Research Topic

Evaluating the implications of financial literacy on retirement well-being and household financial health

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Submitted by:

Ming Lim

Geneva, Switzerland
Approved on the application of:

Dr. Ryan Fedaro

And

Dr. Roy Mouawad

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Abstract

Evidence documenting widespread financial literacy suggests that individuals are not well-equipped to make adequate financial decisions for themselves or their households. At the same time, the economic landscape of the 21st century has made it increasingly difficult for individuals to prepare adequately for retirement. This paper investigates the relationship between financial literacy, stock market participation, and retirement well being. It discusses two possible ways where financial literacy might provide improved retirement outcomes. First, financial knowledge increases an individual's propensity to invest in the stock market, allowing them to benefit from the equity risk premium. The equity risk premium is that individuals can accrue significantly higher returns through equity investments, which are compounded exponentially over longer time horizons. Second, financial literacy influences retirement planning, where developing a savings plan is shown to improve wealth and prevent retirement bankruptcies. Financial literacy lowers the cost of collecting and processing information, allowing individuals to make better informed economic decisions. This knowledge could reduce the potential psychological and economic thresholds for stock market participation and retirement planning. This paper works towards establishing a positive relationship between financial literacy and financial health to provide evidence that financial literacy can lead to improved retirement outcomes.

Chapter 1: Introduction

The 21st century has created an economic environment that is unfriendly to the average consumer, especially if they are not well versed in financial concepts. From a young age, consumers must learn to speak the language of finance, even before entering college or starting their careers in the workforce. Presently, consumers face complicated financial decisions, and a demanding economic environment exacerbates the pressures of these decisions. Consumers often find themselves in severe financial trouble at the early stages of their life, due to credit cards, student loan debt, or poor financial decision making. These mistakes could have severe long term implications on their ability to accumulate wealth at the latter stages of their life. Due to aggressive banking deregulation (Anthes, 2004), increasing complexity in financial markets, and the proliferation of credit (Braunstein, 2002), this environment has forced many individuals to make poor economic and financial decisions for their household. Unfortunately, many of these poor economic decisions have long term consequences, sometimes at a high cost to governments and society.

Perhaps it is fair to say that individuals no longer have an option to be financially illiterate in the 21st century. It has become nearly impossible to live in the present economic environment without some form of financial literacy. Modern societies are predicated upon the assumption that people are literate. Key actions that we do every day, such as communicating and paying bills, require at least some form of basic literacy. Therefore, many governments have mandated reading and writing skills. Thus, perhaps it is fair to posit that learning to read and write financially should also become an essential requirement.

As financial products become more sophisticated, the consumers' inability to understand their complexity has become more evident. Research suggests that most consumers do not understand basic economic concepts such as risk diversification and compounding interest. These concepts are essential aspects of retirement planning and financial health. Delayed retirement, low credit scores, lack of health insurance, stock market participation, and an inability to budget can all lead to severe economic consequences (Lusardi, 2008). All of these factors illustrate the importance of financial literacy when navigating complex financial products and decisions.

This paper researches whether financial literacy has long term implications for retirement and financial health. Financial literacy plays a role in reducing the amount of asymmetric information concerning personal finance, investments, and retirement planning, which ultimately allows individuals to make better-informed decisions for their overall financial health (CFPB, 2013). Investigating the relationship between financial literacy and long-term financial health is essential as households have become increasingly responsible for their retirement well-being, especially with the rapid shift from defined benefit pensions to defined contribution plans. Given such increased responsibility, this paper examines the implications of financial literacy on both stock

market participation and holistic retirement planning. Both of these strategies are well documented in facilitating long term wealth accumulation (Lusardi, 2011).

There is ample evidence to suggest that higher levels of financial literacy help facilitate wealth accumulation by improving stock market participation (Lusardi 2011). For decades, the importance of stock market participation has been well documented (Haliassos and Bertaut, 1995). Exposure to the equity risk premium (ERP) allows individuals to benefit from a return standpoint and risk diversification. Individuals who have exposure to the ERP can benefit consistently from long term compounded returns of 6-8% annually (Malkiel, 2003). The equity risk premium is the premium an individual receives by investing in the overall market. The ERP is calculated by subtracting total market returns from the risk-free rate of return, usually treasury bills or other government-backed paper (Martin, 2019). S&P 500 alone has averaged 7.96% annual returns since its inception in 1957. Including dividends, the return jumps to 11.10% (Martin, 2019.) This equates to an ERP between 4-8% over the last five decades.

These compounded returns are significant for facilitating long term wealth accumulation, whether they are getting exposure indirectly (mutual funds, ETFs) or directly (individual stocks). Ultimately, this illustrates the importance of pushing consumers to be more comfortable with equity participation. With significant downward pressure on risk free rate of returns, the ERP continues to grow. As of May 2020, the 10 year US treasury was yielding 0.62% (Morningstar, 2020). Over longer time horizons, investment returns of 6-8% make a substantial impact on any retirement portfolio, especially when compared to the risk-free rate of returns, which are now less than 1%. To provide a numerical example, if an individual invests $1,000 at age 18, and contributes an additional $500/mo over the next 20 years, he will have over $298,000 if we assume the average annual return of the S&P 500. If this individual continues until age 50, he will have a total of over $874,000. Stretched to age 65, and that number becomes close to 3 million dollars. The equity risk premium amplifies the power of compounding rates of return, but these concepts are still very foreign to many individuals.

Aversion to equity participation arises for many reasons. Haliassos and Bertaut (1995) argue that transaction costs and asymmetrical information create a barrier to entry for the stock market. Additionally, Lusardi (2013) argues that many individuals are simply unaware of the importance of stock market participation and the concepts of compound interest. By improving financial literacy, the amount of asymmetrical information is lowered, ultimately decreasing the cost of collecting data, thus increasing stock ownership. Over time, this creates more opportunities for individuals to gain exposure to equity investments and higher returns.

Lusardi (2007, 2009) argues that individuals with higher levels of financial literacy are more likely to succeed in showing household fiscal responsibility. Likely, individuals who are aware of the fundamental financial and economic concepts that drive economic well being through retirement are the same individuals that undertake careful retirement planning. An argument is made that financial literacy can help to decrease planning costs and reduce the psychological barriers to managing their finances and retirement planning.

Lusardi and Mitchell (2011) suggest that individuals who can successfully calculate their saving needs after retirement are often successful in setting up a retirement plan and sticking to their planning goals. Retirement planning has always been a complicated task. The challenges of managing cash flows and deciding on asset allocation require an individual to collect and process large amounts of information. This paper's contribution is to illustrate that financial literacy can be positively associated with earlier retirement planning and, therefore, a healthier retirement outcome. As mentioned earlier, starting retirement planning and saving can have a considerable impact on the issue of retirement success. From merely the concept of compounding interest alone, having a longer time horizon to plan and save for retirement makes a significant difference.

Why is Financial Literacy Critical in the 21st Century?

The economic climate of the 21st century creates a variety of challenges for personal savings rates. In many countries, a lack of savings is an apparent issue with many working adults. With rising living costs, the proliferation of consumerism and credit, and higher average debt levels, most individuals live paycheque to paycheque, with little opportunity to save. The challenges of saving and the burden of retirement responsibility should make financial literacy a crucial part of an individual's education. BDO Canada Ltd (2019), reported that 53% of working Canadians are living paycheque to paycheque, and more than 40% have non-mortgage debt above $20,000. Furthermore, Statistics Canada reported that 31% of Canadians between the age of 45 to 60 felt that their retirement savings were inadequate (Statistics Canada, 2019).

In the United States, savings rates are equally worrying. The federal reserve published a report on economic well being (2018) that illustrated some concerning data. Despite posting a strong and growing economy for over a decade, many Americans are struggling with their finances. The study revealed that 26% of Americans had zero retirement savings or savings of any kind. A Northwestern Mutual Planning & Progress study (2018) indicated that ⅓ U.S. adults felt physically ill about their financial situation and that the average adult held a personal debt (exclusive of mortgages) of $29,800. Finally, a 2004 Health and Retirement Study in the USA (HRS) concluded that one-third of adults' report that they are not confident about their financial health in retirement. These statistics ultimately indicate that many individuals are struggling financially and are not taking the necessary steps to plan or save for retirement. Whether this is a financial literacy issue or a symptom of the macroeconomy, it seems clear that many individuals will be extremely hard-pressed when reaching retirement age, with little support from the government.

Individuals and governments alike should be aware of the cost of ignorance. Over long time horizons, the consequences of poor financial decision making create a loss not only to the individual but to society as well. Individuals should start taking responsibility for their financial learning, by considering their asset allocation, pension savings and borrowing behaviour. We had already observed the extreme societal consequences when thousands of risky mortgages led to countrywide foreclosures. While there are already

many financial education programs in place, Mandell (2008) reports the lack of substantial results. He indicates the degradation of quality for these programs over the last two decades, so broad populations are being observed to have lower levels of financial literacy. With the existence of financial illiteracy being widespread, governments need to understand the long term implications.

At a time where the global debt is rising substantially, public policymakers have little room to allocate budgets to financial learning. Despite this, the social costs of an over-indebted society may be considerably higher than those of financial education. The cost of ignorance could have significant consequences on large public programs such as social security and other government pension support programs (Lusardi, 2013). In many developed countries, there has been significant pressure on social security systems and private sector pensions due to demographic shifts. Furthermore, market volatility and decreasing interest rates have put pressure on pension managers to find safer yields. (Federal Reserve, 2018).

Many individuals are fearful that these sources of passive income will not be available to retirees within the next two or three decades in America (Auerbach, 2018). Bernanke (2015) believes that the expansion of unfunded pension liabilities could reach 10 trillion dollars by 2030, and entitlement programs will be close to 50% underfunded. This type of risk exposure could lead to millions of American citizens with significantly reduced pension payouts. Shifting pension reliance away from government entitlement programs towards the individual should be a prudent financial decision for many young workers.

Debt Levels & Long Term Consequences

According to the Federal Reserve (2010), young adults in the US are faced with an unprecedented amount of debt. Total student loan debt has ballooned over one trillion dollars, and two-thirds of college graduates in 2010 carried an average of $25,000 in student debt (Federal Reserve, 2010). They are starting working life burdened with student and credit card debt, resulting in significant economic implications for the individual (Draut, 2007). Rapid increases in living costs and stagnating wage growth have contributed to higher average debt levels in Canada as well. Statistics Canada (2019) reports that the ratio of household debt to disposable income was over 150%. Alternatively, this means that households owed more than $1.50 for every $1.00 of disposable income they had. In Vancouver, one of the most expensive cities in Canada, the average debt to income ratio in 2019 was 230%.

