THE EFFECTS OF MANDATORY INFORMATION POLICIES ON CONSUMER BEHAVIOR IN CREDIT MARKETS

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John Michael Collins

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THE EFFECTS OF MANDATORY INFORMATION POLICIES ON CONSUMER BEHAVIOR IN CREDIT MARKETS

John Michael Collins, Ph.D.

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This dissertation examines the effects of public policies that mandate disclosures or education for consumers making decisions in credit and other financial markets.

The first chapter reviews the literature, finding two roles for disclosures: facilitating searches among product alternatives and highlighting risks. Research suggests disclosures do impact consumer choices, and that consumer responses to disclosed information will vary by the format of disclosure, as well as the consumer's current mood and financial literacy level. There are many studies on financial literacy education, but because consumers with the strongest base of information are also the most likely to be educated, results are not conclusive.

The second chapter evaluates state disclosure laws for high-cost mortgage refinance loans using 2005 Home Mortgage Disclosure Act data. Estimates obtained using a variety of econometric techniques, including a sequential response model, suggest that state laws requiring signed disclosures highlighting the risk of "losing your home" result in loan applicants being 3 to 6 percent more likely to reject a loan offer from a lender.

The third chapter reports three lab experiments on how mood or affect influences a consumer's use of disclosures. Unlike control group participants, as well as those in whom anxiety was induced, participants in whom a positive affect was

induced were more likely to notice missing information in a credit card disclosure. These results suggest even simplified disclosure formats need to include all relevant information in order to be effective for consumers in nonpositive moods.

The final chapter is a longitudinal field study in which mandatory financial education was randomly assigned to 127 low-income clients in a subsidized housing program. Estimates using difference-in-differences methods show $540 in additional savings, a 25 percent increase in self-reported financial knowledge, and a 21-point increase in credit scores for educated clients after one year. These findings suggest the importance of appropriately designed field studies and demonstrate that mandated financial education can influence consumer behavior.

These chapters provide insights into how public policies can influence consumer decisions in credit markets. This work also provides a platform for new directions of inquiry into consumer decision making in financial markets.

BIOGRAPHICAL SKETCH

J. Michael Collins received a Bachelor of Science in Education from Miami University in Oxford, Ohio, in 1993, and a Master in Public Policy from the Harvard University John F. Kennedy School of Government in 1998. After working for the Greater Cincinnati Foundation and Neighborhood Reinvestment Corporation on grant initiatives and programs to encourage low-income families to save financial assets and purchase homes, he continued his graduate education at Cornell University beginning in 2004, receiving his Ph.D. in August of 2008. He has accepted a position as an Assistant Professor at the University of Wisconsin-Madison.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

This dissertation examines the effects of public policies that mandate disclosures or education for consumers making financial decisions. It is divided into four distinct chapters. The first chapter provides an overview of the literature of consumers' use of disclosures in financial and other markets. The second chapter evaluates state disclosure laws for high-cost mortgage refinance loans. The third chapter reports on the results of laboratory experiments of mood, or affect, and consumers' use of credit card application disclosures. The final chapter is a longitudinal field study in which mandatory financial education was randomly assigned to low-income clients in a subsidized housing program. Overall, these studies provide evidence that governmental policies mandating that consumers receive disclosure information have an effect on consumer decisions. Likewise, financial literacy education, which also influences disclosure use, has an effect on financial behavior. To the extent that a goal of consumer polices is to encourage consumers to more carefully evaluate the risks of mortgage loan offers or the terms of credit card offers, these results suggest that disclosure and financial literacy education may be effective strategies.

The first chapter provides an overview of disclosure polices for credit markets, with a focus on credit cards and high-cost mortgages. This chapter summarizes the roles for disclosures in credit markets, including disclosures designed to help consumers search before applying for a credit card and disclosures designed to help naïve consumers evaluate the risks of a mortgage refinance loan before accepting an offer from a lender. This chapter provides a brief overview of the mechanisms involved in communicating product disclosures, including how consumers may process disclosed information. This chapter also summarizes previous studies

evaluating consumer disclosure policies and provides a review of the literature related to improving the ability of consumers to make financial decisions through financial literacy education. Overall, the existing literature supports the need for further evidence of the effects of mandatory disclosures, including the extent to which warning-type disclosures affect consumers in the mortgage market, how a consumer's mood may alter the processing of credit card disclosure information, and the effects of mandatory financial education.

The second chapter presents an applied empirical study of consumer rejections of approved high-cost mortgage loan offers using 2005 Home Mortgage Disclosure Act data. This chapter finds that state laws requiring signed disclosures of the risk of "losing your home" result in more loan applicants rejecting a refinance loan offer from a lender. In general, a loan application covered by signed disclosure laws, controlling for applicant, lender, and market factors, results in a 3- to 6-point increase in the rate of applicants rejecting high-cost loans. An additional effect of these disclosure laws is that applicants and borrowers subject to signed disclosures appear to modestly reduce the amount they borrow relative to their income. Although state laws might impact application behavior and lender denials of applications, strong evidence of such effects does not exist.

The third chapter presents the results of a series of three lab experiments using college undergraduates to review credit card disclosures. Credit cards are one of the most common forms of credit offered to consumers and one in which information is highly standardized through mandated disclosures at or before the time of application. Credit card disclosures are highly relevant for college students since most people will apply for their first credit card while in college. Overall, participants do pay attention to the information in mandated disclosures when evaluating credit card offers. Unlike participants in whom anxiety was induced or controls, participants in whom positive

affect was induced were more likely to notice information omitted or missing from a disclosure. Participants in whom positive affect was induced were also more likely to seek more items of information than were controls. This is consistent with positive affect's association with dually broad and flexible thinking, and provides evidence against positive affect leading to careless thinking, as suggested by some theorists. These results suggest that credit disclosure policies should include all relevant information if a goal is more complete use of information by consumers across a range of moods.

The final chapter presents a field study evaluating the impact of a financial literacy education program provided to clients in a subsidized housing program. The financial status and attitudes of 127 clients were tracked for 12 months, including 60 in a treatment group assigned to financial education and 67 in a control group. Based on simple difference-in-differences comparisons as well as propensity score weighted difference-in-differences estimators, the program is associated with $540 in additional savings, a 25 percent increase in positive self-reports of financial knowledge, and a 21 point increase in credit scores. The clients in this study were single mothers with incomes under $20,000 at the start of the study, nearly all of whom had poor credit histories. These results suggest that the program had an effect on the financial status of clients within one year, even among a highly distressed population. If a policy goal is to improve the financial knowledge, savings, and credit of similar groups of consumers, targeted education on financial topics may be a successful approach.

As a whole, the studies presented in these chapters suggest that public polices that mandate information for consumers in financial markets may influence consumer behavior. To the extent that policymakers want consumers to incorporate the risk of losing their home in making decisions about high-cost mortgage loans, signed disclosures may serve a useful role. If a goal is to facilitate information processing of

consumers across moods, it is better to include all relevant information in credit card disclosures than to provide only general information and leave the consumer to search for details elsewhere. Mandating targeted education to consumers with low incomes and poor credit may support at least short-term improvements in savings and credit behavior and is likely to enhance the use of disclosures for financial products. Further research on consumer use of information in financial markets is warranted, particularly given recent problems in consumer credit markets and the lack of substantive recent research in this area. These studies provide a platform for new directions of inquiry in this area.

CHAPTER 1:
LITERATURE REVIEW

1. Mandated Information in Credit Markets

Many products in financial markets involve information disclosures aimed at consumers. Securities and Exchange Commission regulations require firms to provide standardized information to investors on a regular basis, as well as a prospectus to potential investors (Fischel & Grossman, 1984). These documents include details on the firm's financial performance and data useful for analyzing the value of the investment, including potential risks. Banking regulations require disclosures for savings and other products, including the terms of deposits, the structure of interest payments, and account fees (Elliehausen & Lowrey, 1997). But some of the oldest and also most widely used consumer disclosures across any market are focused on the provision of consumer credit (Durkin & Elliehausen, 1999). Passed in 1968, the Truth in Lending Act (TILA) was one of the first consumer information policies in the U.S. The law's legislative sponsor was Senator Paul H. Douglas, an economist and a proponent of providing consumers with information in the marketplace. One example of mandated information under TILA can be observed in each of the more than 8 billion credit card applications that are mailed to households in the U.S. each year (Hagerty, 2008). Every credit card application includes the so-called "Schumer Box," named after the New York congressman who led the effort to create standardized credit card information disclosures in a 1988 amendment to TILA. This special disclosure provides a one-page matrix with the most relevant fees, terms, and conditions of each credit card offer. Mortgages are also covered under TILA, although the complexity of mortgage terms results in requirements for a variety of written disclosure forms. High-cost loans have special disclosures required under the Home Ownership and Equity Protection Act (HOEPA) of 1994. HOEPA disclosures also

include the statement (in capital letters): “YOU COULD LOSE YOUR HOME, AND ANY MONEY YOU HAVE PUT INTO IT, IF YOU DO NOT MEET YOUR OBLIGATIONS UNDER THE LOAN.”

One argument supporting mandatory disclosures in credit markets is that the more information consumers have available, the better they can make fully informed decisions (Rudd, 1983). There is a practical limit to how much information is useful for decision making, however (e.g., Iyengar & Lepper, 2000; for a recent review, see Mitchell, Walsh, & Yamin, 2005; also Scammon, 1977). Policymakers and regulators are forced to make choices regarding the form of written disclosures required for various types of credit products. To make these choices, decision makers need to understand why consumers may need disclosures, how various forms of disclosure might be used by consumers in making actual decisions, and whether current disclosures appear to be effective at reaching policy goals in practice. This section provides an overview of the rationale for disclosures, the mechanisms explaining how consumers may use disclosures, and a scan of past studies examining the impact of various types of disclosures in nonfinancial markets. Because one key factor is consumer financial knowledge, this chapter also reviews the literature related to financial literacy education.

2. Roles of Information Disclosures in Credit Markets

There several roles for disclosures in consumer decision making in credit markets. One role of disclosure is to lower the costs of finding and processing information across product alternatives prior to purchase. In credit markets, disclosures will include details on the terms and conditions of a loan, including the interest rates and fees. One of the initial contributions of the TILA was the development of a standardized annual percentage rate (APR). APR is intended to

summarize the costs of a loan into an effective interest rate, accounting for one-time fees and payments over the life of the loan. By law, APR is defined using the same formula across lenders, making it easier for consumers to compare lenders and loan options. As Stigler (1961) suggested in his influential paper on the economics of information, searching for any product incurs costs for the consumer. Consumers will not seek to learn every detail about a product and its alternatives but instead will search for more information up to the point at which the cost of acquiring each additional item of information equals the expected benefit in terms of a lower price. All markets have imperfectly informed consumers, and markets in which information is costly may result in consumers searching for less information, all else being equal. Disclosures can help lower the costs of acquiring and processing information, resulting in more searching by consumers among alternative options. In credit markets this ideally results in consumers examining more credit card product choices and then selecting products that most closely match their needs at a particular cost.

Disclosures are particularly important for conveying information about product features that consumers have difficulty evaluating in advance. Nelson (1970) defines products as being search goods—products that can be fully examined prior to purchase—or experience goods, which can be evaluated only through use. Simple loan products might be classic search goods where consumers can examine loan terms across lenders and select the one with the terms that best match their needs. Longer-term credit products such as a revolving credit card, however, might entail aspects of experience goods. For example, consumers cannot know how payment issues are managed until they begin using the card. Mandating disclosure of information provides consumers with information about aspects of the card that they could otherwise discover only by using the product.

Disclosures of the terms and costs of credit, as required by TILA, may not actually serve to enhance search outside of the credit card market, however. A review of the role of disclosures by economists at the Federal Reserve concedes there is little evidence that TILA has led to an increase in the number of loan options consumers consider overall (Durkin & Elliehausen, 1999). In part these authors point to the structure of disclosures for most loan products—since the creation of the law, lenders have made the case that accurate terms and conditions cannot be provided to consumers before they apply for a loan. The Schumer Box is a notable exception, but for most loan products disclosures are provided after the consumer has applied for a loan. Credit card disclosures facilitate consumer search by standardizing the APR and the format of the disclosure form, helping consumers compare one credit card offer with another before applying for a card (Durkin, 2002). But for other loan types, consumers engage in search before making an loan application, then receive TILA disclosures after application, or at or just before signing the final loan contract. Because the process of preparing an application incurs costs (opportunity costs of time and monetary costs), searching based on information disclosed after application may not be economically efficient or provide consumers information that can be used effectively in decision making. There is evidence that TILA has resulted in standardized advertising of APR by lenders and has improved the understanding of credit terms by consumers (Day, 1976; Day & Brandt, 1974; see also, Durkin, 2002). Lenders often do voluntarily present information from the TILA disclosure as consumers search for loans, although this is not mandated, and frequently terms will change from the time of application to the time of the closing of the loan contract.

Another role for disclosures in credit markets is related not to searching among products but rather to delivering information consumers use to evaluate a loan product relative to not taking any loan. The disclosure might provide information the consumer

uses to decide to exit the market for an entire class of loans rather than search for another product in the same market. This type of disclosure typically takes the form of a warning about a potential risk or hazard. Viscusi (1993) provides an extensive discussion of laws designed to warn consumers about the cancer risks of a variety of food, drug, cosmetic, and medical products. He describes the function of these disclosures as influencing the consumer's perception of health risks related to these products, which in turn reduces the consumer's expected utility from purchase. Viscusi treats hazard or warning-type disclosures in one of two forms. One form influences the purchase decision by providing information at or before the consumer commits to a product. The other form warns consumers to take precautions after purchasing but before using the product. For example, the disclosure might warn the consumer to wear eye protection before using a pesticide. The consumer may view this warning prior to purchase and decide not to purchase because of it, but the primary purpose of this disclosure is to encourage the consumer to take precautions. There are few examples in financial or credit markets of products that might require consumer precautions in use, however. The more relevant example of disclosures are those that provide information about the risks of a credit product before a consumer becomes indebted by signing the loan contract. These disclosures might lead the consumer to change his or her perception of the probability and/or severity of a negative outcome if he or she were to take on a particular type of loan product. The language included in the HOEPA disclosure "YOU COULD LOSE YOUR HOME" is one example of such a disclosure, designed to warn the consumer prior to signing the mortgage loan contract of the severity of failing to abide by the terms of the loan. These disclosures are provided within 3 days of the loan being signed, which could be several weeks after the initial application was made, but with enough time for a consumer to decide to exit the market for this type of loan. Of course all mortgages

carry the risk of foreclosure. The lender has an objective estimate of a borrower's probability of foreclosure; the borrower has a subjective estimate. In theory, the disclosure provides information that causes the consumer to re-evaluate the subjective risk of losing his or her home by accepting a particular mortgage loan. After incorporating new information highlighting the catastrophic risks of foreclosure, the consumer's expected utility of a potential loan would be lower than prior to disclosure. The expected net marginal benefits of the loan may then be zero or negative, causing the consumer to abandon this transaction and perhaps exit the market for this class of loan products.

3. Rationales for Policies Mandating Information Disclosures

Although disclosure may influence consumer behavior, the rationale for governmental intervention mandating disclosures is a topic of many papers in law and economics. Beales, Craswell, and Salop (1981) provide one of the more thorough reviews of the economic aspects of information disclosure and the role of public policy. Fundamentally, they cite the failure of information markets, specifically the public good properties of information. As with other public goods, information useful for consumers will not be produced or disseminated at socially optimal levels. Sellers will disseminate only that information that gives their product an edge. No one firm has the incentive to offer information that will benefit competing brands. Likewise, no one firm has the incentive to issue negative information about competitors that might implicate its own brand. Without mandates, consumers will not have as much information upon which to make decisions.

While there is a significant literature examining when disclosure might be best left unregulated (see Grossman, 1981; Grossman & Stiglitz, 1980, for early examples), because of several unique features of this market it is unlikely lenders will voluntarily

disclose information about credit products in a consistent manner in the absence of regulations. Fishman and Hagerty (2003) suggest that mandatory disclosures are most important in markets where a large portion of consumers find products hard to understand. This is likely the case for credit markets. Numerous studies show that consumers are poor at analyzing loan terms and interest rate calculations (see Mandell, 1973; 2004a, for one author's research over several decades). Of course, disclosures can be calibrated to the knowledge levels of the consumers for which a particular product is intended. For example, investors in hedge funds receive few mandatory disclosures, because it is assumed that this investor class is more sophisticated and that almost all will be well-informed. Meanwhile, mutual funds attract more uninformed investors and therefore require more extensive disclosures. Fishman and Hagerty suggest that an additional benefit of mandatory disclosures is that otherwise-uninformed consumers may become aware of the need to learn new information and may then seek that information from firms. In fact, this was one of the early findings of the impact of the TILA (Day, 1976; Durkin & Elliehausen, 1999). If mandating disclosures results in consumers becoming more aware of which information is part of all credit offers, lenders might begin to compete based on this information, increasing the average quality of the market overall. Finally, several papers suggest that disclosures should be mandated when consumers find obtaining information about products to be costly (Grossman, 1981; Mazis, Staelin, Beales, & Salop, 1981). Credit contracts tend to be complicated legal agreements that most untrained consumers may find confusing or unreadable. The time required to analyze such agreements, or to find counsel to conduct such an analysis, presents significant costs.

A recent paper by Stango and Zinman (2006) discusses the importance of TILA in light of advances in understanding consumer behavior from the psychology and economics perspectives. The authors use findings from behavioral economics

regarding a common and persistent bias in consumer decision making, the underestimation of the long-term costs of credit payments. The authors find that consumers substantially underestimate the costs of credit when presented with only a payment stream (for example "$400 per month") versus an annual percentage rate (8%). In the absence of standardized measures of the costs of credit, lenders can exploit price discrimination by taking advantage of how well the consumer can convert a payment stream into an effective interest rate. The authors conclude that mandatory APR disclosures such as those included in TILA are an important public policy given this systematic bias in consumer decision making.

Camerer and colleagues in a law review article suggest that disclosures in credit markets are a form of "asymmetric paternalism" in policymaking (Camerer, Issacharoff, Loewenstein, O'Donoghue, & Rabin, 2003). Asymmetric paternalist policies are intended to generate gains for consumers who need protection while having little effect on other consumers. The authors focus on examples from behavioral economics in which consumers may fail to behave as the fully informed rational agents assumed in many economic models. The authors focus on two roles for disclosures in this asymmetric paternalist framework. First, the disclosure addresses uninformed or naïve consumers, who may not be as capable of making an informed choice. The authors suggest the 37-word HOEPA disclosure reminding prospective borrowers they could lose their home "exemplifies asymmetric paternalism: it imposes little cost on the financial institution to reproduce a form disclosure document. The informed consumer will already be aware of the consequences of defaulting on a mortgage, so she will not be helped by the regulation, but neither will she be adversely affected. For the naive consumer, the disclosure can be enormously beneficial, moving her one step closer to educated consumer status" (p. 1233). The authors argue that the costs of disclosure are minimal, because financial institutions amortize the fixed costs

of setting up (largely automated) disclosure systems over many loans and years. The second role of HOEPA disclosures suggested by these authors is related to the fact that these disclosures are delivered in advance and remind loan applicants they have a right to reject their loan offer. Consumers receive HOEPA disclosures 3 days before the loan closing and can void the mortgage contract up to 3 days after signing. Allowing consumers to review the information in the disclosure and to re-evaluate their decisions away from the "heat" of the initial application, when the lender likely emphasizes the benefits of the loan including, potentially, the "cash out" of home equity in the case of a refinance loan, addresses so-called projection biases. Because people overweight the short-term benefits of going through with the loan and are "indulging their current state of mind," providing a cooling-off period allows consumers to exert more self-control. The authors caution that the effects of warning-type disclosures may be mitigated by another phenomenon from behavioral economics, the tendency of consumers to remain wedded to a particular decision even in light of new information. To the degree that people exhibit a bias in favor of the status quo, they will refrain from reversing a decision even when reminded of the potentially catastrophic risks or when given time to exert self-control.

Requiring disclosures with negative information may serve to overcome a problem of asymmetric information in the marketplace. Akerlof's (1970) paper on the market for "lemons" in the used car market shows how adverse selection can result in consumers assuming all products in the market are of poor quality in the absence of other information. There are welfare gains from mandating minimum standards of product disclosures to prevent the dishonest sellers from undermining honest sellers. Disclosures reduce the consumer's level of uncertainty regarding the otherwise-unknown quality of a firm or product. HOEPA and some state-level high-cost loan laws require written disclosures for loan terms such as a balloon payment (when the

entire balance is due before the loan is fully amortized), a prepayment penalty (when a large fee is levied if the borrower tries to refinance or pay off the loan), or yield spread premiums (in which a loan broker charges a higher rate for the loan than the lender does and retains the margin). In theory, consumers may be more willing to enter markets where these practices are prevalent if they know that these terms are mandated to be included in the disclosure statement rather than obscured in legal documents. By facilitating stronger trust of offers, the market can be operate more efficiently in the presence of mandated disclosures (e.g., Diamond, 1985).

