Part Two

Descriptive Statistics

The descriptive statistics for the individuals sampled in part two are shown in Table 4.7. The average household accountant was 51.01 years old ($SD = 15.62$), the average shopper was 51.09 years old ($SD = 15.58$), and the average age difference between the accountant and shopper within each household was 3.47 years ($SD = 3.63$). Approximately 51% of household accounts were male, while only 48% of shoppers were male. A majority of households (58%) reported that accountants and shoppers had the same level of education; while approximately 23% reported that accountants had completed a greater level of education, and 19% reported that shoppers had completed a greater level of education. With the group of households with spouses that reported the same level of educational attainment: approximately 1% reported that both had completed only an elementary level of education, 42% reported that both spouses completed up to secondary education, 14% reported that both had completed up to senior vocational college, and 43% reported that both spouses had completed up to a university education.

On average, household accountants reported higher net income ($M = 15,011.49$, $SD = 18,611.51$) than shoppers ($M = 14,113.77$, $SD = 21,673.13$); and reported contributing a slightly higher percentage of household net income ($M = 0.40$, $SD = 0.41$) compared to shoppers ($M = .39$, $SD = .41$). By definition household accountants reported a higher level of future orientation ($M = 53.89$, $SD = 7.64$) than shoppers ($M = 46.14$, $SD = 7.57$). The average intra-household difference between accountants and shoppers in future orientation scores was 7.75 units ($SD = 6.48$). Accountants also reported having slightly more financial knowledge ($M = 2.17$, $SD = 0.77$) than accountants ($M = 2.07$, $SD = 0.70$).

Household-level characteristics are shown in Table 4.8. The average household reported total net income of €29,671.20 ($SD = 28,614.49$) and also reported holding approximately 77% ($SD = 0.27$) of its assets in tangible assets. The average household debt ratio was 0.37 ($SD = 0.40$), indicating that the average household financed approximately 37% of its assets with debt. A majority of households reported that the accountant and shopper were essentially the same age ($M = 0.82$, $SD = 0.39$) and had the same level of educational attainment ($M = 0.58$, $SD = 0.49$). By comparison, household accountants and shoppers were less equal in bargaining power in terms of net income contributed to the household. Approximately 58% of households reported that the accountant contributed over 60% of household net income. In terms of management practices, 57% of households reported using a system of separate accounts, and a majority of households (61%) reporting sharing control over household financial management.

Table 4.7 Part Two Subsample Individual Descriptive Statistics ($n = 412$)

Variable	Mean	SD	Min	Max
Age				
Accountant	51.01	15.62	20.00	84.00
Shopper	51.09	15.58	24.00	87.00
Difference	3.47	3.63	0.00	25.00
Sex				
Accountant male	0.51	0.50	0.00	1.00
Shopper male	0.48	0.50	0.00	1.00
Educational attainment				
Accountant more education	0.23	0.42	0.00	1.00
Shopper more education	0.19	0.39	0.00	1.00
Same education	0.58	0.49	0.00	1.00
Net Income				
Accountant	€15,011.49	€18,611.51	-€1,959.00	€137,696.06
Shopper	14,113.77	21,673.13	-3,013.25	230,532.03
Percent income contributed				
Accountant	0.40	0.41	-0.31	1.03
Shopper	0.39	0.41	-0.03	1.31
Financial knowledge				
Accountant	2.17	0.77	1.00	4.00
Shopper	2.07	0.70	1.00	4.00
Future orientation				
Accountant	53.89	7.64	27.00	78.00
Shopper	46.14	7.57	18.00	72.00
Difference	7.75	6.48	0.00	33.00

$n = 412$

The balance sheet of the average household is shown in Table 4.9. The average household reported having approximately €35,829 in cash and equivalents. Households owed about €152 in payables and carried an additional €826 in consumer debt, on average. As with the first subsample from Part One of this dissertation, the majority of debt held by the average household was in mortgages, and the majority of assets was held in fixed assets. The average net worth reported was about €198,299 and ranged from -€14,717 to €2,383,555.

Table 4.8 Part Two Subsample Household Characteristics (*n* = 412)

	Mean	<i>SD</i>
Net income	€29,671.20	€28,614.49
Debt ratio	0.37	0.40
Asset tangibility ratio	0.77	0.27
Age bargaining power		
Accountant more than 6 years older	0.09	0.29
Same age (within 6 years of age)	0.82	0.39
Shopper more than 6 years older	0.09	0.29
Education bargaining power		
Accountant more education	0.23	0.42
Same education	0.58	0.49
Shopper more education	0.19	0.39
Income bargaining power		
Accountant contributes over 60% of income	0.58	0.49
Accountant and shopper contribute 40 - 60% of income	0.09	0.29
Shopper contributes over 60% of income	0.32	0.47
Household uses separate accounts	0.57	0.50
Household management structure		
Accountant controls finances	0.23	0.42
Equal control over finances	0.61	0.49
Shopper controls finances	0.17	0.37

n = 412

Table 4.9 Balance Sheet of Average Household in Part Two Subsample ($n = 412$)

	Min	Mean	Max	SD
Current assets				
Cash and equivalents	€0.00	€35,828.68	€632,879.00	€64,232.74
Non-current assets				
Notes receivable	0.00	3,266.54	300,000.00	21,852.33
Financial assets	0.00	16,549.22	750,000.00	63,384.79
Business interests	0.00	1,664.08	150,000.00	10,154.41
Fixed assets	0.00	235,792.71	2,306,502.25	215,399.57
Total assets	0.00	293,101.24	2,383,555.25	267,499.76
Liabilities and equity				
Accounts payable	0.00	152.00	38,037.00	1,957.79
Consumer debt	0.00	826.26	97,260.63	5,507.76
Mortgage debt	0.00	93,823.87	690,000.00	115,979.13
Total liabilities	0.00	94,802.12	698,379.80	116,528.38
Household equity	-114,717.32	198,299.11	2,383,555.25	258,677.01
Total liabilities and equity	0.00	293,101.24	2,383,555.25	267,499.76

Regression Analyses

Bargaining Power, Governance, and Household Capital Structure

The first three analyses of Part Two modeled Equations 3.9 and 3.10 in order to analyze the moderating effects of spousal bargaining power on the influence of accountants' future orientation on household debt ratios. The results of the first analysis are shown in Table 4.11. Consistent with the analyses in Part One of this dissertation, and contrary to the present alternative hypothesis, the future orientation of accountants had a small positive influence on household debt ratios. Consistent with prior studies, household net worth and asset tangibility also influenced household debt ratios. Surprisingly, however, the influence of net income on observed household debt ratios was not statistically significant. The only bargaining power variable that had a statistically significant influence on observed debt ratios was the percentage

of household net income contributed by the shopper. Reporting that the shopper contributed over 60% of household net income was associated with a 0.062 unit decrease in the reported household debt ratio.

When interaction terms were included in the model, the direct influence of accountants' future orientation on the debt ratio was no longer statistically significant, and only the interaction between educational attainment and accountants' future orientation was significant. This was an indication that the influence of accountants' future orientation on household debt ratios was fully moderated by spouses having the same level of educational attainment. A point of clarity is required regarding the interpretation of coefficients when interaction terms are included in the empirical model. A simplified version of Equation 3.10 is shown in Equation 4.1, which for illustrative purposes models only the effects of the accountant's future orientation and the spouses having the same level of educational attainment on the household debt ratio. A corresponding numerical example using the present empirical results is shown in Table 4.10.

$$Debt\ ratio_j = \beta_1 future\ orientation^B + \beta_2 same\ education_j + \beta_3 same\ education_j \times future\ orientation^B \quad (4.1)$$

As shown in Table 4.11, when interaction terms were included in the empirical model, the future orientation of the accountant did not have a statistically significant direct influence on the reported household debt ratio. In other words, the direct effects of the accountant's future orientation on the household debt ratio were not statistically different from zero, controlling for interactions with spousal bargaining power variables. As such, the coefficient for the accountant's future orientation shown in Equation 4.1, β_1 , is interpreted as being essentially equal to zero. The focus of interpretation then becomes the moderating variables (i.e., in this case, spouses reporting the same level of educational attainment).

As can be seen, the coefficient for the direct effects of having the same level of educational attainment, β_2 , must be interpreted as the unit change in the observed household debt ratio when the household reports that the couple has the same level of educational attainment *and* the accountant's future orientation score is equal to zero (i.e., the accountant has average future orientation relative to all household accountants, since this variable was standardized). For example, the present results suggest that when the household accountant has an average level of future orientation (compared to other household accountants, i.e., future orientation equals zero), then reporting that both spouses have an equal level of educational attainment is associated with a 0.372 unit decrease in the reported household debt ratio, compared to households where the accountant has completed a higher level of education. The effects of a one unit increase in the accountant's future orientation on the household debt ratio is then the sum of the coefficient for the direct effects of future orientation on the debt ratio, and the coefficients of terms interacted with future orientation. For example, for households which reported that spouses had an equal level of educational attainment, a one unit increase in the accountant's future orientation (i.e., a one standard deviation increase in future orientation) was associated with a 0.480 unit increase in the observed debt ratio.

Table 4.10 Numerical Example of Coefficient Interpretation with Interactions

	Accountant future orientation = 0	Accountant future orientation = 1
β_2 Same educational attainment	-0.372	-0.372
β_3 Same education x accountant future orientation	0.000	0.852
Total effect on debt ratio	-0.372	0.480

As demonstrated above, the present results suggest that the future orientation of the accountant has a positive influence on the household debt ratio, dependent on whether or not the spouses within the household have the same level of education. Interestingly, however, the relationship between the accountant's future orientation and the household debt ratio appeared to reverse when the households reported that the shopper had a higher level of educational attainment. Specifically, when the accountant reported an average level of future orientation, the shopper having a higher level of educational attainment was associated with a 0.099 unit decrease in the debt ratio. When the future orientation of the accountant increased by one standard deviation, the shopper having a higher level of educational attainment was associated with a 0.170 unit decrease in the debt ratio. In other words, the future orientation of the accountant had a negative influence on the reported household debt ratio, dependent on the household reporting that the shopper had a higher level of educational attainment.