The delay of marriage, children, and purchasing a home ultimately decreases the amount of time an individual has towards retirement savings. Postponing these decisions puts further pressure on the individual to make proper financial choices. An individual with lower levels of financial literacy could be more prone to making mistakes regarding credit scores, health insurance, budgeting and loan applications. To conclude, the economic environment of the 21st century makes it imperative that individuals build a strong financial foundation, early in their lifetime. However, even before an individual

can start working, staggeringly high debt levels make this foundation shaky from an early age.

Savings Adequacy

There are numerous reasons and socioeconomic factors that all pose a challenge towards individuals who are trying to save and plan for retirement. Increasing living costs, rise in contingent jobs, and the rapid increase of instant gratification combined with the proliferation of credit and consumer marketing, all have contributed to high debt levels and low saving rates across many adults (Kozup and Hogarth, 2008).

While there are clear challenges for the current working demographic, there are a variety of challenges facing the millennial generation's future saving behaviour. Young families and individuals have been reported to have higher debt to income ratios when compared to older generations. The average debt to income ratio of 19-34-year-old Canadians has exceeded 180%, compared to 125% for 50-65 year olds (Statistics Canada, 2019).

Millennials face a unique set of challenges and circumstances that will affect their ability to save and accumulate wealth for retirement. While this demographic is by far the most educated generation in history (Council of Economic Advisers, 2014), they face numerous challenges not faced by previous generations. To start, the evolution of the labour force in recent decades has been pushing towards contingent jobs. Traditional relationships between an employer and employee with benefits, salaries and potential employer retirement contribution plans are decreasing (Harris and Krueger, 2015).

Furthermore, there has been a significant shift in retirement responsibility. Workers are increasingly more responsible for saving and planning for retirement. Whether it is the apparent shift from defined benefit to defined contribution plans or the proliferation of individually sponsored retirement plans (401K & RRSP), the majority of workers must now take full responsibility for their retirement outcomes. Delayed life decisions and longer life spans play a significant role in making retirement saving more difficult. Many millennial adults are more likely to delay homeownership and marriage, as well as the idea of having children. These trends may delay the onset of retirement savings, as they take longer to make important life decisions such as homeownership.

These critical life decisions, which are also financially onerous, generally take precedence over retirement savings. Increasing life spans make the prospect of retirement planning a little more daunting. Having more retired years makes it more difficult to maintain standards of living through retirement. If households on average are living longer and hope to retain their typical standard of living through retirement, they will need to either save more or work longer than expected.

Predatory Practice, Asymmetrical Information, Financial Stewardship

In the 21st century, it is becoming increasingly difficult for an individual to navigate their personal finances without being financially literate. People are faced with complicated financial decisions required in everyday life, from comparing mortgage

options to various credit card offerings, where to invest and figuring out how much to save. Furthermore, the proliferation of complex financial instruments and commission-based products makes it even more difficult for a financially illiterate individual to navigate the economic landscape. Improving financial literacy allows individuals to reduce the amount of asymmetric information in the financial services market. They can serve as their own financial stewards, protecting themselves against the rapid proliferation of credit, and borderline predatory practices of banks (Lusardi, 2013).

After 2008, we observed the moral hazard dilemma that faced banks after a significant bailout from the federal government. As a result, banks were more willing to take on more leverage and riskier investments, knowing that they had the support of government bailout money. This risk is clear presently, with record levels of government stimulus and the federal reserve's foray into corporate debt purchasing. All these costs are mostly passed on to the consumer, whether it's from riskier investment losses or long term inflation risk due to excessive quantitative easing. Equipping financial consumers with the knowledge to protect themselves from predatory banking practices could have substantial long term benefits on wealth accumulation and retirement outcomes.

Fiscal Imbalances, Inflation Risk, Low Rates of Return and Debt Monetization

Large and established economies around the globe are facing long-term debt problems that will create pressure for governments to raise taxes and reduce spending. Austerity measures have been rare in the past few decades, where fiscal stimulus has been the most popular policy for most governments and central banks. Furthermore, most major governments have postponed fiscal adjustments, instead choosing to continually lower rates, engage in quantitative easing and lower overall tax burdens (Auerbach, 2018).

The debt burdens in Canada have grown at a substantial rate. Statistics Canada (2019) estimates combined federal and provincial debt to hit $1.5 trillion dollars at the end of 2020. That number is up from $837 billion at the end of 2008. Nominal growth for federal debt grew by $277.4 billion over the last 12 years, roughly three times the amount of debt it was able to repay from 1995-2007 (Statistics Canada, 2019). In the United States, public debt has been growing at an substantial rate as well. Since 2000, total government debt levels have increased from $5.6 trillion to over $25 trillion in 2020 (Federal Reserve, 2020). Federal Government spending is estimated to be around 4.8 trillion dollars in the 2020 fiscal year (Kelly, 2020). This total excludes the trillion-dollar purchasing program that the federal reserve has been undertaking, a number that is much harder to measure.

Ultimately, policymakers at the government and central bank level will reach a threshold with their expansionary fiscal and monetary policy. The primary issue with this is that eventually, the pressure for austerity measures will become too high, and the current working population will bear much of this burden. Raising taxes, interest rates and cutting government expenditure will have a significant effect on personal savings rates and wealth accumulation (Federal Reserve, 2018). While fiscal imbalances are independent of financial literacy, this issue will undoubtedly exacerbate the current challenges of retirement savings.

Continual monetization of federal government debt has been a common theme for many developed countries over the last decade. With two significant recessions over the previous 12 years, central banks have become more comfortable with aggressive quantitative easing policies. The Federal Reserve has been using tools to engage in monetary stimulus that is unprecedented in both magnitude and scope (Kelly, 2020). While the Federal Reserve Act of 1913 prevented the Federal Reserve from purchasing anything outside of government debt securities, special purpose vehicles and partnerships with large investment management firms have allowed them to buy corporate debt as well as exchange-traded funds (Kelly, 2020).

While the consequences of these actions are unclear, it creates a substantial fiscal deficit, moral hazard and economic uncertainty. It appears that there are no longer any fiscal conservatives on either side of the political aisle, and this type of aggressive policy is likely to continue. As a result, consumers and governments alike are at risk in terms of higher interest rates, inflation and taxes. All of these factors pose a potential threat to any retirement savings plan.

Low rates of return have characterized the last 30 years, adding yet another challenge to personal savings rates and retirement planning. A massive savings glut, general lack of aggregate demand, and flight to safety for global investors and governments are the most common explanations for the decline (Bernanke, 2007, 2015). As a result, it has become much more challenging for working individuals to accumulate adequate retirement wealth. Given the savings and consumption life cycle (Lusardi, 2009), this lower rate of return results in substantially lower savings balances during the accumulation phase of the cycle. An investment landscape that features lower rates of return creates additional pressure for individuals to reach for higher yield, sometimes at the expense of higher risk (Fitchner, 2017). Amidst the global pandemic, US treasury yields and other safe-haven asset classes have seen their rates of return plummet. Combined with market volatility and unprecedented action from the federal reserve have made the current economic environment even less predictable.
Ultimately these macroeconomic factors pose additional challenges for working individuals who are trying to accumulate retirement savings, placing an even greater emphasis on proper retirement planning and wealth accumulation. Furthermore, the rapid shift to defined contribution plans places even more responsibility on the individual. With many lacking social security systems and disappearing private-sector pensions, individuals are becoming solely responsible for generating passive income in their retirement years.

To conclude, this paper emphasizes the importance of financial literacy, in an economic climate where saving and investing has become increasingly more difficult. Building upon the relationship between financial literacy and financial stability is essential, as individuals are shouldering a more significant burden of their retirement preparation. Furthermore, they are expected to deal with more complicated financial decisions and financial products throughout their lifetime (Lusardi, 2009). The goal is to

illustrate the impact that financial literacy has on wealth facilitation, through two specific channels; equity participation and retirement planning.

Chapter 2: Summary of Literature Review & Hypothesis Development

The Concept of Financial Literacy

Redmund (2010) defines financial literacy as an individual's ability to manage personal finances throughout the earning lifecycle (Redmund, 2010). Furthermore, this paper establishes personal finances as the ability to "save, borrow, budget and invest. (Redmund, 2010, p.2). Similarly, Lusardi (2013) defines financial literacy as a measure of the degree to which an individual can "process economic information and make informed decisions on financial planning, retirement planning, debt and investing." Finally, the President's Advisory Council on Financial Literacy (2009) defines financial literacy as "**the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being.**"(PACFL, 2009, p.3.) These papers underline the foundational aspects of financial literacy, but more importantly, they convey why these skills are essential for an individual's financial health. The following table illustrates the most common conceptual definitions of financial literacy found in the published literature.

Table 1: Common Conceptual Definitions of Financial Literacy

Source	Definition
PACFL (2009)	"the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being." (p.1)
Hilgert, Hogarth, & Beverley (2003) Lusardi (2013)	Financial knowledge the degree to which an individual can "process economic information and make informed decisions on financial planning, retirement planning, debt and investing." (p.3)
Mandell (2007)	"The ability to evaluate the new and complex financial instruments and make informed judgments in both choice of instruments and extent of use that would be in their own best long-run interests" (p.164).

Lusardi and Mitchell (2007)	[Familiarity] with "the most basic economic concepts needed to make sensible saving and investment decisions" (p. 36).
Schagen (2007)	"The ability to make informed judgements and to take effective decisions regarding the use and management of money" (p. 1).
National Council on Economic Education (NCEE) (2005)	"Familiarity with basic economic principles, knowledge about the U.S. economy, and understanding of some key economic terms" (p. 3).

After carefully reviewing multiple conceptual and operational definitions, this paper defines financial literacy as the following: financial literacy is the ability to use knowledge and skills to manage financial resources effectively for a lifetime of economic well-being (PACFL, 2009).

