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# Financial Illiteracy: Prevalence, Consequences, and Solutions

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Financial Illiteracy: Prevalence, Consequences, and Solutions

**By**

Gerald Matasy

Presented to the Department of Economics  
in fulfillment of the requirements  
for departmental honors.

June 2010

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In the Department of Economics to be taken June 2010

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As Americans have become increasingly responsible for their own financial security their ability to make financial decisions in their best interests has certainly grown in importance. The focus of this paper is to determine what role financial literacy plays in making optimal financial decisions and maintaining economic stability. Using mostly research from other studies and some original research, this paper seeks to examine the level of financial literacy among the general population and what the implications are for the general lack of literacy. What I find is that individuals who have lower levels of financial literacy generally make poorer financial decisions than individuals who are more financially literate. Given that much of the population has low levels of financial literacy and that less financially sophisticated individuals were routinely taken advantage of in the subprime mortgage crisis that nearly brought the U.S. economy to its knees, increased levels of financial literacy can clearly play an important role in reducing the likelihood of future financial crises.

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## **Introduction**

“Everybody wants it. Nobody understands it. Money is the great taboo. People just won't talk about it. And that is what leads you to subprime. Take the greed and the financial misrepresentation out of it, and the root cause of this crisis is massive levels of financial illiteracy” (“Financial Literacy...” 2008).

This assertion made by *The Economist* in 2008 states that the linchpin of the most recent financial collapse was indeed widespread financial illiteracy. Certainly there were other contributing factors that deserve some attention, but, clearly financial literacy played a starring role in the drama.

Over the last few decades the average American has become ever more responsible for their own financial well-being amidst a barrage of increasing complexity in financial products as well as intensifying budgetary pressures. Even before the latest implosion of the financial system the ability of the average American to respond to these stresses in an optimal manner has come into question. One area where the average American's competency is suspected to be lacking is in the area of financial literacy, or the vocabulary, knowledge, and skills thought to be required to make sound financial decisions based on one's budget and goals. Without these skills individuals find themselves at a disadvantage, and when a large portion of the population lacks these skills there may be adverse implications for the stability of the entire economic system.

This paper first explores the various trends that are putting more financial pressure on individuals today including such phenomena as flat wages and income inequality. The next section explores the levels of financial literacy among different demographic groups, other factors that affect the decision-making process, and an evaluation of the financial outcomes experienced by people of varying literacy levels. Next, I discuss financial illiteracy in relation to the subprime mortgage crisis and the effect that the subsequent fall in asset prices will have on the retirement plans of boomers. I conclude this paper with recommendations for fixing financial illiteracy and improving individual



financial outcomes in various ways.

### **Overview of Personal Economic Conditions**

Before examining how financial illiteracy would manifest itself in dollar terms I should acknowledge the general factors that have a direct impact on the balance sheets of the average American. One noteworthy trend is rising income inequality and flat wages generally. Average wages have been flat or falling since 1973 after rising steadily from 1949. Increases in household income post 1973 can be explained by the continued influence of the increased participation of married women in the workforce since the second half of the 20<sup>th</sup> century. The spread between the earnings of skilled and unskilled workers in America has progressively expanded (“American Living Standards”). To get a sense of the magnitude of this effect: after adjusting for inflation, the average increase in income for the the top 1 percent of American households by income between 1979 and 2003 more than doubled while the middle fifth of the income spectrum experienced only a 15 percent rise in income (Hacker 12), confirmed by Frank (2009). Furthermore, between 2004 and 2007, median income was unchanged, while mean income rose substantially, due largely to income gains in the top part of the distribution (Bucks et. al. 2009). Between 1997 and 2007 the Gini coefficient for the U.S. rose from 40.8 to 45, indicating a shift in income to better off in the population (“Field Listing :: Distribution of Family Income ...” 2010).

Another effect that has to do with income and has been on the rise in recent decades is the instability or variability of household income. This phenomenon manifests itself on both sides of the coin: between 1996 and 2005 over half of workers in the bottom quintile moved up to a different quintile, while less than half of those in the top 1 percent in 1996 were still there in 2005 (Auten 2009). Perhaps, then, it should come as no surprise that job turnover rates have become high in recent decades and that job security is increasingly becoming a thing of the past (Schrager 2008). Certainly this trend

has been causing many families quite a bit of stress as volatility does not sit well with a largely risk-averse population.

Related to the increase in income inequality and, perhaps, income instability is a noteworthy rise in wealth inequality – which may be caused in part by low levels of financial literacy. It seems to be the case that as the lower 90 percent of the population have their proportion of the nation's wealth reduced, defined contribution retirement plans have been on the rise – the significance of this corresponding trend will be discussed later. The condition of increasingly skewed wealth distribution has been around and growing since at least the last 40 years. Between 1963 and 1983 the wealthiest 0.5 percent of the population saw their wealth increase by 38 percent, going from 25.4 percent to 35.1 percent of the nation's total wealth. In contrast, the bottom 90 percent of families saw their wealth drop from 35 percent to about 28 percent of total wealth during the same period (“Trends ...” 1996).

Between 1983 and 1998 the median American family approaching retirement – headed by someone between 47 and 64 years of age – actually saw their retirement assets fall even while the stock market was doing quite well (Hacker 121-2, 2006). Between 2004 and 2007 assets and debt rose in equal proportion, leaving average net worth largely unchanged (Bucks et. al. 2009). It seems that the wealth distribution among young households (head of household is under age 30) is even more unequally skewed towards the top of the distribution, with the bottom 50 percent in possession of -4.9% of the wealth, with the top 20 and 10 percent owning 97.0% and 86.2% of their cohorts wealth, respectively (Sum, Khatiwada 2009). It certainly does not help that the personal saving rate – albeit an imperfect measure of saving – for the United States has been between 1 and 5 percent over the last 5 years (“Personal Saving Rate” 2010).

Of the income that is not being saved, there are a few expense categories that have been increasing their share of household outflows. That housing costs outpace overall inflation is another trend with a history. Between 1973 and 1988 the average price of houses in the United States tripled

(“American Living Standards” 1996). Between 1996 and 1997 housing expenditures comprised of 37% of the average family budget (Whiting 2004). In particular, two of the driving forces pushing up the price of homes have been safety and access to good schools within neighborhoods, which inspired many families to get into a bidding war with one another amidst easy credit, at least until the most recent financial crash (Warren 23, 2003). It's worth repeating that easy credit facilitated the housing boom before it went bust, and this credit was apparently used unwisely by many.

Besides housing costs skyrocketing, there is also the question of the soaring price of higher education, which is typically seen as a prerequisite for success in the modern economy. College price inflation also has a history: between 1977 and 1989 tuition and fees at private universities more than tripled on average while the broader index price doubled (“American Living Standards” 1996). Between 1996 and 2006 private and public four-year institutions saw their tuition increase by 32% and 51% respectively, while median family income did not keep up, growing only 27% over the same period (Lillis 2008). College enrollment rose 44% between 1977 and 2003 with an 833% rise in the cash value of student loans as individuals went deeper into debt in pursuit of a middle class lifestyle (Hacker 74-75, 2006). Among the culprits for increasing college costs are increased expenditure on research and spending on largely unprofitable sports programs. Some point the finger at rising administrative costs, which is debatable (Warren 41-44, 2003). Sadly, college graduation rates have fallen; while college enrollment has increased in recent decades, the share of the population that has completed college has stayed flat (Dynarski 2008). It certainly does not help students to acquire debt only to drop out and not have higher earnings prospects to pay off their loans; the returns to “some college” are dismal.

Last but not least is the most obvious of spiraling cost increases: health care. In 1960 health care comprised of 5 percent of total personal consumption expenditure, and by 1989 that figure had grown to 13 percent. Between 1970 and 1988 the number of practicing doctors in the U.S. rose from

137 to 225 per 100,000 inhabitants, but nonetheless costs still rose (“American Living Standards” 1996). According to Das and Das (2009), health care accounted for 5% of GDP in 1960 rising to 16% of GDP in 2009, with projections of up to 30% by 2050. One estimate says that a 55-year-old couple retiring in ten years will have to accumulate over \$400,000 by retirement to cover the cost of Medigap insurance (to cover expenses that are not covered by Medicare) without factoring in the expenses of nursing home care (Skinner 2007). All commentators agree that health care costs have been increasing at an extraordinary clip and will increasingly constrain household budgets if left unchecked.

On top of increased costs, it is not unusual for those with medical insurance to be completely subject to the demands of insurance companies, which respond to higher costs of care passed on from health care providers by then insuring fewer people (“The Crisis in Health Insurance” 1996). This increases the uncertainty that plagues the contemporary American family. The health care system is indeed often criticized for wasteful spending which stems from numerous reasons. The problem of adverse selection has set in motion a negative feedback loop known as a 'death spiral' that prices out successive waves of people as good risks leave the risk-pool (Hacker 140-143, 2006). More and more people are indeed getting a larger exposure to medically related risk: in 2007 about 45.7 million Americans did not have health insurance, putting the uninsured rate at 15.3 percent of the population after steadily increasing from about 13 percent in 1987 (DeNavas-Walt et. al. 2008). For the uninsured, medical catastrophes are often followed by catastrophic levels of debt.

Another area where Americans have been being squeezed over the years is their ever-expanding debt load; they have only just begun to deleverage their own personal balance sheets since the last recession. Besides the ballooning levels of the aforementioned student debt, accumulated medical bills send 425,000 to 700,000 Americans into bankruptcy per year (Hacker 137, 2006). Gross household debt during the 1960s and 1970s was stable, but between 1981 and 2003 the ratio of gross household debt to personal disposable income jumped from 66% to 113% (Iacoviello 2008). Mortgage

innovations such as the issuance of interest-only and adjustable rate mortgages (ARMs) provided subprime borrowers with the opportunity to be homeowners – with extraordinarily high risk and consequences for the financial system, essentially loading people up with debt that they cannot afford to service (Scanlon et. al. 2008). What this deregulation of the mortgage industry has translated into is an increase in the likelihood of mortgage foreclosure of 350 percent versus a few decades ago (Warren 136-137, 2003). Where foreclosure and default occur, bankruptcy often looms (Li, White 2009). Indeed, bankruptcy has become less generous as the laws have changed under the Bush administration effectively making it harder to expunge all debts under Chapter 7. Instead, those who file are more likely to eventually pay all debts back over a period of three to five years under Chapter 13.