The results for the second analysis, which analyzed the stratum of households with relatively homogeneous spousal future orientation, shown in Table 4.12, were generally consistent with those of the first: the future orientation of the accountant had a positive influence on the reported debt ratio; and net worth and asset tangibility were the only economic variables that had a statistically significant relationship with the debt ratio. Additionally, the influence of the accountant's future orientation on the household debt ratio appeared to be completely moderated by spousal bargaining power. When the household accountant had an average level of future orientation, both spouses having the same level of education was associated with a 0.317 unit decrease in the debt ratio, compared to households where the accountant had a higher level of educational attainment. For these same households, however, a one standard deviation

increase in the accountant's future orientation was associated with a 0.549 unit increase in the household debt ratio.

The results for age differences have a similar interpretation within this stratum of relatively homogeneous households. When the accountant had an average level of future orientation, reporting that the spouses were of equal age had no influence on the household debt ratio. Yet, a one standard deviation increase in the accountant's future orientation was associated with a 0.102 unit increase in the debt ratio when the spouses were the same age. Interestingly, within the stratum of households that reported relatively homogeneous spousal future orientation, the only bargaining power conditions that were significant were the spouses having the same age and the same educational attainment. Specifically, the influence on the debt ratio of the shopper having a greater level of educational attainment was statistically no different than that for households where the accountant had a higher level of education. Similarly, the influence on the debt ratio of the shopper being older was statistically no different than that for households where the accountant was older. This suggests that the question of a particular spouse having greater bargaining power is less important than the binary question of whether or not the spouses have equal bargaining power, at least in the condition where the spouses are in relative agreement regarding their future orientation.

Table 4.11 Bargaining Power Predicting Debt Ratio, Complete Sample ($n = 412$)

	β	SE	β	SE
Accountant's future orientation	0.031**	0.016	0.011	0.032
Age difference (vs. accountant older)				
Same age	-0.014	0.060	-0.094**	0.047
Shopper older	0.045	0.071	-0.014	0.056
Education difference (vs. accountant more education)				
Same education	-0.043	0.040	-0.372***	0.038
Shopper more education	-0.051	0.049	-0.099*	0.051
Income difference (vs. accountant contributes over 60%)				
Shopper contributes 40 - 60%	-0.075	0.061	0.005	0.045
Shopper contributes over 60%	-0.062*	0.037	0.005	0.025
Log of household net worth	-0.214***	0.066	-0.082**	0.039
log of household net income	0.025	0.017	0.003	0.011
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.221***	0.037	0.123***	0.028
Third tercile	0.254***	0.040	0.140***	0.030
Same age x accountant's future orientation			0.025	0.032
Shopper older x accountant's future orientation			-0.007	0.036
Same education x accountant's future orientation			0.852***	0.038
Shopper more education x accountant's future orientation			-0.071*	0.041
Shopper contributes 40 - 60% of income x accountant's future orientation			-0.015	0.032
Shopper contributes over 60% of income x accountant's future orientation			-0.002	0.023
R^2		33.16%		66.10%

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.12 Bargaining Power Predicting Debt Ratio, Homogeneous Future Orientation ($n = 215$)

	β	SE	β	SE
Accountant's future orientation	0.056**	0.024	-0.038	0.058
Age difference (vs. accountant older)				
Same age	-0.054	0.086	-0.077	0.055
Shopper older	0.042	0.098	-0.011	0.073
Education difference (vs. accountant more education)				
Same education	-0.006	0.052	-0.317***	0.046
Shopper more education	0.027	0.059	0.006	0.068
Income difference (vs. accountant contributes over 60%)				
Shopper contributes 40 - 60%	-0.060	0.078	-0.020	0.049
Shopper contributes over 60%	0.007	0.052	0.058*	0.034
Log of household net worth	-0.162***	0.055	-0.054*	0.031
log of household net income	-0.016	0.023	-0.012	0.015
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.227***	0.050	0.139***	0.035
Third tercile	0.269***	0.053	0.144***	0.035
Same age x accountant's future orientation			0.102*	0.052
Shopper older x accountant's future orientation			0.080	0.056
Same education x accountant's future orientation			0.866***	0.037
Shopper more education x accountant's future orientation			-0.038	0.080
Shopper contributes 40 - 60% of income x accountant's future orientation			-0.020	0.043
Shopper contributes over 60% of income x accountant's future orientation			-0.014	0.046
R^2	31.06%		69.33%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.13 Bargaining Power Predicting Debt Ratio, Heterogeneous Future Orientation ($n = 197$)

	β	SE	β	SE
Accountant's future orientation	0.009	0.020	0.026	0.037
Age difference (vs. accountant older)				
Same age	0.034	0.077	-0.061	0.063
Shopper older	-0.004	0.097	0.001	0.071
Education difference (vs. accountant more education)				
Same education	-0.053	0.051	-0.367***	0.053
Shopper more education	-0.129	0.081	-0.161*	0.085
Income difference (vs. accountant contributes over 60%)				
Shopper contributes 40 - 60%	-0.102	0.089	0.025	0.094
Shopper contributes over 60%	-0.089	0.059	-0.054	0.050
Log of household net worth	-0.362***	0.032	-0.178***	0.040
log of household net income	0.059**	0.028	0.018	0.020
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.213***	0.051	0.118***	0.041
Third tercile	0.212***	0.057	0.136***	0.047
Same age x accountant's future orientation			-0.017	0.040
Shopper older x accountant's future orientation			-0.070	0.046
Same education x accountant's future orientation			0.765***	0.053
Shopper more education x accountant's future orientation			-0.072	0.047
Shopper contributes 40 - 60% of income x accountant's future orientation			-0.019	0.066
Shopper contributes over 60% of income x accountant's future orientation			0.038	0.034
R^2	43.85%		66.20%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.13 shows the results of the third analysis, which modeled Equations 3.7 and 3.8 using the stratum of household reporting relatively heterogeneous spousal future orientation. In this condition, there was no evidence that the influence of the accountant's future orientation on the household debt ratio was moderated by spousal bargaining power, as the direct effects of the accountant's future orientation on the debt ratio were not statistically significant with and without controlling for interactions with bargaining power variables. However, the results were generally consistent with the previous two analyses with regard to the relationship between differences in spousal educational attainment and the reported household debt ratio. As found with the complete sample and with the stratum of homogeneous households, the results of the third analysis suggest that the influence on the debt ratio of both spouses having the same level of educational attainment is dependent on the accountant's future orientation. When the spouses reported a relatively greater difference in their levels of future orientation, and when the accountant had an average level of future orientation, reporting that the spouses had an equal level of educational attainment was associated with a 0.367 unit decrease in the debt ratio. Under the same conditions, a one standard deviation increase in the accountant's future orientation was associated with a 0.398 unit increase in the household debt ratio. Interestingly, however, the results of this analysis differed from those of the first and second in that, when controlling for interactions with the accountant's future orientation, reporting that the shopper had a higher level of educational attainment was associated with a 0.161 unit decrease in the household debt ratio irrespective of changes in the accountant's level of future orientation.

The next three analyses of Part Two modeled Equations 3.9 and 3.10 in order to analyze the moderating effects of household governance mechanisms on the influence of accountants' future orientation on household debt ratios. The results of the fourth analysis are shown in Table

4.14. Similar to all other results, the future orientation of the accountant appeared to have a small positive influence on the household debt ratio. However, there was no evidence to reject the null hypothesis for this analysis that governance mechanisms do not moderate the influence the accountant's future orientation on the household debt ratio. While the influence of the accountant's future orientation on the debt ratio was not statistically significant when controlling for interactions with household governance structure and the use of separate accounts, the interaction terms were also not statistically significant. Additionally, the model exhibited a slightly worse model fit when including interaction terms $R^2 = .32$, $F(11, 412) = 19.12$, $p < .001$ compared to the model without interaction terms $R^2 = .33$, $F(8, 412) = 26.20$, $p < .001$. (This is likely due to the inclusion of additional variables – the interaction terms – without increasing the explanatory power of the model.)

Table 4.15 shows the results of the fifth analysis, which analyzed the moderating effects of household governance mechanisms on the influence of accountants' future orientation on household debt ratios for the stratum of households with relatively homogeneous future orientation. Again, the future orientation of the accountant appeared to have a small positive influence on the household debt ratio. When interaction terms were included in the model, the household governance structure appeared to completely moderate the influence of the accountant's future orientation on the debt ratio. When the accountant reported an average level of future orientation, the household governance structure appeared to have no influence on the debt ratio. However, when the shopper controlled the finances an increase in the accountant's future orientation by one standard deviation was associated with a 0.174 unit increase in the debt ratio. With regard to the household accounting system, there was no evidence to reject the null

hypothesis that the use of separate accounts does not moderate the influence of the accountant's future orientation on the household debt ratio.

The results of the sixth analysis are shown in Table 4.16. Within the stratum of households exhibiting relative heterogeneity in spousal future orientation, neither the future orientation of accountants nor the use of governance mechanisms appeared to have any influence on household debt ratios. As with the fourth analysis, the model exhibited a slightly worse model fit when interaction terms were included, $R^2 = .41$, $F(11, 197) = 13.49$, $p < .001$, compared to the model without interaction terms, $R^2 = .42$, $F(8, 197) = 18.70$, $p < .001$.