Equity Participation and Financial Literacy

Almenberg and Dreber (2012) analyze the relationship between stock market participation and financial literacy. Their results provide evidence that lower levels of financial knowledge typically result in lower levels of equity participation. Some of these costs include severe risk aversion, low participation rates and unnecessary fee expenses. This study was supported by Van Rooij, Lusardi & Alessie (2011), who also found similar results. Both of these studies compared overall financial literacy scores of individuals, to the amount of equity percentage they held in their investment portfolios. Unsurprisingly, both studies establish a strong positive relationship between financial literacy and stock market participation. Individuals who score lower on financial literacy were significantly more risk-averse, leading to much larger percentages of their investment portfolios in fixed income assets. Tufano (2009) reveals that risk aversion is not unique to financially literate individuals. There are many individuals with established levels of financial knowledge. However, he underlines a significant difference in the way they structure their asset allocations. Financially literate individuals who indicated levels of risk aversion were more likely to have defensive strategies into their investment portfolio while still maintaining equity exposure. Some of these defensive strategies include more value stocks over growth, developed over emerging and stable industries over cyclical ones. Tufano

illustrates how equity exposure in a defensive manner can still allow investors access to the equity risk premium while still being risk-averse.

Multiple studies show that financial literacy improves retirement savings (Bernheim & Garrett, 2003; Lusardi & Mitchell, 2007, 2009), improving financial decision making (Lusardi & Tufano, 2009), and increased exposure to equity risk premiums through stock market participation (Van Rooij, Lusardi, & Alessie, 2011). This paper plans to build upon much of which these previous papers have discussed, particularly the wealth facilitation through equity risk premium exposure and retirement planning. VanRooij, Lusardi & Alessie (2011), in particular, highlight noticeable higher levels of retirement savings for individuals who have at least two decades of equity exposure. They conclude that having a well-diversified equity portfolio, balanced with fixed income securities, facilitated wealth and retirement income at a significantly better rate than individuals who did not expose themselves to equity investments.

Bovenberg (2007) compares different investment strategies over a life cycle savings model with different portfolio asset allocations. Their results illustrate a substantial 12% welfare loss to households who do not participate in stock market participation over their savings life cycle. Furthermore, they show that portfolios that lack proper asset diversification suffer from an overall welfare loss of 3.5%. Similar studies are done by Coco and Maenhout (2005) as well as Calvet and Sodini (2007). Coco and Maenhout observed a stylized life cycle savings model that compared typical investment portfolio allocations to ones without an equity allocation. They report annual losses of up to 4% for the investment portfolios that did not have any stock market participation. Similarly, Calvet and Sodini (2008) observe household investment losses as significant as 4.3% for non-stock market participants. Ultimately these studies assess and provide evidence on the long term impacts equity participation has on household net worth.

While there is substantial evidence illustrating the long term benefits of including equities in an investment portfolio, it is clear that many individuals are averse to participating in the equity risk premium. This paper investigates whether financial literacy plays a role in stock market participation willingness. The degree and magnitude of this relationship are evaluated through statistical analysis. The following hypothesis will be tested to observe whether higher levels of financial literacy equate to improved exposure to the equity risk premium. Formally stated:

H1: There will be a positive relationship between financial literacy and an individual's propensity to participate in the stock market.

Levels of Financial Literacy and the Implications

Research on the topic of financial illiteracy indicates a growing field of study, especially in the past three decades. The excitement around the issue of financial literacy seems to be justified, as many studies reveal deficient levels, across many demographics. For example, Lusardi (2005) explains that many adults approaching retirement age, cannot complete simple interest rate calculations, nor do they understand simple concepts of inflation and risk diversification. Furthermore, the 2014 Health and Retirement Study

(HRS), which is a nationally conducted survey in America, concludes that financial illiteracy is common among Americans over 50 years old (Sonnega, 2014). An especially concerning statistic is the importance of financial planning and fiscal responsibility for individuals at this age, near retirement. The HRS assesses financial literacy through three basic questions, testing interesting compounding, inflation and risk diversification. These questions were tested on youth populations as well with similar results. Young Adults (age 22-29) display surprisingly low levels of financial literacy. Less than 30% of the respondents show a basic understanding of interest rates, inflation, and risk diversification (Lusardi, 2010).

In this study, Lusardi (2010) evaluates findings from a survey that tests three crucial financial literacy concepts; risk diversification, inflation and compounding interest rates. The questions were administered through the National Longitudinal Survey of Youth to dissect how financial literacy impacts financial decision making. An analysis was done to measure average financial literacy levels based on the responses of the three financial literacy questions. Furthermore, demographic variables such as race, gender and ethnicity were included. Findings indicated that 79% of individuals surveyed correctly answered the interest rate question, 54% for inflation, and 47% could accurately explain risk diversification. Additionally, scores were noticeably lower for women, Hispanics, and African Americans. The study concluded that less than 30% of respondents had a basic understanding of all three concepts and that individuals were significantly ill-equipped to deal with fundamental economic decision making (Lusardi, 2010).

Like Lusardi, Moore (2003) conducted a study to establish a relationship between financially literate individuals and informed decision making, specifically towards the avoidance of predatory banking practices. Moore surveyed a population of two groups, with one group having a much higher propensity to engage in risky financial behaviour. He correlated the dangerous economic behaviour group back to their financial knowledge levels. He documented that individuals that have participated in higher-risk financial activities and who have been victims of predatory lending practices are much more likely to have lower levels of financial knowledge (Moore, 2003). His research supports many of the other studies that establish a causal relationship between financial literacy and loan delinquency.

There is evidence suggesting that consumers are not adequately saving for retirement due to a variety of factors. This has been particularly obvious regarding credit and debt proliferation. Northwestern Mutual published a study in 2019, citing that the average American student has over $30,000 in student loans. Furthermore, it revealed that 60% of millennials have zero savings and an average of $8,000 in credit card debt. While bankruptcy is a well-known consequence of early debt accumulation (Roberts and Jones, 2002), there are various other impacts. NEFE (National Endowment for Financial Education) reported that younger indebted individuals were less likely to take advantage of employer-matched pension schemes or invest in retirement plans. Additionally, they revealed that 55% of adults did not have any savings in a registered retirement plan, such as a 401K or IRA (NEFE, 2006).

Additionally, multiple studies have illustrated a link between financial literacy, retirement savings (Clark, 2002) and stock market participation (VanRooij, 2011). Lusardi and Tufano (2009) further explore the relationship between financial literacy and debt management. Their study illustrates how a lack of financial literacy can lead to long term consequences, such as poor financial decisions and heavy debt loads. Bernheim (1995) reported that most individuals in his financial literacy survey failed to illustrate an understanding of concepts relating to equities, mutual funds, bonds, and compound interest. Furthermore, the paper also reported a lack of knowledge regarding debt literacy, specifically loans and interest rates. While this paper surveyed America specifically, Miles (2004) conveyed a similar issue in the U.K., specifically towards interest rates and mortgages. In a 2005 study, Christelis conducted an economic survey in multiple E.U. countries that illustrated respondents scoring low on financial literacy concepts.

Furthermore, Agarwal (2009) presented evidence that debt illiteracy could lead consumers into unfortunate debt situations, with aggressively high-interest rates, credit card fees and predatory lines of credit. He established that financial education regarding debt is becoming crucial in American lives and that improving overall financial knowledge can be a strong predictor in preventing mortgage delinquencies. Finally, in 2005 the National Council on Economic Education conducted a study of students and working-age adults to test their understanding of fundamental financial numeracy skills, concluding that there was a general lack of knowledge for the younger working-age population.

Renowned behavioural economist Peter Thaler, discussed in his book, Nudge that behavioural economics can have substantial impacts on financial decision making (Thaler, 2008). For example, one concept outlines how it is more difficult for an individual to cope with loss, even when the loss is equal to or less than the same magnitude of gain. In the book, this concept is discussed regarding early bonuses. Thaler underlines that it is more beneficial to give bonuses at the beginning of the year, which can be taken away at the end of the year, depending on overall performance. Even if this bonus is equal to what would be generally given at year-end, the pain of losing the bonus exceeds the pleasure of gaining the bonus, therefore improving overall employee performance (Thaler, 2008). This same concept can be applied to financial literacy and stock- market participation. The fear of losing savings in the stock-market generally overwhelms the long term gain that equity exposure has. When individuals are not well versed in basic concepts such as risk diversification and compound interest, the fear of losing a portion of your savings becomes a huge barrier to participation. Financial literacy has been shown repeatedly to improve an individual's willingness to participate in the equity market (Haliassos and Bertaut, 1995). Ultimately, Haliassos and Thaler (1995, 2008) both discuss the importance of stock market participation and why so many people are averse to it.

Multiple studies and reports provide evidence regarding the proliferation of credit and the complexity of financial products in the marketplace. The Financial Crisis Inquiry Commission (2010) discussed predatory practices of banks, intentionally leveraging asymmetrical information to drive up profits. Furthermore, they discussed how rapid

innovations in the financial sector created radically complex products such as CDOs and mortgage-backed security derivatives. With significant downward pressure on interest rates globally, financial institutions are innovating products to try and reach for better yields. Frequently this results in growing complexity and higher risk, creating a high cost to the consumer (Rotfeld, 2010). There is strong evidence to suggest that consumers are struggling to understand the majority of products presented to them by financial institutions, even at a retail level (Lusardi, 2008).

In 2005, Courcane and Zorn attempted to establish a relationship between creditworthiness and financial literacy. Specifically, financial literacy impacted financial behaviours, outcomes and an individual's ability to pay back a loan (Courchane and Zorne, 2005). The study collected data from a variety of sources in the United States with the ultimate goal of trying to establish causation between financial knowledge and financial behaviour. They used data from Freddie Mac to gather credit information from households with incomes below USD 80,000. They collected additional data from Experian, specifically FICO scores, to help with the regression analysis. The researchers used a two-step process, firstly estimating economic behaviour as a function of financial knowledge. Finally, they estimated credit outcomes as a function of financial practices, using the first step. The researchers concluded that the most crucial factor for determining economic behaviour (specifically self-control) was knowledge. They were able to conclude that financial behaviour is a strong predictor for determining an individual's ability to pay back a loan. Furthermore, they were able to successfully illustrate a causal link from financial literacy to behaviour to outcomes.

Statistics Canada (2011) created a report on the financial knowledge of Canadians. Using information from the 2009 Financial Capability Survey, this study evaluates how financial knowledge can impact critical financial decisions, such as purchasing a home or supporting their children's education. They found that the relationship between household financial health and financial knowledge to be notable. Individuals that tested higher in financial literacy were shown to exhibit more disciplined financial behaviour. The study concludes by recommending additional public policy measures to implement further financial education.