As if the outlook was not grim enough, there is still another set of factors that cause all these issues to loom larger. For instance the decision for families to have and raise children comes with a level of economic risk that seems more pronounced than ever as most of the economic costs of raising children are borne by their parents while society largely reaps the benefits. The cost of raising one child in a middle income family to age 18 has been estimated by the U.S. Department of Agriculture to be \$237,000, and up to 37 percent of family income per year for two children through age 18 (Hacker 100-101, 2006). Family economics tend to become more difficult as the family structure veers away from a traditional, married-two-parent household towards cohabitation and single-parenthood. This trend is at least in part motivated by increasing availability and social acceptability of divorce as well as the need for women to stay in the labor force to maintain human capital and thereby maintain earnings potential.

For traditional families, being able to raise children amidst flat wages and rising prices means both parents must work, whereas in earlier generations mothers used to stay home and serve as back-up earners should fathers fall on hard times – which turns out to be the less risky arrangement (Warren 62-63, 2003). Cohabiting couples basically share many of the same economic characteristics of married

couples except that they are twice as likely to split up than married couples (Warren 86-87, 2003). Cohabitation is on the rise, and half of the time children are involved; about 40 percent of children will spend time in a cohabiting household before the age of 16 (Brown and Manning 2009). More generally, between cohabitation and single-parent structures, births to unmarried women as a percentage of all births went from 18% in 1980 to 33% in 2000 (Blau and van der Klaauw 2008). Typically if one parent retains custody of any children it is usually the mother, and she usually finds herself under the additional burden of being the lower-income earner. When comparing childless couples to those with children, the couples with children are more likely to face greater financial hardship (Hacker 101-102, 2006), but single mothers are more likely to face bankruptcy than any other demographic group (Warren 104, 2003). Although great strides have been made in getting divorced fathers to pay child support, those dads often have trouble footing the bill especially since they will either be living on their own or with a new family to support as well; court-mandated child support increases the likelihood that fathers will file for bankruptcy. However, those obligations to children cannot be discharged in bankruptcy (Warren 119-120, 2003). There are certainly intangible benefits to having children, but there is evidence that unmarried mothers in particular will alter their fertility decisions based on factors of unemployment, wages, child support enforcement, and housing variables (Curtis and Waldfogel 2008).

So, between flat wages and rising prices many Americans have found themselves saving less and getting into more debt, often times facing these challenges in alternative family structures that are not as financially stable as traditional structures in an era when children are a growing financial burden. The rest of this essay will be focused on explaining how financial illiteracy may be able to explain in part why so many Americans fail to accumulate sufficient wealth to be able to do things such as retire, and why so many find themselves overburdened with debt. We will start with an examination of Americans' levels of literacy, discuss some tenets of behavioral economics that are relevant to the topic

at hand. Next, I examine the correlation between financial outcomes and financial literacy, and touch briefly on other factors that may be causing people to make poor financial decisions. I conclude by examining some possible solutions for increasing financial literacy with a view towards helping people make better decisions leading, hopefully, to better outcomes.

### **The Current Status of Financial Literacy**

The state of financial literacy in the United States is poor. Most surveys show that many people have trouble with topics requiring numeracy and a knowledge of how debt products and financial assets work. Survey results from the Jump\$tart Coalition indicate that high school seniors are failing in the area of financial literacy; on average, students answered correctly on 58 percent, 52 percent, and 50 percent of questions given in 1997, 2000, and 2002 respectively. Adults scored slightly better but still missed some basic credit and insurance questions. African-Americans and Hispanics generally scored below the average (Hilgert et al. 2003). Repeated tests on students in subsequent bienniums did not show any meaningful improvement; in 2004 the mean score rose to 52.3 percent and hit a high of 52.4 percent in 2006, but then dropped to a new low of 48.3 percent in 2008. There was a bright spot, with a caveat, in 2008 for this survey: it was administered to college students and they returned an average score of 62.2 percent, with seniors scoring 64.8 percent. The caveat is that only 25 percent of Americans graduate from college, so the results are not exactly representative of the population (Mandell 2009). The results from the 2004 and 2006 surveys also indicated that students knew very little about stocks, bonds, and other investments (Lusardi and Mitchell 2007). Low levels of financial literacy are not unique to the United States; other countries in the OECD are similarly afflicted (Lusardi and Tufano 2009).

A survey conducted for the National Council for Economic Education resulted in an F grade for high school students and a C grade for working-age adults; the areas of money, interest rates, inflation,

government and trade, and personal finance in particular were trouble spots. The study also showed some gender and minority gaps, African-Americans and Hispanic scored lower than whites, and women scored lower than men. Another study of the general population conducted by Hilgert and Hogarth in 2002 indicates that consumers are better at dealing with debt, credit, saving, and general financial management, but scored lower on questions involving investments like mutual funds and the stock market; as a group the respondents answered two-thirds of the questions correctly. Those who scored poorly were more likely to be single, be a member of a minority group, have lower income on average, as well as lower levels of education, be young, and be either younger or older than average.

Other data collected from the 2004 Health and Retirement Study showed that only one-third of respondents could correctly answer all three questions related to compound interest, inflation, and risk diversification. For example, most respondents did not know that a mutual fund is generally less risky than a single stock. Another study involving 1,700 people between ages 51 and 56 in 2004 showed that, while 83.5 percent of the respondents could make a simple interest calculation, only 56 percent could perform a division calculation of \$2 million by 5, and only 17.8 percent could perform a 2-year compound interest calculation. Again, African-Americans and Hispanics were less likely to answer correctly than whites (Lusardi and Mitchell 2007). It is also not unusual for individuals to be uninformed about the workings of their retirement plans since the general shift from defined benefit to defined contribution plans occurred, or to be uninformed about the workings of Social Security. Since the financial meltdown occurred a few years ago it probably does not come as a surprise that many individuals were also uninformed about the way adjustable rate mortgages work. Once again, the least informed were minorities, women, those with low levels of education, and those with low income (“Household Saving Behavior...” Lusardi 2008).

Lusardi and Tufano (2009) surveyed 1,000 U.S. residents and found that 36% of the respondents could perform a compound interest calculation, 35% understood that making minimum



credit card payments essentially means never paying the balance off, and only 7% understood that making a \$1,200 payment at the end of a year is more advantageous than making monthly payments of \$100. On average, people of lower financial literacy, as measured by the responses to the questions, were more likely to be women – especially those who were divorced, single or separated – minorities, the young, the elderly, and those with lower average income. Those of higher financial literacy were generally men and those who had higher than average income. Self-evaluation of financial literacy revealed that most people generally overestimate their abilities, but women and minorities scored themselves lower than average. The elderly actually scored themselves much higher than their demonstrated ability, which is an unnerving sign of overconfidence (Lusardi and Tufano 2009).

Lusardi (2008) had also investigated the ability of 812 respondents to deal with more advanced financial literacy topics, specifically those relating to investments. The sample composition was generally higher-income individuals who were highly educated; 30 percent earned \$100,000 or more, and more than 50 percent had at least a college education – it is also worth noting that the survey was conducted online. In addition to that, the average age was about 53, with a range of 40 to 60. Given the demographic patterns observed in the aforementioned studies we might expect this sample to be able to handle questions about financial assets and their characteristics. Indeed over three-quarters do get most answers right and demonstrate some knowledge of risk diversification and the stock market, but only one-fifth of the respondents were able to answer all eight questions correctly (“Financial Literacy...” Lusardi 2008).

A separate study done on college students in 1996 with a different survey demonstrated that even accounting and finance majors had low levels of financial literacy. The average and median scores on a scale of 0 – 100 for all 454 respondents were 44 and 40 respectively. The biggest trouble spots for these students were the topics of risk, global investing, stock market valuation, the impact of interest rate changes, and tax planning. Volpe, Chang, and Pavlicko (1996) looked at the role of

gender, college major, and experience with finances in determining financial literacy. As far as gender went, they found what we expect from looking at other studies, specifically that the average and median scores for women, 40 and 42, were lower than those of men, 50 and 49. The researchers divided the students into business majors and all other majors, the median scores were 50 and 40 respectively. Dividing the results further between finance/accounting majors and marketing and management majors yielded median scores of 50 versus 40. Although these results show that finance and accounting majors have a leg up on others in terms of financial literacy, their scores were still low. Dividing the participants into age groups – 18-25, 26-35, and 36 and up – and also by experience with financial products – did not show any significant differences between groups (Volpe et al. 1996).

### **Explanations for Seemingly Irrational Behavior**

Given the well documented shortcomings of disparate groups of Americans and citizens of other developed nations in the area of financial literacy, it is tempting to ask why this should be the case. It is undeniably costly to make financial mistakes, so surely a rational individual would invest time in becoming financially literate as a way of protecting and growing his wealth. The field of Behavioral Finance may offer some insight into this puzzling lack of financial literacy.

Behavioral Finance is still an emerging social science so this overview is not meant to be exhaustive as new tenets to explain deviation from rational behavior are still being developed. I focus on behaviors that may be affected by discrepancies in financial knowledge to give us some insight into how financial decisions are being made. Some of these tenets seem to stem from the interaction of psychology with low levels of financial literacy.

One method that individuals use to categorize and evaluate financial outcomes – like transactions, investments, and gambles to name a few – is “Mental Accounting.” For example, someone may be unwilling to spend \$100 on a new jacket or pair of jeans if it must be paid for out of

“regular” income, but if they receive a windfall of \$100 then they are more willing to spend it on “frivolous” items (since they were not counting on that money beforehand.) The same faulty logic applies to gambling. For example, if someone found \$1,000 worth of chips at a Las Vegas casino they would treat it as “found money” as opposed to “earned income,” so they would be much more reckless with this money even if they happened to win \$100,000 using those stray chips. Instead of stopping after reaching a certain amount of winnings the individual may continue to gamble.