Table 4.14 Governance Predicting Debt Ratio, Complete Sample ($n = 412$)

	β	SE	β	SE
Accountant's future orientation	0.033**	0.016	0.013	0.037
Household uses separate accounts	0.030	0.033	0.030	0.033
Governance (vs. accountant controls finances)				
Equal control over finances	-0.024	0.038	-0.025	0.038
Spender controls finances	0.035	0.050	0.038	0.050
Log of household net worth	-0.210***	0.067	-0.211***	0.067
log of household net income	0.016	0.015	0.017	0.015
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.219***	0.037	0.220***	0.037
Third tercile	0.259***	0.040	0.257***	0.040
Household uses separate accounts x accountant's future orientation			0.026	0.034
Equal control over finances x accountant's future orientation			0.002	0.058
Spender controls finances x accountant's future orientation			0.042	0.067
R^2	32.91%		32.66%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.15 Governance Predicting Debt Ratio, Homogeneous Future Orientation ($n = 215$)

	β	SE	β	SE
Accountant's future orientation	0.055**	0.024	-0.101	0.092
Household uses separate accounts	0.046	0.042	0.069	0.043
Governance (vs. accountant controls finances)				
Equal control over finances	-0.064	0.060	-0.018	0.067
Spender controls finances	0.039	0.070	0.101	0.075
Log of household net worth	-0.156***	0.055	-0.150***	0.054
log of household net income	-0.028	0.021	-0.026	0.021
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.218***	0.050	0.223***	0.049
Third tercile	0.268***	0.053	0.262***	0.053
Household uses separate accounts x accountant's future orientation			0.064	0.050
Equal control over finances x accountant's future orientation			0.115	0.098
Spender controls finances x accountant's future orientation			0.174*	0.054
R^2	32.83%		33.16%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Table 4.16 Governance Predicting Debt Ratio, Heterogeneous Future Orientation ($n = 197$)

	β	SE	β	SE
Accountant's future orientation	0.007	0.021	0.015	0.039
Household uses separate accounts	-0.035	0.045	-0.037	0.048
Governance (vs. accountant controls finances)				
Equal control over finances	-0.009	0.048	0.000	0.052
Spender controls finances	0.002	0.080	0.004	0.079
Log of household net worth	-0.363***	0.033	-0.363***	0.033
log of household net income	0.056**	0.023	0.056**	0.023
Asset tangibility ratio (vs. first tercile)				
Second tercile	0.208***	0.052	0.205***	0.052
Third tercile	0.237***	0.057	0.236***	0.056
Household uses separate accounts x accountant's future orientation			0.009	0.043
Equal control over finances x accountant's future orientation			-0.025	0.085
Spender controls finances x accountant's future orientation			-0.002	0.033
R^2	41.95%		41.13%	

* $p < .1$. ** $p < .05$. *** $p < .01$.

Determinants of Household Governance

The final two analyses of Part Two of this dissertation analyzed the determinants of household governance mechanisms. The results of the analysis modeling the household management structure are shown in Table 4.17. Differences in age and educational attainment appeared to have a relatively weak influence on the household governance structure. Reporting that the accountant had a higher level of educational attainment was associated with a reduced likelihood of reporting that the spender controlled the household finances. That is, when the accountant had a greater level of age-related bargaining power, the shopper was less likely to control the household finances. Similarly, reporting that the shopper had a higher level of educational attainment was associated with a reduced likelihood of reporting that the accountant controlled the household finances.

Differences in financial knowledge appeared to have the strongest influence in determining intra-household financial management roles $\chi^2(4, n = 412) = 66.03, p < .001$. Relative to households where partners had equal financial knowledge, those in which the accountant had a greater level of financial knowledge were more likely to report that the accountant was the primary financial manager for the household. Finally, relationship quality was associated with a lower likelihood of reporting that the accountant was the primary financial manager rather than reporting equal management. Specifically, a one unit increase in relationship quality was associated with a 29.9% decrease in the odds of reporting that the accountant exercised greater control over financial decisions.

Table 4.17 Multinomial Logistic Regression Predicting Management Roles ($n = 412$)

Variable	Shopper controls vs. equal control		Accountant controls vs. equal control	
	β	<i>SE</i>	β	<i>SE</i>
Age difference (vs. same)				
Accountant six or more years older	-1.89*	1.04	0.29	0.45
Shopper six or more years older	0.19	0.45	0.35	0.48
Education difference (vs. same)				
Accountant more education	-0.33	0.42	0.37	0.32
Shopper more education	0.12	0.34	-0.76*	0.43
Income difference (vs. 40 - 60%)				
Accountant contributes over 60%	-0.53	0.46	-0.01	0.51
Shopper contributes over 60%	-0.25	0.46	-0.54	0.56
Financial knowledge (vs. same)				
Accountant more knowledgeable	-0.60	0.45	1.98***	0.31
Shopper more knowledgeable	0.49	0.31	-0.30	0.47
Relationship quality	-0.11	0.21	-0.36*	0.09
Pseudo R^2	15.48%			

* $p < .1$. ** $p < .05$. *** $p < .01$.

The results of the analysis modeling the use of separate accounts are shown in Table 4.18. The present results suggest that none of the variables included in the model were statistically significant in predicting whether or not households reported using separate accounts to help manage their finances. Further, the relatively low concordance ratio suggests that the present model exhibited relatively poor fit in predicting whether or not sampled households would report using a system of separate accounts. As such, there is insufficient evidence to reject the null hypothesis that relationship quality has no influence on the use of separate accounts by the household.

Table 4.18 Logistic Regression Predicting Use of Separate Accounts ($n = 412$)

Variable	β	SE	Odds Ratio
Age difference (vs. same)			
Accountant six or more years older	-0.07	0.26	1.17
Shopper six or more years older	0.30	0.26	1.69
Education difference (vs. same)			
Accountant more education	-0.16	0.17	0.79
Shopper more education	0.09	0.18	1.01
Income difference (vs. 40 - 60%)			
Accountant contributes over 60%	0.04	0.16	0.90
Shopper contributes over 60%	-0.18	0.17	0.72
Combined financial knowledge	0.14	0.10	1.15
Difference in future-orientation	-0.02	0.02	0.98
Relationship quality	-0.09	0.16	0.92
Combined positive attitude toward saving	0.09	0.08	1.10
Concordance ratio	58.70%		

* $p < .1$. ** $p < .05$. *** $p < .01$.

Chapter 5 – Discussion

Research Findings

Despite decades of research and practice in the area of personal financial planning, the question of debt level optimization remains an open question for individuals and families. Indeed, practitioners have continued to rely on heuristics (see Grable et al., 2013) and researchers have continued to ask “Why do some people overuse credit and acquire debt beyond their means?” (Mendoza & Pracejus, 1997, p. 499). The purpose of this dissertation was to explore factors related to household capital structure in order to answer these questions and better understand how individuals and families can enhance their financial resilience (i.e., solvency and liquidity). The theoretical approach developed to explore this issue was interdisciplinary in nature: findings and perspectives were borrowed from multiple domains (e.g., corporate finance, personal finance, and family and consumer economics) in order to model household capital structure decision-making.

Generally, the findings of this dissertation were consistent with both the corporate finance and personal finance perspectives. In the case of the former, household economic variables were consistently the most important factors in predicting household capital structure; which suggests that much of household debt policy still comes down to dollars and cents (or in the case of this dissertation, euros and cents). In the case of the latter, however, personal factors were shown to influence household capital structure. Indeed, the results from Part Two of this dissertation suggest that household debt policy-making becomes more complicated as additional members are introduced into the decision-making process. Aside from these initial consistencies, the present results are unique in the literature – few have modeled household debt ratios – and offer new insights regarding the factors that influence household debt use and capital structure.

The Unitary Model of Household Capital Structure

As discussed in Chapter Two, the unitary model of the household refers to the assumption that household financial decisions can be modeled by a single utility function; typically, that of a household financial respondent (Bourguignon et al., 2008). The first set of analyses assumed such a model in order to explore the influence of individual behavioral characteristics on household financial decision-making, specifically with regard to household capital structure. This section includes an interpretation and discussion of the present results. Limitations and implications for future research and practice are discussed later in this chapter.

Household Capital Structure

Contrary to the hypothesized relationship, future-orientation was positively associated with the propensity to use household leverage. This is puzzling, as it seems to suggest that future-oriented individuals are relatively more accepting of future costs per unit of future benefit, which presumably reduces future utility. Initially this seemed to contradict studies which have shown that future orientation is positively associated with saving and negatively associated with borrowing (Finke & Huston, 2013; Henegar et al., 2013). A closer analysis of the results suggests that household financing decisions may be more complex than previous studies have supposed. What follows is a model which was developed post-hoc in order to explain the present results which suggest that future-oriented individuals exhibit an increased propensity to use leverage.

First consider an individual with a given capital structure, given rate of time preference, a given investment time horizon, and a world absent of taxes. The total utility that an individual would expect to derive from their capital structure is equal to the total utility to be gained from assets discounted to the present, less the total utility lost from making payments on liabilities

discounted to the present. In principle, this amounts to determining the future value of an investment, the future value of a set of debt payments, discounting both to the present at the individual's rate of time preference, and then subtracting the discounted value of the debt from the discounted value of the asset. This relationship is shown in Equation 5.1, where a_t is the observed level of assets at time t , r_a is the expected return on assets, $P_{d,t}$ is the fixed periodic payment on debt observed at time t for n periods, and r_d is the cost of debt. The discount factor, $D(k)$, is defined by Equation 2.1. The first part of the equation is the discounted utility from assets over the individual's time horizon of k periods. The second part is the discounted (dis)utility from debt at time t , d_t , repaid over n periods discounted over the entire time horizon of k periods.

$$u(\text{capital structure}) = D(k) u(a_t(1 + r_a)^k) - D(k) u\left(\sum_1^n \frac{r_d(d_t)}{1-(1+r_d)^{-n}}\right) \quad (5.1)$$

Individuals derive positive future utility from their capital structure when the discounted utility of assets exceeds the discounted disutility of debt. If an asset is financed completely with debt (such that the present value of the asset equals the principal value of debt at time t) and the return on assets equals the cost of debt $r_a = r_d$, the investment time horizon equals the debt repayment period $n = k$, and a fixed rate of time preference is applied to both assets and debts, then by definition the individual will derive some net positive utility from this financing arrangement. That is, the present value of the asset will be greater than the present value of the sum of debt payments. As the investment time horizon extends beyond the debt repayment period $n < k$, all else equal, the returns from the assets increase and the total disutility from debt is discounted over an even longer period of time, which reduces the disutility of debt financing. The result is a net increase in utility from the capital structure.