Lusardi and Tufano (2009) attempted to dive deeper into the relationship between debt and financial literacy. This study included a comprehensive examination of financial literacy and numerical skills while also collecting demographic data. The data was collected through phone interviews with 1000 residents of the U.S. They assessed debt literacy through a survey of three questions. The questions tested compounding interest, credit card balances, and the time value of money. Additionally, they surveyed the same population to evaluate their financial experiences. These ranged from traditional borrowing, short term borrowing, savings and investments, and finally, credit cards. Lusardi and Tufano used cluster analysis to determine which subset of the population had similar financial experiences, whether they were good or bad. Based on the results, they were able to produce four subsets; Fringe, over-extended, borrowers-savers and in-control individuals (Lusardi and Tufano, 2009). The in-control group made up roughly one-

quarter of the sample and consisted of individuals who did not push their credit limit on cards and lines of credit.

These individuals had higher levels of experience with stocks, bonds and mutual funds. They were more likely to have experience with home financing and had strong overall credit scores. The "borrowers-savers" group consisted of individuals who had high levels of saving and investment experience, but also very high debt levels. This group made up roughly 12% of the population. Approximately 31% of the sample was made up of the "over-extended" group. They had high levels of debt, lower levels of savings and low levels of investment experience.

Furthermore, they had extensive experience with credit, ranging from credit cards to mortgages and lines of credit. Finally, the "fringe" group comprised 30% of the population and were frequent uses of alternative financial services. They had little to no investments and deficient levels of savings. Cluster analysis was used on these four groups to determine a relationship between demographics, debt literacy and overall debt levels. A study between the financial experience data and financial knowledge data helped researchers conclude that there was a strong causal relationship between debt literacy and negative financial experiences relating to debt. They estimated that individuals with lower levels of debt had to pay roughly 45% more in fees and interest than those with higher debt literacy. Based on their results, they estimate that approximately 33% of all credit card fees are paid by consumers who are lacking sufficient debt knowledge.

In 2010, Hastings and Mitchell sought out the possibility that delayed gratification and financial literacy could be strong predictors of retirement savings. Based on previous research done by Laibson (1997), Hastings and Mitchell wanted to measure how varying time preferences could lead to better retirement outcomes. They hypothesized that individuals with more extended time preferences generally had better retirement outcomes, especially when combined with adequate levels of financial literacy. The time preference measurement was given on a questionnaire, which gave participants two options. The participants were allowed to take a small payout immediately or receive a 20-60% more if they waited for the payout in the mail.

The respondents were tested on basic financial literacy concepts to measure economic knowledge and capability levels. Lusardi and Mitchell created these questions in their 2007 study. They included numerical and interest rate concepts, risk diversification and inflation. The study used a regression model to help establish the impacts that time preference and financial literacy had on retirement savings. The study concluded that time patience and financial literacy are both strong predictors of retirement savings, with time preference or impatience levels being the more reliable predictor of the two.

Finally, a study conducted in 2010 (Gerardi et al., 2010) investigated the relationship between financial literacy, mathematical ability, and mortgage defaults. This study is perhaps one of the most relevant studies towards the research of this paper. The researchers interviewed leveraged consumers about the conditions of their mortgage, demographic variables, cognitive and numerical ability. A survey in 2008 was conducted,

with many of the individuals surveyed having subprime mortgage loans issued in 2006. The results illustrated strong evidence that there was a significant link between financial literacy and mortgage defaults. They controlled for general cognitive abilities such as verbal I.Q. and found that financial literacy is heavily associated with loan defaults. Additionally, the researchers found that many of the consumers did not fully understand the details of the financial contracts that they were purchasing. Ultimately the researchers concluded that numerical aptitude and financial literacy were robust indicators when evaluating the probability of delinquency.

In summary, there is a significant amount of research and empirical evidence illustrating how financial literacy plays a substantial role in improving various economic outcomes (Lusardi & Mitchell, 2007, 2011, 2013; Tufano 2009). Furthermore, their evidence suggests that financial illiteracy can lead to potentially catastrophic consequences, such as high debt levels, damaged credit scores, bankruptcy, and compromised physical and mental health (CFPB, 2013; Harnisch, 2010). Conversely, higher levels of financial knowledge are correlated with better investment behaviour, improved behaviour towards debt, credit, and higher levels of net worth (Lusardi, 2009; Sonnega, 2014). Ultimately, there is plenty of evidence to suggest that financial literacy is correlated with positive economic outcomes; however, causation is not yet proven. Furthermore, additional research needs to be done to determine whether other factors are influencing these outcomes. For example, wealth accumulation could be a factor in motivating an individual or a household, to improve upon their financial knowledge. The causality may move in the direction from wealth to financial literacy, however that hypothesis lacks evidence as well.

This paper will present unique research exploring the implications of financial literacy on retirement planning ability. It is clear that retirement planning ability has a substantial impact on retirement well-being. Evidence supports that an individuals' ability to create and adhere to a retirement plan has a prominent effect on long term retirement health. A second hypothesis was formed after carefully reviewing previous evidence and building a methodology to test for this. This paper will use statistical analysis to reject or accept the following hypothesis on retirement planning ability. Formally stated:

H2: There will be a positive relationship between financial literacy and an individual's ability to develop and follow a retirement plan.

Importance of Financial Education, Public Policy Perspective

Many studies show the importance of financial literacy investment in educational institutions around the globe. The Organization for Economic Control and Development (OECD) released a study in 2006, illustrating the impacts financial literacy rates have on national savings rates. Much like Lusardi and Tufano, they establish that financial literacy impacts economic decision making, specifically towards debt and spending behaviour. The OECD underlines the importance of improved national savings rates, especially in the USA, where there is enormous pressure on social security. The pressure on social security combined with vanishing private-sector pensions creates even greater importance

to improve overall savings rates. With a high percentage of the U.S. population approaching retirement with a significant dependence on public programs, policymakers are attempting to develop education programs to improve savings rates (OECD, 2006).

From a public policy perspective, countries have even more economic incentives to improve financial literacy implementation at educational institutions. While the great economic depression was predicated upon predatory banking practices (no income verification loans to fill MBS), many of the predatory loans could have been avoided with necessary financial literacy improvements (Consumer Financial Protection Bureau, 2013). Their annual report revealed that many of the major banks in the USA specifically targeted African American and less educated populations because of their financial illiteracy. Their lack of fundamental financial knowledge made them perfect candidates for subprime adjustable-rate loans. The director of the CFPB, Richard Cordray, implied that financial literacy is the first line of defense for consumers who are navigating the economic landscape of the 21st century. Furthermore, the report from the CFPB showed that complex and predatory financial products coupled with financially illiterate individuals were among the fundamental reasons why the great recession of 2008 occurred. Combining these factors posits a compelling argument for increased financial literacy worldwide (CFPB, 2013).

Further reports conducted by public bodies (Federal Reserve, 2013; OECD, 2006) conclude that reduced rates of financial literacy results in economic impacts that extend far past the individual. The Federal Reserve (2018) argued that the overall strength and vitality of the government depends on the individuals' economic strength. As a result, they deem financial education an absolute necessity in public school. The OECD reported that technology and commercial product innovations had exposed financial consumers to an increased amount of products and services, increasing the risk of predatory practice such as loans, credit availability and fraud (OECD, 2006).

Another public policy case for financial literacy can be made through its health implications. Harnisch (2010) finds a positive relationship between families' physical and mental health and financial literacy. He illustrates that lower levels of financial literacy may result in lower quality of life, higher levels of psychological stress, and lower-income levels. Furthermore, Harnisch describes how crucial financial literacy is in terms of financial stability and freedom in retirement years. He posits that a lack of financial security leading up to and during retirement resulted in significantly lower levels of mental and physical health. Even outside of retirement savings, Harnisch notes that failing health is often a consequence of financial stress, whether it is from overbearing debt or living paycheque to paycheque. In conclusion, Harnisch establishes that financial illiteracy can lead to substantial negative consequences not only at an individual level but on a national and global level as well (Harnisch, 2010).

President's Advisory Council on Financial Capability and Financial Literacy

When reports came out, illustrating the role of predatory banking practices during the 2008 financial crisis, President Barack Obama signed an executive order to form two

advisory councils. The President's Advisory Council on Financial Capability (PACFC) and the President's Advisory Council on Financial Literacy (PACFL). The advisory council on financial literacy was established in 2008 to advise the president on domestic issues relevant to financial literacy and ultimately empower USA citizens with financial knowledge (PACFL, 2008). The White House believed that much of the economic tragedy that occurred to American citizens during 2008 could have been avoided if they were able to protect themselves from predatory practices. In addition to adding stricter regulations to the banking industry, the White House set out to improve financial literacy levels across the country, to reduce the chances of an economic catastrophe like the great recession occurring again (PACFL, 2008). As a result, the Federal government created policies to promote financial literacy training programs nationwide, both in the public and private sectors. As published in the PACFL annual report (2008), the council established from existing studies on financial literacy that equipping consumers with adequate financial knowledge was of the utmost importance. They concluded that financial literacy played a mandatory role in the lives of U.S. consumers, and set out to find an effective way to improve financial education. They concluded that financial literacy could be most effectively administered through the workplace, educational institutions (private & public) and the community. To conclude their annual report, they made 15 recommendations to the President and Federal Government. In summary, the recommendations related to

a) Improving financial education for students from primary to post-secondary levels
b) To administer support to employers as providers of financial education to their employees.
c) To increase the accessibility of financial services for the 10+ millions of unbanked Americans, and to create regulation to remove the conflict of interest from these financial service organizations
d) Identify and promote a standardized set of skills, concepts and behaviours that are considered foundational to financial literacy
e) To promote awareness among US citizens to the levels of their financial literacy, the importance of informed economic decision making, and where they can access information to improve their financial knowledge

Consumer Financial Protection Bureau

The Consumer Financial Protection Bureau (CFPB) was established in 2011 as a government agency in the USA to protect citizens from predatory financial practice. Their mandate was to develop a national strategy to educate and empower American citizens with financial literacy, to help them make better economic decisions. The CFPB believes that the United States' financial stability depends on its citizens' financial well-being, making financial literacy education a priority for the agency. They were extremely vocal about the importance of financial literacy and its role in protecting against the predatory practice. The CFPB believes that financial literacy empowers individuals to protect themselves against economically destructive decision making, as well as allowing greater

control over their finances (2013). After the economic crisis, the Dodd-Frank Act was enacted to reform Wall Street and financial literacy education. They developed and implemented a comprehensive research program in 2012 with the ultimate goal of assessing the economic well-being and capability levels of USA citizens (CFPB, 2013).