When it comes to investments, there is evidence to believe that individuals treat “old money” (amounts that have already accumulated in a given investment account) differently than “new money” (amounts that are going to be contributed). There is a lower propensity to adjust the asset allocation of old money than for new money, even though a dollar is a dollar either way (Thaler and Bernatzi 2007; Milkman and Beshears 2009).

One example of a mental account is “spent money,” and individuals sensitive to this account are more likely to be afflicted with the Sunk Cost Fallacy. Though economists and businesspeople are trained to ignore sunk costs, it has been observed that many people tend to place too much emphasis on them. For example, someone pays \$7-10 to see a movie, and 15-30 minutes into it they determine it to be not at all entertaining, but they decide to stay to get their money's worth. It's bad enough when someone willingly wastes their time in the name of “getting their money's worth,” but this situation can play out in large public projects that will continue to receive funding to completion even though they have been determined to be economically inefficient (though from a political perspective, still relevant and worthwhile) (Friedman et al. 2007).

Just as people do not like to throw money away in their consumption habits, they also dislike losing money on investments disproportionately. This phenomenon is known as “Loss Aversion,” where losses loom larger than equal and opposite gains. For the typical individual losses are felt with two times the magnitude as gains are for the same dollar either way (Tversky and Kahneman 1991). So

when investors lose \$10,000, they feel as if they lost \$20,000. On the other end, if they gain \$10,000, then they feel they gained of \$10,000.

Another peculiar trait of investors is the willingness to sell their winning investments and thereby realize gains, coupled with a reluctance to sell losers and realize losses while they are small. This is known as the “Disposition Effect,” and it is characterized by an overall tendency to sell winners too soon and hold onto losers too long. (Dacey and Zielonka 2008). There also might be evidence that men tend to hold onto losers longer than women (Da Costa Jr., Mineto, and Da Silva 2008).

If an investor were to get over the Disposition Effect and choose to sell some of their losers they may once again be mentally swayed into inaction by “Decision Paralysis,” where one has so many choices that one feels unable to make a choice. As economists, we value choice and tend to think that more options is always a good thing, until it paradoxically inhibits individuals from selecting any option at all. This can make things difficult in the investment world with so many types of investments available. Taking only one asset class as an example, there are over 8,000 mutual funds in the U.S. alone.

Another case in which individuals may be unwilling to change the status quo can be observed when an individual is given a gift and does not want to give it up even for a logically better item. With this kind of behavior – known as the “Endowment Effect” – gifts received by an individual have sentimental value allocated to them by the individual so that the recipient of the gift is reluctant to sell the gift at a reasonable price. For instance, in one study individuals were either given lottery tickets or cash. When the recipients of lottery tickets had the opportunity to switch their endowment for cash, very few switched even though the expected return on the lottery tickets was much lower than the cash offered (Kahneman, Knetsch, and Thaler 1991).

Another apparent mismatch that people have with perceived value and real value is with money itself. People have a tendency to think in nominal terms rather than in real terms – a tendency that

economists call the “Money Illusion.” So, ignoring the effects of inflation they may demand less of a given item because its price has risen (at least in nominal terms.) This also may affect how people see their investments, particularly that \$1 million today will be worth less than \$1 million in the future, but many will fail to make that distinction unless they are reminded of inflation and real versus nominal values (Shafir, Diamond, and Tversky 1997). The financial press is complicit in this deception by constantly referring to nominal values of stock indexes and seldom mentions real values.

While people may ignore the effects of inflation to some extent, they do have a “Bigness Bias” which leads them to notice bigger numbers and ignore smaller numbers, even though small numbers can add up to big numbers. For example, a \$2,000 car stereo system on its own may seem pricey, but as an option on a \$30,000 car it is easier to swallow since it is a small expense relative to the car (though we're holding income constant in this example, and \$2,000 remains \$2,000). The same can be said of mutual fund fees – they are usually very small relative to the returns for any given year, but over time they add up, and can hinder the growth of assets significantly. The problem is that many people ignore fees and consider returns prior to the subtraction of fees, with an industry that is often complicit in this deceit.

In making estimates for something like future mutual fund returns based on past performance individuals may engage in “Anchoring.” Anchors are arbitrary values given by individuals to variables when they are trying to make estimates. When individuals base their estimates on these arbitrary numbers, they are said to be “anchoring,” and thus often making poor estimates (Jacowitz and Kahneman 1995). A good example of anchoring occurs when individuals underestimate the value of their homes in a rising market and prices too low. Likewise overestimating price in a falling market leads to a failure to make a sale.

Sometimes individuals are quite skilled in making the right decisions or making accurate estimates, and when they evaluate their decision-making prowess while disregarding those times where

they had subpar outcomes they are said to have a form of “Confirmation Bias.” This psychological trait has applications in many fields. It refers to the tendency for people to search for evidence that confirms prior beliefs, with an associated tendency to underweight any evidence to the contrary. For example, those who frequently trade stocks may only remember the instances in which they made money when assessing their skill level and they conveniently forget about the times when they experienced losses. They may also have this selective amnesia when evaluating their predictions on the direction of future stock prices, ignoring the negative evidence and focusing only on the positive evidence – and this can be hazardous to one's account balances (Friesen, Weller, and Dunham 2009).

Often confirmation bias is accompanied by “Overconfidence,” or the belief that one's skill level is much greater than it actually is. The ill effects that come from this behavior comes from making huge bets on investments or becoming involved in transactions in which not enough information is known. This also can be evidenced by excessive trading of stocks, racking up poor relative results and high commission costs which, again, is generally regarded as hazardous to the accumulation of wealth (Barber and Odean 2000). It has also been observed that men are more overconfident than women in the area of finance – among others – potentially pushing their investment returns lower than those of women (Barber and Odean 2001).

Something that is even more hazardous to wealth than overconfidence is an “Information Cascade.” Information cascades can be observed in certain environments where the decisions of individuals can be explained largely by the decisions of those who came before them. This is also known as “herd mentality” – that individuals are eager to pile into tech stocks or real estate, for instance, simply because everyone else is doing the same thing. Initially, this may well create an upward movement in the price of a particular asset class, but then the bubble pops, and wealth is destroyed in short order (Hung and Plott 2001).

Finally, one of the more mindless behaviors that individuals engage in is the “1/n Heuristic.”

This behavior is a crude asset allocation strategy for defined contribution plan participants in which their number of choices,  $n$ , serves as the denominator for determining the ratio of assets that one should commit to each fund. So if there are 3 funds: a domestic stock fund, an international stock fund, and a bond fund,  $n = 3$ , and each fund gets roughly 33% of the assets (Bernatzi and Thaler 2007).

### **Financial Outcomes and Financial Literacy**

Many authors have characterized the average level of financial literacy of Americans as poor, so it seems reasonable to ask if there is any relationship between the financial position of an individual and that individual's level of financial literacy. Numerous studies have shown a positive correlation between financial literacy and advantageous financial behaviors. For instance, more financially sophisticated households are more likely to buy risky assets and invest more efficiently; financial sophistication and portfolio choice are positively correlated. In addition to that, households that are considered less-educated with lower-income tended to be less likely to take advantage of lower interest rates and refinance their mortgages compared to households with higher educational attainment and higher income. Indeed many households are confused about the terms of their mortgages, and the less-educated households are more likely to have interest-only and adjustable-rate mortgages, which are seen at best as less advantageous for long-term residence purposes. Evidence has shown that those who underestimate the annual percentage rate on a loan are more likely to borrow and less likely to save. Consumers are generally uninformed about pensions in addition to Social Security, and there is evidence that knowledge about these topics does have an effect on retirement decisions (Lusardi and Mitchell 2007).

The study by Hilgert et al. (2003) mentioned earlier linked the results of literacy levels and skills of cash-flow management, credit management, saving behavior and investment behavior. Generally they found that people who had higher levels of financial literacy had better outcomes in

their finances. For instance, 88 percent of respondents reported following the practice of paying bills on time. The other 12 percent who did not pay on time had lower average scores on financial literacy tests relative to the rest of the respondents. The pattern extends to other cash management behaviors: less financially-literate respondents were less likely to be part of the 46 percent of the sample that reported having a budget, and more likely to be “unbanked,” or not owning a checking and/or saving account, which stood at 9 percent of all U.S. families in 2001. In the area of credit management, lower financial literacy scores correlated to a reduced likeliness of having a credit card, and a higher debt-payment-to-income ratio. This group was less likely to pay off credit cards each month and less likely to review their credit score or compare other credit card offers before signing up for a card. People with lower levels of financial literacy were less likely to save regularly or have an emergency fund. However, fewer than half of *all* households reported saving regularly and having adequate cash reserves to constitute an emergency fund. As far as investing goes, lower literacy correlates with lower wealth and lower participation in retirement plans. But most Americans are not saving enough for retirement regardless of their level of financial literacy (Hilgert et al. 2003).

One area of finances not given much attention in the studies of literacy is holdings of life insurance, which is an important part of planning, specifically for contingencies. A series of studies by Bernheim, Gokhale, and Kotlikoff have generally shown that life insurance holdings by many individuals are insufficient to cover significant financial vulnerabilities. The first of these papers, written with Forni (1999), took data from the 1992 Health and Retirement Survey and found that a sizable minority of households are significantly underinsured; one-third of wives and 11 percent of husbands were at risk of a living-standard reduction exceeding 20 percent. Under-insurance tended to be higher among low-income households, couples with asymmetric earnings, younger households, couples with dependent children, nonwhites, and single-earners. Among some groups the frequency of under-insurance exceeds 66 percent, and severe under-insurance – meaning a potential drop in one's



standard of living of greater than 40 percent – exceeds a frequency of 25 percent.