4. Mechanisms of Disclosure: Consumer Information Processing

The work of Simon (1978) and many others shows that consumers behave as though operating under limited cognitive abilities, resulting in behavior that is boundedly rational rather than purely rational. These cognitive limitations affect how consumers use disclosure information. There is an extensive literature on how labels and warnings should be optimally designed for a variety of contexts (e.g., Edworthy & Adams, 1996; Wogalter, Brelsford, Desaulniers, & Laughery, 1991; Wogalter, Dejoy, & Laughery, 1999; Wogalter & Vigilante Jr, 2003). These studies are largely conducted in lab experiments or on a small scale in particular environments, often in health care or among workers in environments with potential injuries (Viscusi, Magat, & Huber, 1987a). In general, product warnings are designed to cause alarm or to provide information. Many consumer and industrial products include alert-type warnings in the form of icons or particular shapes and colors, generally regarding health and safety risks. Written disclosures require greater comprehension by the user and generally have lower compliance levels (Edworthy & Adams, 1996). Although this research is relevant to label and warning design generally, in credit markets disclosures are generally written and intended to provide information rather than to

trigger alarm. The one exception is the HOEPA disclosure; while it focuses more on disclosing information than on causing alarm, prescribing the use of capital letters in the HOEPA disclosure (and disclosures required by states) is consistent with the findings from product warning labels designed to attract consumer attention and comprehension.

Russo and colleagues (Russo, Staelin, Nolan, Russell, & Metcalf, 1986) show that manipulating the format and content of package displays can have significant effects on how consumers use information. An information matrix reduces the cognitive effort consumers require to analyze information. This suggests that disclosures designed with such a format may help consumers to use provided information—which underscores the model of the Schumer Box for credit card applications. The format of credit card disclosure may have the potential to be used for other consumer credit products. Lacko and Pappalardo (2007) recently presented a study of proposed mortgage disclosure reforms showing that in lab studies consumers applying for a loan from a mortgage broker were better able to use written disclosures when they were presented in simplified formats.

Alba and Hutchinson (1987) conducted an extensive review of experiments in marketing and psychology related to consumer experience levels and the use of information in the context of product choices. The authors summarize the literature and suggest that the more familiar a consumer is with a product or product category, the more quickly he or she can analyze information with little cognitive effort. The implication for credit markets is that the disclosed information may be relied on most intensely by novice consumers and ignored by experienced consumers, which is consistent with the asymmetric paternalist concept discussed previously. The authors also suggest that novices will place more importance on summary-level information, while experienced consumers may be better able to make inferences based on partial

information (see also Bei & Widdows, 1999). Disclosures therefore may help novice consumers categorize information, allowing them to more quickly process and compare product details.

5. Mechanisms of Disclosure: Influencing Risk Perceptions

The literature examining the use of hazard or risk disclosures relies largely on the subjective utility model (Edworthy & Adams, 1996). Conceptually, disclosures influence how a consumer perceives the risk of a product, and that perception in turn influences consumer behavior by changing the utility calculation related to alternative actions (for an example, see Viscusi & Magat, 1987). Because people tend to be poor at estimating subjective probabilities of the risk of a negative outcome, the more detailed and quantitative a disclosure is about a potential risk, the more a consumer will respond to it (Magat, Viscusi, & Huber, 1988). The direction of consumer perceptions can vary, however. In many cases consumers will overestimate low-probability risks and underestimate high-probability risks, a tendency linked to prospect theory (Tversky & Kahneman, 1992). Even with this problem, consumers also are likely to overestimate their ability relative to the average consumer to avoid a risk, regardless of how risky they view an event on average (Magat, Viscusi, & Huber, 1987).

There is a vast literature in psychology and economics regarding how people perceive risks (e.g., Arrow, 1982; Fischhoff, 2002; Lopes, 1994; Weber & Milliman, 1997). One of the most influential works on risk perception is by psychologist Paul Slovic (1987). Rather than an expected-value decision theory framework based on the probability of an event and the severity of the outcome of the event if it occurs, Slovic suggested that risk perceptions are a function of several dimensions, including "dread." The dread dimension is related to the event's controllability, as well as to the

extent to which the mere potential of a negative event triggers feelings of worry. The dread dimension focuses in particular on the potential for a catastrophic outcome related to an event, nearly irrespective of the probability of its occurrence. Using Slovic's framework, one recent study in the financial context shows that a financial disclosure that includes information on the potential for a catastrophic loss has one of the strongest effects on changing risk perceptions of investment options (Koonce, McAnally, & Mercer, 2005). The risk of "losing your home" in the HOEPA disclosure may be a good example of a catastrophic risk in the mind of a consumer. One survey of stressful life events places losing a home to foreclosure as a very stressful event, included in the top 10 most stressful events and listed even ahead of a divorce (Hobson, Kamen, Szostek, Nethercut, Tiedmann, & Wojnarowicz, 1998).

6. Mechanisms of Disclosure: Variations by Mood

Consumers using credit disclosures might find themselves in a variety of emotional states. For example, an applicant for a credit card may be in a positive mood because the card issuer is offering a 10% discount on a major purchase, a tactic common in many retail settings. Meanwhile, a consumer for a home equity loan may be experiencing financial distress and feeling anxious about being able to meet his or her financial obligations.

Many studies demonstrate that a person's mood, even mild transient moods, can have a significant impact on how he or she thinks and processes information. Isen and Daubman (1984) suggest that positive affect aids cognition because people are better able to group information and to then broaden or narrow their analysis as needed. Positive material is more accessible and encompasses a greater proportion of an individual's memory than neutral or negative material (Cramer, 1968). Positive affect can cue and therefore connect to a more diverse set of cognitive material

compared to a neutral mood (Isen, Shalker, Clark, & Karp, 1978). This theory suggests that by aiding the categorization of information, positive affect leads to the creation of broader classes when analyzing information and improved flexibility in thinking (Isen & Daubman, 1984; Isen, Johnson, Mertz, & Robinson, 1985; Kahn & Isen, 1993). Another theory is that affect is an input to cognition, the so-called *mood as information* hypothesis. This theory suggests that choices are made by using "how do I feel about it?" as a heuristic (Clore, 1994; Schwarz & Clore, 1996). According to this theory, affect itself has informational value that individuals use to make a decision, perhaps leading to superficial thinking. One often-cited study (Bless, Schwarz, Clore, Golisano, Rabe, & Wolk, 1996), however, found no impairment of cognitive processing for subjects induced into positive affect who were asked to perform two information-intensive tasks simultaneously and in fact demonstrated better performance. Bless and colleagues explain these results by suggesting that subjects in whom positive affect was induced are better able to employ heuristics to complete tasks, although the nature and form of such heuristics remains unclear. The weight of the evidence suggests that positive affect should enhance consumer use of disclosures, although how mood and the consumer's experience, or the format of the disclosure, interact have not been studied.

The mood-as-information framework would predict that anxious moods will signal the need for vigilance and result in paying more attention to detailed information. Studies on attention focus find that subjects in whom anxious affect was induced think more locally and are less able to make connections across more global ideas than are controls (Fredrickson, 1998; Fredrickson & Branigan, 2005). Isen, Daubman, and Nowicki, however, included fear—which is a related emotion—as an affect induction using film clips in one experiment but did not find any impairment of creative problem solving (Isen, Daubman, & Nowicki, 1987). Another study

concludes that subjects induced into anxiety are biased toward low-risk and low-reward options (Raghunathan & Pham, 1999). A study by Reich and Zautra (2002) suggests mild stress or anxiety may enhance information-processing capacity, "with the person able to draw fine distinctions and able to process many dimensions of judgment simultaneously" (p. 210). Thus the literature regarding how anxiety might impact consumer use of disclosures remains unclear.

Another possible prediction of how a consumer's mood will affect disclosure use is that consumers will process positive information when in a positive mood and negative information when in a negative mood. This theory is based on the idea that people will attempt to preserve their mood by ignoring information incongruent to their current mood (Derryberry & Tucker, 1994). One example is a study finding that people in whom positive affect was induced recall more positive traits of a product than do controls (Yeung & Wyer Jr, 2004). One study of product warning labels that included mood manipulations suggests that subjects in whom positive affect were induced are less likely to process information presented in a format that could ruin their positive mood (Zuckerman & Chaiken, 1998). The authors conclude that labels for subjects in positive affect might better be worded "for your safety" as opposed to "danger." The idea that subjects pay attention only to information that is congruent to their affect is tempered by findings of other studies, however (Adaval, 2001; Isen, 2001; Isen & Patrick, 1983).

It is important to note that affect or mood in the context of most of these studies is being explored as most consumers might typically experience them—mild, transitory feelings. Other studies have examined people with mood disorders, people feeling intense emotions such as anger and fear, or people driven by biological drives such as sex or hunger (for a discussion, see Loewenstein & O'Donoghue, 2004). These situations are different from the most likely situations in which consumers use

disclosures in credit markets. Although policymakers may care about consumers in these more extreme circumstances, it is far more likely in the context of consumer financial decisions that milder forms of affect are most relevant.

7. Evaluating Disclosure Policies

There are few studies of the effects of disclosure on consumers in financial markets. Studies of securities disclosures in financial markets focus mainly on firm or capital market effects rather than on consumer choice, finding modest effects (Ferrell, 2007; Healy & Palepu, 2001; Mahoney, 1995). Studies conducted after the enactment of TILA, which mandated standardized disclosures for consumer credit products in the late 1960s, found that providing information improved the average borrower's accuracy and understanding of loan terms but did not evaluate changes in credit decisions or behavior (Brandt, Day, & Deutscher, 1975; Day, 1976; Day & Brandt, 1974). One study of the effect of TILA disclosures for credit cards finds that consumers in a survey self-report using the disclosures and finding them helpful (Durkin, 2002). In the same survey, consumers report that the TILA disclosure helps them feel more confident in their credit card choices. The author concludes that "evaluating the direct effects of disclosure legislation like Truth in Lending on either consumer behavior or the functioning of the credit marketplace is never a simple matter because there are always competing explanations" (p. 213).

A review by economists from the Federal Trade Commission described research on mortgage disclosures as "largely nonexistent and in its infancy at best" (Froeb, Hosken, & Pappalardo, 2004). A commonly held view is summarized by Hogarth and Hilgert (2002, p. 123), who suggest that mortgage disclosures are part of a "blizzard of papers that need to be signed at application and closing, and their effectiveness is questionable." Despite the lack of findings regarding mortgage

disclosures, the warning-label literature provides some insights. Viscusi, Magat, and Huber (1987b) performed a field experiment with risk warnings on products, finding that consumers do react to information on labels, especially if warnings are specific and the potential harm is serious. One study on consumer food purchases supports the idea that labels focused on negative consequences presented in an arousing format result in consumers being more likely to reject a product (Moorman, 1990).

A number of studies show that mandating information through labels influences consumer behavior, both through a direct role of providing information and by encouraging firms to compete on disclosed attributes. Ippolito and Mathios (1990) studied the cereal market, finding that as regulations were changed to allow firms to advertise the health content of their cereals, consumer consumption of healthier cereals increased. Mathios (2000) studied regulations of mandatory disclosures of fat content for salad dressing, finding that market shares of high-fat dressings dropped while low-fat dressings gained under mandatory disclosure rules. A similar FDA-funded study examined the effects of nutrition-label information, finding modest effects on consumers buying healthier products overall (Levy, Mathews, Stephenson, Tenney, & Schucker, 1988). One study of hygiene quality disclosures displayed in restaurant windows shows that consumers did respond and switch to better-rated restaurants (Jin & Leslie, 2003). The authors conclude that while consumers responded to the mandated disclosures, restaurant owners also improved the average hygiene level, resulting in a reduction in food-borne illness overall. There are also studies of the pharmaceutical market in response to FDA-mandated health-risk warning labels for side effects, although typically these warnings are issued in response to such severe problems with a drug that consumers may react more to media attention and physician advice than to the label (e.g., Kurdyak, Juurlink, & Mamdani, 2007; Rosack, 2005).

8. Improving Consumers' Use of Information: Financial Literacy Education

Clearly, the issuing of disclosures is a common public policy. Mandating disclosures for credit products has the potential to overcome information problems in credit markets and to facilitate more-efficient markets. However, numerous studies and papers question how well consumers can use disclosures given generally low levels of financial literacy. Mandating APR may help standardize credit terms, but if consumers have no benchmark against which to compare an APR, or even a sense of what a larger or smaller APR might mean for their payments, then the TILA disclosure may not have much impact on consumer behavior.

Consumer financial literacy is an enormous topic and one that has been discussed at all levels of government in the U.S. and in international contexts for over a decade. One early article by Beales and colleagues (Mazis, Staelin, Beales, & Salop, 1981) on information problems in consumer markets devoted a small section to consumer education. The authors suggested three roles for consumer education in general. First, education can be useful in updating consumers as technology progresses and new information becomes available about a product or product class. Second, education can be targeted to specific populations or markets most affected by an information deficit. Third, education can efficiently convey information that applies to an entire class of products—information no one firm will have the incentive to disclose.

Several studies have documented the extent to which consumers in the U.S. and other countries fail to demonstrate financial literacy, numeracy, or both (for a review, see Lusardi & Mitchell, 2007). Financial knowledge measures tend to be highest for more-educated consumers and weakest for lower-income consumers (Agnew & Szykman, 2005; Bernheim, 1998; Lusardi & Mitchell, 2006; Mandell,

2004b). A particular area of weakness tends to be understanding interest and interest rates (Moore, 2003).

Campbell (2006) provides an excellent overview of consumer behavior in financial markets, concluding that consumers generally behave as predicted by rational economic theory but occasionally will deviate from predictions, behavior that he labels consumer mistakes. He focuses on mortgage refinance decisions, finding that consumers with less education are among the least likely to refinance when the terms of their loan could be most improved. Bucks and Pence (2006) show that low-income mortgage borrowers are most likely to underestimate how much the interest rate on their loan could change relative to their actual contract. Minority borrowers are 30 percent more likely and low-income borrowers 28 percent more likely to not know their interest rate. Similar effects are shown for less-educated borrowers. Low-income consumers with less than a college degree are among the least accurate or informed about the terms of their mortgage. Agnew and Szykman (2005), in a study of investment knowledge and hypothetical retirement plan choices, find that consumers with lower levels of financial knowledge were less likely to use provided information and showed more signs of information overload. These studies suggest that some groups of consumers—lower-income, lesser-educated, and racial minorities—may systematically exhibit lower levels of financial literacy. This is likely to result in differing financial behavior and reduced use of disclosure information.

9. Evidence of the Effects of Financial Education

Hogarth (2006) provides a review of financial education efforts, noting their rapid increase at the state, federal, and local levels in recent years. A study of state mandates for financial education in high schools by Tennyson and Nguyen using a survey of financial knowledge among high school seniors finds an impact of state

mandates on financial knowledge levels among students (Tennyson & Nguyen, 2001). A separate study helps make the link between increased financial knowledge and improved financial behavior in states with school-based financial education. Bernheim, Garrett, and Maki (2001) studied the relationship between state mandates for high school curriculum and adult savings patterns and net worth. The authors find that students in states where mandates increased the likelihood they were exposed to financial education had higher savings rates and a larger net worth than students exposed to less (or no) mandated financial education.

One problem in financial literacy research is determining a measure of knowledge. Many studies rely on self-reported knowledge scales ("how confident are you in your knowledge of…"). At least one study shows that most people overestimate their knowledge relative to what they actually know. Based on a comparison of answers to a self-reported scale and scores on an actual test of investment knowledge, Agnew and Szykman (2005) find low correlations, especially for people without a college education. Studies relying on self-reported data can lead to ambiguous results.

A more significant problem with existing studies of financial literacy programs are selection effects (Meier & Sprenger, 2007). Unobserved characteristics drive more-motivated clients or more-patient individuals to seek out financial education or counseling *and* also to succeed financially. Hogarth (2006) summarizes 25 papers that evaluate financial education. Of these, only two studies use forms of a quasi-experimental technique to evaluate financial education, both in the workplace setting. Bernheim, Garrett, and Maki (2001) use changes in state high school curricula to predict retirement savings, finding a positive effect for states with increasing mandates. Duflo and Saez (2003) implemented a randomized experiment for a retirement planning seminar, finding marginally positive results of the offer of education on enrollment in a savings plan. A series of studies with college students

that randomly assigned an offer of credit card education and credit management training was hampered by low response rates and strong selection effects among responders (Gartner & Todd, 2005). One study used length of exposure to education as an evaluation technique for examining low-income clients in a matched savings program, a portion of whom also received financial education (Schreiner, Clancy, & Sherraden, 2002). The study found that each additional hour of education improved savings behavior up to about 8 hours of coursework. Other studies use nonrandomized control groups or self-reported knowledge and behaviors (or both). There currently are no field experiments of financial education among low-income consumers using random assignment and behavioral measure of outcomes.

10. Public Financial Literacy Education Campaigns

In 2007, the five primary bank regulatory agencies (OCC, FDIC, FRB, OTS, and NCUA) published an accessible educational pamphlet for consumers, entitled "Interest Only Mortgage Payments and Payment Option ARMS—Are They for You?"[1] The brochure defines terms, such as negative amortization, in layman's language. It also includes a worksheet to guide consumers through an evaluation of a mortgage product. This is an example of passive consumer education. It is not required for any type of product but is generally available to help consumers become more informed when searching for a loan. Another example is the Financial Literacy and Education Commission, established in the 2004 Fair and Accurate Credit Transactions (FACT) Act. A collaborative of 20 federal agencies, the commission has created a consumer hotline (888-my-money) and website (mymoney.gov) to provide information on financial topics. Some evidence from Sweden described by Lusardi and Mitchell (2007) suggests that the efforts of a major national information campaign

[1] http://www.occ.treas.gov/toolkit/newsrelease.aspx?JNR=1&Doc=8WZDEM4.xm

about a new retirement program yielded strong enrollment, but after the information campaign was reduced, enrollments dropped. While such efforts may be complementary, they are better characterized as general public awareness education rather than personal financial literacy education.

11. Conclusion

In April 2007 the Federal Trade Commission (FTC) held a conference on the implications of behavioral economics for consumer protection and disclosure.[2] At the end of the conference, experts from various perspectives discussed information disclosure policies, and the consensus among this group was that more empirical laboratory and field work is needed to understand the role of disclosures for consumers in financial markets. Recently, staff of the FTC recommended a comprehensive effort to improve federal mortgage disclosures (Clark, 2008). More than one-third of states have additional mortgage disclosure requirements, including simplified levels of information, specifically valenced wording, and required formats and timing. The experiences of these states present quasi-experiments that may prove useful for assessing potential changes in mortgage disclosures.

The credit card market is different from the mortgage market in many ways. Consumers have more experience with credit cards, the negative financial risks of credit cards are smaller in magnitude, the costs of search are relatively low, and the mandated disclosures are simpler than those required for mortgages. But the role of disclosures for consumer in the credit card market has its own unique features. The consumer's initial decision to apply for a new card is likely to be a function of his or her experience with credit cards, as well as his or her emotional state. Credit card issuers routinely attempt to induce consumers into a positive mood with "free gifts."

[2] see: http://www.ftc.gov/be/consumerbehavior/docs/agenda.shtm

Meanwhile, cash-strapped consumers might seek credit cards during periods of anxiety about financial matters. These conditions may result in differing use of disclosures.

It is clear that financial literacy also matters with regard to how various types of consumers may be able to use and process information mandated through information policies. Education mandates for consumers may complement consumer disclosure policies. The evidence on the current level of knowledge of consumers, especially lower-income consumers, consumers from minority racial groups, and consumers without a college education, suggests major deficiencies in how well consumers understand critical financial topics such as interest rates. The problem is linked to a lack of knowledge of basic terms and systems, as well as to poor levels of numeracy. It is unclear whether financial literacy education in itself leads to better use of the information included in mandated disclosures or even leads to improved financial behavior. The weight of the evidence suggests that increasing financial literacy is strongly correlated with improved financial behavior, but the design of existing studies does not provide conclusive evidence. Further studies using a randomized approach are much needed if we are to better understand the effects of financial literacy education.

Some argue that consumer information policies are not sufficient to protect people from unscrupulous firms in the financial marketplace. The complexity of financial products means that consumers will never fully understand the risks and costs involved and that financial institutions will always have the upper hand. The format of disclosures and intensity of education may not be enough to level the playing field for consumers. Under an admittedly extreme form of this view, only regulations that place strict liability on the lender, and that effectively prohibit practices that could be harmful to the consumer, will provide adequate protection

(Ferguson, 2000; Willis, 2006, 2008). The critique of this view is that regulators, and even consumer advocates, may not agree on what types of financial products are "too risky" versus "innovative." Some consumers may be worse off without the existence of products that would be unsuitable for other consumers (Collins, Belsky, & Case, 2005). Information-based policies help consumers better sort themselves into the most appropriate types of financial products. Given information that is transparent and accessible, as well as sufficient knowledge and skills for processing that information, policies such as disclosure and education may help support a more efficient consumer financial market and optimally protect most consumers from harm.

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CHAPTER 2:
YOU COULD LOSE YOUR HOME:
THE EFFECTS OF STATE POLICIES MANDATING SUBPRIME MORTGAGE RISK DISCLOSURES ON CONSUMER EVALUATIONS OF LOAN OFFERS

1. Introduction

Home mortgages are one of the largest financial commitments a consumer will make in his or her lifetime, and the terms and conditions of a mortgage can be quite complex (Gibler & Nelson, 2003; Hogarth & Hilgert, 2002). High-cost cash-out refinance mortgages are among the most complicated and risky types of mortgage credit. Federal and some state laws require consumers seeking these loans to be provided with information disclosures, including language suggesting the loan applicant consider his or her choice carefully because "you could lose your home." This warning is unique among consumer disclosures in credit markets in its attempt to focus the consumer on the potential risks of taking out a loan. Potentially, otherwise uninformed consumers will take this risk into account when evaluating whether to accept a mortgage refinance offer from a lender.