Assuming that individuals adopt longer time horizons and a lower discount rates as future orientation increases, then an individual will derive increasingly more utility from a given capital structure as future orientation increases. If an individual desired to maintain a target (future) utility from their capital structure, then as future orientation increases additional increments of debt could be added to the capital structure in order to hold future utility constant. It seems more likely, however, that as future orientation increases an individual would prefer to derive more utility in the future thereby increasing the future utility from capital structure. The framework illustrated here explains that as future orientation increases, individuals can increase their future utility via incremental investment in assets financed with debt, thereby increasing the observed debt ratio of the household consistent with the present methods and empirical results.

This helps explain why previous studies have found that individuals may consider some types of debt to be future-oriented debt (Brennan & Binney, 2008). Under certain conditions, using debt to finance the purchase of an asset increases future utility. An important distinction is to be made here – it is not simply mortgages on tangible assets that may be considered future-oriented (as we controlled for that motivation), but any debt which is used to finance investment in a balance sheet asset. It is possible that these findings could extend to financing investment in intangible assets (e.g., human capital) as well. While the present study did not estimate a value for human capital to be included on the balance sheet, the present results indicated that education had a positive influence on the use of leverage. To the extent that human capital is an asset with an expected rate of return over some investment horizon which could be financed with debt to be repaid under the conditions discussed, then financing investments in human capital with debt would be expected to increase future utility. As an individual's future orientation increases they

would be expected to derive even greater future utility from such a financial arrangement and accordingly exhibit a greater willingness to use debt to finance investments in human capital.

Asset Allocation

The present results did not support the alternative hypothesis that individual future orientation is negatively associated with the proportion of total assets held in cash and equivalents. However, other behavioral factors did appear to influence household asset allocation. Consistent with expectations, risk tolerance appeared to have a negative relationship with the proportion of total assets allocated to the least risky asset class. This suggests that individuals who are relatively more tolerant of asset price volatility and uncertainty are likewise more willing to allocate a larger proportion of asset portfolio to risky asset classes (e.g., financial securities and fixed assets).

The economic outlook of the household financial respondent was also an important behavioral factor in predicting the proportion of household assets allocated to cash and equivalents. Individuals with a more positive outlook regarding their future economic circumstances allocated a smaller proportion of assets to the safest asset class, all else equal. Care must be exercised when interpreting this particular finding because the observed relationship does not imply causality. Within the context of a scenario analysis, for example, it may be that individuals who felt that their economic condition would improve in the next five years effectively assigned a low probability to the possibility of encountering a financial shock. Such an individual may have determined that a more effective use of resources was to allocate additional assets to risky securities in order to realize some return rather than keeping a (relatively) large store of cash. The causal relationship could also run in the opposite direction: it may be that individuals with comparatively more assets allocated to risky classes felt more

positive about the possibility of earning higher future returns and therefore felt more positive about their future economic condition. Recommendations for future research related to this specific issue are discussed later in this chapter.

Conversely, the relationship between looking for a new job and the allocation of assets to cash and equivalents was less intertemporally ambiguous. That is, those who reported looking for a new job in the present allocated a greater proportion of assets to cash in the present. One plausible explanation is that, to the degree that individuals consider their labor income an implicitly risk-free asset, uncertainty regarding the stream of labor income would effectively reduce the expected value of the annuity and thereby induce an increase in the allocation of assets to the risk-free class (Campbell et al., 2001). Another explanation is that individuals allocate assets to cash and equivalents not solely as a means of minimizing portfolio variance, but also on the basis of estimated working capital needs. Individuals who are looking for a new job may allocate additional resources to cash not because they are rebalancing their portfolio to minimize variance, but because they simply anticipate the possibility of needing additional liquid resources to meet short-term consumption needs (whether these needs arise from a shortfall in labor income or from required investment in new work attire and materials). This concept is not without precedent in the finance literature: it is generally accepted that corporations keep a portion of their cash holdings specifically to support operations (Koller et al., 2015).

If the concept of working cash is applied to the household, it could help explain many of the present findings. When household financial characteristics were not included in the model, the relationship between age and the proportion of total assets allocated to cash was consistent with other empirical findings which challenge the theoretical predictions of lifecycle models (Poterba & Samwick, 2001). Specifically, the proportion of assets held in cash and equivalents

declined with age but then increased slightly for individuals over the age of 65. This would suggest that households maintain some base level of working cash over the course of their lifetime and allocate additional increments of wealth to risky asset classes, until they reach retirement age at which point wealth is gradually liquidated and consumed. However, when financial characteristics were included in the model age was not a statistically significant factor in predicting the proportion of assets allocated to cash and equivalents.

Individuals with only secondary or vocational education allocated fewer assets to cash than those with a college education. Net income was included as a control variable (and was not statistically significant) so it seems incorrect to interpret this education effect in terms of earnings. For example, the initial inclination may be to infer that individuals with a lower of education have lower earnings and are accordingly more cash constrained. This is not a correct interpretation, since income was controlled. It would seem that there is something about the condition of having a college degree, aside from additional earnings, that is related to holding a greater proportion of assets in cash, all else equal. To the extent that having a college degree indicates working in a profession which requires a relatively higher level of routine expenditures to maintain association memberships, continuing education, and professional working attire, then a household working cash perspective could explain this observed relationship.

Net worth appeared to have a curvilinear relationship with the proportion of total assets allocated to cash and equivalents. There was no difference between households in the first and fourth net worth quartiles with regard to the proportion of assets allocated to cash, all else equal. By comparison, however, households in the second net worth quartile reported much higher ratios of cash to total assets. This could also be understood in terms of working cash: the first increments of additional wealth are allocated to liquid assets in order to meet short-term capital

needs, which is observed as an increase in the ratio of cash to total assets. Additional increments of wealth are allocated to risky asset classes such that the ratio of cash to total assets declines to the point where there is no statistical difference between those in the first and fourth net worth quartiles, all else equal.

Within the context of financial resilience, the present results suggest that individuals consider and balance competing motivations in determining their liquidity position. For example, individuals who are relatively risk tolerant may exhibit a propensity to accept the risk of financial distress associated with keeping a relatively small proportion of financial assets allocated to cash. This motivation may be counterbalanced by other considerations (e.g., economic expectations or a job search, as discussed) which lead individuals to increase their balance of household working cash. Of particular interest for financial planners and counselors was the finding that self-reported financial knowledge had no influence on the allocation of household financial assets. While somewhat disappointing, these findings are consistent with other studies which have shown that financial behavior is not solely a function of objective or subjective knowledge. The implication for practitioners is that while financial education may be one component of a strategy toward building household financial resilience, it should not be the main component.

Debt Structure

The present results did not support the alternative hypothesis that individual future orientation is positively associated with the proportion of mortgage and non-consumer debt that comprise total liabilities. In fact, the present results suggest that none of the behavioral factors analyzed in this dissertation are significant in determining the household debt structure. When household financial characteristics were not considered, individuals who reported a more

positive economic outlook obtained a higher proportion of their borrowed capital via mortgages. A possible explanation is that individuals have a general preference for matching debt maturity to asset returns as a way of ensuring resources are available to satisfy required debt payments. (Incidentally, such a practice could help individuals maintain their solvency position and financial resilience.) Individuals may choose to finance long-term assets (e.g., real estate) with long-term mortgages in part because they expect the asset to maintain or increase in value over a similarly long period of time. Such an explanation would be consistent with the practice of using long-term assets as collateral for mortgage financing (which was generally supported by the present findings as they relate to asset tangibility; Geltner, Miller, Clayton, & Eichholtz, 2014). It may be that individuals with a more positive outlook for their future economic condition estimate that their assets will better retain or increase in value, which effectively increases an individual's estimated capacity for and propensity to use mortgage financing. Despite this possibility, the relationship between future economic outlook and the proportion of total debt derived from mortgage and non-consumer debt was not statistically significant when controlling for household financial characteristics.

Although the relationship between economic outlook and the mortgage debt ratio was not statistically significant, the present results concerning net income also suggest that individuals consider future resource availability when structuring their debt. Specifically, an increase in net income was associated with an increase in the proportion of debt borrowed via mortgages. Assuming that individuals estimate their future net income and resource availability by anchoring their estimates to their current net income, then individuals who report a higher level of net income may expect to have relatively more resources in the future to support mortgage debt service payments (Das & van Soest, 1997; Pompian, 2012).

Age had a negative influence on the proportion of debt held in mortgages and non-consumer debt. This seems consistent with the idea of matching debt maturity to expected economic benefits and resource availability. Specifically, as individuals age, their remaining lifetime is reduced thereby shortening the period over which assets financed with debt would be expected to yield economic benefits. Further, as an individual approaches retirement the (present) value of their labor income is gradually reduced to zero. As such, individuals may desire to avoid long-term mortgage obligations in late life due to uncertainty regarding the availability of resources to satisfy debt obligations in addition to retirement consumption needs. A counterargument is that it could make more economic sense for individuals to keep mortgage debt in late life (as opposed to paying-off the obligation) so as to finance an increase in consumption while leaving (a portion of) the burden of repayment to their estate. Such being the case, what can explain the presently observed negative relationship between age and the proportion of debt held in mortgage and non-consumer obligations? One possible explanation is that individuals, to the degree that they have a bequest motive, may wish maximize the value of their estates in part by minimizing the quantity of debt outstanding at death. A second, related explanation is that individuals have a general desire to resolve losses quickly (Hardisty et al., 2013a). Inasmuch as a shortening lifespan reduces the time period over which losses can be resolved, then as individuals age they may choose to utilize relatively more consumer financing in order to facilitate a quicker resolution of obligations.

Interestingly, individuals in the third net worth quartile appeared to obtain a higher proportion of their financing via mortgages and non-consumer loans relative to those in the first net worth quartile. However, there was no difference in debt structure between those in the first and second net worth quartiles; nor between those in the first and fourth quartiles. It seems that

households with the lowest and highest net worth both engage in a relatively high degree of borrowing via consumer credit compared to those with middling net worth. What could explain this finding? It may be that households at the low end of the net worth continuum are capital constrained such that most borrowing is done via credit cards or extended lines of credit. By comparison, households at the high end of the net worth continuum may prefer to use equity to internally finance investments, thereby using consumer debt simply to finance working capital. Further, it may be that households between these two extremes are in the process of wealth building and require debt financing to make investments in assets.