These researchers did a follow up study of older workers from the same 1992 HRS data. The picture was a bit rosier for this group: on average, life insurance holdings were sufficient to avert significant potential declines in survivors' living standards. However, this result is not surprising since older workers tend to have fewer liabilities to worry about should an untimely death occur as any offspring are much closer to adulthood on average. Moreover, there were a few problem areas of note. For one there was a mismatch between needs and holdings for individuals who are at risk of suffering from a significant decline in standard of living upon the death of a spouse. Life insurance holdings would have little impact on the financial security of these at-risk individuals because they simply were not large enough. There was also a tendency to leave vulnerabilities uncovered by groups in opposite ends of the spectrum of insurance needs. For instance, groups with high vulnerability such as lower-income households, especially nonwhites, as well as groups with low vulnerability, like older individuals and primary earners, were both more likely to have less coverage than they needed (Bernheim et al. 2001; 2003).

Using more recent data from the 1995 Survey of Consumer Finances, Bernheim, Carman, Gokhale, and Kotlikoff (2002) found a disconnect between needs and holdings, and found no correlation between life insurance and financial vulnerability at every stage of the life cycle. They found evidence that substantial vulnerabilities are widespread, particularly for younger couples. Two-thirds of secondary earners between the ages of 22 and 39 face are at risk to suffer a drop in their standard of living of over 20 percent, while the remaining third of this group are at risk for a reduction exceeding 40 percent. Though one-fifth of these households do hold sufficient life insurance to offset any potential drop, the remaining households face substantial risk. Between all age groups, 56 percent of secondary earners and 6 percent of primary earners are at risk for a decline in their living standard of more than 20 to 40 percent before applying life insurance holdings, and 42 percent and 5 percent after,

respectively. This seemed to be consistent with an apparent gender bias in life insurance toward women: for any given level of financial vulnerability, at-risk wives get more protection than men, as the average at-risk wife has \$166,628 of protection on her husband and the average at-risk husband has \$24,827 on his wife. Along with this was a more striking finding that roughly two-thirds of poverty among surviving women and more than one-third of poverty among surviving men results from a failure to ensure survivors of an undiminished living standard through insurance.

A more recent study by the Bernheim, Berstein, Gokhale, and Kotlikoff (2006) revealed similar findings of under-insurance – even though the study was done using data from 386 employees from Boston University, who are better-paid and better-educated than the general population. The correlation between saving and insurance prescriptions and actual decisions being made by BU employees is very weak for saving and essentially zero for life insurance. As far as saving goes, BU households generally over-save, with married households consuming less than is recommended – which is not necessarily bad, although 38 percent of single employees and 30 percent of married employees save less than is recommended. The difference between actual and recommended saving is indeed large, especially for low-income households, where instead of saving 10 percent of their income, they save 0 percent or even have a negative saving rate. As much as two-thirds of BU employees are not in a position to smooth their living standards without exceeding their debt limits. As far as under-insurance goes, 21 percent of wives would experience a decline in their living standards of 20 to 40 percent, with another 25 percent at risk for a decline of more than 40 percent. For men the numbers for significant and severe declines are 11 percent and 6 percent respectively. For secondary earners in general, 28 percent of them face vulnerability associated with a drop of more than 40 percent in their standard of living before considering insurance holdings, and 14 percent after the holdings are applied (Bernheim et al. 2006).

Results from a study of people over the age of 50 suggest that those who are more financially

knowledgeable are more likely to plan for retirement. Those who understand compound interest are more likely to have planned for retirement, and planning is positively correlated with wealth (Lusardi and Mitchell 2007). Those who are considered to be non-planners tend to hold \$17,000 to \$20,000 less wealth at the median than those who plan, which comes out to about a 20 percent difference. Two separate studies indicate that as much as a third of people over the age of 51 have given no thought to retirement at all, despite being so close to the typical retirement age (Lusardi “Household...” 2008). Lack of planning is concentrated among familiar groups: African-Americans, Hispanics, women, and those with low education. Although planning is a predictor of saving, it is not always the case, as few people create savings plans and ever fewer are able to stick to them. In fact a large fraction of those with higher education do not take the first step of planning at all. Evidence suggests that changes in wealth do not appear to lead to more planning: instead the direction of causality appears to be that planning leads to more wealth in most cases, but those who are not financially literate tend not to plan much at all (Lusardi “Household...” 2008). In addition, the more financially knowledgeable a person is, the more likely they are to not only plan for retirement but participate in the stock market, allowing for greater wealth accumulation, except for cases of black swans erasing that wealth (Lusardi “Financial Literacy...” 2008). Indeed, men, on average, have been found to have higher financial literacy than women and they are also more likely to participate in the stock market (van Rooij et al. 2007).

It probably does not come as a surprise that low financial literacy leads to bad financial decisions whether it is in the area of investing or debt and credit. In Lusardi and Tufano's (2009) study of debt literacy the researchers performed a cluster analysis of 1,000 survey respondents based on their behaviors and experiences with debt and credit instruments. The first cluster, Cluster 1, contained those who had a relatively large amounts of experience with mutual funds, stocks, and bonds, and were most likely to have a mortgage and sometimes an auto loan, but were not heavily indebted. Cluster 2

had the largest amount of experience with financial assets but were also the most heavily indebted, especially with credit card debt. Cluster 3 contained people who were most profitable to credit card companies by frequently making minimum payments on cards, incurring late fees, incurring over-the-limit fees, and using cash advances; they also had much less experience with financial assets. Cluster 4 also had little experience with financial assets and this group was most likely to be involved with alternative financial services like payday loans and tax refund loans, and they were more likely to use pawn shops. They were also likely to be “unbanked,” as 20% of them did not have a checking account, and 38% did not have a savings account.

The demographics by cluster seemed to follow along with the literacy findings. Clusters 1 and 2 typically exhibited higher average levels of literacy, each had high average incomes, but Cluster 1 tended to have higher wealth than Cluster 2. Cluster 3 most closely resembled what is considered to be an average American as they were roughly comparable to the rest of the overall sample in terms of income and demographics, since they were all over the map. Those in Cluster 4 had the lowest income and were more likely to be female, as well as single or separated. Clusters 3 and 4 were also shown to have lower levels of financial literacy. The researchers also evaluated the relationship between financial literacy and indebtedness, relying on self-reported measures of literacy and ability to handle debt loads. The pattern that emerged was that those who reported higher levels of literacy also reported little trouble paying off debt, while those who reported lower literacy had more trouble, holding more debt than they could handle. Indeed, women, African-Americans and those with low wealth and income in particular reported an inability to judge their debt load at all. Estimates on the cost of ignorance show that the less financially knowledgeable a person is, the more he or she spends on managing debts (Lusardi and Tufano 2009).

In cases where people seek out advice for their financial problems, another pattern emerges in relation to financial literacy. People with a lower literacy level are more likely to rely on friends and

family for financial advice, though they are not necessarily qualified to give very good advice. In contrast, those with higher levels of financial literacy tend to rely on media sources like newspapers, books, and the internet. Many individuals often ignore the need to use calculations and worksheets to plan, which may be the reason why so many who say they plan fail to reach their goals. Seeking professional advice is uncommon on the whole, and many are skeptical about recommendations unless they confirm preexisting biases. Perhaps one area of contention is that the incentives of financial professionals are not always aligned with the best interests of their clients. Be that as it may, there is some evidence that professional advice does indeed lead to better financial outcomes in the areas of debt and investments (Lusardi “Household Savings...” 2008). The notion that many rely on friends and family for advice, even though those individuals are the very same people who by-and-large do not have a firm grasp on financial literacy themselves, leads to a chain reaction of bad decisions.

Certainly, good decisions are not being made even by those who are of higher relative financial literacy, as the knowledge and skills that many people need for their own finances is still lacking across the board. Of course there are other factors to consider when looking at the broader economy to see how a lack of financial skill manifests itself, such as easy credit and conflicts of interest in the mortgage industry.

### **Broad Economic Developments from the Perspective of Financial Literacy**

There are many variables to beside financial illiteracy that contributed to the recent financial crisis. The demand for financing was spurred by a number of factors, including a history of flat wages, mortgage interest deductibility, low interest rates leading to cheap credit, and increased consumer activity spurred by the media and social interactions with a changing attitude toward debt. Increases in financial leverage and consumer spending were further facilitated by nations like China as they financed the trade deficit, real estate speculation, and most definitely predatory lending, fraud, and

other sketchy lending practices for those loans that were securitized. Eventually we wound up with over-indebted consumers and banks holding innovative assets like mortgage-backed securities, the value of which turned out to be not as high as rating agencies originally suggested as the underlying mortgages defaulted at unprecedented levels.

The average American consumer's budget has stagnated since the early 1970s due to moribund real wages, despite an ever-rising standard of living. When pocketbooks could not keep up with consumption aspirations, the conditions became more favorable for debt-financing to fill in the conspicuous consumption gaps for many consumers. The behavior of household debt closely mirrors trends in income inequality. Between 1963 and 1980 increasing income inequality was just starting to build steam and household debt was holding stable, but beyond 1980 household debt jumped out of proportion with changes in income, increasing from 66% of disposable personal income to 113% from 1981 to 2003 (Iacoviello 2008). Behind much of this jump in debt is the ubiquitous mortgage. A feature of mortgages in the United States and other countries is the tax deductibility of interest payments, which gives people an incentive to buy a home rather than rent. Gervais and Pandey (2008) argue that if this incentive were to be removed households would readjust their balance sheets and hold less mortgage-related debt. Evidence from tax reforms in Denmark in the mid-1980s show that households do respond to tax incentives, in the Danish case, the tax benefits of holding mortgage-related debt went down and as a result households paid down their debt more quickly (Alan and Leth-Petersen 2006). Furthermore, through refinancing consumers are able to consolidate consumer debt into their mortgage and thereby receive an interest payment deduction for consumer debt too. This applies especially to home equity lines of credit (Cynamon and Fazzari 2008). So, excessive indebtedness can partly be laid at the feet of governments, including the U.S., which tax-advantage debt. Governments are further culpable for the crisis because of the favorable treatment afforded to capital gains realized on real estate and other assets.