In the last two decades lenders have developed more refined techniques for assessing and pricing consumer credit risk. Meanwhile, capital markets have lowered the premiums required for higher-risk loan capital, facilitating the development of "subprime" home mortgages for borrowers with a history of credit problems such as chronic delinquencies, bankruptcy, or unstable or undocumented income (Quercia, Stegman, & Davis, 2004). In 2005 alone lenders loaned more than $200 billion in subprime refinance mortgages, representing between 15 and 20 percent of all home refinance loans made that year. The expansion of subprime lending increased the ability of borrowers with poor credit to gain access to the mortgage market (Collins, Belsky, & Case, 2005; Gramlich, 2007). Yet consumer advocates frequently ask

whether consumers can navigate this segment of the market, especially because the risk of default is at least two to three times higher than in conventional mortgage markets (GAO, 2004). Media reports of the "crisis" of subprime mortgage foreclosures in 2008 have heightened the debate over whether consumers were fully informed of the risks of their loans when they accepted the mortgage contract. This has spurred some consumer advocates to argue that subprime lending should largely be curbed in order to prevent lenders from praying on naïve borrowers. Disclosure policies may present one strategy for allowing expanded access to credit while also providing uninformed consumers with a mechanism to avoid credit they cannot sustain.

The promise of information disclosures for facilitating improved consumer decision making is reflected in a range of public policies. There has been little study of the impact of mortgage disclosures, however, and the issue of whether disclosures facilitate more efficient markets or drown consumers in a sea of legalese is the subject of ongoing debate.[1] Federal Reserve Board Governor Randall Kroszner (2007, para 6) stated at a 2007 conference on subprime lending that the market is "more efficient, when accurate information is available to both consumers and suppliers" while also noting that "pages and pages of fine print may provide comprehensive descriptions that lawyers love, but consumers find confusing, or, worse, useless." In 2008 policymakers were again considering proposals to revise home mortgage disclosure regulations (12 CFR Part 26, 2007). Similarly other financial regulators, including agencies overseeing consumer credit cards and mutual funds, were reviewing the requirements for enhanced disclosures for various other types of financial products. This chapter provides evidence that state policies mandating signed disclosures about

[1] For a discussion see Belsky and Essene, (2007); Durkin (2007).

the risk of high-cost refinance mortgages are associated with consumers being more likely to reject a loan offer.

In 2005, 18 states required enhanced disclosures of the risk of high-cost mortgages, in addition to those required by federal laws. Ten of these states required consumers to acknowledge receipt of the disclosure with a signature, unlike federal law, and 4 required these disclosures for high-cost loans that were not required to have disclosures in the federal law. Using 2005 Home Mortgage Disclosure Act data, the analysis presented in this chapter evaluates whether refinance loan applicants in states with enhanced risk disclosures are more likely than applicants in states without such laws to reject an offer of a loan from a lender. Refinance mortgages are ideal for this analysis because these loans are one of the more discretionary segments of the mortgage market. Refinance borrowers have reduced time pressures relative to home purchase borrowers, who are seeking a loan while also trying to bid to purchase a home (Gibler & Nelson, 2003). Refinance borrowers also have at least one prior experience with obtaining a mortgage in the past (Lee & Hogarth, 2000). In the high-cost segment of the market, borrowers are generally not seeking to refinance in order to obtain a better interest rate or term (in 2005 interest rates for these loans were between 11 and 20 percent, more than double the conventional mortgage interest rate). Borrowers seek high-cost refinance loans primarily because they want to convert home equity into liquid cash. Doing so increases the consumer's debt level relative to income. Assuming home equity extracted through the refinance is consumed and not invested, the borrower also increases his or her leverage ratio of debt to assets. Both of these factors increase the risk of default and foreclosure. If disclosures in this market are effective, then when consumers sign a disclosure containing "You Could Lose Your Home," they will re-weigh their alternatives and potentially walk away from a loan offer. Overall, this analysis suggests that states requiring mortgage applicants to

sign a disclosure warning "you could lose your home" result in a greater likelihood that consumers will reject an approved high-cost refinance loan offer from a lender.

While the Home Mortgage Disclosure Act has been used in many studies of mortgage lending, this study is the first to use the applicant's decision to reject a lender-approved loan offer to examine state mortgage disclosure laws. One challenge with any analysis of state legal regimes is unobserved correlations between the reasons the state passed the law and the behavior of interest. In this analysis, loan applications covered by state information disclosure laws may have unobserved characteristics that also influence the decision to reject or accept an approved loan offer. To account for market effects, this study uses census-tract fixed effects, as well as cross-state border-county grouping fixed effects, to provide comparisons within otherwise similar labor and housing markets. This border-county approach is further enhanced by focusing on markets without waterways coincident with geographic boundaries as a proxy for more cohesive markets, as well as the use of distance weights to emphasize proximity to the state border. To test the effects of state laws on lender or loan applicant behavior, a sequential response model is also used to simultaneously model application, approval, and acceptance processes.

2. Background

All loan applicants receive a Truth in Lending Act (TILA) disclosure as part of the credit application process. In theory, TILA disclosures help consumers by lowering the costs of acquiring and processing information about prospective loans, resulting in consumers examining more alternatives in the marketplace, a classic example of information search (Stigler, 1961). A review of the role of disclosures by economists at the Federal Reserve concedes there is little evidence that TILA has resulted in an increase in the number of loan options consumers consider overall,

however (Durkin & Elliehausen, 1999). These authors point out that TILA disclosures are not provided to consumers until after an application for a loan is submitted. Because the process of preparing an application entails costs (opportunity costs of time and monetary costs), information disclosed after application may be of little use to consumers.

Another role for disclosures is related not to searching among products but rather to delivering information consumers can use to evaluate a loan product relative to itself. In this role, disclosures provide information that influences the consumer's decision to exit the market entirely, rather than to search for another product in the same market. This type of disclosure typically provides a warning about a potential risk or hazard. The function of these disclosures is to influence the consumer's subjective perception of risk, which in turn reduces the consumer's expected value for the product being evaluated. This role of disclosure has been extensively reviewed in the context of laws designed to warn consumers about the health risks of a variety of food, drug, cosmetic, and medical products (e.g., Viscusi, 1993), but not for products in consumer credit markets.

Under the Home Ownership and Equity Protection Act (HOEPA), for "high-cost" refinance mortgages, defined as having an interest rate at least 8 percentage points over a comparable term Treasury security (approximately 12.5% in 2005 for a 30-year loan), a disclosure form is provided with the following text:

> You are not required to complete this agreement merely because you have received these disclosures or have signed a loan application. If you obtain this loan, the lender will have a mortgage on your home. YOU COULD LOSE YOUR HOME, AND ANY MONEY YOU HAVE PUT INTO IT, IF YOU DO NOT MEET YOUR OBLIGATIONS UNDER THE LOAN.

HOEPA disclosures are required to be provided at least 3 business days before the closing of the mortgage contract, and consumers have up to 3 days after signing the mortgage contract to rescind their agreement.[2]

As of 2005, 29 states had active legislation for enhanced consumer protection regulations for high-cost mortgage borrowers, most modeled on HOEPA regulations, as summarized in Appendix Table 2.C.2. State laws have a range of disclosure provisions, but 18 states require the "you could lose your home" caution about the risk of the loan, and 10 require this warning disclosure to be signed, which differentiates these disclosures from federal HOEPA disclosures. Appendix Figure 2.A.1 contains the California disclosure as an example of a state form that includes warning-type language and a signature by the consumer. Most state statutes prescribe the wording of the disclosure document, many augmenting the language of the HOEPA form similar to the California example. The average length of the disclosure wording required by state laws is 307 words, with a range of 20 to 1,407 words. Several state laws specify the typeface and format of the form; other states simply require certain pieces of information and a specific phrase for the disclosure.

Four states had regulations in 2005 requiring written mortgage disclosures for non-HOEPA loans. These states effectively lowered the APR threshold, triggering HOEPA-type disclosures from 8 points over a comparable-term Treasury. Illinois, Michigan, and Washington, DC, lowered the threshold to 6 points, and New Mexico to 7 points (although this analysis is on high-cost loans, Michigan's law applies to all refinance loans, not just high-cost loans). All of these states, except Michigan, require the disclosure to be signed at least 3 days prior to the loan closing. Six states require borrowers applying for high-cost loans to receive third-party counseling before obtaining a loan. Clearly, obtaining counseling incurs a cost for the loan applicant in

[2] Beyond disclosures, HOEPA loans are also prohibited from having certain features, including balloon payments, negative amortization, and most prepayment penalties.

terms of the time required to find and complete the service, and some borrowers will not be willing to incur this cost. Of course, consumers may view the counseling requirements as a signal, much like a disclosure form, that this loan has higher risks than they might expect. Although counseling requirements may have effects similar to those of written risk disclosures, a primary difference is that while signed disclosures may require only a small amount of the consumer's time, counseling requires a more significant commitment.[3]

2.1. The Application Process for High-Cost Refinance Mortgages

It is important to understand the process that leads to a consumer receiving a loan offer before analyzing the effects of disclosures. Figure 2.1 illustrates the application process for a subprime home mortgage refinance loan. Three stages are described, from the entrance to the market, to the lender's evaluation of the application, to the mortgage being originated. The branches of interest in this study are bolded.

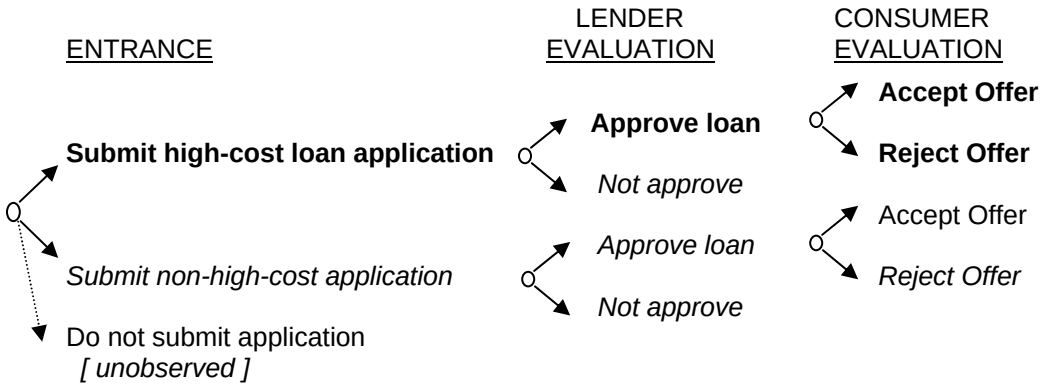

Figure 2.1: Home Mortgage Refinance Decision Nodes

The first phase, labeled ENTRANCE, occurs when the consumer makes an application for a home refinance mortgage. The decision to refinance has been

[3] Massachusetts offers loan applicants the ability to waive counseling with a signed form; other states do not have such procedures.

modeled in previous studies as being influenced by changes in home prices, income, household type, borrower demographics, as well as the overall interest rate environment (Hurst & Stafford, 2004; Pavlov, 2001). The decision to apply with a particular lender may be the result of an information search process, including the lender's advertised loan products and products terms, or the borrower may be approached directly by a lender with an invitation to submit an application.[4] This stage involves lenders and loan applicants determining which type of loan product the applicant should be evaluated for. Because mortgages are offered by lenders along a continuum of interest rates based on the risk of the loan, consumers cannot be sure of the loan for which they qualify. Borrowers reveal information about their characteristics to the lender in an attempt to establish themselves as appropriate for the best possible loan. A consumer might be considered "in the market" prior to making an application, but such behavior is unobservable and therefore illustrated with a dashed line in the figure. Applicants for non-high-cost refinance loans are a different market—many will seek better interest rates or terms and will not be seeking home equity. Moreover, most will not receive a disclosure containing risk language.

The second phase, defined in the illustration as LENDER EVALUATION, is the underwriting process used to determine whether a loan application meets the minimum threshold requirements for approval. The approve-deny decision is observed in HMDA data and has been widely studied to test for racial discrimination by lenders (e.g., LaCour-Little, 1999; Ladd, 1998). This phase is completely centered on the decision of the lender.

The final phase is CONSUMER EVALUATION. Borrowers can reject an approved loan offer from a lender by simply refusing to sign the loan documents or by

[4] See Apgar and Fishbein (2005) for a discussion, as well as the potential for loans being "sold not sought," meaning the lender or broker initiated the application, not the borrower.

exercising a right of rescission up to 3 business days after the contract is signed.[5] In the refinance market a consumer might reject the offer and simply remain out of the market, or he or she might repeat the process in search of a better offer. In HMDA data, however, repeated applications cannot be observed, only the outcome of each application in isolation. This stage has not been directly examined in other studies. A study by Ho and Pennington-Cross (2006) modeled the probability of loan applications resulting in originated loans. The authors did not examine the choice to accept or reject the loan conditional on the loan being approved by a lender, however.

It is important to note that state laws mandating disclosure could influence the ENTRANCE and EVALUATION stages as well as the applicants' decisions to accept an approved loan offer. Consumers in jurisdictions lacking mortgage disclosures may perceive greater risks of receiving a poor loan offer and decide not to enter the market—an example of Akerlof's lemons problem (Akerlof, 1970). Previous studies do suggest that state mortgage laws may encourage more or different types of borrowers to enter the high-cost mortgage market, although the effects are neither strong nor consistent (Harvey & Nigro, 2004; Ho & Pennington-Cross, 2006b; Li & Ernst, 2006). One study on lender behavior in states with laws regulating high-cost mortgages (Ho & Pennington-Cross, 2006a) finds about a 5-point reduction in the rate of lenders denying subprime loan applications in states with stricter lending laws (relative to a mean probability of being rejected of *42 percent*). Nevertheless, the effects of state laws on the ENTRANCE and EVALUATION stages are important precursors to consider when analyzing consumer rejections of loan offers.

[5] There are several exceptions to the right of rescission. It is only available for home equity or refinance loans and only for loans with a new lender (refinancing with the holder of the existing note is exempt).

2.2. The Role of Signed Disclosures in the High-Cost Mortgage Market

The language "YOU COULD LOSE YOUR HOME" warns the consumer prior to signing the contract about the severity of failing to abide by the terms of the mortgage. After incorporating new information highlighting the catastrophic risks of foreclosure, the consumer's subjective expected value of a potential loan would be lower than prior to disclosure. The expected net marginal benefits of the loan may then be zero or negative, causing the consumer to abandon this transaction and perhaps exit the market for this class of loan products.

This analysis seeks to test the hypothesis that state laws mandating signed risk disclosures result in consumers with approved high-cost refinance loans being more likely to reject a lender's loan offer. For disclosures to have an effect on a consumer's decision, the information included in the disclosure must result in a change in the consumer's valuation of the costs and benefits of taking out a high-cost refinance loan. The benefits (B) are immediate, in the form of the loan proceeds net of costs and fees paid at the loan's closing. The required repayments occur in a defined stream over T periods in the future. Assuming no probability of default and a constant discount rate, the expected net present value of future payments is $P = \sum_{(1\ldots T)} p(t)/(1+r)^t$. Allowing for an exogenous probability, π, that the consumer will default on the loan, the expected net present value of future payments is $\pi(P + C) + (1-\pi)P$. While default, especially a default nearer to time t=1, will result in a consumer paying less than the full stream of payments, it is assumed that the total cost of default over what would have been paid in under a no-default condition is greater than P. This is due to the substantial transaction costs related to foreclosure, as well as the costs of future credit for a consumer with a history of default, as well as nonfinancial costs.[6] For simplicity, the cost under default is represented as $\pi(P + C)$.

[6] At least in 2005, the time of data used in this analysis, borrowers are unlikely to expect lenders to forgive a portion of the loan balance in the case of default. Historically, loan forgiveness is very rare.

While lenders may have an objective probability of default for a loan application, the consumer at best maintains a subjective expected probability of default, which includes zero or a substantially low probability such that the consumer perceives default to be close to zero. Likewise, the lender has an expected loss given a default based on the loan application. The consumer, even if the expected probability of default is greater than zero, may not associate default with all of the costs of losing one's home, including the loss of the bundle of housing and nonhousing services provided by the property, as well as any financial capital invested in that home.

The disclosure adds information to the consumer's consideration of the probability of default (π) and of the costs of default (C). The consumer will accept the loan offer if expected benefits of the loan (B) are greater than the expected costs such that, $B > (P + \pi C)$. Information about the risk of losing one's home can have an influence by increasing the subjective expectation of the probability of default, π, or of the subjective expectation of the cost of losing a home in default, C; or even possibly both. It is expected that signing a disclosure influences the consumer's expectations and results in an increased probability of rejecting a loan offer, although the effects on the consumer's perceptions of π and C are not each directly observed.

This model assumes constant discount rates and preferences for risk aversion; the disclosure primarily informs subjective expectations of π and/or C. While a role of a search-oriented disclosure such as TILA is to facilitate the consumer's expectations regarding the calculation of the stream of payments, P, the disclosures in this analysis are differentiated from TILA by focusing on the risk of losing one's home.

2.3. Risk Disclosures and Consumer Perceptions of Mortgage Risk

The literature examining the use of hazard or risk disclosures relies largely on the subjective utility model (Edworthy & Adams, 1996). Conceptually, disclosures

influence how a consumer perceives the risk of a product, and in turn that perception influences consumer behavior by changing the utility calculation related to alternative actions (for an example, see Viscusi & Magat, 1987). There is a vast literature in psychology and economics regarding how people perceive risks (e.g., Arrow, 1982; Fischhoff, 2002; Lopes, 1994; Weber & Milliman, 1997). Some of the most influential work on risk perception is by psychologist Paul Slovic and colleagues (Slovic, 1987, is one widely cited summary). Slovic presents evidence that suggests risk perceptions are a function of multiple dimensions, including "dread." The dread dimension is related to an event's controllability, as well as to the extent to which the mere potential of a negative event triggers feelings of worry. The dread dimension particularly focuses on the potential for a catastrophic outcome related to an event, nearly irrespective of the probability of occurrence. Using Slovic's framework, one recent study in the financial context shows a financial disclosure that includes information on the potential for a catastrophic loss has one of the strongest effects on changing risk perceptions of various investment options (Koonce, McAnally, & Mercer, 2005). The risk of "losing your home" in the HOEPA disclosure may be a good example of a catastrophic risk in the mind of a consumer. One survey of stressful life events places losing a home to foreclosure as one of the top 10 most stressful life events, even ahead of a divorce (Hobson, Kamen, Szostek, Nethercut, Tiedmann, & Wojnarowicz, 1998).

Camerer and colleagues (Camerer, Issacharoff, Loewenstein, O'Donoghue, & Rabin, 2003) suggest that HOEPA disclosures help uninformed or naïve consumers, who may not be as capable of making an informed choice as other consumers. The authors suggest that the disclosure reminding prospective borrowers they could lose their home "exemplifies asymmetric paternalism: it imposes little cost on the financial institution to reproduce a disclosure document. The informed consumer will already be aware of the consequences of defaulting on a mortgage, so she will not be helped

by the regulation, but neither will she be adversely affected. For the naive consumer, the disclosure can be enormously beneficial, moving her one step closer to educated consumer status" (2003, p. 1233). The authors argue that the costs of disclosure are minimal because financial institutions amortize the fixed costs of setting up (largely automated) disclosure systems over many loans and years.

There are also reasons to believe some classes of consumers may systematically be uninformed or naïve. Campbell (2006) provides evidence that consumers with less education are less likely to refinance when the terms of their loan could be most improved. Bucks and Pence (2006) show that minority mortgage borrowers are less likely to know the interest rate on their mortgage. These studies suggest that some groups of consumers—especially lesser-educated and minority applicants—may systematically exhibit lower levels of financial literacy. This is likely to result in differing financial behavior and reduced use of disclosure information.

In addition to the benefits for uniformed consumers, Camerer et al. (2003) also suggest that because HOEPA disclosures are delivered 3 days in advance of the loan closing and remind loan applicants that they have the right to reject the loan offer, consumers can reevaluate their decisions away from the "heat" of the initial application. Lenders offering a high-cost refinance loan typically will provide an estimate of net proceeds to the borrower—meaning the borrower will soon have a check for any balance of loan in excess of the amount needed to pay off the current loan. This is money is likely targeted by the consumer for immediate consumption or repayment of unsecured consumer debt (Hurst & Stafford, 2004). A large transfer of illiquid home equity to expendable funds may trigger consumers to vastly underestimate the potential burden a loan will impose on their financial situation in the future and to overestimate the value of the conversion of home equity into cash in the present. This is a common and well-established phenomenon, described as consumers

employing a hyperbolic discount rate in favor of the present (Laibson, 1997). This can result in what Camerer et al. cite as a "projection bias" in which consumers overweight the short-term benefits of going through with the loan relative to future costs. The warning of the HOEPA disclosure combined with the 3-day window to reconsider the transaction can help consumers exert more self-control such that the benefits of the immediate proceeds of a loan may be reassessed in light of the future costs, including the stream of debt payments as well as the potential costs of default.

While these two effects—informing the naïve consumer and offering time to recalibrate expectations of projected and present costs and benefits—are convincing, Camerer et al. (2003) also caution that the effects of HOEPA disclosures may be mitigated by another behavior phenomenon, status quo bias. Consumers tend to remain wedded to a particular decision even in light of new information. To the degree that loan applicants exhibit a bias in favor of the status quo, they will refrain from reversing a decision even when reminded of the potentially catastrophic risks by the disclosure or when given time to exert self-control.