The Collective Model of Household Capital Structure

Part Two of this dissertation built on the theoretical underpinnings and analyses conducted in Part One by modeling household capital structure within the context of a collective decision-making model. As discussed, the collective model of the household assumes that financial decisions are not (necessarily) dictated by a single spouse, but are a function of each household member's personal preference and their relative influence over the resource allocation process (Bourguignon et al., 2008). The first set of analyses within Part Two modeled the household debt ratio as a function of the collective bargaining process; and as a function of household governance. The second set of analyses explored the influence of household relationship quality on household governance. Following is an interpretation of the results from both sets of analyses in Part Two.

Bargaining Power and Household Capital Structure

Consistent with the findings from Part One, individual future orientation appeared to have a generally positive association with the household debt ratio. It may be that more future-oriented individuals exhibit a greater propensity to use financial leverage because they desire to

finance investments in future-oriented debt in order to grow their wealth (Brennan & Binney, 2008). However, the results from Part Two suggest that an individual's propensity to use leverage is moderated by their partner's bargaining power.

Relative educational attainment appeared to be the most significant dimension of bargaining power for moderating a partner's influence on the household financial position. One might be inclined to think that this strong influence could be related to both spouses having a high degree of educational attainment, in which case the results would be explained by a high level of aggregate household knowledge. The descriptive statistics presented earlier suggest, however, that this is not the case. As a group, households reporting equal spousal educational attainment were near evenly split between those where both spouses had completed only up to a secondary level of education, and those where both had completed up to a college degree. Thus, it seems that this particular result is not a function of high aggregate educational attainment, but rather reflects the unique aspect of the household power distribution when spouses have an equal level of education.

When the household debt ratio was modeled without interaction terms, the accountant's future orientation appeared to have a statistically significant positive influence on the debt ratio. When interaction terms were included, the direct effects of the accountant's future orientation were not statistically significant, but the interaction of the accountant's future orientation with the relative educational attainment of the shopper was statistically significant. Further, when the accountant's future orientation was held constant (i.e., equal to 0, indicating an average level of future orientation), households where the shopper had a higher level of educational attainment than the accountant reported lower debt ratios than those where the accountant had a higher level of educational attainment than the shopper. This result seems consistent with those of Part One:

accountant-dominant households used more leverage than shopper-dominant households.

However, the other observed relationships in Part Two suggest that the dependent relationships between the accountant's future orientation, relative spousal bargaining power, and the household debt ratio are complex.

When the accountant had an average level of future orientation (i.e., still held constant relative to the conditions described above), households where spouses had an equal level of educational attainment reported lower debt ratios than those where the accountant had a higher level of educational attainment than the shopper. This seems to make sense considering that the shopper had additional bargaining power in this condition. The magnitudes of the coefficients suggest that these households used even less leverage than households where the shopper had a higher level of educational attainment than the accountant. When the spouses had relatively equal educational attainment, an increase in the accountant's future orientation was associated with an increase in the household debt ratio, relative to households where the accountant was older. Conversely, when the shopper had a higher level of educational attainment, an increase in the accountant's future orientation was associated with a decrease in the household debt ratio. What could explain these relationships?

At first, one may be inclined to interpret these findings as suggestive that when bargaining power is relatively equal, more future-oriented accountants desire to take on additional debt in order to constrain the budget of the shopper (Thaler & Shefrin, 1981; Bertaut et al., 2008). This explanation is inconsistent with other present findings: the use of debt to modify the budget constraint of the shopper only makes sense if future orientation is negatively associated with leverage (i.e., household borrowing is positively influenced by the shopper's present orientation). The evidence from Part One suggests that individual future orientation

actually has a positive association on the individual propensity to use leverage. As such, the leverage-as-constraint explanation is not supported by the totality of the present evidence.

An alternative explanation is that conflict in intertemporal motivations leads spouses to respond to their partners' borrowing propensities in different ways, dependent on the bargaining power of each. For example, households with equally powerful spouses may use less leverage than households with a powerful accountant, all else equal, because the shopper has relatively more influence on household financial decisions. The accountant's future orientation still has a positive relationship with leverage in this condition because the accountant has an equal ability to influence household finances. That is, more future-oriented accountants are able to influence household financial decisions such that additional debt is added to the capital structure. Shopper-dominant households use less leverage than households with a powerful accountant, all else equal, reflecting the shopper's relatively lower propensity to use leverage. Under this condition a dominant shopper reacts to their partner's propensity to use leverage by constraining borrowing and a negative relationship is observed between the accountant's future orientation and the household debt ratio.

If the spousal-intertemporal-conflict explanation is correct, then it is reasonable to expect that these relationships would be more pronounced for households with relatively greater heterogeneity in spousal future orientation. When spousal future orientation was relatively homogeneous, the same general relationships held: the accountant's future orientation had a positive influence on household leverage when educational attainment was equal, but a negative influence on household leverage when the shopper had a greater level of educational attainment. One notable difference, as compared to the model with the full sample, was that shopper-dominant households with averagely-future-oriented accountants used more financial leverage

than accountant-dominant households. At first, this finding seems contradictory to the intertemporal-conflict explanation. Given the condition of relative homogeneity in future orientation there is, by definition, little difference between accountants and shoppers. It is reasonable to expect that, holding the accountant's future orientation constant, the capital structures of accountant-dominant and shopper-dominant households would be similar, which is what was observed.

Spousal future orientation was relatively heterogeneous, shopper-dominant households used less leverage regardless of the accountant's level of future orientation. Additionally, when educational attainment was equal, the accountant's future orientation still had a positive influence on the household debt ratio. Taken together, these results seem consistent with an intertemporal-conflict explanation for the observed relationships: when spouses have relatively similar levels of future orientation, then the capital structures of accountant-dominant and shopper-dominant households resemble each other. The difference in future orientation leads shopper-dominant households to respond to the accountant's propensity to use leverage with some constraints on borrowing. When there is a greater difference in spousal future orientation, shopper-dominant households constrain the use of leverage regardless of their partner's future orientation. A limitation of this explanation is that it does not suggest a compelling reason for equal-powered households to use less financial leverage than accountant-dominant or shopper-dominant households when future orientation is relatively homogeneous.

It could be that there is something about the collaborative process within an equal-powered household which generally reduces the propensity to use leverage, holding future orientation constant. Within a homogeneous household, perhaps it is that each member, being somewhat equally disposed to use leverage, sacrifices some of that personal preference in

negotiating the household capital structure such that the household uses less leverage than if they were dominated by either the accountant or the shopper. If so, then the management structure of the household and the influence of relationship quality on the management structure may reveal additional details about such a bargaining process. It would be expected that households characterized by equal control over finances use less leverage than those which are controlled by either the accountant or shopper (especially assuming homogeneous spousal future orientation); and relationship quality would have a negative influence on the centralization of control be either the accountant or shopper. This was the subject of the second set of analyses and the results are discussed in the following section.

Household Governance

It was initially hypothesized that accountant-managed households would use less financial leverage than equally-managed or shopper-managed households. This was based on the initial belief, based on the prior literature, that future orientation would negatively influence the individual propensity to use leverage. Given the results of Part One, a revision to these hypotheses would suggest that accountant-managed households would use more leverage than equally-managed or shopper-managed households.

The present results suggest that the management structure of the household has little to no influence on household capital structure. When testing the governance model of household capital structure without including interaction terms, the future orientation of the accountant had a positive influence on the household debt ratio, consistent with all prior analyses. When interaction terms were included to test for moderation, however, the model lost explanatory power, and neither the accountant's future orientation nor the household governance mechanisms or their interactions had a statistically significant influence on the household debt ratio.

An exception to this was observed when testing the model within the stratum of households with relatively homogeneous levels of future orientation. Under this condition, the household management structure did appear to moderate the influence of the accountant's future orientation on the household debt ratio. Contrary to (revised) expectations, however, there was no difference in the household capital structure between equal-managed or shopper-managed households relative to accountant-managed households, holding the accountant's future orientation constant at an average level of future orientation. Further, the accountant's future orientation had a positive influence on the household debt ratio when the finances were managed by the shopper. This result seems to contradict those of the bargaining power models. It is important to remember that under the condition of relative homogeneity, there is little difference between accountants and shoppers. The presence of a more future-oriented accountant implies a relatively more future-oriented shopper.

If individual future orientation is positively associated with the propensity to use financial leverage, then an increase in the shopper's future orientation should be associated an increased use of leverage even by shopper-managed households. In the case of a homogeneous household, an increase in the accountant's future orientation implies some increase in the shopper's future orientation. This helps explain the positive association of the accountant's future orientation with the household debt ratio in the governance model when spousal future orientation is relatively homogeneous. This is contradictory to the intertemporal-conflict explanation proposed in the previous section. Why is it that when spousal future orientation is relatively homogeneous shopper-managed households with a more-oriented accountant use more leverage; but shopper-dominant households with a more future-oriented accountant use less? It would seem that bargaining power and management structure influence household capital structure in different

ways; and that the shopper's bargaining power must not be positively associated with the shopper controlling household financial decisions, which is supported by the present empirical results.

While households with a relatively more-educated shopper were less likely to report that the accountant managed the household finances than both spouses having equal control, they were just as likely to report having a management structure of shopper-control as equal-control. This suggests that a shopper-dominant power distribution does not necessarily imply a shopper-controlled management structure. It is not surprising, then, that the shopper's bargaining power and the household management structure have different influences on the household capital structure.

Regarding the other tests of the governance models, the relationships between management structure and household capital structure were not statistically significant within the full sample and the heterogeneous stratum because governance mechanisms have no influence on household capital structure. The accountant's future orientation had a positive association with the debt ratio when the shopper controlled financial decisions and when future orientation was relatively homogeneous simply because a higher level of future orientation reported by the accountant implied a higher level of future orientation for the shopper. Considering the implications of the unitary model, a household managed solely by a more future-oriented shopper would be expected to use more financial leverage than one managed solely by a less future-oriented shopper. It would seem that these results simply reflect the positive association between individual future orientation and the propensity to use financial leverage; but that governance mechanisms have no influence on household capital structure.