A series of information cascades, in which individuals mimic the decisions of other individuals, has helped motivate the undertaking of increased levels of debt. People tend to care about their ranking in the consumption hierarchy; their status depends on their ability to consume, and saving face depends on consuming at a certain standard that had an upward trajectory, at least before the recent slowdown of the global economy (Watkins 2009). Adam Smith said that not being poor means being able “to appear in public without shame, ” quoted in Pressman and Scott (2009). We essentially have a population that bases much of its self-worth on what they own and consume relative to those around them. Mass media advertising targets the upper-middle-class, while those below that level can only aspire to such excesses in the absence of access to credit. Over time, influence from the media and the behaviors of neighbors, friends, and family had led people to spend more and more – often with money they do not actually have – to maintain a level of consumption that will allow them to appear acceptable in society, leading to an information cascade of ever-increasing consumption. Indeed, once debt carried a social stigma but now that it is accepted that neighbors and other peers are using credit to finance their lifestyle, we get what amounts to a second information cascade of ever-increasing indebtedness – or at least increasing pressure to finance consumption (Cynamon and Fazzari 2008).

When pressure to consume, not just to maintain personal relationships but to maintain a certain status, coupled with reduced incomes, easy credit and the psychological tendency for individuals to mimic the actions of those around them meets low levels of financial literacy, increased indebtedness surely follows. In the short-term, Gross Domestic Product is inflated by this unsustainable run up in consumption, which is being shifted forward into earlier time periods, and GDP growth can only be maintained by further rises in debt. This increase in GDP in conjunction with the lower interest rate environment helps to inflate asset prices as well, including houses which was also directly influenced by low interest rates and a refinancing boom in which all kinds of creative mortgages came out to play as underwriting standards plummeted. The conditions for predatory lending and fraud just got that

much more conducive, and consumption showed no signs of slowing for an initial period. The incidence of such high levels of sketchy lending to the average American should have come as no surprise since a “lack of knowledge and information makes them easy prey; lack of income and the need for credit further tilts the playing field in favor of unscrupulous creditors” (Watkins 2009).

The increased use of exotic mortgages such as Adjustable Rate Mortgages (ARMs), Option-ARMs, and Interest-Only (adjustable or fixed) was originally seen as a useful innovation for helping to make home-ownership more affordable in the midst of rising home prices. However, the proliferation of these various forms of financing only made it harder for many consumers to make informed decisions without the help of professional financial advice – which most people do not seek – and so the increased use of these new types of mortgages ended up making the countries in which they were used more vulnerable to crises (Scanlon et al. 2008). At the same time, the use of these mortgages was seen as desirable since it allows borrowers with lower credit ratings to purchase homes, albeit at higher interest rates. This is what Alan Greenspan, and others, celebrated as what was called “the democratization of credit.” Subprime lending to buyers who were properly qualified was not seen as a questionable practice, though the risk assessment involved as well as the design of those loans may not have been optimal in retrospect.

Of course the system that gladly served up these mortgages – the Shadow Banking System – is not blameless, as conflicts of interest within the system always existed. Originators took advantage of the financial unsophistication of many borrowers while also taking advantage of the lack of due diligence to see to it that the originators are getting loans to qualified borrowers, allowing predatory lending and mortgage fraud to become widespread. Many borrowers got put in mortgages without understanding the terms, or without understanding if they were borrowing more than their incomes could handle. While homeowners got in over their heads, originators, who were largely unregulated and unlicensed in the run-up to the meltdown, collected their commission and looked for more



unwitting customers. None of this mattered as long as house prices continued to rise.

Outright fraud was committed in some cases by the borrowers fabricating information on applications, typically for subprime loans and/or broker originated loans, some of which also have involved identity theft. Other types of fraud resulted from collusion among industry insiders, participating in such things as appraisal fraud, fraudulent property flipping, straw buyers, and, again, identity theft. Though not illegal like fraud, predatory lending differs from subprime lending in that it is deliberately abusive lending that targets vulnerable groups like the elderly, people with low incomes, minorities, and people with limited financial knowledge. Predatory lending is also found with other loan types like payday loans or credit cards – which were solicited relentlessly by mail before the credit crunch (Lander et al. 2008). Indeed, besides the financial incentive to issue as many loans as possible, and the more exotic the loan – with higher fees and a higher interest rate – the better the pay, the existence of poorly informed borrowers was a main contributor to predatory lending (Bond, Musto and Yilmaz 2009).

The risks of the questionable loans became entrenched throughout the rest of the system largely with adverse selection. Arrangers supposedly held more information about the quality of the loans being issued – unless they did not do their due diligence – than the warehouse lenders which provided the original funding for the loans being made until they could be sold. Similarly, the asset managers that purchased mortgage-backed securities from the arrangers – sometimes with or without due diligence – and the credit-rating agencies that were not given a whole lot of information up front and typically do not do much due diligence anyway. Other frictions between these parties persisted, for instance the principal-agent frictions between investors and asset managers and model errors on the part of the rating agencies for which investors had to pay. Credit rating agencies had been labeling the high-return mortgage-backed securities, but the inconsistencies between the risk and reward of these securities did not send up red flags until their credit quality became obvious. The parties of this system

were ready and willing at all points to keep pumping out loans, which contributed to homeownership hitting a record high of 69% in 2004, spurring increased real estate speculation and thus decreased housing affordability (Lander et al. 2008). Beyond those conflicts of interest remain frictions between the original mortgagor and the servicer that must collect payments on behalf of the investors who now own the securities tied to these loans, but when foreclosure starts to loom moral hazard comes into play and mortgagors thus have little incentive to maintain their property (Ashcraft and Schuermann 2008).

The possibility of default became greater and greater especially for holders of ARMs as rates trended upward, out-pacing increases in wages adding to the burden of additional consumer debt that had piled up as well. Sometimes owners experienced repayment shocks in the form of balloon payments on interest-only loans. As a result, living paycheck-to-paycheck became more and more common, and a class in America called the 'debt-poor' grew significantly. This growing group of more than 4 million Americans is so named because so much of their incomes is tied up in payments to creditors that they are essentially living in poverty. The debt poor used to only make up 0.2 percent of the population in 1982, but by 2003 they made up 1 percent of the population and accounted for 1.3 percent of the population in 2007 (Pressman and Scott III 2009). The stress of incremental debt burdens compounds the issue of income inequality, which is implicated by empirical evidence to generate health problems, proving costly on two fronts in a society in which the ranks of those with health insurance is falling. As consumer budgets becoming increasingly constrained the demise of the debt-fueled economic boom became ever more certain.

The over-leveraged American consumers found themselves generally unable to borrow any more, so debt issuance first slowed and then fell along with consumption. With the slowdown in consumption came the slowdown in overall GDP growth, which heads to layoffs. Layoffs dare an added stress on a population where more and more people live paycheck-to-paycheck and have very little in emergency funds due to past low saving rates. Consequently, bankruptcy filings are up. If that

was not enough grief, the type of bankruptcy that allowed consumers to wipe out all their debt, Chapter 7, has become harder to get, so most filers have to resort to Chapter 13, which requires repayment of everything under a restructured payment plan (Pressman and Scott 2009). This provides feedback all the way up the securitization chain as income streams begin to fall apart when people are unable to pay their mortgage or other debt that has been securitized, reducing the value of these assets. Banks holding large amounts of these securities as assets found themselves in a world of trouble especially under mark-to-market accounting regimes. These developments pushed financial institutions such as Lehman Brothers, Bear Stearns, and Washington Mutual into insolvency and prompting the bailouts carried out in late 2008 to provide banks with more capital, preceded by massive interest-rate reductions in 2007, which remain near zero at the time of this report. The slowdown of most of the global economy and the utter collapse of asset prices led to concerted efforts to prop up the global economy by governments around the world. Quite an amazing crisis to have come about thanks in part to the low level of financial literacy among consumers. It may not have been the main cause, but regardless of the pressure to consume, it is fair to say that people generally do not like to be taken advantage of. If consumers knew ahead of time what the mortgage originators were up to and actually understood the terms of the loan documents they were signing – whether or not it was a loan that was previously discussed or if it was a less suitable substitute proposed by an originator at the last minute for the sake of earning a higher commission – we could probably write off at least some of the swiftness and the severity of this most recent financial crisis.

Now that this string of events has transpired, America finds itself with much of the population needing to deleverage their balance sheets. One novel idea for the millions of homeowners who have purchased a home within the last five years and now find themselves underwater with their homes – they owe more on their mortgage than their house is worth – is to just leave the house and stop making payments. For some individuals this may be the better decision as opposed to staying and paying

despite the negative effects that walking away from the obligation would have on one's credit score. The states where lenders can pursue recourse for nonpayment typically were not hit the hardest in home value declines. There has been some commotion in the media about the notion of walking away, with many leaders in the financial industry and in government, including President Obama, explaining that paying a loan is the honorable thing to do and not paying reflects badly on the borrower, sets a bad example for children, and has adverse effects on communities, among other things. The social stigma of forgoing payment and leaving is definitely there, and it is rekindled every time someone with influences magnifies the supposed shame and irreparable damage such an action would have on credit scores and personal finances in general. On the other hand, as more people walk away, the social stigma is lessened.

Putting a moral burden on borrowers, who apparently are not supposed to act in their own self interest while exempting lenders from their social responsibility since they allowed so many unsuitable loans to be issued seems one-sided and unfair. Many borrowers looking for a way to stop paying on a losing arrangement find that lenders and servicers drag their feet on making mortgage modifications, possibly because of the interests of company shareholders and holders of mortgage-backed securities. If consumers who are underwater in their mortgages can overcome the effects of guilt and shame that come with strategic default – effects that belong under the umbrella of behavioral economics – they would still have to be able to calculate the costs of continuing to pay the mortgage versus the cost of renting, along with the costs of foreclosure. While the information required to calculate these costs is readily available through the internet, the financial sophistication to do so is amply suspect. Evidence suggests that if many gave serious consideration to strategic default people would be walking away in droves, as millions of U.S. homeowners could individually save hundreds of thousands of dollars doing so. This kind of behavior has been shown to catch on in the fashion of an information cascade when a few individuals in a neighborhood decide to walk away (White 2009).