Both state and federal laws require the same basic language regarding the risk of losing one's home. The most important distinctions in state laws are that a subset of states require the risk disclosure to be signed by the loan applicant at least 3 days prior to the loan closing and/or that the state law for a signed disclosure applies to loans not covered by the federal HOEPA law. The signature focuses attention over and above the federal form, or draws attention to the risk for loans without other disclosures of the risk of foreclosure.

2.4. Prior Studies Evaluating Mortgage Disclosures

There are few empirical papers that test the risk disclosures for consumer financial choices. A commonly held view, summarized by Hogarth and Hilgert (2002),

suggests that mortgage disclosures are part of a "blizzard of papers that need to be signed at application and closing, and their effectiveness is questionable" (p. 18). Studies conducted after the enactment of TILA show that the average borrower's accuracy and understanding of loan terms improved, but these studies did not evaluate changes in credit decisions or behavior (Brandt, Day, & Deutscher, 1975; Day, 1976; Day & Brandt, 1974). Studies of risk disclosures for securities focus mainly on firm or capital market effects rather than on consumer choice and generally find only modest effects of disclosed information (Ferrell, 2007; Healy & Palepu, 2001; Mahoney, 1995). One field experiment on warning labels on cleaning products found that consumers do react to information on labels, especially if warnings are specific and the potential for harm is viewed as being severe (Viscusi, Magat, & Huber, 1987). Studies of health risks in pharmaceutical and food markets also find modest effects of warnings, although there are often major changes in marketing or effects of media attention that may confound the effects of any written disclosure of risks in isolation (Altekruse, Street, Fein, & Levy, 1996; Edworthy & Adams, 1996; Wogalter & Vigilante Jr, 2003).

3. Data

This analysis is conducted with data on refinance loan applications from 2005 reported to bank regulatory agencies, as well as a database of state laws constructed by the author and augmented with research on state lending laws in another study. These data sources are described below.

3.1. Home Mortgage Disclosure Act Data

The Home Mortgage Disclosure Act (HMDA) database is released each year by the FFIEC (www.ffiec.gov) to document each loan application recorded by

regulated mortgage lenders. The 2005 HMDA data include 13.1 million refinance mortgage applications for owner-occupied single family homes in metropolitan areas submitted to 7,749 lending institutions. Each record includes the census tract of the property being financed, the amount of the loan requested, the applicant's race and gender, the applicant's income listed in the application, the financial institution receiving the application, and other features of the loan. The lender is required to record whether the application was denied, withdrawn by the applicant, too incomplete to evaluate, approved but rejected by the applicant, or approved and originated as a loan. Of 6.6 million lender-approved applications, just over 954,300, or 14.5 percent, were rejected by the borrower. HMDA data is recorded for mortgage applications in all 50 states and the District of Columbia. Applications are submitted from 66,000 census tracts located in 2,294 counties in metropolitan areas. A small number (less than 1 percent) of records were dropped from the dataset, including applications for preapprovals, applications with missing county and state information, or missing income and loan amounts. The means, standard deviations and number of observations for variables used in this analysis with these data are displayed in Appendix Table 2.A.4. A summary of the data by type of loan application as used in this analysis is listed in Table 2.1.

Table 2.1: 2005 Home Mortgage Disclosure Act Refinance Applications: Record Count

Total Applications	12,971,610
Approved by Lender	6,582,674
Originated Loan	5,628,372
Originated HOEPA Loan	14,903
Rejected by Applicant	954,302

Among loans that were approved and originated, the relative interest rate is recorded measured by the annual percentage rate (or APR) compared to the rate on a Treasury security of a similar duration. This "spread" is *only* recorded if the difference is at least 3 percentage points (or 300 basis points, abbreviated 300 BPS). If a loan is originated with an APR is 12.5 percent and the Treasury rate on the date of the loan closing is 4.5 percent, for example, the APR spread recorded in HMDA would be 8.0. Meanwhile, a loan with an APR of 6.5 percent would have no APR spread recorded. In addition, approved and originated loans include an indicator of whether the loan was subject to HOEPA. Information about APR spread and the HOEPA status of an application is not confirmed until the loan is actually made; therefore, it is not reported in HMDA for lender-approved loan applications rejected by the applicant. HOEPA status and APR spread information is available for approved applications accepted by the borrower and originated as a mortgage loan. In 2005, out of 5.6 million originated loans, only 14,903 were designated as HOEPA loans, representing just one-quarter of one percent of loans made. About 85 percent of loans designated as HOEPA loans had APR spreads in excess of 8 percentage points (or 800 basis points), which is the threshold in the HOEPA law, and all but 6 percent of HOEPA loans were associated with APR spreads of at least 3 percentage points (or 300 basis points), a level generally considered to be "subprime." Loans with lower APR spreads most likely triggered HOEPA as a result of high fees relative to the loan balance. Loan fees are not observed in HMDA data, however; only APR spreads are.

3.2. State Lending Law Data

Previous studies have examined state mortgage lending laws from various perspectives, but none have specifically evaluated the effects of disclosure provisions. For this analysis, the law or statute governing mortgage originations for each state was

downloaded from each state's legislative website. Those states with mortgage lending laws were then classified as having any disclosure provisions. The wording and format of the disclosure was noted and any recommendations or requirements for counseling detailed. Exemptions from state laws were also noted, as well as the loan terms triggering the regulation. These features are summarized in Appendix Table 2.C.2. Other components of these laws that may affect loan applicants or lenders were also noted, including the prohibition of certain loan terms or enforcement provisions. These provisions have been well documented in an index of state lending laws created by Ho and Pennington-Cross (2006a). The index scores state laws based on a series of factors, with state index scores ranging from 0 to 11. The score is based on measures of prepayment penalty restrictions (0–4), balloon payment restrictions (0–4), counseling requirements (0–1), and restrictions on mandatory arbitration (0–2). If the law does not require any restriction or requirement, then zero points are assigned, while more restrictions result in more points. Because this index includes counseling provisions, this analysis alters the index in states with counseling by subtracting one point. This modified version of the index is intended to provide a proxy for the strength of regulations affecting loan applications covered by disclosure or counseling laws. The index can serve as a control to analyze the effects of state information provisions over and above other lending restrictions.

4. Identification of Applications Covered by State Laws

A discussed above, HOEPA status and APR spread information is available only for loans that are actually approved, accepted, and originated. Thus, to calculate a rejection rate among consumers, the denominator has to be estimated:

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Pr(reject | approved offer ) = # offers accepted / total offers
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Estimates of HOEPA status and APR spread take advantage of the correlations of applicant characteristics by neighborhood and lending institution. Loan applications by consumers in the same tract to the same lender for the same type of loan are likely to be highly similar. Because lenders tend to provide similar products in similar areas, this provides a proxy for the APR spread on nonoriginated loans. HOEPA status was estimated using a lender fixed effects regression using the 6 million originated applications, controlling for applicant and census tract characteristics (see Appendix 2.B for details). The values from this estimate were then predicted out of sample for all loan applications, and the predicted value was substituted for loan applications that lacked HOEPA status because the loan was not originated. This produces an estimate of 17,715 HOEPA loan applications, including 14,903 originated loans actually designated as HOEPA loans and 2,812 loans approved by lenders but rejected by applicants estimated to be HOEPA loans. This suggests a 15.9 percent rejection rate, similar to the 14.5 rate among non-HOEPA loans. Predicted HOEPA status is used only for loan applications that were not originated in this analysis, but as a check of the model, each actual HOEPA loan was compared to its predicted value.

This estimation procedure correctly identified 84 percent of actual HOEPA-originated loans. The underestimate of HOEPA loans is not correlated across states based on a t-test of the difference between predicted and actual values; any bias introduced will not vary systematically with the laws being analyzed. This approach provides a set of approved loan applications for the denominator of the probability of a loan applicant rejecting an approved loan offer. A summary of HOEPA status is detailed in Table 2.2 and provided for each state in Appendix Table 2.A.1.

The APR spread for loan applications was estimated using approved and originated loans that do report an APR spread in order to construct tract-lender-loan-type means. The APR spread was estimated using 66,000 census tracts across two loan

types (government insured vs. conventional) and over 7,749 lending institutions. This resulted in approximately 3.5 million cell means, which were then merged back into each tract-lender-loan-type combination. In cases where no other loans of the same type and lender were originated in the same census tract, the overall tract mean was used in place of the lender-tract mean for applications missing an APR spread. Through this procedure the APR spread of loans that were approved but rejected by the borrower were estimated for all refinance loan application records lacking an APR spread in the HMDA dataset.[7] This approach correctly identified the APR spread category for loans with recorded APRs in 81 percent of cases. The tract-lender mean APR tended to underestimate the actual APR for loans with an APR recorded.

Table 2.2: Estimated Number of Applications Subject to HOEPA & State Laws

Application Type	N
All Estimated HOEPA Loans	17,715
State with Disclosure Law	12,492
Covered by Disclosure Law	10,051
Covered by Signed Disclosure	4,282
State with Counseling Law	2,544
Covered by Counseling Requirement	2,017
State with No Law	4,738

The regression approach for determining HOEPA status and for calculating tract-lender mean APR spreads relies on the assumption that the distribution of APRs for loans that were rejected by the applicant follows a pattern similar to those of

[7] Lenders only report the APR on closed loans if that loan has an APR at least 3 percentage points (300 BPS) greater than a Treasury security of a similar term (typically the 30-year bond or the 10-year note). Any closed loan with no APR reported is assumed to have a spread of zero. In reality the APR spread on these unreported loans could be any value from 0 to 3, but since federal regulations are triggered above an APR spread to Treasury of at least 8 percentage points, and the lowest state law threshold is 6 points, such an assumption is unlikely to have much effect on this estimation of APR spreads.

approved loans that were accepted by the applicant. If there is any APR-based search behavior on the part of consumers, they will reject higher APR loan offers but will be more likely to accept lower APR loan offers. This suggests it is likely that approved loans that were not originated have a higher APR on average than is predicted in this analysis. By assuming a similar distribution of interest rates for originated loans and approved loan applications rejected by consumers, the APR of rejected loans estimated here is likely to be conservative. The final dataset of high-cost loan applications includes 166,355 high-cost refinance loans, all estimated to be subject to HOEPA or to have interest rates of 10.5 percent or more.

5. Summary of Empirical Strategy

Among states with no disclosure or counseling statutes, 14.4 percent of refinance loan applications that were approved by lenders were rejected by borrowers. In states with warning-type disclosures, 16.4 percent of refinance loan applications estimated to be covered under state laws were rejected by applicants. In states with signature requirements for warning-type disclosures, 20.2 percent of applications estimated to be covered by the law were rejected by applicants. These associations between policies and consumer behavior are suggestive. An alternative explanation is that the characteristics of lending institutions and loan applicants in the highest-cost segment of the mortgage market vary systematically among states with disclosure laws and directly influence rejection rates. There is also the potential that disclosure laws are related to other lending regulations and to statewide patterns in lender and loan applicant behavior that could lead to spurious conclusions. This analysis is designed to address each of these potential problems through the use of several estimation methods.

The consumer's decision to reject an approved high-cost refinance loan offer from a lender is modeled here as a dichotomous choice, as it is observed in the data. A consumer accepts the loan if and only if the net benefits from the loan exceed the expected discounted present value of the expected costs, including any costs associated with default. If the consumer's net expected benefits from the loan are negative, the consumer will reject the loan. This analysis models the probability that a consumer rejects the lender's loan offer as depending on the type of the disclosure required by state law, after controlling for other loan applicant, lender, and market characteristics. The hypothesis is that disclosure laws result in consumers being more likely to perceive the net expected benefits of a high-cost refinance loan offer as being negative, all else equal, which is observed in the data as a loan applicant rejecting a loan offer.

5.1. Borrower Rejection Models

Within each state some loans require disclosures and others do not, with the exception of Michigan and Illinois, where all loans in this analysis have a state disclosure (sensitivity tests are provided regarding these two states). All HOEPA loans have a federal written disclosure of the risk of losing a home regardless of state laws. State laws take three forms: (1) adding a warning in addition to the HOEPA disclosure, (2) adding a warning in addition to HOEPA disclosures and requiring a signature, and (3) adding a signed warning disclosure for non-HOEPA loan applications. It is expected that the latter two situations will provide consumers with new information or information in an attention-getting format by way of the disclosure that federal HOEPA disclosures do not achieve. By including loans covered and not covered between and within states, a form of a difference-in-differences estimator can

be developed.[8] The specification for a borrower's rejecting an approved offer of a high-cost loan from a lender is modeled in Equation 1.

$$\text{Eq 1: } Backout_i = \beta 1\ Disclosure_{i,s} + \beta 2\ HOEPA\ dummy_i + \beta 3\ Disclosure_{i,s} * HOEPA\ dummy_i + \beta 4\ Minority\ dummy_i + \beta 65\ Disclosure_{i,s} * Minority\ dummy_i + \beta 6\ Law\ index_s + \beta 7\text{-}9\ \mathbf{X}\ Applicant_i + \beta 10\text{-}\ \beta 13\ \mathbf{L}\ Lender_l + Fixed\ Effects_{t,b} + \varepsilon_{i,s} * [\mathit{Weight}]$$

State disclosure laws (β1) are dummy variables coded based on the data in Appendix Table 2.C.2. Generally, specification includes applications covered by risk disclosures, signed disclosures or both, although models of counseling requirements are also included to examine the potential role of counseling as a signal of risk. In this specification, loan applications are identified as being "covered" based on the application's estimated APR or HOEPA status, taking into account any exemptions from disclosures states may provide, as shown in Appendix Table 2.C.2. Because there are only 51 jurisdictions in the data and more than half have some variation of lending law, laws are generally modeled separately and together. Coefficient β2 is a dummy indicating the loan application is estimated to be covered under the federal HOEPA disclosure. This allows the behavior of these loan applicants to vary from those seeking non-HOEPA high-cost loans. Coefficient β3 is the interaction of loans covered by state laws and also by federal HOEPA disclosures. Coefficient β4 is a dummy indicator of the race of the applicant based on racial categories reported in HMDA, where 1 is equal to any non-white race. Coefficient β5 is the interaction of a loan covered under a state law and a minority applicant. To the extent that previous studies show minorities behaving as though less informed, this interaction may provide evidence about the role of risk disclosures in remedying information deficits or naïveté. Coefficient β6 is the index of state mortgage lending laws described

[8] The estimate controls for the rate of rejection among noncovered loans in the state with the exception of MI and IL, where all loans are covered. As a sensitivity test, loans in these states were coded separately as well as excluded from specifications. These approaches did not result in significantly different findings, and these states remain in the analysis.

previously and is included to control for the strength of state lending laws that may accompany state disclosure laws. The matrix of applicant characteristics, **X**, includes the natural log of applicant income, a measure of economic status. It also includes the ratio of the applicant's income to the amount of the loan, a measure of how much debt relative to income the applicant seeks. Lower incomes relative to larger amounts of debt suggest riskier loans. The dummy indicating whether the amount of a loan exceeds $360,000 is included primarily because loans over this amount are exempted from some state laws, but also signals borrowers seeking large loans and may be related to differing applicant behavior. The matrix of lender characteristics, **L**, includes dummy indicators for the regulator agency as well as the lender's market share of subprime loans in the state. Indicator variables for the regulator of each lender are important to include because certain regulators may preempt state disclosure laws.[9] Applications to lenders regulated by the Office of the Comptroller of the Currency (OCC) and the Office of Thrift Supervision (OTS) are coded.

This specification is estimated using a fixed effects OLS linear probability model with robust and clustered standard errors to manage the heteroskedastic errors of a binary variable (Green, 2003). A linear probability model is used for several reasons. While coefficients are not constrained to 0 and 1, interpretation as marginal effects regarding the percent of loan applications rejected by applicants is straightforward. Most of the models described in this analysis require an interaction between state-law dummies and loan-level dummies. Interactions of dichotomous variables in a standard probit model are difficult to interpret and can lead to spurious results (Norton, Wang, & Ai, 2004). There is some evidence that recent studies have

[9] In 2006 the Supreme Court ruled in Watters vs. Wachovia Bank NA that nationally chartered banks, such as those regulated by the OCC, can have certain state laws preempted in favor of national laws. The general practice for lenders was to comply with state disclosure laws in 2005 because the costs of compliance were low, while the potential for future legal disputes over the loan closing process could have become a potential legal liability.

underestimated advantages of linear probability models for large datasets and models involving interactions, and may often even lead to the misuse of logit and probit models (Hoetker, 2007).

5.2. Fixed Effects

The first set of models in this analysis uses census-tract fixed effects to account for unobserved housing and labor market factors that may influence rejection rates. While this helps control a wide range of place-related attributes, this approach still results in disparate areas being compared between and across heterogeneous jurisdictions. One alternative is to use fixed effects for 49 border county groupings that straddle 37 states with and without disclosure laws. State boundaries are not correlated with states passing mortgage laws, yet mortgage markets are likely to be more similar on either side of the border than loan applications located outside the grouping, creating a form of a natural experiment. Border-grouping fixed effects have been used in several recent analyses (Dube, Lester, & Reich, 2007; Huang, 2008; Pence, 2006). The border-grouping approach has also been widely used with HMDA data in the examination of state lending laws (Bostic, Engel, McCoy, Pennington-Cross, & Wachter, 2008; Ho & Pennington-Cross, 2006a). The approach typically identifies groups of contiguous counties within MSAs and creates a fixed effect dummy for each grouping. By including these dummies in a specification, a form of within-group difference in differences is estimated. Borrowing from Pence (2006), this analysis improves on past studies of state lending laws by using distance weights. Recognizing the potential for heterogeneity within border pairings, the distance in linear miles of each census tract from the state border is calculated based on its longitude and latitude. Weighting the location of the loan application by the inverse of its distance from the border places more emphasis on closely located areas rather than

treating all applications within a contiguous county as having an equal weight.[10] A further refinement is to limit the border-grouping fixed effects models to only those groupings that are not divided by a waterway. Waterways may result in sharper distinctions at the border than non-waterway-bounded areas. Of course, defining a river or waterway boundary is subject to interpretation (Hoxby, 2007). Border county groupings are a rough proxy for the level of homogeneity within a market. Many groupings have boundaries that are partially defined by a river and are not defined as river-bounded in this analysis. These judgments were made after reviewing maps with population density to gauge the extent to which borders appeared to be simultaneous with a waterway that divided significant population areas. A list of the county groupings within and without water boundaries is provided in Appendix Table 2.A.2 and Appendix Table 2.A.3.

5.3. Sequential Responses Model

The last approach used is to test for the broader market effects of state risk disclosures for high-cost refinance mortgages. Because consumer decisions to reject a loan offer are contingent on the decision to initially apply for a high-cost loan, and then on the lender's decision to approve the loan, it is possible that the effects of laws are reflected throughout the application process. Applicants and lenders may alter their behavior regarding how and when to apply and whether to approve a loan application. This analysis estimates the outcome of a borrower rejecting an approved loan offer using a maximum likelihood sequential response model to simultaneously estimate all three stages (apply-approve-reject) of an application. This approach has been used in

[10] The latitude and longitude of each census tract and county centroid was downloaded from www.census.gov and the distance of each tract from the closest cross-border county calculated using a standard formula incorporated into Stata 10's *globdist* routine. Distances were also calculated using the centroid of the MSA as the comparison, yielding very similar weighted coefficients.

previous studies of sequential processes (Danzon & Lillard, 1983; Hu, Lahiri, Vaughan, & Wixon, 2001; Murray, 1997).

Buis (2008) created a routine in Stata (*seqlogit*) to implement a sequential logit estimator. Buis's model simultaneously estimates the effect of explanatory variables on the probability of passing from the first stage (application) to the next (approve-deny) and then to the final outcome (accept-reject). The final outcome is weighted by the log-odds that the application passed each prior transition, taking into account the mean variance at each transition and the extremes of the differences in the final outcome. The third-stage estimates reflect the weighted impacts of prior stages. The sequential probability of applicants rejecting an approved loan offer has four branches:

1. Not Apply for high-cost loan (vs. apply as in 2, 3, and 4)
2. Apply for high-cost loan, Loan denied by lender (vs. approved as in 3 and 4)
3. Apply for high-cost loan, Loan approved by lender, Borrower rejects (vs. 4)
4. Apply for high-cost loan, Loan approved by lender, Borrower accepts (vs. 3)

The model has three stages. The first stage is application for a high-cost loan or a low-cost loan. The second stage is conditional on an application being made for a high-cost loan, whether the loan is approved or not by the lender. The final stage is the applicant's acceptance or rejection of the offer conditional on an application being made for a high-cost loan that was approved by the lender, which is a comparison of branch 3 and branch 4, above. This is the conditional probability Pr(Accept | approved | applied). There is no counterfactual such that Pr(accept | denied | applied). The specification for the model is as follows:

$$\text{Eq 2: } \Pr(\text{Backout}_i) = \beta 1\ \text{Law}_s + \beta 2\ \text{Law index}_s + \beta 3\text{-}6\ \mathbf{X}_i + \beta 7\text{-}9\mathbf{L}_i + \beta 10\ \text{county vacancy rate}_i + \varepsilon_{i,s}$$

The matrix of applicant characteristics, **X**, includes the natural log of applicant income, the ratio of the applicant's income to the amount of the loan, the natural log of

the amount of the loan, and indicators of the loan applicant being a member of a minority group or single. The matrix of lender characteristics, **L**, includes dummy indicators for the regulator agency as well as a dummy indicating whether the amount of a loan exceeds $360,000. County vacancy rate is used as a proxy for the surrounding market condition.