It is important to consider the influence of relationship quality in assessing the plausibility of the intertemporal-conflict explanation. Somewhat consistent with the present hypothesis, relationship quality was negatively associated with the likelihood of the accountant retaining centralized control over financial decisions compared to sharing control. It must be noted that relationship quality had no influence on the likelihood of the shopper retaining control compared to sharing control. Even though governance mechanisms appeared to have no influence on household capital structure, this result may reveal something about the collaborative process: positive relationships are generally associated with more equal management holding bargaining power (and other factors) constant. Within the present theoretical framework, this result suggests that inasmuch as an accountant may have more bargaining power or financial knowledge, accountants in households with positive relationships may voluntarily collaborate with their less-patient spouse in order to reduce agency costs and achieve more efficient financial outcomes (Deacon & Firebaugh, 1988; Jackson & Yariv, 2011; Jensen & Meckling, 1976). In other words, an accountant in a household characterized by positive relationships may willingly forsake some leverage, which they would otherwise prefer, as part of a collaborative process for setting household debt policy.

Taken together, the most plausible explanation for the results of Part Two seems to be the intertemporal-conflict explanation. First, individual future orientation appears to have a positive influence on the propensity to use financial leverage. Accountants, being more future oriented than shoppers, accordingly prefer to use a greater level of financial leverage than shoppers. Within the collective model of the household, bargaining power appears to explain household capital structure better than household governance. When spouses have relatively similar levels of future orientation, then the capital structures of accountant-dominant and shopper-dominant

households resemble each other. By contrast, shopper-dominant households appear to use less leverage than accountant-dominant households. If the less-dominant accountant is very future oriented, then the dominant-shopper responds by further constraining the proportion of debt which comprises the household capital structure, presumably due to their conflicting intertemporal motivation and dominant ability to influence household finances. The household capital structure of equal-powered spouses is characterized by less debt than those of accountant-dominant households. However, unlike in shopper-dominant households, accountants with an equal amount of bargaining power still retain an ability to influence the household capital structure such that the accountant's future orientation has a positive influence on the household debt ratio. Finally, relationship quality is negatively associated with the accountant wielding dictatorial control over household finances relative to sharing control; which suggests, to a degree, that positive household relationships facilitate a collaborative process for making collective intertemporal choices and managing lifetime household resources (Deacon & Firebaugh, 1988).

Limitations

As with any study, the analyses undertaken in this dissertation were marked by some limitations. Sampling was a challenge in many respects, and several of the study limitations relate to sample selection and sample size. Most notably, a large number of households were omitted from the original sample in Part One due to values on diagnostic tests which fell outside accepted tolerance ranges (Regression with SAS, 2015). Despite the large number of households omitted from the sample, this was done to conform to generally accepted diagnostic criteria in order to maximize the explanatory power of the models; and with the recognition that future studies should explore the issue of sample selection in greater depth. Even so, by omitting so

many households from the study sample the present results may be limited in their generalizability.

The findings in Part Two were similarly limited due to sampling-related issues. Specifically, these analyses were limited due to the use of a small sample. Out of $n = 1,490$ households that had a partner present in the household, in only $n = 464$ households did both the head of household and their partner complete the CFC scale. Aside from limiting the generalizability of results, the small sample size also presented methodological challenges in modeling financial outcomes to test hypotheses. Specifically, the small sample size used in these analyses limited the number of variables that could be included in the empirical models. As such, there may be some factors which influence household capital structure which were omitted from the collective models, thereby reducing their explanatory power.

The lacking reliability of the scales used in this study represent an additional methodological limitation. The CFC scale used in the present analyses exhibited a marginally acceptable level of internal consistency in both parts of this dissertation. Second, by measuring an individual's future orientation during only one year of their participation in the study, an implicit assumption that future orientation is stable over time is embedded in the present implementation of the CFC scale. While this is a common assumption in economic analysis, "relatively little is known about the stability of time preferences," and some empirical evidence suggests that future orientation is not stable over time (Meier & Sprenger, 2015, p. 273). Two areas of additional research are needed with regard to the CFC scale. First, additional research is needed to test the assumption of future orientation stability and to explore the implications for using the CFC scale. Second, further research is needed to explore the construction and reliability of the DHS version of the CFC scale, as these issues are beyond the scope of the

present study. Additionally, the risk tolerance scale used in this study exhibited a low level of internal consistency, so the results pertaining to risk tolerance must be interpreted with some care.

Other limitations were related to study design, due mostly to limited data availability and limited research concerning the analyses undertaken in this dissertation, specifically with regard to the collective models of household capital structure. For example, the present empirical models excluded the influence of taxes and interest rates. While the utility model of capital structure, which was developed ex-post to explain the present findings, implies that taxes, the interest rate on debt, and the expected returns on invested capital influence the composition of household capital structure, these variables were not measured within the DHS – a limitation in the data available. Additionally, the analyses in Part Two were designed based on a review of the extant literature, and resultantly no analyses were included to test relationship quality as a moderator of spousal bargaining power. Incidentally, even if such analyses had been planned the small sample sizes available in Part Two may have limited the ability to test such relationships since doing so would require several more interaction variables (i.e., the interaction of each bargaining power differential with the accountant's future orientation). Each of these limitations have implications for future research, which are addressed in the following section.

Implications for Future Research

The utility model of capital structure developed ex-post to explain the (unexpected) positive relationship between individual future orientation and the household debt ratio represents the greatest opportunity for future research. The simple version presented in this dissertation implicitly assumes that debt is not tax deductible and that there is therefore no utility to be gained from tax shields. This assumption was made ex-ante due to limitations of the data

availability regarding (i.e., information on household marginal tax rates was not reported) and to simplify the analysis of concurrent borrowing and saving. Similarly, tax shields were omitted from the ex-post theoretical model simply to explain the present empirical findings. In reality, some countries (including the Netherlands and the United States) allow individuals to deduct certain types of interest on debt (e.g., home mortgage interest) which has the effect of reducing the taxes paid by the household. That is, debt can have value or increase utility to the extent that it acts as a tax shield. Research is needed to further develop and refine the proposed utility model of household capital structure in such a way that accounts for the value of tax shields from debt service, the interest rate on debt, and expected returns on invested capital.

Once a refined version of the model has been developed, additional research will be needed to further test the model empirically. This will require researchers address some of the current study limitations. Ideally, researchers should collect data from households regarding their marginal tax rate (which may be approximated simply by consulting the appropriate tax table for the household's taxable income), the interest rate on each loan and credit card, and the expected rate of return on each asset. For example, household financial respondents may know the rate of interest earned on savings and checking accounts, certificates of deposit, and their expected rate of return on financial securities. Empirical studies should also explore the influence of individual attitudes toward debt on the household debt ratio. It seems plausible that individuals with a subjective negative attitude towards debt (a function, perhaps, of conditioned social norms) may value obligations in such a way that they derive relatively more disutility from borrowing than those with a less negative attitude toward debt (Ajzen & Fishbein, 1977). This would be expected to influence the proportion of household assets financed with debt.

The present findings related to household asset allocation and debt structure also present opportunities for future research. With regard to the asset allocation, it was noted that the present results are limited in their ability to infer the causal direction of households' allocation of total assets to cash. Is it that individuals feel positively about their economic future and then invest in risky assets? Or, is it that individuals who hold a larger proportion of their assets in risky investments expect their wealth to grow and accordingly feel more positive about their future economic situation? Aside from addressing these questions via longitudinal study, research should also further develop and explore the concept of working cash as applied to the household; and should also explore how the allocation of assets to working cash influences the asset allocation within the investment portfolio. Do individuals keep a store of cash for working capital and then consider this an investment in the risk-free asset within the context of their total asset portfolio? Or, do individuals use mental accounting to separate working cash from the combination of investments in the risk-free and risky assets in their investment portfolios?

With regard to debt structure, the present results suggest that individuals match debt maturities to the periods when resources will be available to service the debt. Further research is needed to more rigorously explore this possibility, in addition to exploring the other facets of household debt structure (Servaes et al., 2006). Additionally, research is needed to explore how bequest motives might influence household debt structure in late life.

Future research efforts should also address the methodological challenges and limitations noted in the previous section. The debt ratio is inherently exposed to the potential for extreme values because households may report as little as €1 in assets and €0 in debt which results in an undefined debt ratio; and following the method employed in this dissertation of adding €0.01 to both assets and debts, the resulting debt ratio would equal 101. While Tobit regression was used

to model the household debt ratio based on the methods employed by other researchers (see Cunha et al., 2006), it is notably sensitive to violations of the assumptions of constant and normally distributed errors. Standard diagnostics were used in the extraction of study samples to ensure the data met the assumptions required to make reliable inferences, but in the process several observations were omitted. Future research could avoid these complications by utilizing different analytical methods such as ordinal logit regression or multinomial logistic regression. A multinomial logistic regression analysis was completed in Part One of this dissertation as a post-hoc test, but using the limited data set extracted primarily for the Tobit analyses.

The previous section alluded to yet another area of future research: an analysis of the DHS version of the CFC scale. As mentioned, additional research is needed to explore the stability of future orientation over time (Meier & Sprenger, 2015). The results of such studies will have serious implications for theoretical and empirical research related to consumer behavior and individual financial decision-making. If future studies show that future orientation changes over time, then it calls into question much of the prior research related to future orientation and personal finance, the manner in which future orientation has been measured (including the DHS methodology), and the results presented in this dissertation. With regard to CFC scale construction, future studies should examine the dimensions of future orientation measured by the DHS version of the scale. Does the scale measure only the weight given to future periods, or does it also measure the number of periods considered (i.e., time horizon)? If the scale is actually measuring two distinct dimensions of future orientation, can scale reliability be improved by measuring each dimension separately? Further, would the relationships found by the present analyses change if different specifications of the scale were used?