Though more loans defaulting is bad news for banks and lenders in terms of maintaining bank capital and revenues to avoid more threats of insolvency, deleveraging has to happen one way or another, especially in light of the low and declining household wealth of the average American. To make matters more difficult, the Baby Boom generation has just started entering into retirement, and whether or not most of them can finance a full and sustained retirement remains to be seen. Boomers who will be retiring soon may be buoyed as they are more likely than younger workers to have a defined benefit pension plans – provided their previous employer has not filed for bankruptcy in order to rid itself of such obligations – along with Social Security (Gustman, Steinmeyer, and Tabatabai 2010). Those who will be retiring later and have more money in defined contribution plans (like 401(k)s) will likely be in a more dire situation. In the coming years, it may become commonplace to see more people working well past the age of 65. Younger generations of Americans have a lot of saving to catch up on, though they might not be aware of it, or in a position to make good saving and investment decisions for the long term.

### **Recommendations For Increasing Financial Literacy and Obtaining Better Outcomes**

#### *1. Learn More about the Limits of Financial Literacy*

There are a few key things that can be done get a better grip on financial literacy and ultimately help individuals make better financial decisions. Since studies involving financial literacy are relatively new, more research to foster a better understanding of what people know and what they need to know is essential. Specifically the surveys in use need to be improved in terms of robustness and the questions should be standardized so that survey results are more easily comparable. One problem that affects the usefulness and validity of some surveys is high internal consistency, meaning that some questions are not differentiated enough from others. If internal consistency is high among too many questions then the survey may be failing to capture as much unique information as it could if it had significantly

different questions.

It is important to be gathering data on different aspects of personal finance, making sure to cover all the relevant content while keeping social bias to a minimum. I included some easier questions among the more investment-inclined questions in my survey because of the population I was studying. The Jump\$Start surveys done on high school students may have problems with social bias as well as construct, congruent and predictive validity, but did better with respect to content validity (Lucey 2006). Content validity is the focus of some researchers who are interested in focusing on deficiencies in areas that people must know versus those that are of tangential importance. For example: personal finance basics is fundamental but estate planning is not relevant to many. Measuring financial literacy takes more than 5-10 survey questions to understand where the knowledge pitfalls are so that educational programs can be better targeted at critical areas where people are lacking knowledge (Volpe, Chen and Liu 2006). To this end, I designed a survey of financial literacy that incorporated questions asked in previous research as well as questions targeted at the specific financial concerns of my subjects, American college students.

### *Financial Literacy Survey of PSU Students*

#### *Methodology*

The aim of my study is much like that of Volpe et al. (1996) with similar goals of finding out the relationship between illiteracy and gender, age, and college major. Essentially the idea was to duplicate the survey and see what kind of results we would get with college students 14 years later.

The basis of my survey was indeed taken from Volpe et al (1996), who had utilized a 10-question survey from written by John Markese of the American Association of Individual Investors which was originally used in a 1993 article of *Money* magazine. Questions 8 and 9 (7 and 8 on the original) were updated to reflect an updated time period and the currency Germany uses now – the euro

– respectively. Among the other 4 questions that were added, 3 came from papers authored by Lusardi (“Financial...” 2008) and Lusardi and Tufano (2009), and I created the other one about the effective discount of buying 2 cases of beer and then getting another case for free. My guess is that students will do better on questions that are more directly relevant to their own experiences.

These questions were added because it seemed like many of the questions listed in the original survey had a significant social bias to them, addressing relatively higher level investment knowledge and not so much basic personal finance. Many of those original questions seemed like they would be hard for most young people to answer correctly since they are scarcely relevant to students. Originally the topics covered included risk, tax planning, diversification, professional designations and definitions, global investing, and the impact of interest rate changes, among others. More relevant to students are the effect of inflation on purchasing power, and what percentage of a discount “buy two get one free” sales entail. Other questions relevant to students involve credit cards, particularly the effect of compound interest on the balance of a credit card, as well as the implications of making minimum payments. The questions that were added were either formulated or modified to keep the number of answer choices to three, so as to stay consistent with the rest of the questions on the test.

The surveys included some demographic questions and a field for students to sign for the release of their records in order to test for the main possible relationships between age, gender, and major, as well as a few other areas for investigation like household income and high school GPA. Other studies (Lusardi) have examined the sources that people derive their financial advice from – notably from financial professionals which most people apparently shun in favor of asking advice from peers – so questions were included to find out from where these students were getting their information if they were indeed seeking advice at this point in life. A sample of the survey questions can be found in Appendix A.

The sample of students was drawn from three 200-level economics classes during the 2009-

2010 academic year at a large urban university. Surveys were conducted towards the beginning of class in each class. Participation by the students was, of course, voluntary. In order to get the students to make a good effort on the test, the following incentives for high scores were provided: \$50 cash for the top two scores on the test and girl-scout cookies for other people who got high scores. Prizes were later determined to be anyone who scored 9 or above out of 14, who did not receive a cash prize. The first cash prize was given to the individual with the highest score of 13/14, and the second prize was given to a winner of a lottery drawing between respondents with the second highest score of 11/14. The total sample size was 82 students.

### *Results*

The mean for the first 10 graded questions was only 44 percent for all the participants, with a median score of only 40 percent – the same numbers that Volpe et al. (1996) came across. With all questions included the mean and median scores was 48 and 50 percent, respectively. The weakest areas for all respondents were understanding the impact of interest rate changes, stock market valuation, and tax planning (questions 11, 6, and 5) with a correct response ratio of 32, 30, and 8 percent, respectively. Overall, respondents did better on questions about risk, sales and discounts, and the impact of inflation (questions 2, 12, and 15) with a correct response ratio of 61, 68, and 78 percent, respectively.

Breaking the sample down by gender, major, and age, differences between groups emerge (Appendix B has a series of panels on the overall sample and the subgroups). Since women usually lag behind men, on average, when it comes to financial literacy, I examined their respective scores to see if that pattern held for my sample. The average scores for men and women on the original ten questions were 49 and 36 percent, respectively; including all questions the scores improve to 58 and 40 percent, respectively. Median scores for men and women for the original 10 questions were 50 percent and 30 percent, improving to 57 percent and 39 percent for all questions. Using chi-square tests for



significance at 1 degree of freedom, the difference between men and women scores was significant for questions 9 (which asks to take exchange rates into account to determine mutual fund performance) and 14 (which asks about the implications of making minimum payments on a credit card) at 0.5% (chi-square statistics of 8.99 and 13.25), question 7 (which asks whether one has lost money on a stock that lost 40 percent the first year and gained 40 percent the next year) at 1% (chi-square statistic of 7.18), question 10 at 10% significance (chi-square statistic of 2.73). Taking all correct and incorrect answers into account, the pattern of men outscoring women was significant at the 0.005 level for both the original 10 questions and for all 14 questions (chi-square statistics of 12.39 and 19.84). These findings are consistent with the notion that men are generally more financially literate than women.

Another pair of complimentary groups that Volpe et al. (1996) examined were business majors versus non-business majors (including economics majors in this study). The average scores for business and non-business students on the original 10 questions were 40 percent and 49 percent; accounting for all 14 the scores change to 46 and 52 percent. Median scores for business and non-business majors on the original 10 questions were 40 and 50 percent, respectively, while the medians for the whole test were 43 and 50 percent, respectively. Significant differences for individual questions were comparatively sparse and weak: question 12 favored business students with significance at 5% (chi-square statistic of 4.51); question 3 favored non-business students at 10% (chi-square statistic of 2.85). In aggregate, non-business students did better than business students and the difference was significant at the 0.01 level for all 14 questions and at the 0.10 level for the original 10 questions (chi-square statistics of 6.96 and 3.6 respectively). This result, while not very strong, is contrary to what Volpe et al. (1996) found. Curiously, question 12, (which asks what the effective discount of a “buy 2 get 1 free” sale of beer implies) was more often answered correctly by business majors than non-business majors. Whether this reflects a heightened ability on the part of business students to have a keen sense for thrift for goods in general or just for beer is unclear may require

further investigation.

Finally, I compare the results for those between the ages of 18 and 25, and those aged 26 and up. The younger group had an average score of 42 percent versus 50 percent for the more seasoned crowd on the original 10 questions. Including all 14 questions, the younger group came away with 46 percent versus the older group's 58 percent. Median scores for the young group and the older group on the original 10 questions were 40 and 50 percent, respectively, and to 43 and 57 percent, respectively, when all 14 questions are taken into account. There were indeed a few individual questions where older respondents had the upper hand, notably question 14 (about minimum credit card payments) with significance at the 0.005 level (chi-square statistic of 9.63); differences on questions 4 (which asks what is meant by the term "Registered Investment Adviser") and 7 (on stock market losses and subsequent gains) were significant at the 0.01 level (chi-square statistics of 7.37 and 7.12). The discrepancy on question 15 (which asks what the effect of inflation on purchasing power is) was significant at the 0.05 level (chi-square statistic of 5.95). Overall, the older crowd scored higher on all 14 questions with significance at the 0.005 level, but for the original 10 questions, the difference was only significant at the 0.10 level (chi-square statistics of 11.61 and 3.63 respectively). These findings are inconsistent with Volpe et al. (1996) who found that age did not make a difference in financial literacy. The strength of the older crowd relative to the younger group on question 14 is quite alarming. Most of the younger students do not understand that making minimum payments on credit cards will not pay the card off in a timely manner, if at all. It is also worth noting that the older group evaluated their level of financial knowledge to be higher on average than the younger group's average self-evaluation with those averages being 4.42 and 3.71 respectively on a 7-point scale.

Even that high average score for self-evaluation for the older group was lower than the overall average for the 1,000 respondents in a study by Lusardi and Tufano (2009), which is 4.88. On average it seems that people are generally self-aware, albeit slightly generous, in their self-evaluation. Another

slight point of contrast to the study by Lusardi and Tufano (2009) is that questions 13 and 14, which came from that study, had correct response rates roughly 10 percent higher – the catch is that I reduced the number of possible answers by one, which itself may explain the difference. Either way, overall correct response rates for each question were below 50 percent. Fortunately question 15, which essentially tested the concept of inflation and buying power and was taken from Lusardi (“Financial...” 2008), had a correct response rate of 78 percent. Unfortunately that was the one and only bright spot of knowledge on average for all the questions, with the overall picture of general financial illiteracy among all groups once again reinforced. A search for a correlation between high school GPA or household income and financial literacy was fruitless. The situation becomes even less encouraging after calculating that only 10 percent of my respondents consult professionals for financial advice, consistent with the discussion of such behaviors from Lusardi (“Household...” 2008).