Note that this model has more different coefficients than previous models. The structure of the equation is such that the same variables are used to predict all three stages. Some of the variables included in prior models, such as lender subprime market share, are endogenous at prior stages. The state-law dummy serves as the single indicator of any effect of state laws. Continuous variables are also expressed as a difference from the county or census-tract means to approximate a fixed effects model for unobserved market-level factors.

6. Results

6.1. Fixed Effects Models

Appendix Table 2.A.5 presents four variations in a specification with the dependent variable of a loan applicant rejecting an approved loan offer from a lender. These models are run for all high-cost loans (defined as HOEPA loans and/or loans with an APR spread of at least 600 basis points). All of these specifications include census-tract fixed effects, designed to account for unobserved heterogeneity in local labor and housing markets. The coefficients on the variables indicating that application is for a loan requiring disclosure show the impact of the state law controlling for other variables in the specification. Model 1 includes indicators only for any warning-type disclosure (18 states, all of which at a minimum use the language "you could lose your home") and also a subset of the laws that require the applicant to sign the disclosure form. This model shows no effects for the disclosure in general but

a marginal increase in applicants rejecting approved loan offers of 6.4 percentage points for signed disclosures. This effect is concentrated among HOEPA applications, as shown in model 2, where the signature dummy alone shows no effect on non-HOEPA loans but a strong 10.7 percentage-point effect when interacted with HOEPA status. The interaction of a signed disclosure with minority borrowers in model 3 is not significant but is positive, and introducing that control pushes the main effect of signed disclosures to be 3.2 percentage points without reducing the impact on applicants for HOEPA loans. Model 4 adds a control for states with counseling laws. This weakens the effects of signed disclosures overall, but the effects remain for HOEPA loans, albeit at lower levels of statistical significance. Applications with counseling requirements appear to also have elevated rates of borrower rejection of loan offers in this model.

As an initial sensitivity test, model 1 is shown in Appendix Table 2.A.6 with three variations in the sample. First, the two states discussed earlier where disclosures apply to all loans in the sample, Michigan and Illinois, are dropped from the sample. The coefficient on the main effect of disclosure remains nonsignificant, and the effects of signed disclosures remain significant and of a similar magnitude. Second, the model is run excluding these 2 states and 6 additional states where counseling is required. Similar results are found. Finally, the sample is shifted to exclude HOEPA loans and to include loans with APR spreads between 300 and 700 basis points, excluding loans that are subject to other laws, and adding loans in Illinois not subject to disclosure laws. Loan applications from Michigan, where all applications require disclosures, are excluded. The effects of the Illinois signed disclosure remain positive and significant. As an additional sensitivity test, model 1 is shown in Appendix Table 2.A.7 with three variations in the covariates. First, a fixed effect of a state having any foreclosure risk-warning disclosure law shows that, all else equal, states with disclosure laws have

lower rates of borrowers rejecting loan offers. The coefficient on loans requiring a signed disclosure remains positive, significant, and of a similar magnitude, however. Adding fixed effects for states with counseling requirements as well as a dummy for the state of New Jersey, which has signed disclosures and counseling requirements, shows that signed disclosures and counseling requirements are associated with higher rates of borrowers rejecting a loan offer. Models 3 and 4 include a covariate for a fixed effect for the 10 states with signed disclosure laws, showing that these states, all else equal, have lower rejection rates but that signed disclosures have a larger and significant effect. Model 4 suggests these effects are primarily in the HOEPA loan market. These tests suggest that the models presented in Appendix Table 2.A.5 should provide a general sense of the effects of the laws being examined.

Appendix Table 2.A.8 presents the same 4 models of state laws and controls for the same data, except that only counties in the 49 border groupings are included. Controlling for border-group fixed effects, including weights for the distance of tract of the loan applicant from the border, further refines the prior estimates to account for heterogeneity within and across states. The results of these models are decidedly weaker. Model 2 shows a marginally significant positive effect of signed disclosures on HOEPA loans of 8.3 percentage points. Model 3 shows stronger effects for signed disclosures for HOEPA loans of 9.6 percentage points, and for the interaction with minority applicants of 7.4 points. There is no main effect of signed disclosures, however. Including counseling requirements weakens the results, but the effects of signed disclosures for HOEPA loans remains.

Appendix Table 2.A.9 repeats the models of Appendix Table 2.A.8, excluding river-bounded contiguous counties. Arguably these models provide the strongest comparisons within heterogeneous markets. However, most of the results are nonsignificant. Model 3 shows positive coefficients for signed disclosures overall and

interacted with HOPEA applications, but only the interaction with a minority applicant is significant. The effect is strong, suggesting a 8.9 percentage-point increase in minority borrowers receiving a signed disclosure. The sample is reduced significantly, to less than 18,300 of the original 166,000 approved loan applications in the first set of specifications.

6.2. Sequential Response Model

The models examined in the previous section all estimate the probability of a loan applicant accepting an offer contingent on that offer being approved by a lender. This assumes that states passing laws requiring disclosure or counseling have no effect on the probability of a loan applicant applying for a high-cost loan or on the probability that a lender will approve the application. Ho and Pennington-Cross (2006a) suggest that states most likely to pass high-cost lending laws also are more likely to have subprime loan applications and increased subprime-loan application denials by lenders. Concern for this issue led the authors to determine outcomes by jointly estimating the probability of a loan application being in a state with a lending law, and then estimating outcomes of interest using that predicted value as an instrument. Ho and Pennington-Cross's approach suggests caution in interpreting the results in the previous sections.

Table 2.A.10 displays the results of all three stages. The model is run for loan applications covered by disclosure laws separately and then simultaneously. Marginal effects, based on a 16 percent average overall rate of borrowers rejecting loans, for the third-stage model suggest about a 6.6 percent increase in rejections of loan offers, even after modeling the application process and weighting this final outcome by these earlier stages. While stage three is the outcome of interest, there are no significant

effects of state laws in prior stages. Note that the test in these models is a general effect of the law, not a specific effect of the law for loans covered by the law.

Appendix Table 2.A.11, Appendix Table 2.A.12, and Appendix Table 2.A.13 provide the same model run on the data with differences from census-tract means for continuous variables, approximating tract fixed effects. The prior model county "de-meaned" data may detect unobserved housing market characteristics, while the tract de-meaned data may detect unobserved neighborhood or applicant characteristics. Each stage is shown as a separate table because of space constraints, although each model is one estimation procedure across all three tables. At the initial stage of application, there is no effect of disclosure of signed disclosure laws, but there is a small reduction in the rate of borrowers applying for high-cost loans in states with counseling requirements. Based on a mean rate of application for high-cost loans of 3 percent, the marginal effects of the logit model suggest about a 1.2 percent decrease in borrowers seeking high-cost loans in states with counseling laws. At the second stage, the lender's decision to approve or deny the loan application, there is a marginally significant effect of a state having a disclosure law on lenders being less likely to deny a high-cost loan application. Based on an average denial rate among high-cost loans of 40 percent, this results in about a 3.7 percent reduction in denial rates for high-cost loan applications in these states, and about a 4.0 percent reduction when a covariate for a state having a signed disclosure law is added. A state having a signed disclosure law does not have any significant effect in any of the models. In model 4 a state having a counseling requirement increases denials by about 6.5 percent, although this effect is marginally significant. The final stage, a borrower rejecting a high-cost loan offer, shows only positive and significant effects of states having a disclosure required for high-cost loans, but not for signature or counseling laws. The estimated magnitude

of a state having a disclosure law for high-cost loans is about 4.5 percent across all of the models (4.6, 4.7, and 4.2).

These results are very different estimations than the prior estimations without sequential process modeling. The estimates in these models are of a state having a law, and the specification contains different variables without the fixed effects for border groupings. Yet these results suggest there is no reason to suspect that the findings of Appendix Table 2.A.5, Appendix Table 2.A.8, and Appendix Table 2.A.9 are significantly biased by application or lender behavior.

6.3. Estimated Risk Reduction

Given the results presented in the previous sections, there appears to be an association between state disclosure laws and borrowers rejecting high-cost refinance loan offers from lenders. This is suggestive of borrower behavior to take more caution in their use of credit. We do not observe in the data whether these applicants rejecting a loan offer are likely to exit the market altogether or whether they re-enter the market and seek a loan they perceive as less risky. One rough proxy for borrowers' taking more or less risk is the ratio of their income to the amount of the mortgage. This measure will vary by regional housing costs and is not likely to be linear as income or housing values increase. But in general, the higher the ratio of income to debt, the more risk. For example, an applicant with $50,000 in income seeking a $100,000 mortgage (1:2 ratio) takes less risk than an applicant with $50,000 in income taking a $300,000 mortgage (1:6 ratio). Appendix Table A.2.11 and Appendix Table A.2.12 present some models that suggest the income-to-debt ratio is associated with loans being covered by state laws run on data for loans with APR spreads of 300 basis points or more. This is a larger sample than used in the estimations of borrowers rejecting loan offers because in theory borrowers may respond to the disclosures by

entering a lower-cost portion of the subprime market (a 300 basis-point spread in APR to Treasury is still considered subprime, but not entirely "high-cost"). Models 1, 2, and 3 are run on all lender-approved loan applications with APR spreads of 300 basis points or more. Models 4, 5, and 6 are run only for originated loans in this APR range.

Appendix Table 2.A.11 and Appendix Table 2.A.12 show in models 2 and 3, and 5 and 6, a modest 7- to 9-point increase in this ratio, given an average of 50 in this sample (ratios were multiplied by 100). Far from conclusive evidence, these results are suggestive that disclosures may serve to do more than increase the probability of rejecting a loan offer but encourage applicants for high-cost loans covered by signed disclosures to reduce the amount borrowed. An interaction of loans with signed disclosures and HOEPA status shows mixed effects. For all approved applications there is a positive effect using non-river-bounded county grouping fixed effects. Both border-grouping models for originated loans (models 4 and 5) show negative effects of HOEPA loans covered by signature laws. There were no effects of interactions of loans covered by signed disclosures and minority borrowers, however.

These estimations are exploratory but suggestive that the effects of signed disclosure laws do result in changes in loan applicant behavior in the subprime market. The structure of the data do not allow us to observe whether borrowers are engaging in more search, exiting the market, or both. If a policy goal is to encourage borrowers to take (slightly) less debt for each dollar of income, signed disclosure may have some effects.

7. Discussion

Signed disclosure requirements appear to have a positive association with borrowers rejecting approved high-cost loan offers. Signed disclosure laws have an effect on the rate of borrowers rejecting loan offers of between 3 and 10 percentage

points, compared to an average rate of 16 percent overall. Applications covered by unsigned disclosures do not appear to have effects in OLS models of borrower rejections. States with disclosures laws, regardless of signature, appear to have effects in sequential logit models. There is also preliminary evidence that signed disclosure laws also have a modest effect on reducing the amount of mortgage debt that loan applicants seek relative to income in the subprime market.

This study contributes to the literature by focusing on borrowers rejecting approved loan offers, a consumer choice not previously examined, and by studying the effects of consumer risk disclosures in the credit market, also a relatively unexamined topic. High-cost mortgage refinance applications are used as an applied example of borrower choice under various state laws. This study improves on the methodology used in past studies using HMDA data to examine state high-cost loan regulations in several ways. First, subprime lenders are identified by actual rate spreads and not reliant on a list compiled by a governmental agency. Second, this study improves on border fixed effects strategies used in other studies by adding distance weights and by excluding border areas with river boundaries to provide more robust comparisons within heterogeneous areas. Last, this study uses a sequential response model to account for effects of laws on applicant or lender behavior.

8. Conclusions

"YOU COULD LOSE YOUR HOME" is an important warning for consumers about to sign a mortgage contract. Based on this analysis of home refinance loans in 2005, this warning may in fact be more effective than commonly presumed.

The effects shown in this analysis are not large, especially given the relatively low occurrence of borrowers rejecting an approved loan offer overall, but nonetheless suggest that signed risk disclosure requirements have effects on loan applicants'

review of loan offers. These results are based on high-cost refinance loans reported in HMDA data in 2005 and may not be generalized to purchase or home improvement loans, or even to subprime loans at lower rates. These results also rest on the assumption that the estimated interest rates of loans that were approved by lenders but not accepted by loan applicants share an interest rate distribution with similar loans that were originated by that lender and/or in the same census tract.

If a goal of public policy is to encourage consumers to be less likely to take on high-cost refinance mortgages, or to reduce the amount consumers borrow relative to income, the implementation of warning-type disclosures with required borrower signatures may be one strategy. One concern may be that consumers overreact to these disclosures and will avoid credit unnecessarily, or that markets will respond by restricting credit. The sequential response model does not suggest such effects. Borrowers clearly remain active in this market despite the risk warnings. This may prove to be a valid example of asymmetric paternalist polices, wherein the uninformed consumer is protected from his or her naïveté or self-control problems, while the informed consumer is unaffected. If helping uninformed consumers without impeding informed consumers is a policy goal, the effects of signed disclosures on minority borrowers in particular may imply that risk warnings in the mortgage market may be one approach worthy of consideration.

As federal regulators consider changes to mortgage and other credit regulations in 2008, these findings may be instructive. These findings also provide further evidence of the need for greater financial literacy among consumers if understanding the terms and disclosures provided in credit markets is a policy goal.

APPENDIX 2.A. DATA TABLES

Table 2.A.1: Count of High-Cost (APR rate spread of 600 basis points or more over Treasury) Loan Applications by State in HMDA Data

	All Applications		Subject to Disclosure		Signed Disclosure		Require Counseling	
	600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA
AL	4,046	239	0	0	0	0	0	0
AK	140	17	0	0	0	0	0	0
AZ	4,255	539	0	0	0	0	0	0
AR	1,891	166	0	0	0	0	0	157
CA	10,888	1,576	0	1,303	0	1,303	0	0
CO	1,326	108	0	108	0	108	0	0
CT	1,993	230	0	230	0	0	0	0
DE	587	91	0	0	0	0	0	0
DC	73	7	46	1	46	1	0	0
FL	13,325	1,394	0	1,394	0	0	0	0
GA	6,637	562	0	0	0	0	6,549	557
HI	349	8	0	0	0	0	0	0
ID	577	78	0	0	0	0	0	0
IL	1,589	326	1,327	247	1,327	247	0	0
IN	3,556	336	0	335	0	0	0	0
IA	1,903	198	0	0	0	0	0	0
KS	1,714	175	0	0	0	0	0	0
KY	1,727	323	0	293	0	0	0	0
LA	2,270	424	0	0	0	0	0	0
ME	807	73	0	0	0	0	0	0
MD	4,641	404	0	0	0	0	0	0
MA	2,213	192	0	0	0	0	0	192
MI	8,896	629	8,896	629	0	0	0	0
MN	2,080	159	0	0	0	0	0	0
MS	1,925	164	0	0	0	0	0	0
MO	4,698	339	0	0	0	0	0	0
MT	272	54	0	0	0	0	0	0
NE	791	147	0	0	0	0	0	0
NV	1,609	202	0	0	0	0	0	0
NH	612	89	0	0	0	0	0	0
NJ	4,909	543	0	495	0	495	0	495
NM	724	121	178	120	178	120	0	0
NY	5,851	842	116	711	116	711	0	0
NC	5,040	320	0	0	0	0	0	311
ND	161	30	0	0	0	0	0	0
OH	6,330	580	0	580	0	580	0	0
OK	1,981	436	0	436	0	436	0	0
OR	1,060	130	0	0	0	0	0	0
PA	7,282	893	0	586	0	0	0	0
RI	532	62	0	0	0	0	0	0
SC	2,429	216	0	0	0	0	0	214
SD	193	99	0	0	0	0	0	0
TN	4,006	524	0	0	0	0	0	0
TX	8,120	2,305	359	2,182	0	0	0	0
UT	538	17	0	17	0	0	0	0
VT	324	39	0	0	0	0	0	0
VA	5,311	636	0	0	0	0	0	0
WA	2,006	252	0	0	0	0	0	0
WV	932	129	0	0	0	0	0	0
WI	3,298	253	0	253	0	253	0	0
WY	223	39	0	0	0	0	0	0
US	148,640	17,715	10,922	9,920	1,667	4,254	6,549	1,926

Table 2.A.2: Count of High-Cost Loan Applications by Border Grouping, State Law, and HOEPA Status

River	Area	All Applications		Subject to Disclosure		Signed Disclosure		Require Counseling	
		600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA
0	Allentown NJ-PA	236	32	1	29	1	15	0	0
0	Augusta SC-GA	366	44	0	0	0	0	0	25
0	Chattanooga TN-GA	347	75	23	74	16	24	0	0
0	Cheyenne Laramie CO-WY	135	17	0	10	0	10	0	0
0	Chicago Kankakee IN-IL	1,075	73	0	0	0	0	0	1
0	Duluth MN-WI	154	39	2	18	0	0	0	0
0	Erie-Ashtabula-Chautauqua PA-NY	233	48	0	11	0	0	0	0
0	Fairfield-Putnam-Dutchess CT-NY	531	50	0	30	0	24	0	24
0	Gaston-Mecklenburg-York NC-SC	655	47	0	0	0	0	0	46
0	Hillsborough-Middlesex-Worcester NH-MA	823	82	0	7	0	0	0	36
0	Lancaster Baltimore PA-MD	1,297	64	94	6	94	6	0	0
0	McHenry Kenosha WI-IL	158	19	0	14	0	6	0	0
0	Muscogee-Russell GA-AL	288	52	0	6	0	6	0	0
0	New London Fall River CT-RI	185	28	0	26	0	0	0	0
0	Philadelphia PA-MD-NJ	3,696	404	0	268	0	159	0	159
0	Port Arthur TX-LA	260	18	0	0	0	0	179	17
0	Portland NH-ME	137	9	0	9	0	0	0	0
0	Providence CT-MA-RI	828	71	0	0	0	0	0	49
0	Reno Washoe-Placer NV-CA	285	33	2	28	2	28	0	9
0	Rockford WI-IL	229	11	0	2	0	2	0	0
0	Rockingham-Essex NH-MA	323	25	0	19	0	0	0	0
0	Sequoyah-Crawford-Sebastian OK-AR	170	15	50	15	50	15	0	0
0	Sherveport LA-TX	160	15	0	0	0	0	0	0
0	South Bend Benton Harbor MI-IN	348	18	0	0	0	0	286	18
0	Sussex-Orange NJ-NY	255	29	0	13	0	8	0	8
0	Texarkana Bowie-Miller TX-AR	77	12	2	7	0	0	0	4
0	Toldeo MI-OH	584	48	173	48	0	28	0	0
0	Tolland-Hartford-Hampden CT-MA	912	83	0	83	0	68	0	0
0	Trenton PA-NJ	559	73	2	67	2	20	0	0
0	Wilmington Horry-Brunswick SC-NC	174	30	0	14	0	14	0	16
0	Youngstown OH-PA	488	40	0	38	0	32	0	0
0	Cincinnati OH-IN-KY	967	87	0	62	0	0	0	25
1	Clarksville IN-KY	104	10	0	5	0	0	0	0
1	Davenport IA-IL	146	14	0	8	0	8	0	0
1	El Paso Las Cruces TX-NM	350	32	0	25	0	5	0	0
1	Evansville KY-IN	143	16	38	10	38	10	0	0
1	Fargo MN-ND	52	12	0	0	0	0	0	0
1	Grand Forks ND-MN	37	2	0	0	0	0	0	0
1	Huntington KY-OH-WV	169	15	0	0	0	0	0	14
1	Louisville KY-IN	447	85	0	81	0	0	0	0
1	Memphis AR-TN-MS	1,077	218	581	160	581	127	0	0

Table 2.A.2 (Continued)

River	Area	All Applications		Subject to Disclosure		Signed Disclosure		Require Counseling	
		600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA	600-800 BPS	HOEPA
	New York NY-NJ	1,750	170	8	133	8	133	0	79
1	Parkersburg WV-OH	69	12	0	7	0	7	0	0
1	Pensacola Baldwin-Escambia AL-FL	333	23	166	23	0	0	0	0
0	Pittsburgh PA-OH-WV	349	48	0	0	0	0	108	27
1	St Louis MO-IL	1,335	107	0	15	0	0	0	0
1	Twin Cities MN-WI	221	17	32	15	32	15	0	0
0	Washington DC VA-DC-MD	1,962	208	46	1	46	1	0	0
1	Wheeling WV-OH	85	20	0	16	0	16	0	0
	All Areas	**25,564**	**2,700**	**1,220**	**1,403**	**870**	**787**	**573**	**557**
	Non-river bounded	**19,246**	**1,947**	**395**	**905**	**211**	**466**	**573**	**464**

Table 2.A.3: Mean Rates of Borrowers Rejecting Approved Loan Offers By State, Border Grouping and HOEPA Status