Finally, additional research is needed to better understand the determinants of household capital structure within the context of collective financial decision-making. First, larger samples are needed, which requires researchers to exercise diligence in incentivizing participation and collecting data from multiple members within each household. Second, research should explore and test the explanation offered for the present empirical observations. Why is it that relative bargaining power appears to influence household capital structure but not the household management structure? If management structure is not the process via which bargaining power influences the proportion of debt used to finance assets, then what is? If setting household debt policy is truly a process of working through intertemporal conflicts, then how do households work through these conflicts? It may be that heterogeneity in spousal future orientation is positively associated with money arguments which may occur during the process of debt policy negotiation (Britt et al., 2010). These questions are not meant to be exhaustive, but represent merely some of the opportunities for future research to build upon and extend the work presented in this dissertation.

Implications for Practice

The results of this dissertation also have important implications for the practice of financial planning. Most importantly, the present results suggest that common solvency heuristics (i.e., a debt ratio no greater than 40%) may not adequately represent a household's utility-maximizing capital structure and should not be applied indiscriminately to all households. A household's optimal or utility-maximizing capital structure is likely to be unique and specific to the household's economic situation, investment opportunities, access to capital, and the personal characteristics of the financial decision-makers. As such, the utility-maximizing debt ratio for a household may well exceed 40% particularly if its financial decision-makers have a

high degree of future orientation and invest substantially in human capital (which is not recorded on the balance sheet). One recommendation for practitioners is to collect data on clients' future orientation in order to better evaluate the reasonableness of a household's financial position.

With regard to asset allocation, the present results suggest that individuals give some consideration to their needs for working capital when determining how much cash to keep on hand. The implication for practice is similar to that noted above regarding solvency ratios: one size heuristics do not fit all households. A heuristic based on monthly income or monthly expenses ignores the uncertainty of future income flows and resource availability and the opportunity cost of keeping resources in cash. A recommendation for financial planners is to adopt a goal-oriented approach in working with clients in order to align estimates of household working capital needs with the life-goals and activities of the household.

An additional implication for practice is that bargaining power and governance mechanisms may be ineffective in aligning the motivations of spouses when they differ greatly in their intertemporal preferences. It seems likely that when intertemporal motivations are relatively heterogeneous that some other mechanisms are used to negotiate household financial decisions, which could include forms of costly communication such as money arguments (Britt et al., 2010). A recommendation for financial counselors is to collect data on clients' future orientation and financial management practices, in addition to other information, in order to develop a better understanding of sources of financial disagreement. As with the recommendations for future research, these few implications are not exhaustive but simply represent a starting point for how the present research can be used to shape how practitioners think about the complex issue of household capital structure the process by which households balance their competing intertemporal motivations to set household debt policy.

Summary and Conclusions

This dissertation began with a simple question: what is the optimal amount of debt for the household? This is an important question because, while debt can be used to finance important investments (e.g., higher education or a home), increasing debt relative to assets increases the risk of financial insolvency and cost of financial distress (Brealey et al., 2014). Maintaining solvency has been considered a primary objective of financial planning, and many practitioners use a household debt ratio of 40% as a heuristic benchmark (Grable et al., 2013). Despite the many studies which have explored saving and borrowing behaviors in isolation, which affect asset and debt accumulation respectively, few have examined the issue of debt optimization. By contrast, theories of capital structure have been developed within the domain of corporate finance to answer precisely this question (Brealey et al., 2014).

The few studies which have applied theories of capital structure to the household have done so in a somewhat literal manner (Cunha et al., 2006). This dissertation extended this line of research by developing a model of household capital structure tailored to the household via the inclusion of personal factors, such as time preferences, which have been shown to influence personal financial behavior. Contrary to expectations, the present results suggest that future orientation has a small positive influence on the propensity to use financial leverage. This model and the present results help explain previous observations that individuals consider some types of debt to be positive and future-oriented (Brennan & Binney, 2008). An important implication for practice is that commonly used solvency heuristics may not adequately represent a particular household's optimal level of debt. Rather, a household's utility-maximizing debt level is likely to be unique and determined by its economic situation and the future orientation of its financial decision-maker. It is recommended that practitioners collect data on clients' future orientation,

among other characteristics, in order to better evaluate the reasonableness of a household's financial position.

With regard to asset allocation, it was initially suspected that the mix of assets in which the household invests is a complex function of multiple trade-offs. Whereas Modern Portfolio Theory has been proposed and used in a prescriptive manner to describe how households should allocate their assets in order to create a minimum-variance portfolio, behavioral theories have been used to describe and predict how households actually allocate their assets (Brealey et al., 2014; Cai et al., 2013; Campbell et al., 2001; Thaler, 1999). More recently, empirical findings have not supported lifecycle models of asset allocation (Auger et al., 2012; Laibson, 1997; Marekwica et al., 2013; Poterba & Samwick, 2001).

It was hypothesized that future-oriented individuals would derive relatively more utility from the large expected future gains associated with long-term investments and allocate a greater proportion of assets to long-term asset classes whereas present-oriented individuals would allocate a greater proportion to cash (Hardisty et al., 2013a). The results did not support this alternative hypothesis. The results did suggest that other behavioral factors influence household asset allocation; risk tolerance and (subjective) economic outlook in particular. It seems that a household's liquidity position is a complex function involving trade-offs between different motivations – much as initially suspected, though realized in a different manner.

Two important implications for financial planners stand out. First, as with the findings concerning household capital structure, commonly used liquidity heuristics may not adequately represent a particular household's optimal allocation of resources to cash. Some households will require more and some less dependent on a variety of factors which influence their needs for working-capital and the allocation of additional resources within the minimum-variance

portfolio. Second, as the present results suggest that financial knowledge has little to no influence on household liquidity, financial planners and counselors craft strategies to help households meet liquidity goals which focus more on goal-oriented behavioral interventions and less on simply imparting information via traditional forms of financial education.

The second part of this dissertation challenged the assumptions of the unitary model within the context of household capital structure. Building on the collective bargaining framework commonly used to model intra-household financial decision-making, it was hypothesized that an individual's future orientation would influence the household capital structure, but that this influence would be moderated by the relative bargaining power of their spouse (Britt et al., 2010; Castilla, 2014). It was also hypothesized that households would employ different financial management practices (e.g., keeping separate accounts and centralizing managerial control) which would also moderate an individual's influence on the household capital structure (Andrews, 2010; Kenney, 2006; Lampel et al., 2014).

Through a series of initial descriptive analyses, the "accountant" and "shopper" (i.e., respectively, the more- and less-future-oriented individual within a household) were identified (Bertaut et al., 2008). It was initially expected that the accountant's future orientation would have a negative influence on the household debt ratio; but that this influence would be moderated by the shopper's relative bargaining power. While the accountant's future orientation had a small positive influence on the household debt ratio, the shopper's relative bargaining power appeared to fully moderate their partner's influence.

Other findings from the tests of the collective models were also interesting and informative. In particular, households with spouses who were relatively equal in bargaining power utilized less leverage than those where either the accountant or the shopper was more

dominant. Additionally, the accountant's future orientation appeared to have a positive influence on the household debt ratio when bargaining power was equal, but a negative influence when the shopper had more bargaining power. Further, the model was tested with subsamples of households with homogeneous future orientation and those with heterogeneous future orientation, and the results suggest that, as expected, the shopper's bargaining power had a stronger moderating effect on the accountant's future orientation when spousal future orientation was heterogeneous. With regard to household governance, relationship quality appeared to have a somewhat negative influence on the degree of control centralization. However, governance mechanisms appeared to have no direct or moderating influence on the household debt ratio.

The most plausible explanation for the results observed from tests of the collective models seems to be that household capital structure is negotiated through a collective bargaining process, and that conflicts in intertemporal motivations lead spouses to respond to their partners' propensity to use leverage in different ways, dependent on their relative bargaining power. When bargaining power is equal or when household relationships are good, accountants may willingly forsake some leverage, which they would otherwise prefer; but they are still able to express their propensity and thereby positively influence the proportion of household assets financed with debt. When shoppers have more power, they respond to their partners' propensity to use leverage in the opposite manner by restricting debt in the capital structure. This moderating influence increases as spousal intertemporal conflict (i.e., the difference in future orientation) increases. This finding adds to the literature by bringing additional clarity to the manner in which individuals within the household system interact to make intertemporal financial decisions and set household debt policy (Deacon & Firebaugh, 1988). It also lends additional support to the collective model

of household, which suggest that household resource allocation involves the interaction of multiple individual utility functions (Jackson & Yariv, 2011).

In conclusion, household capital structure is influenced by individual intertemporal motivations. Future orientation positively influences an individual's propensity to use debt to finance investments. Asset allocation, by contrast, is a function of working capital needs, lifecycle factors, and risk tolerance. The debt which is used to finance assets seems to be generally structured so as to match the periods in which resources will be available to service the debt. Finally, within a household comprised of more than one individual, household debt policy is negotiated through a complex bargaining process which can be affected by the degree of congruence in household members' future orientation.

References

- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888-918.
- Andrews, R. (2010). Organizational social capital, structure and performance. *Human Relations*, 63(5), 583-608.
- Angeletos, G. M., Laibson, D., Repetto, A., Tobacman, J., & Weinberg, S. (2001). The hyperbolic consumption model: Calibration, simulation, and empirical evaluation. *The Journal of Economic Perspectives*, 15(3), 47-68.
- Auger, P., Devinney, T. M., Dowling, G., Eckert, C., & Lin, N. (2012). Inertia and discounting in the selection of socially responsible investments: An experimental investigation. Available at SSRN 1995879.
- Bertaut, C. C., Haliassos, M., & Reiter, M. (2008). Credit card debt puzzles and debt revolvers for self-control. *Review of Finance*, 13(4), 657-692.
- Bieker, R. (2011). Differences between Black and White household financial well-being: What do household financial ratios indicate? *National Social Science Journal*, 37, 8-16.
- Blackburn, M., & El-Deredy, W. (2013). The future is risky: Discounting of delayed and uncertain outcomes. *Behavioral Processes*, 94, 9-18.
- de Boer, N. (2009). *Recovery strategies for Dutch pension funds*. (Master's thesis). University of Amsterdam. (0513199)
- Bourguignon, F., Browning, M., & Chiappori, P. A. (2009). Efficient intra-household allocations and distribution factors: Implications and identification. *The Review of Economic Studies*, 76(2), 503-528.