### *Comments on Test Design*

As I mentioned earlier some easier and more pedestrian questions were introduced into the survey in order to mitigate the amount of social bias within the survey. I wanted to test for more practical skills that students might use every day and thereby enhance the content validity of the survey. The problem with this is that some of the introduced questions may then interact with the other questions and possibly increase internal consistency between pairs of questions. I utilized a cross-tab analysis to account for these effects, and the first thing that I found was that answering correctly on most questions other than question 15 will likely lead to correctly answering number 15, probably because it is arguably the easiest question on the survey. In particular, question 15 and question 7, as well as question 14 and question 15, seemed to be answered correctly together, which is probably because both of them utilize percentages or interest rates in both cases. Basic math operations may be what I actually tested here. Questions 2, 10 and 11 seemed to form a cluster, probably because each

question asks about an abstract financial concept and relies on the respondents' grasp of financial terms. Question 12 seemed to form clusters with questions 3, 5, and 9 for reasons that are unclear to me since question 12 deals with sales discount vocabulary and percentages while the rest of the questions are geared more toward long-term money management and investing concepts. Strikingly, anyone who answered correctly on tax planning (question 5) also answered correctly on question 12, which suggests that people who are alert to the tax implications of certain financial decisions are also aware of what the “buy two get one free” sales lingo means in discount percentage terms. See Appendix C for the cross-tab table.

### *Suggestions for Future Research*

There is clearly a need for a standardized financial literacy survey that is relevant in its content validity and predictive validity. A good survey would be lower in internal consistency, so that individual personal finance topics can be more easily isolated. That being said, a good survey may inevitably include a multitude of questions, so perhaps separate surveys at different difficulty levels should be devised and administered separately so that respondents do not get overwhelmed with a giant list of questions. With a standardized survey, future studies will be more readily comparable, allowing researchers to combine their efforts to get a better sense of the financial literacy levels of different demographic groups within the population. Low financial literacy is a multifaceted problem that requires thoughtful examination before effective remedies can be recommended.

### *2. Education*

Education seems an obvious choice to help people to make better decisions, and there is some evidence that individuals would be willing to pay the necessary taxes to add financial literacy programs to the public school curriculum (Davis and Durband 2008). However, there is some debate about the

effectiveness of education in bettering financial decision-making. Where motivation to learn about personal finances is lacking, as is the case with some high school students, education has little effect on increasing literacy. For younger students, it may be difficult for them to see why they need to learn about finances. If they do not understand the importance of this topic they are more likely to be apathetic towards education initiatives (Mandell and Klein 2007). The results are more positive for those students who *are* interested, as education has been shown to have an effect on rates of saving in the short and long term for this group, suggesting that education may be useful in stimulating more saving (Bernheim et al. 2001).

Beyond high school, the next place many are exposed to financial education is in the workplace, and here the results are mixed as well. At one large employer, “before and after” tests of financial literacy surrounding a financial education program only showed a small increase in average scores, rising from 54 to 55 percent. In another study, a company put on a seminar to educate employees about the benefits of saving and utilizing the company's retirement savings program. Of those employees who attended, only 14 percent joined the savings plan despite all of them expressing an interest in saving more; the 14 percent induced to sign up at the seminar is not much better than the 7 percent who signed up without the seminar (Benartzi and Thaler 2007). The results were less dismal for Bayer, Bernheim and Scholz (1996; 2009), who find that seminars in the workplace significantly increase participation and contribution rates in company retirement plans, and that the effects are even stronger for non-highly compensated employees. An earlier study found that the employer-provided seminars also have an effect of increasing saving more broadly, outside of saving in retirement plans (Bernheim and Garrett 2003). Hira and Loibl (2005) find that employer-provided education programs not only increase financial literacy and lead to financial success, but they also increase workplace satisfaction.

Outside the workplace there exists a plethora of financial education programs administered by many public and private organizations, including businesses, community organizations, faith-based

organizations, the military, and community colleges. Some of these organizations may be aiming to promote goodwill or are seeking to serve the community, perhaps as part of one of several financial education initiatives like the National Partners for Financial Education, which has coalition partners in the federal government, including The U.S. Department of the Treasury, The U.S. Department of Labor, The Federal Reserve System, and the Securities and Exchange Commission. These initiatives can be generally divided into three categories: broad programs that address budgeting, saving and credit management; specific programs aimed at increasing competency with retirement savings programs which are indeed typically provided by employers; and another set of specific programs aimed at helping people with issues regarding home buying and homeownership. Generally the results of these programs are positive in getting more people to make better decisions.

The limitations of these programs is that evaluations of the effectiveness of these programs generally lack detailed feedback that would prove useful to educators in knowing the magnitude of the effects of education as well as what methods of delivery and which topics produced the greatest effects. One suggestion is to use what is known as Jacobs' five-tiered approach which involves five steps: a needs assessment of the target audience; accountability, particularly gathering the information about the program, its costs, and its participants; clarification to assess a program's strengths and weaknesses; measuring the progress of each individual toward their goals on an ongoing basis; and, building on the last step, is measuring the long-term and short-term effects of a program. With that kind of structure, these programs would have a greater chance of evolving to be more effective (Fox et al. 2005).

Although education may be ineffective in some situations, when it comes to getting individuals to stop procrastinating it may help many seek out financial advice. As my findings and those of others show, few people actually seek out experts for financial advice, relying mostly on their (comparably less-qualified) peers instead. There is evidence that shows that people who implement professional advice typically have better financial outcomes than if they had chosen to go it alone. A problem with

many people is that if they did receive advice they would only act on it if it matched their preconceived biases (Lusardi “ Household...” 2008). If education has trouble stimulating some individuals to actually save and stay out of debt delinquency, then at least more familiarity with financial terms and concepts could help them know what they should be doing and know what to expect from a financial professional. It is probably the case that if people are better equipped with a more extensive financial vocabulary they will be less intimidated by financial professionals and have a better nose for financial scams from those who feign fiduciary responsibility. Along with that could go another idea: just as people learn how to drive and have to obtain a driver's license before they can drive on their own, some say that perhaps a general financial license should be obtained by consumers before they are allowed to contribute to company pensions or purchase a home – although it might raise the cost of saving (Lusardi “Financial Literacy...” 2008). While educational initiatives may not always produce the desired effect, it will play a growing role in promoting better financial health.

### *3. Consumer Protection and Changes to the Choice Environment*

Since trying to get people to do better for themselves can sometimes come up short it is a good idea to try to come up with other ways to reduce the extent to which they are put at a disadvantage from the start. Thaler and Sunstein's book, *Nudge* (2009), has some public policy suggestions to that end for helping to produce better economic outcomes throughout society. They have a few suggestions for helping people make better decisions with debt instruments outside of using education. For instance the application for federal student loans known as the Free Application for Federal Student Aid (FAFSA) is notoriously cumbersome, but since federal loans are typically much better than private student loans – the market for which is notoriously full of unscrupulous lenders seeking to take advantage of the poorly informed – filling out the FAFSA is an annual chore for those who need financial aid for college. To make the FAFSA less painful they suggest simplifying it by cutting the

number of questions asked, as well as combining the FAFSA with tax return forms since they ask many of the same questions. Generally clarifying the process and simplifying the application as well as publishing how the government determines the amount of aid each student gets will help borrowers compare between loan options. Alternatively, to avoid having to go into debt, parents could be provided an incentive of an initial investment in a 529 college savings plan just for signing up.

Other suggestions apply to more ubiquitous debt instruments like credit cards, which have already attracted new regulations in the last year. Since many fail to keep track of the details of their credit card transactions, particularly the cost of using plastic, credit card companies should be required to send out hard and electronic copies of all fees assessed each year. This way consumer will find out how much they are actually paying for their purchases – which may be well above market value in many cases. In addition to this level of transparency, any hidden fees should be made much more obvious. For mortgages there are similar suggestions toward more transparency so that lenders and loans are more easily comparable. Costs should also be reported in two distinct categories: fees and interest, so that the borrower knows exactly what they are paying for (*Nudge* 2009).

In addition to making debt instruments more user friendly, methods of saving should also be more streamlined. One way to get people to save more is by spicing up savings bonds with a gambling element, as is the case with Premium Bonds in the United Kingdom. Although the expected return of these kinds of bonds is lower than other bonds of comparable risk, it appears that people are attracted to the speculative aspect of these bonds as sales rise as the size of the prize linked to the bond increases in size, though demand also responds to the yield provided as well. These kinds of bonds have been found to be more popular with lower-income households (Tufano 2008). Indeed, evidence from a study involving more than 500 people in Clarksville, Indiana suggests that Prize-Linked Savings Bonds have the potential to be quite popular among low-income households in the United States, and get those who do not save often enough to start saving more. This kind of product may even be able to get



gamblers to switch their chosen speculative activity to buying more of these prize-linked bonds, turning gambling activity into higher demand for savings. Roadblocks to this kind of product becoming more widely used besides the lower expected return include an entrenched gambling industry, as well as being yet another savings instrument on the market which is already bulging with alternatives (Tufano et al. 2008). One way to distribute these bonds is to sell them at outlets that would allow greater take-up by lower-income people, like post offices or corner stores.

A more popular string of ideas revolves around making saving and investing decisions more effective is to make the consequences of inaction or indecision less harsh. For instance when it comes to employer-sponsored retirement plans procrastination can be very costly, especially in cases where employees have to “opt in” to the plan. In addition, this also entails deciding how much to save, when to make a contribution, and what kind of assets to be invest in. These details can simply be more than people can handle at their current state of financial literacy – and if that does not stop them alone – then the decision paralysis they may face when deciding which funds to invest in, for instance, may prevent them from making a good choice. So, the solution is to change the system so that the default option is more favorable. Automatic enrollment in retirement plans requires employees to “opt-out” if they are truly not interested. This tweak alone changes participation rates dramatically, getting employees to join in sooner and getting more involved in the long-term.