<u>Implications of Financial Literacy Research</u>

Financial knowledge, education and literacy have all gained traction in academic literature, especially in the last two decades. Researchers, academics and governments have all established the crucial role that financial literacy plays in society and the overall health of a nation. The consequences of having limited access to financial education and low financial literacy levels, generally result in decreased retirement savings, bankruptcy, and high levels of consumer debt. In recent decades, the growing prevalence of mortgage card debt, lines of credit and bankruptcy, can be traced back to a general lack of financial literacy (Jappelli & Padula, 2013). Researchers have also established that financial illiteracy can result in aggressively poor attitudes towards saving, debt obligation, retirement planning, investment and overall money management (Lusardi, 2013).

The ultimate goal of improving financial literacy levels at an individual level should have a profound global impact. While that sounds hyperbolic, global communities stand to benefit a great deal if its citizens are collectively making better economic decisions (OECD, 2006). By improving the financial well-being of individuals, it ultimately impacts households, communities, nations, and the world. If the majority of individuals cannot balance their personal expenses (Lusardi, 2009), how can we expect governments to balance their fiscal budget? Perhaps this is one reason why the government debt levels around the globe continue to climb.

Jappelli (2011) argued that the collective financial well-being of individual citizens should be a priority for governments, as the government's strength lies within its people's financial stability. While countries benefit directly from the improved economic decision making of its citizens, the inverse could also have catastrophic consequences. The 2008 financial crisis, characterized by subprime loans, aggressive leverage and speculation, is a perfect example. Millions of Americans took out multiple mortgages on multiple homes, with adjustable rates and no income verification. The consequence was over 3 trillion USD lost in home equity and 6.9 million USD lost in shareholder value for American citizens (Federal Reserve, 2010).

Each of these sources touched on the lack of financial literacy and its long term implications. In each study, it became apparent that the financial health of today's consumer is generally characterized by poor financial decision making, ultimately leading to high levels of debt (credit card, student loan, line of credit, mortgage) and a complete lack of retirement savings. Additionally, public policy implications are discussed, as well as large public organizations such as the OECD and CFPB. Therefore, this paper will focus on the crucial role that financial literacy plays in financial well-being and retirement outcomes.

Based on the research and outcomes observed from the literature review, this paper will test the hypothesis that financial literacy has a positive relationship with a) stock market participation and b) the ability to develop a retirement plan. This hypothesis was developed after carefully reviewing the outcomes of many empirical studies. Evidence from these studies illustrates the strong positive relationship financial literacy has on many financial indicators, including equity participation and retirement planning.

Chapter 3: Methodology

Methods

Current research indicates that financial literacy is responsible for numerous positive economic outcomes. It is clear that financial literacy has a positive impact on economic outcomes from improved financial decision-making to fewer debt delinquencies and bankruptcies. This paper aims to explore two methods in which financial literacy can improve retirement outcomes. By focusing on stock market participation and retirement planning, the paper will seek to establish that financial literacy can be an impactive factor on these two variables. As previous studies have already found, stock market participation and retirement planning have a causal relationship to positive retirement outcomes (Bernheim & Garrett, 2003; VanRooij, 2011). We can infer that through these two avenues, financial literacy will positively impact retirement outcomes as well.

This paper will conduct original research by surveying a population for their financial literacy. While previous studies have measured financial literacy in a variety of ways, this paper will ask individuals to specifically self-assess their financial literacy. Each individual will be asked to rate their financial literacy level between one and five, based on the following definition: financial literacy is the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being (PACFL, 2009).

The survey will also ask individuals to self-assess their ability to manage their finances, make critical financial decisions, and willingness to participate in the stock market. Data from financial management and financial decision making will be combined to estimate retirement planning ability more accurately. Based on the results, this paper will use statistical analysis to determine the relationship between financial literacy, an individual's ability to retirement plan, and their willingness to participate in the stock market. Finally, control variables such as age and gender will be used in the survey to account for demographic information. By incorporating these demographic variables, it should help mitigate common-method bias in my analysis.

The expected outcome of this research is to examine whether there is a strong positive relationship between financial literacy, stock market participation and retirement planning. The goal is to provide statistical evidence that individuals with higher levels of financial literacy have more control over retirement planning and more exposure to the equity risk premium. This evidence would further support previous academic literature that illustrates the importance of financial literacy at a public and private level.

Sample

In this research, we gather data from a book of clients at an established investment and wealth management firm. This financial institution is one of the largest in Canada, providing families, businesses and charitable foundations with investment management solutions. They are a full-service brokerage firm with over 400,000 clients and over $325 billion in assets under management. Their goal is to provide personalized investment solutions, tax and estate planning and wealth management advice. It is important to note

that established financial institutions in Canada can charge relatively high fees for their services and require a minimum amount of investable assets. For this particular firm, the minimum threshold is set at $500,000. When observing the results of this methodology, it is crucial to consider that many individuals do not have the luxury of a full-service brokerage firm to help them with their financial goals.

The book comprises 184 households, with an average net worth of CAD $778,000 investable assets. This research will survey the participants to gather data on their financial literacy, risk aversion towards equity participation and finally, retirement planning ability. The demographics of this prospective sample have an age range of 38-89 years old, with a gender split of (46% females to 54%) males. Of the 184, 41 are currently retired, and the remainder of households are currently working and saving for retirement. This particular book of clients was picked because of their relative affluence and overall experience with financial markets. These characteristics will hopefully allow for more accurate self-assessments when it comes time to respond to the survey.

Table 2: Population Sample

Male	Female	Average Age	Retired	Working
63	53	56	27	89

Of the sample, 116 individuals replied to the survey. The 116 individuals were made up of men and women between the ages of 34 and 86. The average respondent is 56 years of age. Finally, 53 women and 63 men responded to the survey, with 27 in retirement and 89 working. The data set is used to examine how these working and retired individuals rate their ability to manage finances and willingness to participate in equity investments.

Data Collection:

Original data was collected by surveying the prospective population. The survey allowed us to collect self-reported data on financial literacy, financial decision making, retirement planning and stock market participation. Demographic data is also collected for control variables (age, gender and retirement status). The information was gathered through two primary methods, survey and email response. 116 of 184 individuals responded within a timeframe of 3 weeks. All of the data collected and analyzed came from primary sources. No additional secondary sources were used to extend the data set. A total of eight variables were recorded and used in this data set. (please see Appendix A for the survey questionnaire).

Independent Variable:

The independent variable measured in this model is financial literacy. Question one of the survey asks respondents to self report their financial literacy level, based on the definition: financial literacy is the ability to use knowledge and skills to manage financial

resources effectively for a lifetime of financial well-being (PACFL, 2009). Statistical analysis will model how financial literacy affects the four dependent variables.

Dependent Variables:

   This model measures four dependent variables; willingness to participate in the stock market, ability to manage finances, ability to make financial decisions and confidence in retirement. The latter three dependent variables are used to operationalize retirement planning ability. We can observe how financial literacy impacts an individual's stock market participation and retirement planning ability by gathering data from these four dependent variables. The data on these variables were collected from questions 2-5 in the survey.

Control Variables:

   Gender, age and retirement status are the three control variables that were collected outside of the survey. The financial institution that serviced this book of clients provided this information. These variables serve to improve the accuracy of data in the regression analysis. Observing their role in the regression model helps to isolate the overall impact financial literacy has on the dependent variables.

Data Analysis:

   Before the data analysis, a pretest was issued with the survey to a group of 20 individuals with similar demographic backgrounds as the sample group. This pretest was used to observe if the test result and data were accurate enough to be used for research. The most important factor was making sure participants understood the financial literacy definition provided, and that it provided clarity for the rest of the survey. Data received was well defined and gave us clear independent and dependent variables that could ultimately be used for analysis.

   Statistical analysis using ordinary least squared (OLS) is used on respondents' data to observe the relationship between variables. With financial literacy as the independent variable, analysis is done to examine the relationship with Stock Market Participation and Retirement Planning ability. The statistical analysis will focus specifically on correlation and regression analysis to gain further insight into the relationship between the independent and dependent variables.

   The regression analysis allows us to examine further how financial literacy influences an individual's stock market participation and retirement planning. The regression coefficient describes the mathematical relationship between the independent variable and the dependent variable. P-values for each of these coefficients will be evaluated to determine significance. The next chapter provides further discussion of the statistical analysis.

Chapter 4: Findings

Descriptive Statistics

In this section, the independent and dependent variables are analyzed to illustrate basic descriptive measures. Table 3 below provides some insight into the distribution and frequency of the variables that were measured.

Table 3: Descriptive statistics

Variables	N	Mean	Std. Dev	Skewness	Kurtosis
Financial Literacy (IV)	116	2.540	1.240	0.512	-0.675
Ability to Manage Finances	116	2.700	1.239	0.400	-0.786
Ability to Make Financial Decisions	116	2.550	1.225	0.542	-0.621
Confidence in Retirement	116	2.820	1.436	0.181	-1.327
Stock Market Participation	116	2.640	1.373	0.537	-0.886

Initial observations of the descriptive data reveal many positive outcomes. Firstly, the standard deviation of the primary data sits at acceptable levels. Confidence in retirement seems to have the most dispersion, but it still lies within an acceptable range. As observed earlier, this is likely because many significant variables cause an individual or household to be confident (or not confident) in their retirement. Many of these variables, such as income levels, living costs and household size, are not measured in this model. With socioeconomic factors having a robust influence on retirement confidence (Lusardi, 2013), this variable is likely to have more significant variation and, ultimately, a much lower R-squared.

All of the variables present a slight positive skewness, meaning that the distribution tail extends further to the right. The data is revealed to be relatively symmetrical but has a slightly heavier distribution to the left of the model. Furthermore, the negative kurtosis levels illustrate a flattening of the distribution curve with lighter tails. The distribution is shown to be platykurtic, revealing that the extreme values are well below half of the normal distribution. As a result, the data sample is observed to have a small number of outliers.

The mean of the variables illustrates some interesting data, mostly supported by the evidence in the literature review. Self-reported financial literacy scores from the primary data show an average of 2.54/5. This illustrates a reasonably low standard of financial literacy across the population. Taking into account that this population is relatively affluent ($778,000 in investable assets) and are all participating in some sort of financial planning, the average self-reported financial literacy score is lower than

anticipated. However, Lusardi (2008, 2011, 2013) supports this, providing evidence that financial literacy levels are low across the majority of demographics.