State	600-800 BPS	HOEPA
AL	37.5%	23.0%
AK	7.9%	52.9%
AZ	12.7%	9.5%
AR	35.2%	20.5%
CA	7.6%	15.0%
CO	10.0%	20.4%
CT	12.4%	10.4%
DE	17.9%	8.8%
DC	5.5%	85.7%
FL	14.1%	12.9%
GA	28.6%	12.8%
HI	2.3%	75.0%
ID	19.8%	25.6%
IL	16.8%	27.9%
IN	14.3%	17.6%
IA	16.6%	11.6%
KS	18.2%	11.4%
KY	14.8%	11.5%
LA	21.7%	15.1%
ME	12.5%	17.8%
MD	11.9%	8.4%
MA	8.0%	25.5%
MI	16.6%	21.5%
MN	9.8%	28.3%
MS	33.0%	36.0%
MO	17.3%	15.0%
MT	13.6%	22.2%
NE	11.9%	20.4%
NV	12.7%	12.4%
NH	13.6%	25.8%
NJ	12.0%	13.3%
NM	8.3%	21.5%
NY	14.0%	31.5%
NC	25.4%	16.9%
ND	14.9%	23.3%
OH	17.3%	26.0%
OK	16.7%	8.7%
OR	10.1%	20.8%
PA	14.8%	20.5%
RI	10.9%	22.6%
SC	18.0%	25.9%
SD	13.5%	7.1%
TN	18.1%	16.6%
TX	13.8%	6.1%
UT	10.2%	47.1%
VT	9.3%	23.1%
VA	17.3%	7.4%
WA	8.0%	17.5%
WV	34.2%	14.7%
WI	10.8%	21.3%
WY	16.1%	25.6%
US	16.2%	15.9%

Border Grouping	600-800 BPS	HOEPA
Texarkana Bowie-Miller TX-AR	15.8%	24.0%
Sherveport LA-TX	36.5%	0.0%
Parkersburg WV-OH	19.1%	24.7%
Cheyenne Laramie CO-WY	29.9%	0.0%
Port Arthur TX-LA	33.9%	3.3%
Sussex-Orange NJ-NY	9.4%	1.9%
Erie-Ashtabula-Chautauqua PA-NY	13.3%	23.5%
Wilmington Horry-Brunswick SC-NC	18.9%	6.3%
Reno Washoe-Placer NV-CA	6.1%	27.3%
Tolland-Hartford-Hampden CT-MA	19.0%	2.7%
New London Fall River CT-RI	15.4%	13.3%
Grand Forks ND-MN	17.1%	12.8%
Rockingham-Essex NH-MA	15.7%	18.8%
Chicago Kankakee IN-IL	16.5%	20.0%
Youngstown OH-PA	14.6%	6.3%
Davenport IA-IL	19.9%	35.0%
Chattanooga TN-GA	30.4%	25.0%
Pensacola Baldwin-Escambia AL-FL	15.9%	28.0%
Trenton PA-NJ	42.5%	16.7%
Pittsburgh PA-OH-WV	21.0%	12.5%
Gaston-Mecklenburg-York NC-SC	8.4%	6.3%
Providence CT-MA-RI	11.8%	23.5%
Philadelphia PA-MD-NJ	12.4%	13.3%
Clarksville IN-KY	10.7%	8.2%
Fairfield-Putnam-Dutchess CT-NY	13.1%	22.2%
Duluth MN-WI	12.5%	10.0%
Rockford WI-IL	27.9%	10.4%
Lancaster Baltimore PA-MD	24.0%	7.7%
St Louis MO-IL	9.7%	10.3%
New York NY-NJ	12.9%	16.1%
Evansville KY-IN	11.6%	15.1%
Cincinnati OH-IN-KY	10.4%	40.9%
Louisville KY-IN	9.2%	21.1%
Huntington KY-OH-WV	8.6%	25.6%
Portland NH-ME	9.7%	0.0%
Wheeling WV-OH	18.8%	16.1%
Memphis AR-TN-MS	15.4%	14.5%
McHenry Kenosha WI-IL	24.1%	10.5%
Fargo MN-ND	12.8%	31.3%
Augusta SC-GA	11.5%	8.3%
Toldeo MI-OH	17.7%	30.4%
Allentown NJ-PA	10.8%	10.0%
Muscogee-Russell GA-AL	13.8%	13.3%
Twin Cities MN-WI	7.0%	31.8%
South Bend Benton Harbor MI-IN	10.2%	15.2%
El Paso Las Cruces TX-NM	11.9%	22.0%
Sequoyah-Crawford-Sebastian OK-AR	14.9%	10.3%
Washington DC VA-DC-MD	10.7%	13.5%
Hillsborough-Middlesex-Worcester NH-MA	12.3%	21.4%

Table 2.A.4: Descriptive Statistics for 2005 HMDA data on High-Cost Loan Applications

	HOEPA Estimated Loan Applications n= 17,715		600–800 APR Spread Loan Applications n= 141,783	
	Mean	SD	Mean	SD
Lending law index	3.197	2.354	3.187	2.668
Log Income Applicant	3.649	1.162	3.830	3.840
Ratio Income: Loan Amount	75.087	332.813	54.959	54.851
Tract application denial rate	28.360	10.049	29.444	29.569
Ratio Tract Income: MSA income	91.107	28.375	87.807	87.519
County Housing Vacancy rate %	9.650	6.563	9.133	9.048
Minority Applicant Dummy	0.151	0.355	0.241	0.238
Single Applicant Dummy	0.535	0.498	0.653	0.662
Lender regulated by OCC Dummy	0.079	0.266	0.122	0.106
Lender regulated by OTS Dummy	0.050	0.219	0.079	0.075
Tract backout % for APR 300-600 BPS	12.514	10.577	13.940	13.771
Lender % subprime APR in state	13.993	16.616	32.493	31.753
Gov't insured loan Dummy	0.114	0.326	0.001	0.001
Loan >$360 conforming limit Dummy	0.035	0.197	0.038	0.045

Table 2.A.5: Borrower Rejection of Approved Loan Offer for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant with Census-Tract Fixed Effects and State-level Robust Clustered Standard Errors

	1		2		3		4	
Loan requires disclosure dummy	-0.039							
	(1.29)							
Loan disclosure requires signature dummy	**0.064**	*	**0.053**		**0.032**	*	**0.043**	
	(2.45)		(1.49)		(2.05)		(1.15)	
Loan disclosure requires signature * HOEPA application			**0.107**	*	**0.107**	*	**0.097**	+
			(2.23)		(2.22)		(1.91)	
Loan disclosure requires signature * minority applicant					**0.028**			
					(0.83)			
Loan requires counseling dummy							0.047	*
							(2.09)	
HOEPA Application dummy	-0.024	+	-0.042	**	-0.037	**	-0.045	**
	(1.72)		(3.24)		(2.74)		(3.42)	
Lending law index	0.003		0.004		0.003		0.001	
	(0.93)		(1.24)		(0.94)		(0.44)	
Log Income Applicant	-0.033	**	-0.033	**	-0.033	**	-0.033	**
	(3.05)		(3.07)		(3.07)		(3.06)	
Ratio Income: Loan Amount	0.012	**	.004	**	.004	**	.002	**
	(3.74)		(3.73)		(3.73)		(3.73)	
Minority Applicant dummy	0.024	**	0.024	**	0.024	**	0.024	**
	(4.58)		(4.53)		(4.28)		(4.42)	
Lender regulated by OCC dummy	0.292	**	0.292	**	0.293	**	0.292	**
	(10.41)		(10.50)		(10.50)		(10.47)	
Lender regulated by OTS dummy	0.085	**	0.084	**	0.085	**	0.084	**
	(9.45)		(9.42)		(9.44)		(9.40)	
Lender % subprime APR in state	-0.002	**	-0.002	**	-0.002	**	-0.002	**
	(7.92)		(7.95)		(7.97)		(7.98)	
Loan >$360 conforming limit	0.052	**	0.053	**	0.053	**	0.055	**
	(3.06)		(3.20)		(3.13)		(3.22)	
Constant	0.275	**	0.271	**	0.272	**	0.275	**
	(5.68)		(5.71)		(5.72)		(5.82)	
R-squared	0.116		0.116		0.115		0.116	
N	166355		166355		166355		166355	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.6: Sensitivity to Variations in Sample for Borrower Rejection of Approved Loan Offer for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant with Census-Tract Fixed Effects and State-level Robust Clustered Standard Errors

	Exclude MI & IL (states covering all high-cost loans)		Exclude MI, IL & States with Counseling Requirements (NJ, NC, SC, GA, AR, MA)		300-700 APR Spread Loans Only (Test of IL), Exclude MI	
Loan requires disclosure dummy	-0.036		-0.03			
	(1.03)		(0.80)			
Loan disclosure requires signature dummy	0.071	*	0.068	*	0.111	**
	(2.16)		(2.03)		(3.02)	
R-squared	0.122		0.094		0.076	
N	154915		129797		372877	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.7: Sensitivity to Variations in State Law Fixed Effects for Borrower Rejection of Approved Loan Offer for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant with Census-Tract Fixed Effects and State-level Robust Clustered Standard Errors

	1		2		3		4	
State has any disclosure law (18 states)	-0.047 (3.90)	**	-0.023 (1.40)					
State has signed disclosure law (10 states)					-0.044 (3.63)	**	-0.042 (3.48)	**
Loan requires disclosure	-0.021 (0.80)		-0.024 (0.93)					
Loan disclosure requires signature	0.058 (2.07)	*	0.062 (2.33)	*	0.047 (2.66)	*	-0.036 (0.94)	
State has counseling requirement (6 states)			0.053 (3.41)	**				
Loan requires counseling			0.019 (1.15)					
Loan in New Jersey (signed disclosure and counseling required)			-0.112 (5.53)	**				
Loan requires signed disclosure * HOEPA							0.101 (1.99)	+
R-squared	0.116		0.117		0.116		0.116	
N	166355		166355		166355		166355	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.8: Borrower Rejection of Approved Loan Offer for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant with Border-Grouping Fixed Effects Weighted by Distance to Border and State-level Robust Clustered Standard Errors

	1		2		3		4	
Loan requires disclosure dummy	-0.008							
	(0.26)							
Loan disclosure requires signature dummy	0.066		0.014		0.012		0.011	
	(1.44)		(0.85)		(0.67)		(0.70)	
Loan disclosure requires signature * HOEPA application			0.083	+	0.096	*	0.090	+
			(1.86)		(2.18)		(2.00)	
Loan disclosure requires signature * minority applicant					0.074	**		
					(3.57)			
Loan requires counseling dummy							0.037	
							(0.79)	
HOEPA Application dummy	-0.016		-0.03		-0.03		-0.027	
	(0.62)		(1.47)		(1.47)		(1.21)	
Lending law index	-0.006	+	-0.004		-0.004		-0.003	
	(1.78)		(1.26)		(1.16)		(0.77)	
Log Income Applicant	-0.058	**	-0.058	**	-0.058	**	-0.058	**
	(13.65)		(13.70)		(13.67)		(13.56)	
Ratio Income: Loan Amount	0.001	**	0.002	**	0.002	**	0.002	**
	(4.44)		(4.47)		(4.47)		(4.45)	
Minority Applicant dummy	0.039	**	0.039	**	0.036	**	0.039	**
	(3.55)		(3.57)		(3.30)		(3.56)	
Lender regulated by OCC dummy	0.316	**	0.316	**	0.316	**	0.315	**
	(10.31)		(10.28)		(10.29)		(10.25)	
Lender regulated by OTS dummy	0.092	**	0.09	**	0.09	**	0.09	**
	(6.13)		(5.67)		(5.77)		(5.67)	
Lender % subprime APR in state	-0.002	**	-0.002	**	-0.002	**	-0.002	**
	(8.30)		(8.27)		(8.25)		(8.28)	
Loan >$360 conforming limit	0.061	**	0.061	**	0.061	**	0.06	**
	(4.13)		(4.13)		(4.16)		(3.96)	
Constant	0.376	**	0.375	**	0.375	**	0.373	**
	(16.17)		(16.05)		(16.09)		(15.67)	
R-squared	0.169		0.169		0.169		0.169	
N	28050		28050		28050		28050	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.9: Borrower Rejection of Approved Loan Offer for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant with non-River-Boundary Border-Grouping Fixed Effects Weighted by Distance to Border and State-level Robust Clustered Standard Errors

	1		2		3		4	
Loan requires disclosure dummy	0.023							
	(1.13)							
Loan disclosure requires signature dummy	**0.026**		**0.011**		**0.018**		**0.01**	
	(0.83)		(0.43)		(0.70)		(0.42)	
Loan disclosure requires signature * HOEPA application			**0.064**		**0.079**		**0.069**	
			(1.26)		(1.66)		(1.44)	
Loan disclosure requires signature * minority applicant					**0.089**	**		
					(9.14)			
Loan requires counseling dummy							**0.024**	
							(0.52)	
HOEPA Application dummy	-0.03		-0.032		-0.031		-0.028	
	(1.18)		(1.48)		(1.47)		(1.36)	
Lending law index	-0.006	+	-0.005		-0.005		-0.004	
	(1.79)		(1.53)		(1.51)		(0.87)	
Log Income Applicant	-0.059	**	-0.059	**	-0.059	**	-0.059	**
	(15.15)		(14.84)		(14.65)		(14.75)	
Ratio Income: Loan Amount	0.018	**	0.001	**	0.002	**	0.001	**
	(3.11)		(3.11)		(3.10)		(3.04)	
Minority Applicant dummy	0.053	**	0.054	**	0.049	**	0.053	**
	(5.15)		(5.17)		(5.32)		(5.19)	
Lender regulated by OCC dummy	0.347	**	0.346	**	0.346	**	0.346	**
	(11.82)		(11.69)		(11.68)		(11.62)	
Lender regulated by OTS dummy	0.108	**	0.106	**	0.107	**	0.106	**
	(6.09)		(5.35)		(5.54)		(5.31)	
Lender % subprime APR in state	-0.002	**	-0.002	**	-0.002	**	-0.002	**
	(6.54)		(6.51)		(6.49)		(6.51)	
Loan >$360 conforming limit	0.062	**	0.061	*	0.061	*	0.059	*
	(2.85)		(2.64)		(2.66)		(2.53)	
Constant	0.377	**	0.38	**	0.38	**	0.378	**
	(16.53)		(16.43)		(16.33)		(16.89)	
R-squared	0.199		0.199		0.199		0.199	
N	18289		18289		18289		18289	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.10: Sequential Logit Model: County Mean Differenced Data

	Stage 1: Apply for High-cost Loan		Stage 2: Lender Approve High-cost Loan		Stage 3: Applicant Rejects Approved High-cost Loan	
State Disclosure Law	0.054		(0.02)		0.41	**
	(0.35)		(0.24)		(2.89)	
State Signed Disclosure	0.34		-0.026		0.066	
	(1.48)		(0.26)		(0.45)	
Lending law index	0.00		0.03	*	0.025	*	0.01		0.011	
	(0.04)		(2.45)		(2.36)		(0.21)		(0.27)	
Log Income Applicant (difference from county mean)	0.03		(0.05)		-0.054		0.18	**	0.186	**
	(0.74)		(1.26)		(1.26)		(3.42)		(3.17)	
Log Loan Amount (difference from county mean)	(0.32)	**	0.22	**	0.223	**	(0.73)	**	-0.738	**
	(6.72)		(6.57)		(6.43)		(11.65)		(11.27)	
Ratio Income: Loan Amount (difference from county mean)	(0.00)	**	0.00		0		0.00	+	0	
	(3.45)		(0.21)		(0.21)		(1.67)		(1.59)	
Ratio Tract Income: MSA income	(1.13)	**	0.27	**	0.263	**	0.08		0.114	
	(18.27)		(5.64)		(5.64)		(0.82)		(1.17)	
County hsg vacancy rate	(0.02)	**	0.00		0.001		(0.01)		-0.004	
	(4.13)		(0.40)		(0.33)		(1.48)		(1.29)	
Minority Applicant Dummy	0.20	**	(0.05)	*	-0.053	*	0.55	**	0.564	**
	(4.27)		(2.28)		(2.31)		(12.11)		(12.65)	
Single Applicant Dummy	(2.33)	**	0.75	*	0.727	*	(1.48)	*	-1.442	*
	(4.01)		(2.37)		(2.44)		(2.42)		(2.25)	
Lender regulated by OCC	4.64	**	(2.99)	**	-2.975	**	5.41	**	6.193	**
	(3.41)		(6.10)		(4.70)		(8.31)		(5.99)	
Lender regulated by OTS	(3.48)	**	2.57	**	2.576	**	(3.29)	**	-4.096	**
	(3.16)		(5.85)		(4.32)		(6.59)		(5.64)	
Constant	4.68	**	(1.38)	**	-1.377	**	3.15	**	3.344	**
	(14.88)		(8.74)		(9.51)		(13.93)		(10.94)	
R-squared										
N = 12,971,610										

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.11: Sequential Logit Model: First Stage (Application for High-cost Loan) using Census-Tract Mean Differenced Data

	1		2		3		4		5	
State has any disclosure law (18 states)	0.087		0.016						-0.131	
	(0.76)		(0.12)						(0.88)	
State has signed disclosure law (10 states)			0.174		0.183				0.193	
			(0.94)		(1.21)				(1.12)	
State has counseling requirement (6 states)							-0.41	*	-0.457	**
							(2.50)		(2.90)	
Lending law index	-0.005		-0.009		-0.009		0.02		0.021	
	(0.14)		(0.26)		(0.25)		(0.52)		(0.60)	
Log Income Applicant (difference from tract mean)	0.002		0.002		0.002		0.002		0.001	
	(0.06)		(0.06)		(0.06)		(0.05)		(0.04)	
Log Loan Amount (difference from tract mean)	1.513	**	1.447	**	1.443	**	1.525	**	1.452	**
	(6.12)		(7.36)		(6.57)		(5.67)		(6.78)	
Ratio Income: Loan Amount (difference from tract mean)	0		0		0		0		0	
	(0.61)		(0.61)		(0.61)		(0.61)		(0.61)	
Ratio Tract Income: MSA income	-0.156		-0.101		-0.097		-0.136		-0.072	
	(0.53)		(0.41)		(0.36)		(0.42)		(0.27)	
County hsg vacancy rate	-0.007	*	-0.006	*	-0.006	*	-0.006	*	-0.005	*
	(2.53)		(2.41)		(2.45)		(2.33)		(2.10)	
Minority Applicant Dummy	-0.285	**	-0.284	**	-0.285	**	-0.275	**	-0.276	**
	(6.69)		(6.62)		(5.95)		(5.92)		(6.21)	
Single Applicant Dummy	-0.261	**	-0.258	**	-0.257	**	-0.257	**	-0.252	**
	(14.69)		(14.25)		(14.20)		(14.81)		(14.51)	
Lender regulated by OTS	1.409	**	1.405	**	1.405	**	1.404	**	1.399	**
	(9.63)		(9.65)		(9.72)		(9.67)		(9.57)	
Lender regulated by OCC	1.158	**	1.155	**	1.154	**	1.16	**	1.156	**
	(6.71)		(6.76)		(6.70)		(6.73)		(6.79)	
Constant	-12.722	**	-12.56	**	-12.56	**	-13.021	**	-12.87	**
	(15.13)		(14.64)		(14.93)		(16.57)		(16.65)	

N = 12,971,610

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.12: Sequential Logit Model: Second Stage (Lender Denial of High-cost Loan Application) using Census-Tract Mean Differenced Data

	1		2		3		4		5	
State has any disclosure law (18 states)	-0.094	+	-0.13	*					-0.091	
	(1.74)		(1.98)						(1.31)	
State has signed disclosure law (10 states)			0.09		0.012				0.077	
			(1.23)		(0.19)				(1.02)	
State has counseling requirement(6 states)							0.162	+	0.11	
							(1.83)		(1.11)	
Lending law index	0.028	**	0.028	**	0.027	**	0.015		0.019	+
	(4.42)		(4.45)		(2.98)		(1.43)		(1.78)	
Log Income Applicant (difference from tract mean)	-0.014		-0.012		-0.014		-0.013		-0.012	
	(0.36)		(0.33)		(0.36)		(0.33)		(0.32)	
Log Loan Amount (difference from tract mean)	-0.661	**	-0.697	**	-0.647	**	-0.663	**	-0.699	**
	(12.16)		(10.64)		(8.57)		(11.36)		(10.66)	
Ratio Income: Loan Amount (difference from tract mean)	0	**	0	**	0	**	0	**	0	**
	(2.61)		(2.67)		(2.59)		(2.58)		(2.65)	
Ratio Tract Income: MSA income	0.103		0.133	+	0.079		0.088		0.127	+
	(1.53)		(1.82)		(1.06)		(1.21)		(1.68)	
County hsg vacancy rate	-0.004		-0.004		-0.004		-0.004		-0.004	
	(1.35)		(1.43)		(1.29)		(1.31)		(1.41)	
Minority Applicant Dummy	0.072	**	0.075	**	0.082	**	0.075	**	0.074	**
	(2.58)		(2.93)		(3.16)		(2.73)		(2.86)	
Single Applicant Dummy	0.04	*	0.042	**	0.037	*	0.037	*	0.04	*
	(2.41)		(2.63)		(2.24)		(2.19)		(2.53)	
Lender regulated by OTS	-0.39	**	-0.391	**	-0.388	**	-0.385	**	-0.389	**
	(7.06)		(7.03)		(6.94)		(7.06)		(7.13)	
Lender regulated by OCC	0.097		0.091		0.116		0.098		0.086	
	(1.25)		(1.16)		(1.46)		(1.25)		(1.11)	
Constant	5.716	**	5.807	**	5.773	**	5.862	**	5.878	**
	(11.75)		(10.73)		(11.14)		(10.53)		(10.16)	

N = 12,971,610

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.13: Sequential Logit Model: Third Stage (Borrower Rejects Approved Loan Offer) using Census-Tract Mean Differenced Data