Determining how much one should save as a percentage of income has proven to be a somewhat spurious task, many participants opting to chose a percentage that is a multiple of 5, or just investing enough to get the employer match. It may be wise in this case to set the default option up as a contribution rate of 10 percent with full match, and any savings in excess of that would be up to the participant to decide on. On top of that, many participants do not think to increase their saving rate year after year to keep up with inflation. Another novel idea to increase saving is the “Save More Tomorrow” concept, where retirement plan contributions go up with each pay raise, for instance at a

rate of 3 percent per pay raise. One more tweak that is equally important is the question of asset allocation. The default allocation should be different for people of different ages: more aggressive for younger workers, more conservative for older workers. In addition to that, there should be limits to how much of one's company retirement assets can be invested in company stock since it can be extraordinarily risky and utterly devastating in certain cases, such as the collapse of Enron. Since workers will also be allowed to choose their own allocation should they be more proactive, it would behoove plan providers to prevent decision paralysis and include three simple blended funds that reflect different asset allocations (aggressive, moderate, and conservative) (Benartzi and Thaler 2007).

Another retirement system that could use modification for increased user-friendliness is the Social Security system. It needs to include a more sophisticated benefit calculator that can take more variables into consideration such as life expectancy, spousal information (their age, health, working history and retirement expectations), as well as how much money one expects to make while taking Social Security payments since those payments would be heavily taxed. If nothing else, the Social Security Administration could implement a favorable default option for those who are having trouble making a decision (Thaler and Sunstein 118-119, *Nudge* 2009). The general idea is to make the consequences of procrastination much less harsh by changing the default options to be close to optimal for the average person; it is a very low cost solution and it poses great potential benefits.

## **Conclusion**

The objective of this paper is to highlight the financial pressures that Americans now face in relation to their financial literacy. I examine the effects of financial literacy on financial decisions. I find that financial literacy is generally low in America, and this is correlated with poor financial outcomes at the individual level. In addition, people with lower levels of literacy are systematically exploited by unscrupulous lenders in the subprime mortgage crisis and by lenders in other markets such

as payday loans. The interaction between unsophisticated borrowers and an aggressive industry culture that has been so costly served as a main driver of the debt-fueled boom and subsequent bust. Included here are suggestions for improving levels of financial literacy and the financial well-being of individuals in America in the interests of improving quality of life and adding stability to our overall economic system.

The original research that I performed for this paper certainly could have included a much larger sample if not for the constraints of time and incentives for respondents. Additionally, some of the data could have been more useful if demographic questions were asked directly instead of relying on student records, in which some pieces of information were missing. In future studies more emphasis should be placed on retrieving a more comprehensive snapshot of financial literacy levels, including gaining an understanding of how well individuals' personal finances are faring, and the effects of education on literacy and behavior. Since the state of financial literacy has become more crucial to the health of the economy, it is essential that we understand the nature of, and solutions, to this pressing problem.

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**Appendix A: Financial Knowledge Quiz (15 questions)**

1. On a scale from 1 to 7, where 1 means “very low” and 7 means “very high,” how would you rate your overall financial knowledge? (Please circle the correct response.)

**1          2          3          4          5          6          7**

2. You can't lose money investing in a U.S. Treasury bond, because it is backed by the United States Government. (Please circle the correct response.)

**TRUE          FALSE**

3. Investing in a mutual fund that holds a diversified portfolio of stocks protects your investment against market declines. (Please circle the correct response.)

**TRUE          FALSE**

**For questions 4-15, please circle either a), b), or c).**

4. If a financial planner's business card says that he or she is a Registered Investment Adviser; the planner:

- a) meets rigorous standards set by the Securities and Exchange Commission (SEC).**
- b) is recommended by the SEC.**
- c) has simply paid a \$150 registration fee to the SEC.**

5. You're considering investing in a mutual fund expected to distribute \$1 a share in dividends. You should:

- a) buy now so you'll get the distribution.**
- b) buy after the distribution is paid.**
- c) buy either way, because it doesn't matter .**

6. Let's say the price/earnings ratio on Standard & Poor's 500-stock index is 23 and its dividend yield is 2.5%. This means that the stock market is relatively:

- a) undervalued by historical standards.**
- b) overvalued.**
- c) fairly valued.**

7. You invested \$1,000 in a stock two years ago. The stock's trading price declined 40% the first year and rose 40% the next. As a result, you've:

- a) lost money.**
- b) made money.**

**c) broken even.**

**(OVER)**

8. A broker recommends a municipal bond that matures in 2016 but is likely to be called, or redeemed, as early as 2011. The best gauge of your expected return is its:

**a) current yield.**

**b) yield to maturity.**

**c) yield to call.**

9. You own shares in the Germany Fund. The value of your fund's investment in U.S. dollars would be higher if:

**a) the dollar weakens against the EURO (the currency of Germany).**

**b) the dollar strengthens against the EURO.**

**c) neither; a change in the dollar's value doesn't matter in this case.**

10. The figure that best reflects a mutual fund's performance over a period of years is :

**a) its current yield.**

**b) the total of dividends and capital gains it has paid.**

**c) its total return**

11. If interest rates climb one percentage point, which of these securities would be hurt the least?

**a) A 20-year zero-coupon bond.**

**b) A 20-year bond selling at its face value.**

**c) A 20-year bond selling at a premium above its face value.**

12. If you bought two cases of beer for \$40 total and got one case for free, what is the effective discount *per case*?

**a) 50% off**

**b) 33% off**

**c) 25% off**

13. Suppose you owe \$1,000 on a credit card with an interest rate on outstanding balances of 20% per year, compounded annually. If you make no payments and incur no fees in addition to the interest payments, how many years would it take for the amount you owe to double?

**a) Less than 5 years**

**b) 5 to 10 years**

**c) More than 10 years**

III

**(OVER)**

14. Suppose you owe \$3,000 on your credit card and decide to stop charging on that card in the future. You make the minimum payment of \$30 each month. At an interest rate of 12% per year (or 1% per month), how many years would it take to eliminate your credit card debt?

- a) **Less than 10 years**
- b) **Between 10 and 15 years**
- c) **You will never pay the card off if you make the minimum payment.**

15. Suppose that your savings account pays an interest rate of 1% per year and that inflation is running at 2% per year. After 1 year, the money in your savings account will be able to buy:

- a) **more than it could buy today.**
- b) **exactly the same as it could buy today.**
- c) **less than it could buy today.**

Answers:

2: F	3: F	4: C	5: B	6: B	7: A	8: C
9: A	10: C	11: C	12: B	13: A	14: C	15: C

IV

**Appendix B: Survey Results For All Subsamples**

	Self-evaluation	Risk	Diversification	Advisor Qualif.	Tax Planning	Stock Market Valuation	Business Math	Bond Performance	Global Investing	Mutual Fund Performance	Impact of Int Rate Change	Beer Discount	Credit Card Balance	Minimum Payments	Inflation & Buy Power
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
<b>Total Participants: 82</b>															
Number	3.95	50	48	38	7	26	43	43	40	40	26	48	39	40	64
Percentage		61%	59%	46%	9%	32%	52%	52%	49%	49%	32%	59%	48%	49%	78%
<b>Total Known Male Participants: 46</b>															
Number	3.87	31	28	24	2	15	30	24	30	26	17	31	24	30	39
Percentage		67%	61%	52%	4%	33%	65%	52%	65%	57%	37%	67%	52%	65%	85%
<b>Total Known Female Participants: 25</b>															
Number	3.96	12	13	10	1	7	8	16	7	9	6	16	10	5	19
Percentage		48%	52%	40%	4%	28%	32%	64%	28%	36%	24%	64%	40%	20%	76%
<b>Total Participants of Non-Business Administration Majors: 38</b>															
Number	3.92	26	26	18	4	12	22	22	19	22	15	22	17	22	29
Percentage		68%	68%	47%	11%	32%	58%	58%	50%	58%	39%	58%	45%	58%	76%
<b>Total Participants of Business Administration Majors: 44</b>															
Number	3.98	24	22	20	3	14	21	21	21	18	11	35	22	18	35
Percentage		55%	50%	45%	7%	32%	48%	48%	48%	41%	25%	80%	50%	41%	80%
<b>Total Participants Known to be Under Age 26: 51</b>															
Number	3.71	29	28	19	3	17	22	28	25	25	18	34	21	19	38
Percentage		57%	55%	37%	6%	33%	43%	55%	49%	49%	35%	67%	41%	37%	75%
<b>Total Participants Known to be Age 26 and Over: 19</b>															
Number	4.42	13	12	14	0	5	15	11	11	9	5	13	12	15	19
Percentage		68%	63%	74%	0%	26%	79%	58%	58%	47%	26%	68%	63%	79%	100%

**Appendix C: Cross-Tab Table**

Cross-tab	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15		total
q2	50	31	24	4	17	27	29	28	29	19	31	20	24	41		50
q3	31	48	22	5	17	28	25	25	24	15	35	22	26	37		48
q4	24	22	38	2	12	24	26	21	21	10	28	24	26	34		38
q5	4	5	2	7	2	2	2	2	3	3	7	1	3	3		7
q6	17	17	12	2	26	15	15	14	15	8	16	10	10	20		26
q7	27	28	24	2	15	43	23	25	26	16	29	24	30	41		43
q8	29	25	26	2	15	23	43	18	23	13	27	23	23	35		43
q9	28	25	21	2	14	25	18	40	22	12	30	17	23	31		40
q10	29	24	21	3	15	26	23	22	40	13	28	19	20	33		40
q11	19	15	10	3	8	16	13	12	13	26	16	10	12	19		26
q12	31	35	28	7	16	29	27	30	28	16	57	27	28	43		57
q13	20	22	24	1	10	24	23	17	19	10	27	39	21	32		39
q14	24	26	26	3	10	30	23	23	20	12	28	21	40	35		40
q15	41	37	34	3	20	41	35	31	33	19	43	32	35	64		64
total	50	48	38	7	26	43	43	40	40	26	57	39	40	64		