Additionally, the dependent variables also present low confidence levels in retirement, financial decision making and financial management. Despite a significant amount of investable assets, the population group still feels relatively uncertain regarding their retirement. Higher living costs in Western Canada, coupled with the current economic environment and volatile markets, most likely contribute to their retirement uncertainty. The literature review supports this data, where Statistics Canada reported that ⅓ Canadians between the ages of 45 and 60 felt unconfident about their retirement savings (Statistics Canada, 2019). Furthermore, descriptive statistics revealed a relatively low average of stock market participation from respondents. This data is unsurprising, given the risk aversion of the population. Many of the clients in this book felt strongly about capital preservation and ultimately felt more comfortable dealing with safer financial investments such as bonds, annuities and money market accounts. Evidence provided by VanRooij (2011) also supports that the majority of individuals are averse to equity participation, therefore forgoing an opportunity to benefit from the equity risk premium.

Evidence presented by Haliassos and Bertaut (1995) illustrates low individual levels of both stock market participation and financial literacy. They determine that individuals with weaker financial knowledge, such as business cycles and interest rates, are less likely to participate in equity investments. The data also revealed lower levels of self-reported financial decision making and financial management. The mean for these two variables is slightly smaller than expected, but the overall level is not a surprise when relating it to evidence observed in the literature review. The CFPB (2013) established that many American citizens make poor financial choices due to a lack of financial knowledge. Research completed by Lusardi & Tufano (2009) supports this data, with their evidence illustrating that financial literacy has a strong positive relationship with financial decision-making, specifically with mortgage and credit card debt.

To conclude, the descriptive statistics provide insight into the primary data that has been collected. While some of the results reveal some surprisingly low averages for the independent and dependent variables, this data is ultimately supported by evidence observed in the literature review. Overall, none of the descriptive measures provide any evidence to doubt the original hypotheses. The standard deviation, skewness, and kurtosis fall within acceptable bounds, and none of the averages for each variable are extreme. The next section will further explore the relationship between financial literacy and the observed dependent variables.

Correlation:

Table 4 illustrates the correlation matrix for the independent and dependent variables and the control variables. The Pearson correlation coefficients provide insight into the strength of the relationship between variables. The interpretation of this data reveals that the independent variable has a significant positive relationship with three of the dependent variables. The fourth dependent variable (Retirement Confidence) has a moderate positive relationship with financial literacy. It further illustrates that two of the control variables (gender and age) have a statistically insignificant relationship with financial literacy. In contrast, the third control variable (retirement) has a moderate positive relationship.

Table 4: Correlation Matrix

	Financial Literacy	Ability to Manage Finances	Ability to Make Financial Decisions	Confidence in Retirement	Stock Market Participation	Gender	Age	Retired
Financial Literacy	1							
Ability to Manage Finances	0.674**	1						
Ability to Make Financial Decisions	0.688**	0.523**	1					
Confidence in Retirement	0.373**	0.355**	0.334**	1				
Stock Market Participation	0.750**	0.518**	0.544**	0.447**	1			
Gender	-0.081	-0.028	-0.074	-0.005	0.028	1		
Age	0.034	0.005	0.219*	0.088	0.077	0.026	1	
Retired	0.402**	0.333**	0.470**	0.384**	0.429**	-0.014	0.586**	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Important measures to observe in the correlation matrix are the Pearson Correlation coefficient and the p-values associated with them. The correlation coefficient indicates the strength of the relationship between variables. The P-value evaluates the significance level of the coefficient. P-values lower than .01 convey high levels of significance.

The first relationship observed in this correlation matrix is between financial literacy and the first dependent variable, the ability to manage finances. The Pearson Correlation for this relationship is .674 with a p-value < .01. The Pearson Correlation infers a strong positive relationship; p-value infers a high significance level. This essentially means that there is less than a 1% chance we would have observed the same results if the variables were unrelated (coefficient of 0). Based on the high significance level, we can conclude that there is a strong association between financial literacy and financial management.

The same can be said of the relationship between financial literacy and the second dependent variable, the ability to make financial decisions. The Pearson Correlation for this relationship is .688, with a p-value of less than .01 as well. Based on these measures, we can conclude that financial decision-making ability has a strong positive relationship with financial literacy.

The relationship observed between financial literacy and retirement confidence also reveals a positive relationship. The Pearson correlation for this relationship is .373,

with a p-value of less than .01. Given the significance level, we can conclude that a moderate positive relationship exists. It is worth highlighting that this correlation coefficient is the least significant when compared to the other dependent variables.

The relationship between financial literacy and willingness to participate in the stock market reveals the most substantial relationship between variables. With a correlation coefficient of .750 and a p-value of less than 1%, we can infer a strong positive relationship with a high significance level. This data is supported by anecdotal evidence, where it was observed that most clients with lower levels of financial knowledge were more risk-averse and, therefore, unlikely to participate in equity investments. Their preferred asset allocation was found to have a more substantial weighting in fixed income securities and more defensive equity choices. Furthermore, the evidence provided in the literature review illustrates similar results (VanRooij, 2011). The findings relating to the correlation matrix demonstrate that the dependent variables all have a positive relationship with financial literacy. Three of the four dependent variables infer a strong positive relationship to financial literacy, while retirement confidence reveals a moderate positive relationship.

Control variables are also accounted for, providing insight into the significance they have on this model. Adding various control variables will allow the isolation of their effect on the dependent variable, giving clarity to the overall impact the independent variable has. Failure to isolate the control variables could potentially compromise the internal validity of the primary data. In this matrix, we can observe how two of the three control variables have little to no effect on dependent variables.

Age and gender appear to be statistically insignificant and have a non-linear relationship with the other variables. Inferential statistics are used to observe mean differences between the two gender groups. The t-test reveals almost no variation of means between genders, as shown in table 5.

Table 5: Distribution of the sample

Variables	Gender M(1) F(2)	N	Mean
Financial Literacy	1	63	2.630
	2	53	2.430
Confidence in Managing Finances	1	63	2.730
	2	53	2.660
Confidence in Financial Decision Making	1	63	2.630
	2	53	2.450
Confidence in Retirement	1	63	2.830
	2	53	2.810
Confidence in Stock Market Participation	1	63	2.600
	2	53	2.680

Finally, this model controls for whether the respondent is retired or not. This variable was ultimately added to observe if younger individuals with higher levels of financial literacy and stock market participation could retire early. Unsurprisingly this control variable also correlated highly with all of the dependent variables. As mentioned earlier, multiple variables and socioeconomic factors influence retirement outcomes. While it is clear that independent and dependent variables all correlate strongly with retirement confidence, further analysis would ultimately be out of scope.

Regression Analysis:

To further explore the relationship between variables and to support the assumptions made from the correlation matrix, regression analysis using OLS is done on the same primary data. The explanatory power of this model is shown through the estimated effect financial literacy has on stock market participation and retirement planning ability. Table 6 illustrates the results of the regression analysis to further examine the strength and significance of each dependent variable to financial literacy.

Table 6: Regression Analysis

	Ability to Manage Finances		Ability to Make Financial Decisions		Confidence in Retirement		SMP Willingness	
Gender	-0.034	0.067	-0.159	-0.061	0.022	0.065	0.118	0.239
	(0.21)	(0.17)	(0.20)	(0.16)	(0.25)	(0.24)	(0.23)	(0.17)
Age	-0.026**	-0.009	-0.007	0.009	-0.021*	-0.014	-0.026**	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Retired	1.465***	0.413	1.494***	0.459*	1.711***	1.261**	1.897***	0.619**
	(0.31)	(0.27)	(0.30)	(0.27)	(0.36)	(0.39)	(0.33)	(0.30)
Financial Literacy		0.622***		0.612***		0.266**		0.755***
P-Value		>.01		>.01		>.05		>.01
Constant	2.370***	1.003**	1.347**	0.002	1.874**	1.289*	1.594**	-0.066
	(0.54)	(0.45)	(0.51)	(0.39)	(0.62)	(0.71)	(0.57)	(0.43)
n	116	116	116	116	116	116	116	116
R^2	0.17	0.47	0.23	0.53	0.18	0.22	0.23	0.59
Difference in R^2		0.3		0.3		0.04		0.36

***. P-Value $\leq$ .01 Highly Significant
**. P-Value $\leq$ .05 Significant
*. P-Value $\leq$ .1 Moderate

The relationship between the financial literacy and dependent variables is examined through key regression measures. Firstly, the regression coefficient (row 9) and their corresponding p-values are analyzed. The coefficient will be used to observe the numerical relationship between variables, while the p-value denotes its significance. In this case, the p-value significance levels are set to 10%, 5% and 1%, indicated by an asterisk. Any P-value $\leq$ 5% provides evidence to reject the null hypothesis and conclude that there is a significant relationship between the variables. The coefficient describes the degree of the mathematical relationship, while the p-value indicates the level of significance. For example, if the regression coefficient between financial literacy and financial management is 0.5, this illustrates a 0.5 unit change in financial management when financial literacy increases by one. Finally, changes in R^2 are observed for each relationship. The difference in R^2 represents the amount of unique variance that financial literacy explains when added to the control variables.

Financial Literacy and Financial Management

The first relationship examined is between financial literacy and an individual's ability to manage their finances. The regression coefficient β is .622, with a p-value of less than one percent. As a result, this illustrates a strong relationship with a high significance level. The analysis indicates that there is less than a 1% chance the same results occur if the two variables do not co-vary. This suggests that there is enough evidence to reject the null hypothesis and infer that financial literacy is positively associated with financial management. Furthermore, the difference in R^2 between the control and independent variables allows us to observe the difference in variance when financial literacy is added to the regression model. Prior to adding financial literacy, the control variables accounted for 17% of the variation on the dependent variable. However, when financial literacy is introduced, R^2 increases to 47%. Therefore, we can infer that financial literacy explains a significant amount of variation in this model.

To conclude, the regression analysis provides enough evidence to find that financial literacy has a strong relationship to financial management with a high significance level. The association has a positive correlation, and the variables are directly related to each other. Finally, the difference in R^2 illustrates the amount of unique variance that is explained by financial literacy in this model.

Financial Literacy and Financial Decision Making

The second dependent variable observed is an individual's ability to make financial decisions. The regression analysis reveals a β of .612 with a p-value of less than 1% when compared to financial literacy. Like the first variable, this indicates a robust numerical relationship with a high degree of significance. As a result, the null hypothesis is rejected, and we can conclude that there is a direct mathematical relationship with a high significance level between financial literacy and financial decision making. When isolating the control variables, the R^2 of the regression line is 23%. When financial literacy is introduced, the R^2 increases by 30% to a total of 53%. Therefore, we have evidence to

infer that financial literacy explains a significant amount of variance in this model when compared to the control variables.