	1		2		3		4		5	
State has any disclosure law (18 states)	0.289	**	0.298	*					0.263	+
	(2.76)		(1.99)						(1.67)	
State has signed disclosure law (10 states)			-0.022		0.169				-0.006	
			(0.13)		(1.43)				(0.04)	
State has counseling requirement (6 states)							-0.261		-0.107	
							(1.36)		(0.66)	
Lending law index	-0.003		-0.003		0		0.022		0.006	
	(0.15)		(0.15)		(0.00)		(0.72)		(0.25)	
Log Income Applicant (difference from tract mean)	0.059		0.059		0.062		0.057		0.057	
	(1.24)		(1.20)		(1.24)		(1.13)		(1.17)	
Log Loan Amount (difference from tract mean)	0.129		0.136		0.051		0.121		0.136	
	(0.75)		(0.85)		(0.23)		(0.62)		(0.86)	
Ratio Income: Loan Amount (difference from tract mean)	0.001	**	0.001	**	0.001	**	0.001	**	0.001	**
	(4.26)		(4.23)		(4.18)		(4.22)		(4.22)	
Ratio Tract Income: MSA income	0.51	*	0.505	*	0.59	*	0.564	*	0.514	*
	(2.23)		(2.38)		(1.98)		(2.08)		(2.43)	
County hsg vacancy rate	-0.005		-0.005		-0.005		-0.005		-0.005	
	(1.07)		(1.07)		(1.08)		(1.17)		(1.08)	
Minority Applicant Dummy	-0.425	**	-0.425	**	-0.44	**	-0.442	**	-0.424	**
	(9.33)		(9.86)		(11.30)		(11.21)		(10.04)	
Single Applicant Dummy	-0.127	**	-0.128	**	-0.119	**	-0.12	**	-0.127	**
	(2.81)		(2.95)		(2.63)		(2.61)		(2.89)	
Lender regulated by OTS	-1.114	**	-1.113	**	-1.124	**	-1.128	**	-1.117	**
	(11.59)		(11.67)		(11.03)		(11.38)		(11.88)	
Lender regulated by OCC	-2.735	**	-2.733	**	-2.777	**	-2.748	**	-2.727	**
	(21.65)		(21.74)		(19.47)		(20.30)		(21.56)	
Constant	-4.157	**	-4.182	**	-4.024	**	-4.511	**	-4.267	**
	(4.69)		(4.21)		(4.00)		(4.19)		(4.26)	

N = 12,971,610

+ p<0.10, * p<0.05, ** p<0.01

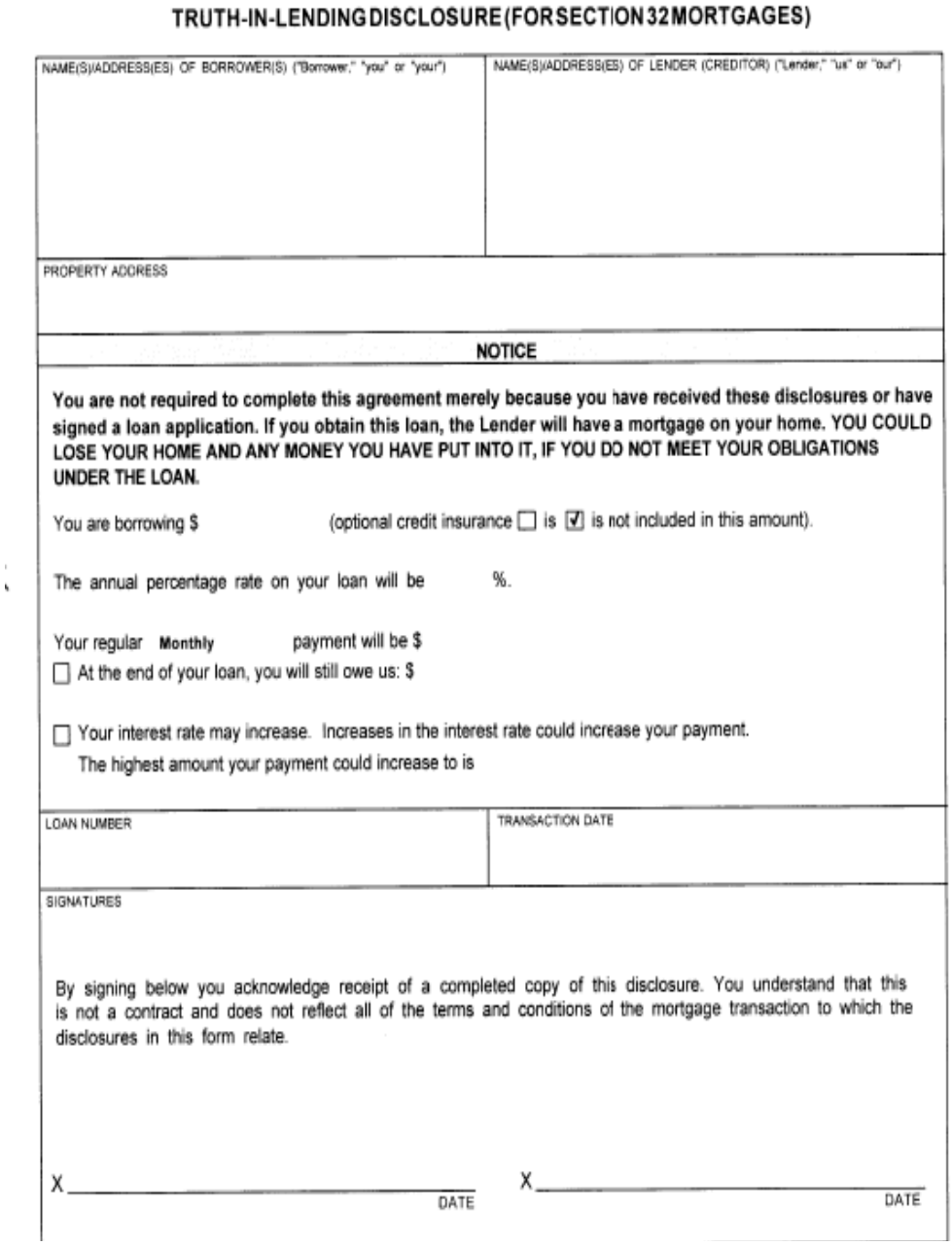
Table 2.A.14: Income to Loan Amount Ratio (Income/Loan Amount * 100) for Subprime Loan Applications in 2005 HMDA by Type of State Disclosure Law with Interactions of Law and HOEPA Applications and Law and Minority Loan Applicant

	All Lender Approved Applications (Rejected and Accepted by Borrower)						Borrower Accepted Applications Only (Originated Loans)					
	- 1-		- 2-		- 3-		4		5		6	
Application w/ Signed Disclosure	5.841		6.657	**	6.669	*	2.356		7.476	**	9.056	**
	-1.35		-3.21		-2.66		(0.55)		(3.99)		(4.83)	
Signed Disclosure * HOEPA Application	3.239		30.299	+	22.499		-0.487		-8.205	*	-10.145	+
	-0.5		-1.93		-1.6		(0.08)		(2.14)		(1.88)	
Signed Disclosure * Minority Applicant	2.612		1.354		-0.968		2.822		-3.114		-3.995	
	-0.42		-0.37		-0.38		(0.77)		(1.31)		(1.68)	
HOEPA Application	10.353	**	30.234		22.083		6.244	*	4.584	*	5.531	+
	-2.87		-1.63		-1.25		(2.65)		(2.10)		(2.01)	
600-800 APR Spread Application	-4.008	*	-2.358		-2.716		-5.509	**	-3.105	*	-4.093	+
	-2.22		-1.35		-1.12		(3.13)		(2.08)		(1.92)	
Lending Law Index	-29.644	*	0.32		0.7		-30.357	+	0.075		0.246	
	-2.19		-0.91		-1.27		(1.93)		(0.22)		(0.46)	
Tract mean loan amount	-0.202	**	-0.222	**	-0.282	*	-0.184	**	-0.152	**	-0.149	**
	-3.84		-3.51		-2.29		(3.63)		(4.91)		(2.94)	
Tract mean income	0.001	**	0.001	**	0.001	*	0	**	0	**	0	**
	-4.53		-3.48		-2.27		(4.10)		(8.69)		(7.14)	
Tract denial rate (credit proxy)	0.38	**	0.574	**	0.628	**	0.375	**	0.597	**	0.686	**
	-6.14		-6.06		-4.56		(6.66)		(5.85)		(4.91)	

+ p<0.10, * p<0.05, ** p<0.01

Table 2.A.14 (Continued)

	All Lender Approved Applications (Rejected and Accepted by Borrower)						Borrower Accepted Applications Only (Originated Loans)					
	- 1-		- 2-		- 3-		4		5		6	
Minority applicant	-1.489	**	-2.651		-1.525		-1.141	*	-1.966	**	-2.323	**
	-2.79		-1.64		-1.49		(2.42)		(4.67)		(3.21)	
Single applicant	-10.809	**	-11.406	**	-10.675	**	-10.516	**	-9.304	**	-9.368	**
	-6.52		-6.32		-6.97		(6.91)		(7.85)		(5.78)	
Lender regulated by OCC	1.309		0.89		1.394		2.898	*	2.282		3.238	
	-0.93		-0.56		-0.69		(2.08)		(1.38)		(1.60)	
Lender regulated by OTS	-0.318		2.349		3.463		-1.391		2.459		2.961	
	-0.25		-0.88		-0.9		(1.33)		(1.03)		(0.86)	
Lender's share of subprime in state	-0.003		-0.102	*	-0.124	**	0.011		-0.108	**	-0.105	*
	-0.09		-2.3		-3.36		(0.43)		(3.79)		(2.67)	
Govt insured loan application	-6.908	+	-11.043		-6.295		3.654		1.65		6.137	
	-1.81		-0.83		-0.48		(0.99)		(0.17)		(0.43)	
Loan >$360 conforming limit	-8.105	**	-9.498	**	-10.069	+	-7.337	**	-7.811	**	-6.011	*
	-11.48		-3.97		-2.03		(9.74)		(4.96)		(2.11)	
Constant	104.69		42.137	**	35.086	**	112.883	**	40.009	**	36.482	**
	0		-7.48		-3.38		(3.39)		(8.69)		(4.71)	
R-squared	0.066		0.034		0.045		0.118		0.077		0.087	
N	443666		80852		53350		416751		76555		50427	
	County FE		Border Group FE		Border FE, No River Bounded		County FE		Border Group FE		Border FE, No River Bounded	



TRUTH-IN-LENDING DISCLOSURE (FOR SECTION 32 MORTGAGES)

NAME(S)/ADDRESS(ES) OF BORROWER(S) ("Borrower," "you" or "your")	NAME(S)/ADDRESS(ES) OF LENDER (CREDITOR) ("Lender," "us" or "our")

PROPERTY ADDRESS

NOTICE

You are not required to complete this agreement merely because you have received these disclosures or have signed a loan application. If you obtain this loan, the Lender will have a mortgage on your home. YOU COULD LOSE YOUR HOME AND ANY MONEY YOU HAVE PUT INTO IT, IF YOU DO NOT MEET YOUR OBLIGATIONS UNDER THE LOAN.

You are borrowing $ (optional credit insurance ☐ is ☑ is not included in this amount).

The annual percentage rate on your loan will be %.

Your regular **Monthly** payment will be $

☐ At the end of your loan, you will still owe us: $

☐ Your interest rate may increase. Increases in the interest rate could increase your payment.
The highest amount your payment could increase to is

LOAN NUMBER	TRANSACTION DATE

SIGNATURES

By signing below you acknowledge receipt of a completed copy of this disclosure. You understand that this is not a contract and does not reflect all of the terms and conditions of the mortgage transaction to which the disclosures in this form relate.

X _____ DATE

X _____ DATE

Figure 2.A.1: National HOEPA Disclosure

CONSUMER CAUTION AND HOME OWNERSHIP COUNSELING NOTICE

If you obtain this loan, the lender will have a mortgage on your home. You could lose your home, and any money you have put into it, if you do not meet your obligations under the loan.

Mortgage loan rates and closing costs and fees vary based on many other factors, including your particular credit and financial circumstances, your earnings history, the loan-to-value requested, and the type of property that will secure your loan. Higher rates and fees may be justified depending on the individual circumstances of a particular consumer's application. You should shop around and compare loan rates and fees.

This particular loan may have a higher rate and total points and fees than other mortgage loans and is, or may be, subject to the additional disclosure and substantive protections under Division 1.6 (commencing with Section 4970 of the Financial Code). You should consider consulting a qualified independent credit counselor or other experienced financial adviser regarding the rate, fees, and provisions of this mortgage loan before you proceed. For information on contacting a qualified credit counselor, ask your lender or call the United States Department of Housing and Urban Development's counseling hotline at 1-888-466-3487 or go to www.hud.gov/fha/sfh/hcc for a list of counselors.

You are not required to complete any loan agreement merely because you have received these disclosures or have signed a loan application.

If you proceed with this mortgage loan, you should also remember that you may face serious financial risks if you use this loan to pay off credit card debts and other debts in connection with this transaction and then subsequently incur significant new credit card charges or other debts. If you continue to accumulate debt after this loan is closed and then experience financial difficulties, you could lose your home and any equity you have in it if you do not meet your mortgage loan obligations.

Property taxes and homeowner's insurance are you responsibility. Not all lenders provide escrow services for these payments. You should ask your lender about these services.

Your payments on existing debts contribute to your credit ratings. You should not accept any advice to ignore your regular payments to your existing creditors.

ACKNOWLEDGMENT

I/We hereby acknowledge receipt of this Consumer Caution and Home Ownership Counseling Notice.

_____ _____

Borrower Date

Figure 2.A.2: California Disclosure

APPENDIX 2.B. ESTIMATING HOEPA LOANS

The APR spread for loan applications was estimated using 6 million approved and originated loans that do report an APR spread to construct tract-lender-loan type means. The APR spread is estimated using 66,000 census tracts, 2 loan types including FHA/VA insured vs. conventional and by 7,750 lending institutions. This resulted in approximately 3.5 million cell means, which were then merged back into each tract-lender-loan type combination. In cases where no other loans of the same type and lender were originated in the census tract, the overall tract mean was used in place of the missing rate spreads. Through this procedure the APR spread of loans that were approved but rejected by the borrower were estimated for all refinance loan application records lacking an APR spread in the HMDA dataset.

The HOEPA status was estimated using an OLS linear probability model using 6 million approved and originated loan applications with lender fixed effects and tract-lender-type mean APR spreads based on the following specification:

$$HOEPA_i = \beta 1\ \text{Log income}_i + \beta 2\ \text{Log loan amount}_i + \beta 4\ \text{County mean income}_c + \beta 5\ \text{Gov't dummy}_i + \beta 6\ \text{Jumbo loan dummy}_i + \beta 7\ \text{Minority dummy}_i + \beta 8\ \text{Single dummy}_i + \beta 9\ \text{Log income}_i + \beta 10\ \text{Income/loan}_i + \beta 11\ \text{Tract Denial rate}_t + \beta 12\ \text{Tract Income:MSA Income}_t + \beta 13\ \text{income:loan amt}_i + \beta 14\ \text{Tract-Lender Mean APR}_{t,l} + \beta 15\ \text{Log tract mean loan amount}_t + \beta 16\ \text{Mean Tract Income}_t + \beta 17\ \text{Mean origination rate}_t + [7{,}749]\ \text{Lender Fixed Effects} + \varepsilon_i$$

Appendix Table 2.B.1 summarizes the results of this model. A dummy variable for tract-lender-loan-type APRs greater than the HOEPA threshold had the strongest effects.

Table 2.B.1: HOEPA Status Prediction Probit Model

DV: HOEPA status		
Variable	Beta	Sig
Log Loan Application Amount	(0.00072)	**
Log Income in Application	(0.00002)	*
Gov't insured loan Application	(0.00608)	**
Minority Applicant Dummy	(0.00022)	**
Ratio Income to Loan Amount	0.00000	**
Loan >$360 conforming limit Dummy	0.00074	**
Single Applicant Dummy	(0.00024)	**
Tract-Lender Mean APR Spread	0.00163	**
Lender mean % loans with APR >300BPS	(0.00429)	**
Tract log mean loan amount	0.00000	**
Tract log mean income	(0.00000)	**
Tract backout rate | APR 300-600 BPS	(0.00056)	**
Tract application denial rate	(0.00313)	**
Tract-Lender-Type Mean APR>8 pts	0.44489	**
Tract % Loans Sold to GSE	0.00123	**
Ratio Tract Income to MSA income	0.00000	**
County Housing vacancy rate	0.00000	*
Constant	0.00352	
n	6587357	
Adj R-squared = 0.5153		
Lender FE(7749 categories)	F=211.167	
* = 5% level; ** 1% level		

This produces an estimate of 17,715 HOEPA loan applications, including 14,903 originated loans and 2,812 loans approved by lenders but rejected by applicants. As a check, this estimation procedure correctly identified 84 percent, or 12,596, of actual HOEPA-originated loans as being estimated for HOEPA status. The R-squared of this specification was 0.52, and a joint F-test of coefficients was strongly significant. The underestimate of HOEPA loans is not correlated across states; any

bias introduced will not vary systematically with the laws being analyzed. Other specifications for estimating HOEPA were attempted, but lender fixed effects combined with a set of loan and tract characteristics generated the strongest predictions relative to actual HOEPA loans.

Appendix Table 2.B.2 summarizes HOEPA-estimated loans compared to actual HOEPA loans for each state. A t-test of the average difference between actual and predicted HOEPA applications was not significant.

Table 2.B.2: HOEPA Status Prediction Versus Actual for Approved Loans

State	Predicted - Actual	% Actual	State w/ law?
AL	55	30%	0
AK	9	113%	0
AZ	51	10%	0
AR	34	26%	0
CA	235	17%	1
CO	22	25%	1
CT	24	11%	1
DE	8	10%	0
DC	6	600%	1
FL	181	15%	1
GA	73	15%	1
HI	6	300%	0
ID	20	34%	0
IL	91	38%	1
IN	59	21%	1
IA	23	13%	0
KS	20	13%	0
KY	37	13%	1
LA	64	17%	0
ME	13	21%	0
MD	34	9%	1
MA	48	33%	1
MI	135	27%	1
MN	45	39%	1
MS	59	56%	0
MO	52	18%	0
MT	12	29%	0
NE	30	26%	0
NV	24	13%	0
NH	23	35%	0
NJ	72	15%	1
NM	26	26%	1
NY	268	46%	1
NC	54	20%	1
ND	7	30%	0
OH	151	35%	1
OK	38	9%	1
OR	27	26%	0
PA	183	26%	1
RI	14	29%	0
SC	55	33%	1
SD	7	8%	0
TN	87	20%	1
TX	142	6%	1
UT	8	89%	1
VT	9	28%	0
VA	49	8%	0
WA	44	21%	0
WV	19	17%	0
WI	53	26%	1
WY	10	34%	0
US	2816	19%	
States without Law		37%	0
States with Law		48%	1

t-test 0.37 vs. 0.48 = -0.44 (1-tail)

APPENDIX 2.C. PROPENSITY SCORE MATCHING MODEL

A propensity score matching routine can pair loan applications by observable characteristics such that lender-approved offers are similar in as many respects as possible with the exception of being covered by a state law requiring counseling. A quasi-experimental design can be introduced by using a matching estimator to pair applications by propensity score across states with and without laws (Morgan & Winship, 2007).

A matching model uses observable characteristics for loan applications covered by state laws and loan offers not covered by state laws to pair each "treatment" case with a "control" case that is as similar as possible using observed data. Comparing applications matched along key characteristics, with the exception of being covered by a state law, provides an additional methodology as a check of the findings in the previous regression specifications. Propensity score matching estimates the "treatment" status of each record (where 1 equals covered by a law and 0 not covered) using a probit model. The predicted probabilities of treatment derived from this model for all observations in the dataset becomes the propensity score (Morgan & Winship, 2007). Using refinance applications reported in HMDA, this approach can be used to predict loan applications that are approved and covered by state disclosure or counseling laws. The Stata routine *psmatch* implements propensity score matching using common support to estimate average treatment effects on the treated (Sianesi, 2001). The probit model to estimate the propensity of a loan being covered by disclosure or counseling laws is predicted using the following specification:

$$\text{Eq. 5: } \Pr(\text{Covered}_i) = \beta 1\ \text{Hoepa\_hat}_i + \beta 2\ \log \text{income}_i + \beta 3\ \text{income:loan amt}_i + \beta 4\ \text{Tract denial rate}_t + \beta 5\ \text{OCC dummy}_l + \beta 6\ \text{OTS dummy}_l + \beta 7\ \text{Gov't dummy}_i + \beta 8\ \text{County Housing Vacancy}_c + \beta 9\ \text{Jumbo loan dummy}_i + \beta 10\ \text{Minority dummy}_i + \beta 11\ \text{Single dummy}_i + \beta 12\ \text{Lender's state subprime \%}_i + \beta 13\ \text{Law Index}_s + \beta 13\ \text{Tract-lender-type mean APR}_s + \varepsilon_i$$

Generally Eq 5 uses the same variables used in previous models. However, to better predict coverage under state laws, the predicted estimates from the specification used to identify applications as being covered under HOEPA are included (β1) as well as tract-lender APR spread means (β13). Designed primarily as a check on previous models, the matching specification does not include fixed effects for counties or cluster standard errors. Once the propensity scores are estimated, loan applications covered by state laws are paired with applications that have similar scores and observed application characteristics but are located in a state without disclosure or counseling laws. Stata matches each application with replacement—meaning the same control might serve more than one treatment case. Because some cases had identical propensity scores, the data were randomly sorted before running the matching routine to randomize the assignment of cases with identical propensity scores. The model is run on all 6 million approved loan applications. Unlike previous models, this approach combines all high-cost loan applications predicted to be covered by state laws, including state laws applying to HOEPA loans and laws applying to non-HOEPA loans.