- Brealey, R., Myers, S., & Allen, F. (2014). *Principles of corporate finance*. New York, NY: McGraw-Hill/Irwin
- Brennan, L., & Binney, W. (2008). Social responsibility and credit availability. In *ANZMAC 2008: Marketing: shifting the focus from mainstream to offbeat: Proceedings of the 2008 Australian and New Zealand Marketing Academy Conference* (pp. 1-7). Promaco Conventions Pty Ltd., Canning Bridge, WA.
- Britt, S. L., Huston, S., & Durband, D. B. (2010). The determinants of money arguments between spouses. *Journal of Financial Therapy*, 1(1), 42-60.
- Cai, M., Shi, J., Ni, Y., & Pan, R. (2013). Do heterogeneous background risks matter to household asset allocation? *Asia-Pacific Journal of Financial Studies*, 42(4), 563-589.
- Cain, M. D., & McKeon, S. B. (2014). CEO personal risk-taking and corporate policies. *Journal of Financial and Quantitative Analysis (JFQA)*, Forthcoming.
- Campbell, J. Y., Cocco, J. F., Gomes, F. J., & Maenhout, P. J. (2001). Investing retirement wealth: A life-cycle model. In *Risk aspects of investment-based Social Security reform* (pp. 439-482). University of Chicago Press.
- Cunha, M. R., Lambrecht, B., & Pawlina, G. (2006). Household capital structure. Retrieved from <http://www.fep.up.pt/conferencias/pfn2006/Conference%20Papers/546.pdf>.
- Das, M., & van Soest, A. (1997). Expected and realized income changes: Evidence from the Dutch socio-economic panel. *Journal of Economic Behavior & Organization*, 32(1), 137-154.
- Deacon, R. E., & Firebaugh, F. M. (1988). *Family resource management: Principles and applications*. Allyn & Bacon: Boston, MA.

- Den Haag (2016, October 12). *Unmarried partnerships*. Retrieved from <https://www.denhaag.nl/en/residents/to/Unmarried-partnership.htm>.
- Finke, M. S., & Huston, S. J. (2013). Time preference and the importance of saving for retirement. *Journal of Economic Behavior and Organization*, 89, 23-34.
- Francois, C., Helene, C., & Astrid, H. (2009). *Do spouses cooperate? And if not: Why?* (Working Paper 2009-10). Pontoise, France: Université de Cergy.
- Frederick, S., Loewenstein, G., & O'Donoghue, T. (2002). Time discounting and time preference: A critical review. *Journal of economic literature*, 40(2), 351-401.
- Garrett, S. (2012). *Three essays on cognitive processes in financial decision-making* (Unpublished doctoral dissertation). Texas Tech University, Lubbock, TX.
- Geltner, D., Miller, N. G., Clayton, J., & Eichholtz, P. (2014). *Commercial real estate: Analysis and investments* (3rd ed.). Cincinnati, OH: South-Western.
- Goosens, H. (2016). Dutch civil code. *Book 1: Law of persons and family law*. Retrieved from <http://www.dutchcivillaw.com/civilcodebook01.htm>.
- Grable, J. E., Klock, D. D., & Lytton, R. H. (2013). *The case approach to financial planning: Bridging the gap between theory and practice*. Erlanger, KY: National Underwriter.
- Greenwood, R. & Empson, L. (2003). The professional partnership: Relic or exemplary form of governance? *Organization Studies*, 24(6), 909-933.
- Hardisty, D. J., Appelt, K. C., & Weber, E. U. (2013a). Good or bad, we want it now: Fixed - cost present bias for gains and losses explains magnitude asymmetries in intertemporal choice. *Journal of Behavioral Decision Making*, 26(4), 348-361.

- Hardisty, D. J., Thompson, K. F., Krantz, D. H., & Weber, E. U. (2013b). How to measure time preferences: An experimental comparison of three methods. *Judgment and Decision Making*, 8(3), 236-249.
- Hausman, J. A. (1979). Individual discount rates and the purchase and utilization of energy-using durables. *Bell Journal of Economics*, 10(1), 33-54.
- Haynes, G. W., & Avery, R. J. (1996). Family businesses: Can the family and the business finances be separated? Preliminary results. *Entrepreneurial and Small Business Finances*, 5(1), 61-74.
- Henegar, J. M., Archuleta, K., Grable, J., Britt, S., Anderson, N., & Dale, A. (2013). Credit card behavior as a function of impulsivity and mother's socialization factors. *Journal of Financial Counseling and Planning*, 24(2), 37-49.
- Jackson, M. O., & Yariv, L. (2011). Collective dynamic choice: The necessity of time inconsistency. *American Economic Journal: Microeconomics*, 7(4), 150-178.
- Jappelli, T., & Pistaferri, L. (2002). Incentives to borrow and the demand for mortgage debt: An analysis of tax reforms. (Centre for Studies in Economics and Finance Working Paper No. 90). Salerno, Italy: University of Salerno.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Kenney, C. T. (2006). The power of the purse: Allocative systems and inequality in couple households. *Gender and Society*, 20(3), 354-381.
- Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2013). *Intermediate accounting* (13th ed.). Hoboken, NJ: Wiley.

- Koller, T., Goedhart, M., & Wessels, D. (2015). *Valuation: Measuring and managing the value of companies* (6th ed.). Hoboken, NJ: Wiley.
- Lam, S. S., Zhang, W., & Lee, R. R. C. (2013). The Norm Theory of Capital Structure: International Evidence. *International Review of Finance*, 13(1), 111-135.
- Lampel, J., Bhalla, A., & Jha, P. P. (2014). Does governance confer organizational resilience? Evidence from UK employee owned businesses. *European Management Journal*, 32, 66-72.
- Loewenstein G. (1987). Anticipation and the valuation of delayed consumption. *The Economic Journal*, 97(387), 666-684.
- Loewenstein, G., & Thaler, R. H. (1989). Anomalies: Intertemporal choice. *The Journal of Economic Perspectives*, 3(4), 181-193.
- Meier, S., & Sprenger, C. (2015). Temporal stability of time preferences. *Review of Economics and Statistics*, 97(2), 273-286.
- Mendoza, N. A., & Pracejus, J. W. (1997). Buy now, pay later: Does a future temporal orientation affect credit overuse?. In M. Brucks & D. J. MacInnis (Eds.) *Advances in Consumer Research* (p. 499-503). Provo, UT: Association for Consumer Research.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 48(3), 261-297.
- Moon, S. J., Yuh, Y., & Hanna, S. D. (2002). Financial ratio analysis of Korean households. *Family and Consumer Sciences Research Journal*, 30(4), 496-525.
- Oh, Y., & Bush, C. B. (2014). Exploring the role of dynamic social capital in collaborative governance. *Administration and Society*, 48(2), 1-21. doi: 10.1177/0095399714544941.

- O'Neill, B., & Xiao, J. J. (2011). Financial resiliency before, during, and after the Great Recession: Results of an online study. *Journal of Consumer Education*, 28, 34-43.
- Ostry, M. J. D., Ghosh, M. A. R., & Espinoza, R. A. (2015). *When should public debt be reduced?* International Monetary Fund: Washington, DC.
- Pollak, R. A. (2007). Bargaining around the hearth. *Yale Law Journal Pocket Part*, 116, 414-416.
- Pompian, M. M. (2012). *Behavioral finance and wealth management: How to build investment strategies that account for investor bias* (2nd ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- Poterba, J. M., & Samwick, A. A. (2001). Household portfolio allocation over the life cycle. In S. Ogura, T. Tachibanaki, & D. A. Wise (Eds.), *Aging issues in the United States and Japan* (pp. 65-104). Chicago, IL: University of Chicago Press.
- Raelin, J. D., & Bondy, K. (2013). Putting the good back in good corporate governance: The presence and problems of double-layered agency theory. *Corporate Governance: An International Review*, 21(5), 420-435.
- Rauh, J. D., & Sufi, A. (2010). Capital structure and debt structure. *Review of Financial Studies*, 23(12), 4242-4280.
- SAS Data Analysis Examples. UCLA: Statistical Consulting Group. Retrieved from <http://www.ats.ucla.edu/stat/sas/dae/tobit.htm> (accessed May 12, 2016).
- Schaner, S. (2015). Do opposites detract? Intrahousehold preference heterogeneity and inefficient strategic savings. *American Economic Journal: Applied Economics*, 7(2), 135-174.
- Servaes, H., Tufano, P., Ballingall, J., Crockett, A., & Heine, R. (2006). *The theory and practice of corporate debt structure*. Deutsche Bank: New York, NY.

- Shefrin, H., & Thaler, R. H. (1988). The behavioral life-cycle hypothesis. *Economic Inquiry*, 26, 609-643.
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783.
- Spencer, H. L., & Fan, J. X. (2002). Savers, debtors, and simultaneous debtors and savers. *Journal of Financial Counseling and Planning*, 13(2), 25-39.
- Stiglitz, J. E. (2010). *Freefall: America, free markets, and the sinking of the world economy*. New York, NY: WW Norton & Company.
- Strotz, R. H. (1956). Myopia and inconsistency in dynamic utility maximization. *The Review of Economic Studies*, 23(3), 165-180.
- Thaler, R. H. (1981). Some empirical evidence on dynamic inconsistency. *Economics Letters*, 8, 201-207.
- Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*, 12(3), 183-206.
- Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, 89(2), 392-406.
- Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26(1), 24-36.
- Van der Crujssen, C., de Haan, J., & Jansen, D. J. (2016). Trust and financial crisis experiences. *Social Indicators Research*, 127(2), 577-600.
- Van Puyvelde, S., Caers, R., Du Bois, C., & Jegers, M. (2012). The governance of nonprofit organizations integrating agency theory with stakeholder and stewardship theories. *Nonprofit and Voluntary Sector Quarterly*, 41(3), 431-451.

Webley, P., & Nyhus, E. K. (2006). Parents' influence on children's future orientation and saving. *Journal of Economic Psychology*, 27(1), 140-164.

Zeitoun, H., Osterloh, M., & Frey, B. S. (2014). Learning from ancient Athens: Demarchy and corporate governance. *The Academy of Management Perspectives*, 26(1), 1-14.