Evaluating the regression coefficient, p-values and differences in R^2 allow us to make multiple conclusions. Firstly, the relationship between financial literacy and financial decision-making ability is positive, and the variables are directly related. Furthermore, the relationship is statistically significant, and we can conclude that financial literacy is a strong predictor of financial decision-making ability.

Financial Literacy and Retirement Confidence

The third dependent variable that is investigated is retirement confidence. The regression analysis reveals a **β** of .266 with a p-value of less than 5% when compared to financial literacy. This indicates a numerical relationship with a high degree of significance. However, it is important to note that financial literacy seems to have a much smaller statistical impact on retirement confidence when compared to the other dependent variables. With a lower regression coefficient and higher p-value, we can infer that the relationship between financial literacy and retirement confidence is less significant.

Furthermore, the relatively low R^2 indicates that the regression line does not accurately predict actual values and that financial literacy explains only 22% of the variation in retirement confidence. Additionally, when related to the control variables, only a 4% R^2 difference is observed when introducing financial literacy into the model. This reveals that most of the variation for retirement confidence is not described by financial literacy. In other words, there are a variety of other factors that are heavily influencing retirement confidence with financial literacy only accounting for a small percentage of that variation.

While the regression analysis between financial literacy and retirement confidence provides enough evidence to reject the null hypothesis, it is essential to note that it has a much smaller impact relative to the other dependent variables. The evidence conveys a low numerical but direct relationship between the variables. To conclude, there is a positive and robust relationship between financial literacy and retirement confidence.

Financial Literacy and Stock Market Participation Willingness

Finally, the relationship between financial literacy and stock market participation willingness is examined. Observation of the table reveals a **β** of .755 with a p-value of less than 1%. This illustrates a positive .755 unit change in stock market participation willingness for every one unit change in financial literacy. Combined with a high significance level, we can conclude that the relationship between financial literacy and stock market participation willingness is statistically significant, and we can reject the null hypothesis.

Additionally, the difference in R^2 indicates a significant impact when financial literacy is introduced to the model. As R^2 increases from .23 to .59, we can conclude that financial literacy accounts for 36% more variance in this model than the control variables. In other words, it reveals that financial literacy explains 36% of unique variance that other

variables in the model cannot explain. The total R^2 value illustrates that this regression model explains 59% of the variation in the dependent variable.

To conclude, when compared to all other variables in this model, stock market participation willingness has the strongest positive relationship to financial literacy. Observation of β, R^2, and the p-value allow us to conclude that these variables have a strong numerical relationship with a positive correlation and a high significance level. This evidence further illustrates that financial literacy is a strong predictor of an individual's willingness to participate in equities and that their relationship is statistically significant.

Findings and Conclusions

After careful analysis of all regression data, multiple conclusions can be made. Firstly, financial literacy appears to have a strong positive relationship with every dependent variable investigated. Three of the four dependent variables have high significant levels, and the large R^2 difference, when compared to the control variables, indicates their explanatory power within the model. Retirement status is the only variable to have a p-value above 1%; however, it is still below 5% and, therefore, statistically significant. The null hypothesis for each relationship is rejected, and a conclusion is made that financial literacy carries a robust and positive relationship with each dependent variable.

Multiple studies cited in the literature review illustrate evidence that supports the same conclusion. Lusardi (2008), Jappelli (2013), Gerardi (2010) and Fichtner (2017) all provide evidence that financial literacy impacts at least one of the dependent variables from this study. These studies are much larger in both size and magnitude, reaffirming the conclusion that financial literacy has a strong, positive association with financial management, financial decision making, retirement confidence and equity participation.

Control Variables:

In addition to the independent and dependent variables, control variables were also introduced into the regression analysis. Since they can sometimes strongly influence results, they are held constant, so the relationship between the independent and dependent variables can be isolated.

Age and gender are the first two control variables that are observed. Their overall impact on the dependent variables is virtually negligible. The β and p-values reveal that the numerical relationship is exceptionally minor and that there is insufficient evidence to conclude a non-zero correlation between variables. As a result, it is observed that age and gender do not have a significant numerical relationship with the dependent variables.

The third control variable in the regression model, retirement status, is shown to have a more robust impact than the previous control variables. Before introducing financial literacy into the model, retirement status had a high β coefficient across all four dependent variables, with a high significance level. This coefficient and significance level is noticeably higher than the other control variables—however, the overall significance

changes when financial literacy is introduced. For example, we observe a beta coefficient of 1.465 with a high significance level when related to financial management. When financial literacy is added to the regression model, the coefficient drops to .413, and the p-value increases substantially outside of the significance levels. Therefore, retirement status becomes less statistically significant, and it is possible that financial literacy partially moderates its impact.

Statistical Analysis Conclusion

This section provides relevant statistical data to help test our hypothesis. Statistical measures observed from the correlation matrix, regression analysis and descriptive statistics, give greater insight into the relationship between financial literacy and the four dependent variables. Findings from the statistical analysis will help to determine the impact of financial literacy on retirement well-being and household financial health.

Early Retirement Status

This brief section will underline some interesting primary data that is relevant to the research topic. Observation of the research data reveals a small group of individuals who have retired much earlier than the rest of the sample size. Their self-reported data is depicted below.

Table 7: Early Retirement

Respondent	Financial Literacy Rating	Ability to Manage Finances	Ability to Make Financial Decisions	Confidence In Retirement	Stock Market Participation	Age	Retired (Y/N)
9	5	5	5	4	5	53	Yes
33	4	4	4	5	5	63	Yes
36	4	5	4	5	5	62	Yes
87	5	4	5	4	5	62	Yes
91	4	4	4	5	5	44	Yes
92	4	3	4	5	5	50	Yes
103	5	5	5	5	4	41	Yes
Mean	**4.43**	**4.29**	**4.43**	**4.71**	**4.86**	53.57	

Of the 116 respondents in the population, 27 are retired. Of the 27 retirees, only seven are under the age of 66. The above table features the seven individuals who were able to retire before the age of 66. While the sample size is substantially low to be statistically significant, a few measures are worth noting.

The average score for each dependent variable is considerably higher than the population averages. For example, the average financial literacy rating observed is 4.43, substantially higher than the population mean of 2.54. The same difference is found for each dependent variable as well. Ultimately, the sample size is far too small to have any significance. Still, it is worth mentioning that every single early retiree in this population reports solid financial knowledge scores and equity participation willingness. Further research must be completed to establish if these variables are positively associated with early retirement.

Chapter 5: Summary, Conclusions, and Recommendations

As discussed in the literature review, there is ample evidence suggesting that individuals are increasingly becoming economically vulnerable due to low savings rates, higher debt burdens and low levels of financial knowledge. Rapidly rising living costs and complex financial markets further exacerbate the problem. The aggressive proliferation of credit and consumer marketing has made retirement savings and outcomes even more precarious. As a result, millennials are predicted to be the first generation in United States history, to be financially less secure than their parents (Fichtner, 2017). There has been growing concern among policymakers in many countries, who are observing a substantial lack of financial literacy and retirement savings. From a public policy perspective, we likely see a significant expansion of unfunded liabilities in the United States pension and social security sector. With retirement responsibility continually being shifted on the individual, this creates a substantial issue of systemic risk and social instability. Finding viable public policy measures to improve overall financial knowledge has become a challenge for many governments, looking to mitigate their underfunded entitlement programs. Establishing variables that can improve retirement savings rates and household financial health has become a priority for many policymakers. This section will summarize evidence produced by our primary data and will add recommendations based on the findings.

The empirical analysis shows evidence that financial literacy has a strong association with stock market participation, retirement planning, and thus positive retirement outcomes. Based on the statistical analysis, financial literacy appears to have a strong, positive relationship with many financial measures that are closely associated with household financial health and retirement security. In this data set, respondents with higher levels of financial literacy have higher success rates in retirement planning and stock market participation.

Evidence presented from the statistical analysis is consistent with evidence shown in previous research. Lusardi (2007, 2008, 2009, 2013) provides data revealing positive long term impacts financial literacy has on financial decision making, retirement planning and retirement savings rates. Additionally, Malkiel (2003) establishes strong evidence that well-diversified stock market participation is a significant contributing factor to wealth accumulation in the long term. Further research from (Haliassos and Bertaut, 1995; Martin, 2019; Lusardi and Mitchell, 2011b) also support the same conclusion.

The evidence presented in this paper is unique from the above studies for three specific reasons. Firstly, the data for both dependent and independent variables are self-reported, providing a unique perspective on how individuals view their ability to navigate financial challenges. The perception of one's knowledge might have an altered effect on economic outcomes, even if the degree of magnitude is unclear. Secondly, using three dependent variables as a way to operationalize retirement planning ability is unique to this research. By analyzing specific data on financial decision making, management and

retirement confidence allows for a more holistic view on how individuals rate their retirement planning ability. Finally, a unique method of this paper is the addition of controlling for retirement status. Introducing a variable that has a strong influence on the dependent variables allowed us to statistically isolate the effect of the independent variable to a better degree of accuracy. The difference in R^2 values for each dependent variable would be substantially higher if we did not introduce retirement status as a control variable. This enables us to observe that financial literacy plays a significant role in explaining the variation of the dependent variables when compared to retirement status.

Prominent differences in data appear to be with only one dependent variable, retirement confidence. Previous literature provides evidence that financial literacy has a significant positive relationship with retirement confidence (Auerbach, 2018; Lusardi and Mitchell, 2011b). While this paper was also able to convey a positive relationship between the same variables, the data was not nearly as significant. Perhaps this is attributed to the higher average net worth of clients within the tested population, but concrete reasons for this difference are unknown.

To conclude, the evidence from this paper suggests that financial literacy is a strong predictor for retirement planning ability and equity participation. Based on this evidence, we can draw inferences that higher levels of financial literacy can have a positive impact on household financial health and positive retirement outcomes.

Limitations:

Several limitations were encountered throughout this study. First and foremost, the population in which the primary data was gathered was not randomly selected. Therefore, the amount of bias present in the population is unclear, and it would be inaccurate to assume the results are representative of the general public.

The assumption is that this group will be more financially literate and more comfortable with equity participation than a randomly selected group. Since their average net worth is over $775,000, investable assets, it is clear that this group is already affluent. Furthermore, since this population proactively sought out the advice and guidance of the firm, we can posit that they perhaps are more willing and open to retirement planning. The sample size is also limited by age and educational background. They are substantially older and more educated than a randomly selected population of individuals, and as a result, possibly more financially knowledgeable.

The measurement of financial literacy scores is also prone to inaccuracy because all of this data is self-reported and is at risk of social desirability bias. Limitations on time and funding prohibited more accurate ways of assessing financial literacy. Asking people to rate their ability to make complex financial decisions and to navigate their retirement planning is inherently quite challenging to estimate accurately. The data may not be an objective representation of actual financial literacy levels. Self-reported data may contain some degree of measurement error, especially when the respondents are rating themselves.

Additionally, the timing in which this survey was released has some significant but unintended limitations. Unfortunately, the survey was released before the most

significant stock market correction since 2008. The timing would certainly affect how individuals felt about their retirement confidence and their willingness to participate in the stock market. Response data produced from the survey was returned over four weeks, between the end of February and the end of March. Coincidently, this four-week period happened to have the most significant correction of global stocks in over a decade. The unfortunate timing likely impacted the way respondents felt about their willingness to participate in equity markets, considering the impact the market correction has had on retirement portfolios.

Finally, limitations in sample size and additional control variables ultimately prohibited the statistical analysis from being more comprehensive. Other control variables like net-worth, risk tolerance and annual income could have produced better statistical analysis. Those variables also play a significant role in retirement outcomes and household financial health, isolating their impact would have helped to identify the true impact that financial literacy has on the dependent variables. To conclude, the prospective sample that is being surveyed for data in this paper has many limitations. It is important to take this into account when observing the analysis and to form a conclusion.

Recommendations

This paper recommends further research that could build upon the relationship between household financial health and financial literacy. While the implications of financial literacy on household financial health are apparent, additional research could add further clarity to its importance. Exploring supplemental statistical analysis with ancillary control variables such as annual income, net-worth and number of dependents could allow for greater insight between the relationship of financial literacy and long term financial health. Further exploration into how financial literacy affects early retirement status could be an intriguing project as well. The primary data in this paper and anecdotal evidence suggests a positive relationship; however, the sample size is too small.

Additional research from a public policy standpoint is also crucial. In the United States, the degradation of financial literacy education in schools is especially concerning (Anthes, 2004), and those consequences were felt through the 2008 subprime mortgage crisis. The CFPB (2013) cites widespread financial illiteracy as one of the significant factors contributing to the great recession of 2008. Perhaps the implementation of effective financial education policy could prevent or reduce the risk of another economic collapse. Implementing a system that not only teaches financial literacy but emphasizes its long term importance for both individuals and governments, should be an essential aspect of policy research.

Finally, further research could explore *where* financial training programs should be provided (schools, colleges, employers), *who* the target audience should be and *when* exposure to financial literacy training is the most effective. It is also critical for researchers and policymakers to set appropriate parameters to measure the impact of these training programs. Overall there is additional research that could be done regarding financial literacy implementation, but the important thing is that policymakers are starting to take

notice. While the public policy costs of implementing financial literacy are substantial, so too are the social costs of over-indebted, government-dependent individuals in retirement. With unprecedented levels of debt across households, corporations and governments, fiscal responsibility needs to be highly emphasized. Policymakers should continue towards implementing legislation that promotes financial knowledge and education. If meaningful steps are made towards improving financial literacy, hopefully, it can help alleviate some of the financial pressures we are witnessing households deal with today.

Contributions and Concluding Remarks

Given the strong relationship between financial literacy, retirement planning, and financial health, it is vital to understand how we can foster financial knowledge in broad populations. Especially in the 21st century, where employers are shifting away from defined pensions, individuals shoulder greater responsibility for their household finances. Without defined pensions, workers are forced to decide how much they must save for retirement and where to allocate their pension savings.

Additionally, the complexity of markets has increased substantially, and the growing sophistication of financial products has made investment decisions ever-more challenging. Combined with the rapid proliferation of credit access, consumers are dealing with unprecedented challenges when trying to take care of their long term financial health. This shift in responsibility only creates a greater need for consumers to equip themselves with the appropriate tools to make wise financial choices. Evidence presented outside of this paper illustrates that individuals are not well equipped to make financial decisions related to mortgages, college debt, retirement savings, and investment. From a macro perspective, central banks around the world are undertaking aggressive monetary policy to keep interest rates low and to stimulate a sluggish economy.

With prominent governments issuing record levels of debt, long term risks of inflation and market instability make the retirement outlook even more challenging. This paper presents strong evidence that improving levels of financial literacy can lead to enhanced financial stability in the long run. Improving an individual's ability to navigate the financial environment properly can hopefully mitigate some of the economic risks and challenges presented in the 21st century.

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Appendices

Appendix A: Self-Assessment Questions for Primary Data

Please answer the following statements with a score between one and five. 1 being the lowest (poor) and 5 being the highest (great).

The following definition can be used to help you answer the first question.

Financial Literacy can be defined as such: The ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being.

1) Please rate your level of financial literacy, as defined above. (1-5)
2) Please rate your ability to manage your personal finances and plan for retirement. (1-5)
3) Please rate your ability to make important financial decisions. (1-5)
4) I am confident that I will reach my retirement goals. (1-5)
5) I am willing to participate in the stock market and other equity products (ETFs, Mutual Funds etc.) (1-5)

Appendix B: Primary Data Results

Respondent	Financial Literacy Rating	Ability to Manage Finances	Ability to make Important Financial Decisions	Retirement Confidence	Stock Market Participation	Gender	Age	Retired (Y/N)
1	2	2	2	4	3	M	56	No
2	2	3	2	3	3	M	36	No
3	4	5	3	1	4	F	57	No
4	2	3	2	1	1	M	38	No
5	2	3	1	2	2	F	40	No
6	3	4	1	1	3	M	42	No
7	2	4	2	1	1	F	34	No
8	3	3	4	2	2	F	54	No
9	5	5	5	4	5	M	53	Yes
10	1	2	1	5	1	F	66	No
11	1	2	2	1	2	F	68	No
12	3	3	3	1	1	M	42	No
13	3	5	1	3	3	M	37	No
14	2	4	2	4	2	F	57	No
15	1	3	4	1	1	F	74	No
16	4	4	5	4	4	M	64	No
17	2	1	2	2	1	F	46	No
18	1	1	1	3	2	F	60	No
19	2	3	3	4	3	M	65	No
20	3	3	2	5	3	F	80	Yes
21	1	2	3	4	2	M	61	No
22	4	3	4	5	5	F	68	Yes
23	1	3	2	5	1	M	41	No
24	2	2	2	5	2	M	72	No
25	5	5	5	4	5	M	84	Yes
26	4	3	3	3	4	F	51	No
27	3	2	2	5	4	F	54	No

28	2	1	2	2	3	M	61	No
29	1	2	2	1	2	F	69	No
30	3	3	1	4	4	M	47	No
31	2	4	2	5	2	F	34	No
32	2	2	3	4	1	M	53	No
33	4	4	4	5	5	M	63	Yes
34	1	1	1	4	1	M	36	No
35	2	2	3	3	1	F	47	No
36	4	5	4	5	5	F	62	Yes
37	4	3	3	4	5	F	78	Yes
38	5	5	5	4	5	M	37	No
39	1	1	2	2	2	F	62	No
40	1	2	1	1	2	F	65	No
41	2	3	3	4	1	M	80	Yes
42	2	1	2	2	2	M	56	No
43	4	4	4	3	4	M	59	No
44	2	4	3	2	4	F	41	No
45	3	2	2	5	3	M	40	No
46	1	2	1	4	3	M	35	No
47	2	1	2	3	2	M	63	No
48	4	2	3	4	5	F	42	No
49	4	3	2	5	5	F	70	Yes
50	3	4	2	4	3	F	57	No
51	3	2	3	3	2	M	53	No
52	1	4	1	5	2	M	49	No
53	3	2	3	2	3	F	49	No
54	2	4	2	3	1	M	68	No
55	4	4	4	3	5	F	56	No
56	5	5	5	3	4	F	81	Yes
57	2	2	1	1	3	F	52	No
58	1	1	1	1	2	M	49	No
59	1	2	2	2	1	M	44	No

60	1	3	1	2	2	F	80	Yes
61	3	2	2	3	1	M	77	Yes
62	2	2	3	3	2	M	85	Yes
63	3	1	1	3	2	M	61	No
64	3	2	3	3	3	M	83	Yes
65	4	4	4	2	3	M	21	No
66	2	3	2	1	1	M	60	No
67	2	3	3	3	2	F	70	Yes
68	3	4	2	2	3	M	52	No
69	1	2	1	3	1	F	51	No
70	2	3	2	2	2	M	50	No
71	5	5	5	5	5	F	83	Yes
72	5	4	3	1	5	F	46	No
73	5	5	5	4	4	M	67	Yes
74	3	4	3	2	3	M	63	No
75	2	2	2	1	2	F	48	No
76	2	1	1	2	2	M	42	No
77	1	1	2	2	1	F	68	No
78	3	2	2	1	3	M	73	Yes
79	1	3	3	2	2	M	71	no
80	1	1	3	4	1	F	43	No
81	3	1	2	2	2	M	56	No
82	2	2	1	1	2	F	56	No
83	2	3	2	2	1	F	68	No
84	3	4	3	4	2	F	73	Yes
85	1	1	4	2	3	M	84	Yes
86	3	2	4	2	2	M	61	No
87	5	4	5	4	5	M	62	Yes
88	1	1	2	3	2	F	51	No
89	2	2	2	3	2	F	42	No
90	3	3	2	1	2	M	48	No
91	4	4	4	5	5	F	44	Yes

92	4	3	4	5	5	F	50	Yes
93	1	2	3	1	3	M	72	Yes
94	4	3	5	5	3	M	70	Yes
95	1	2	1	2	1	F	41	No
96	2	2	1	1	3	M	63	No
97	3	3	3	3	3	M	39	No
98	2	2	2	2	2	F	40	No
99	3	1	3	1	3	M	51	No
100	2	2	1	2	1	M	63	No
101	5	5	4	5	5	M	37	No
102	2	2	3	1	1	F	35	No
103	5	5	5	5	4	M	41	Yes
104	4	3	4	4	5	F	48	No
105	2	2	2	2	1	F	55	No
106	2	1	2	1	3	F	62	No
107	1	1	1	2	2	M	56	No
108	2	2	2	1	2	M	54	No
109	3	3	2	3	3	F	55	No
110	1	1	1	1	1	M	40	No
111	4	5	4	4	5	M	71	Yes
112	5	5	5	5	5	M	60	No
113	2	1	2	1	2	F	54	No
114	1	2	1	1	1	M	35	No
115	4	3	3	5	5	M	39	No
116	2	2	3	4	3	F	39	No