The matching estimator suggests that applicants reject approved loan offers at a 6.3 percentage point greater rate for applications covered by disclosure laws and 9.4 percentage points for applications covered by counseling laws. Both are strongly significant. Overall, this method provides another indication of the effects of disclosure and counseling laws, even though fixed effects for county or border groupings are not included in the matching.

Table 2.C.1: Estimated Rate of Loan Applicant Rejecting Lender Approved Refinance Loan Offer

ATT	Treated	Controls	Diff	SE	t
Loans Covered by Disclosure Laws	0.119	0.102	0.018	0.004	4.75
Loans Covered by Counseling Requirements	0.102	0.068	0.034	0.006	5.75

Table 2.C.2: Summary of Laws Regarding First-Lien Refinance Mortgage Applications

State (FIPS code)	APR Trigger	Disclosure Form	Signed Disclosure	Counseling Required	Disclosure Form Title	Number Words in Disclosure	Timing prior to closing	Exemptions
Federal HOEPA Law	8%	YCLH			Truth in Lending (for Section 32 Mortgages)	93	3 days	
Arkansas (5)	8%			Yes				Loan >150k; FHA/VA, Freddie Mac & Fannie Mae loans
California (6)	8%	YCLH; FSFR	Yes		Consumer Caution	362	3 days	Loan >360k
Colorado (8)	8%	YCLH; FSFR	Yes		Cautionary Notice	254	3 days	
Connecticut (9)	8%	YCLH			Warning Statement	58	3 days	
Florida (12)	8%	YCLH			Notice to borrower	289	3 days	Freddie Mac & Fannie Mae loans
Georgia (13)	Prime+4%			Yes				Loan >360k
Illinois (17)	6%	YCLH	Yes		Notice to borrower	220	3 days	
Indiana (18)	8%	YCLH			Notice to borrower	234	3 days	Loan >360k
Kentucky (21)	8%	YCLH			Notice to borrower	222	3 days	Loan <15k or >200k; Freddie Mac & Fannie Mae loans
Maryland (24)	7%				Counseling Notice	301	At application	Applicant Income >87,000

Key to Disclosure Language: YCLH = “YOU COULD LOSE YOUR HOME”; FSFR = “YOU MAY FACE SERIOUS FINANCIAL RISKS”

Table 2.C.2 (Continued)

State (FIPS code)	APR Trigger	Disclosure Form	Signed Disclosure	Counseling Required	Disclosure Form Title	Number Words in Disclosure	Timing prior to closing	Exemptions
Massachusetts (25)	8%			Yes				
Michigan (26)	All APRs	YCLH; FSFR			Borrowers Bill of Rights & Caution	217	At application	All refinance loans covered
Minnesota (27) *	All APRs				This is Very Important	33	3 days; Read aloud at application	Prepay penalties less than 2 months interest or 2% of loan balance
New Jersey (34)	8%	YCLH	Yes	Yes	Notice to Borrower	240	3 days	Loan >360k
New Mexico (35)	7%	YCLH	Yes		Notice to Borrower	239	3 days	Loan >360k
New York (36)	8%	YCLH; FSFR	Yes		'Shop Around' Notice	339	10 days	Loan >300k
North Carolina (37)	8%			Yes				Loan >300k
Ohio (39)	8%	YMYH	Yes		Warning Statement	59	3 days	
Oklahoma (40)	8%	YMYH	Yes		'Shop Around' Notice	250	3 days	
Pennsylvania (42)	8%	YMYH			Notice to Borrower	217	3 days	Loan >100k
South Carolina (45)	8%			Yes				Loan >360k
Texas (48)	APR of 12%	YMYH			Important Notice	336	At application	Loan <20k or >192k

Table 2.C.2 (Continued)

State (FIPS code)	APR Trigger	Disclosure Form	Signed Disclosure	Counseling Required	Disclosure Form Title	Number Words in Disclosure	Timing prior to closing	Exemptions
Utah (49)	8%	YMYH; FSFR			Notice to Borrower	160	3 days	
Vermont (50)	APR of 9% (3% over declared rate: 6%)		Yes, but not a warning		'Shop Around' Notice	20	3 days of application	
Washington, DC (11)	6%	YMYH	Yes		Red Flag Warning	1407	3 days	Applicant income >107k, loan >360k or FHA loan
Wisconsin (55)	8%	YMYH; FSFR	Yes		Caution & Counseling Notice	307	3 days	
		18	10 w/ warning	6				

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CHAPTER 3:
EXTRANEOUS AFFECT AND CREDIT CARD OFFERS

Credit cards are one of the most common forms of credit offered to consumers and one in which information is highly standardized through mandated disclosures. Three experiments examine the effects of affect inductions (mild positive or anxious affect) on the use of credit card disclosure information by college undergraduates. Overall, these consumers made use of federally mandated disclosures but also show evidence that their affect or mood influences the process. Participants in whom positive affect was induced were more likely to notice omitted or missing information in the disclosure as well as to seek more items of information than controls. This is consistent with positive affect being associated with broader and also more flexible thinking. These results suggest that credit disclosure policies should include all relevant information if a goal is more complete use of information by consumers across various moods.

1. Introduction

Consumers make product and service choices on a daily basis. Most of these choices are based on some combination of price, product attributes, perceived utility, and the consumer's willingness to pay. In most markets consumers are able to make decisions among products with minimal regulation of information by government. For a subset of products and services, information is not as transparent, even for well-informed consumers. Credit cards are one example of a product for which public policies mandate a specific set of information to be displayed in a standardized format. In light of an increase in consumer defaults in credit markets in the last several years, regulators have discussed changes to mandated disclosures for credit cards and other forms of consumer borrowing, with the goal of improving consumer decision making.

One factor that may alter how a consumer uses mandated product disclosures is the consumer's mood or affect. Affect typically is involved when consumers evaluate products (Gorn, Goldberg, & Basu, 1993). For example, when a consumer is offered a credit card he or she may also receive a "gift" or a discount on purchases made with the card. Gifts are likely to induce positive affect for the consumer (e.g., Isen & Daubman, 1984; Isen, Daubman, & Nowicki, 1987). Other consumers may feel stress or anxiety about taking on a credit card because of financial problems or increasing debts (Drentea, 2000). In either situation the consumer's affect may result in different processing of disclosure information.

The use of credit cards is widespread among consumers, but the costs of cards can vary significantly. Card issuers aggressively seek new accounts and frequently target college students with credit offers. Although regulations have recently required clearer disclosures of balance payment options for consumers, the emphasis of credit card disclosure policies is on the application process. The initial decision to apply for a new card is a critical point for consumers and is the time when terms, conditions, and pricing are most relevant. It is also a time when credit card issuers intentionally seek to induce consumers into positive affect through gifts, discounts, and rewards. Applying for a card may also be associated with consumers feeling anxious about their financial position and ability to manage credit. This paper examines the roles of positive and anxious affect in consumer processing of information about credit card offers. The results have implications for policymakers designing disclosures and for marketers promoting products with detailed terms and conditions to be considered before making a purchase.

2. Literature Review

2.1. Positive Affect and Cognition

Many studies demonstrate that a person's mood, even mild transient moods, can have a significant impact on how he or she thinks and processes information. Isen and Daubman (1984) suggest that positive affect aids cognition because people are better able to group information and then broaden or narrow their analysis as needed. In part this is related to the fact that positive material is more accessible and encompasses a greater proportion of an individual's memory than neutral or negative material (Cramer, 1968). People in positive affect can therefore cue and connect to a more diverse set of cognitive material compared to when in a neutral mood (Isen, Shalker, Clark, & Karp, 1978). More than offering access to more information, positive affect also helps people to analyze information by increasing their flexibility to connect and relate positive or neutral ideas to one another (Isen, Niedenthal, & Cantor, 1992). By aiding the categorization of information, positive affect leads to the creation of broader classes of information and therefore improves flexibility in thinking (Isen & Daubman, 1984; Isen, Johnson, Mertz, & Robinson, 1985; Kahn & Isen, 1993). The neurological basis of the effects of positive affect on thinking and decision making is theorized to be related to the release of dopamine in the brain, activating brain regions responsible for thinking, attention control, and planning (Ashby, Isen, & Turken, 1999).

Estrada and colleagues provide one keen example of how positive affect is associated with more-flexible thinking, as well as seeking and using more information in making a decision (Estrada, Isen, & Young, 1997). The authors provided experienced physicians with a packet of information, as would be typical for a medical case consultation, in order to diagnose a patient. Half of the physicians received a small bag of candy in their case consultation package and half did not. Those

physicians receiving candy, in whom positive affect was induced, more carefully reviewed patient information, more quickly and accurately diagnosed symptoms, and expressed more openness to alternative diagnoses. These results suggest that people, even experts working in their domain of expertise, will use information differently and more effectively when in a positive mood.

An alternative theory to the idea that affect facilitates cognition is that affect is an input to cognition, the so-called *mood as information* hypothesis. This theory suggests that choices are made by using "how do I feel about it?" as a heuristic (Clore, 1994; Schwarz & Clore, 1996). According to this theory, affect itself has informational value that individuals use to make a decision, supposedly leading to superficial thinking. The theory is premised on the idea that positive affect is a signal for people that all is well, and this feeling of relative security leads people to engage in sloppy processing of information and inattention to details. Support for the mood as information theory, however, is weak. One study (Bless, Schwarz, Clore, Golisano, Rabe, & Wolk, 1996) found no impairment of cognitive processing for participants in whom positive affect was induced when asked to perform two information-intensive tasks simultaneously. A similar study found little support for the hypothesis that participants in whom positive affect is induced will be more superficial in their thinking (Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, & Simons, 1991). Supporters of the mood-as-information theory explain these results by suggesting that subjects in whom positive affect has been induced use general knowledge structures or heuristics, although the nature and form of such heuristics in information processing remains unclear.

Other studies suggest that positive affect results in more abstract cognition (Fredrickson & Branigan, 2005). This may be true but does not necessarily imply inattention to details or sloppy thinking processes. The release of dopamine in the

regions of the brain related to thinking, planning, and attention control can enable people to both think more broadly and pay more attention to details as needed (for a discussion, see Isen, 2001, 2008).

Another view suggests that the valence of information and the affect of the consumer interact such that consumers will process positive information when in a positive mood and negative information when in a negative mood. One study of product warning labels found that people in whom positive affect was induced were less likely to process information presented in a format that could ruin their positive mood (Zuckerman & Chaiken, 1998). The authors conclude that labels for subjects in positive affect are better worded "for your safety" as opposed to "danger." Another study finds that people in whom positive affect was induced recall more positive traits of the product being evaluated than do controls (Yeung & Wyer Jr, 2004). The idea that people pay attention only to information that is congruent to their affect is tempered by the findings of other studies. For example, Reed and Aspinwall (1998) found that participants in a self-affirming (positive) condition attended to negative information from a warning about health risks and even demonstrated an enhanced ability to process that negative information.

2.2. Anxious Affect and Cognition

There are several categories of research related to anxious affect applicable to consumers evaluating product information, although in general they are not as well developed as the literature studying consumers in positive affect. One set of studies is focused on arousal, typically related to heightened motivation to successfully perform a task (for example, Easterbrook, 1959). This form of arousal can be viewed as stress or a form of anxiety. Generally, mild arousal has been shown to improve performance on tasks, while more extreme anxiety impairs performance and reduces people's

ability to use informational cues (for a discussion, see Isen, 2008). One recent study by Reich and Zautra (2002) suggests that mild stress or anxiety may enhance information-processing capacity, "with the person able to draw fine distinctions and able to process many dimensions of judgment simultaneously" (p. 210). Higher levels of stress will reduce a person's ability to process information, resulting in greater use of simplified judgments and poorer discrimination of information.

Another branch of research focuses on anxiety as a form of negative affect. Raghunathan and Pham (1999) induce anxiety using empathetic stories and conclude that subjects in whom anxiety is induced are biased toward selecting low-risk and low-reward options. They find that anxiety heightens a focus on risk and primes people to attempt to reduce uncertainty. The authors also suggest that anxiety will cue negative material in memory, which leads to a narrower range of material, less systematic processing, and even interference as people try to work to overcome negative feelings. Lerner and Ketlner (2001) examined fear, which could be viewed as related to anxiety in some ways, although fear generally is associated with a strong flight response. The authors found that fear impedes consumers' processing and understanding of information, increases expected probabilities for negative events, and increases the weight consumers place on negative outcomes. Aylesworth and MacKensie (1998) found that negative affect in general decreases information processing and that thus may be related to people being more cognitively depleted because they have to spend more resources on their perceived problems.

Derryberry (1993) examined stress or anxiety as a form of negative affect, finding that although subjects in whom positive affect was induced could notice a wider range of primary information while also completing secondary tasks, subjects in whom anxiety was induced could not perform as well, demonstrated no improvement in concentration, and were more likely to miss peripheral information. Fredrickson and

colleagues report consistent findings regarding positive and negative affect and the processing of global and local information. Subjects in whom negative affect related to anxiety was induced demonstrated less ability to make connections to global information (Fredrickson, 1998; Fredrickson & Branigan, 2005). In one study of anxiety as a personality trait, as opposed to a mild transient mood, anxious subjects focus on local details if threatened (Derryberry & Reed, 2002).

These studies do not suggest a particular hypothesis for the effects of a mild anxious affect on consumer processing of product disclosure information. While some studies suggest that a mild level of anxiety or stress may enhance performance on tasks, other evidence shows that anxiety may weaken information processing. These studies do not suggest that anxious affect has similar effects on flexible thinking as has been shown for positive affect.

2.3. Relevance of Credit Card Application Process for College Students

A nationally representative survey of college undergraduates found that credit card holding among college students increased from 48 percent to 92 percent of undergraduate students from 1998 to 2003, with the average balance outstanding doubling to $2,400 over the same period (NellieMae, 2005). This same survey found that the majority of college students with credit cards obtain their first card during their freshman year and that direct mail solicitation is the primary source for students selecting a credit card vendor. Much of the literature analyzing the use of credit cards by college students and young adults focuses on restricting access to credit (Manning, 2000). No articles examining the use of credit card disclosure information by this population of consumers were located. The decision to apply for a credit card is highly relevant for this population of consumers. In particular, credit cards are likely to be a new product for this group of consumers and one with which prior experiences are

minimal. In a review of the literature related to consumer experience, Alba and Hutchinson (1987) conclude that experience with a product helps consumers to make more efficient use of available product data and to better use inferences to elaborate on available information. Lacking experience, college students may be a group of consumers for whom the design and use of mandated disclosures is particularly important.

3. Procedures and Methods

Pretest: Forty participants (21 females and 19 males) were recruited from the same subject pool of college undergraduates from which the main sample was drawn to pretest photos and words intended to induce affect. Each subject viewed 30 photos and 30 words of a neutral valence at a computer in a laboratory with individual cubicles. After viewing the neutral words and photos, half were randomly assigned to view 30 words and 30 photos of either a positive valence or of an anxious valence. Words and photos were drawn from those used in prior studies as well as from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1999) and the Affective Norms for English Words (ANEW) (Bradley & Lang, 1999). After viewing each word or photo, participants indicated their feelings along 7-point scales, including positive affect measures (good-bad, happy-sad, pleasant-unpleasant), anxious affect measures (calm-afraid, relaxed-tense, peaceful-nervous), and three neutral scales (refreshed-tired, proud-ashamed, curious-bored). All participants in the pretest study viewed neutral words or images first, then completed a filler task, and then were assigned to view either positive images and words or anxious images and words. The filler task was intended to give participants a break from a repetitive task. Although neutral prompts were not expected to induce affect, the filler task allowed any unintended induction from the neutral photos and words to dissipate before the

anxious images and words or positive images and words were evaluated. Images or words scoring as positive, anxious, and neutral were selected for use in the following studies, after excluding those with high variances.

3.1. Study 1: Hypothetical Intent to Apply Before and After Receipt of Credit Card Disclosures by Consumers in Positive, Neutral, or Anxious Affect

The first study was designed to test whether disclosures have any effects at all on this group of consumers. If consumer judgments about a credit card offer are made solely on marketing materials, and mandated disclosures are ignored, intent to apply for the card would be similar regardless of the terms and conditions in the disclosure. If these consumers do appear to ignore the disclosure in general, there is the potential that positive affect could stimulate dually broad and focused thinking such that participants in whom positive affect was induced would be more likely to incorporate the terms and conditions from the disclosure when evaluating their intent to apply. In addition, this study was designed to examine whether affect results in differential assessments of the card offer. If participants in whom positive affect is induced view all card offers more favorably and subjects in whom anxious affect is induced view all cards more negatively, this would support the notion of consumers using their mood as information.

This study used a 3x2 within-subjects design with 93 college undergraduates (43 females) in a consumer simulation lab on computers. As in all of the studies presented in this chapter, participants received course credit and not cash payments, in part to avoid the potential of payments inducing positive affect in the group intended to serve as controls. Each participant first viewed 10 words demonstrated from the

pretest to be of a positive, anxious, or neutral valence.[1] Participants were told they were being asked questions about these words as part of a "pre-test for a future marketing experiment because today's study would take less time than the minimum required by the lab." Participants viewed each word on the computer screen and were then asked to think about how it made them feel. Below the word was a prompt to type the first associate ("type the first word that comes to mind"). Next they were asked to rate how that word made them feel along a set of nine 7-point mood scales, as was employed in the pretest.

After the induction, participants viewed a brief marketing letter offering a "college student credit card" on the computer screen. The first display was viewed by all subjects and contained only nonspecific, general information such as that the card was "pre-approved" and offered "free online account management" (see Appendix 3.A). None of the card's terms, conditions, or pricing were included. This is consistent with the approach card marketers often employ, where an initial ad or letter provides only general information. All participants were then asked to answer the question "If you were in the market for a credit card today, how likely would you be to apply for this card?" using a 7-point scale ranging from "very unlikely" to "very likely."

On the next screen, a standard credit card disclosure matrix in a 10-point typeface with a high level of detail was displayed (see Appendix 3.A). Half of the participants were randomly assigned to a card with good terms and conditions, the other half to a card with poor terms and conditions, as summarized in Table 3.1. These terms and conditions were determined by comparing offers included in the New York State Banking Department Credit Card Survey conducted the month the experiment began. After viewing the onscreen disclosure, participants were then asked the same

[1] Positive words: smile, blossom, joy, music, holiday, beautiful, cozy, fun, soft, puppy. Anxious: exam, interview, panic, risk, crisis, intense, cancer, failure, presentation, perform. Control: verb, door, hand, chair, clock, branch, month, street, number, window.

question regarding their hypothetical intent to apply after reviewing the detailed disclosures, with no opportunity to go back and reexamine the initial advertisement or the disclosure matrix.

Table 3.1: Terms and Conditions of Good and Bad Credit Card Offers Viewed

	APR 6 months	APR post-promotional period	APR if missed payment	Annual fee	Grace period	Late fee	Account setup fee
Poor card	9.0%	18.24%	32.24%	$48	15 days	$39	$29
Good card	0.0%	9.24%	16.24%	$0	30 days	$19	$10

Of the 29 participants in the positive condition, 14 viewed the good card and 15 viewed the poor card offer. Of the 32 participants in the control condition, 15 viewed the good card offer and 17 viewed the poor card offer. In the anxiety condition, the 32 participants were evenly split, with 16 each viewing the good or bad card offer.

Manipulation Check

The manipulation check involved participants answering the same nine 7-point mood rating scales used in the pretest. Each 3-question scale was combined into a composite score, reported in Table 3.2. The positive and anxiety mood scales were generally reliable; using a Chronbach's alpha the coefficient was *0.878* for the three positive mood scale items, and *0.828* for the three anxious mood scale items. As might be expected, the composite neutral mood scale was less reliable (α*=0.484*).

A mixed two-way analysis of variance (ANOVA) on the mood scale ratings with three between (positive, anxiety, and neutral mood scales) and three within (positive words, anxious words, and neutral words) conditions revealed a significant main effect of scale type (*F=41.68, p<.001*) but not of affect manipulation condition.

A comparison of the mood scale scores reveals that participants in the anxious words condition rated their mood as significantly more anxious on the anxiety scale than participants in the neutral words condition (*M=2.4, M=2.9, t=1.95, p=0.03*). There were not significant differences between participants in the anxious words condition and participants in the neutral words condition in responses on the positive or neutral mood scales, however.

Table 3.2: Manipulation Check Study 1, Mood Scale Ratings (Mean, Variance, and Number of Observations)

	Positive words (n=29) Mean (Var)	Control words (n=32) Mean (Var)	Anxious words (n=32) Mean (Var)
Positive scale (1=happy)	2.71 (1.00)	2.89 (1.50)	3.25 (1.55)
Anxiety scale (7=anxious)	2.66 (0.98)	2.37 * (1.32)	2.92 * (1.16)
Neutral scale	3.34 (0.87)	3.67 (1.41)	3.98 (0.79)

* *t=-1.95; p=0.03*

Results

All participants began with the same overview of a credit card offer with no terms and conditions provided. They answered an initial intent to apply for the card, then received disclosures with terms and conditions, and then again indicated their intent to apply. Treating intent to apply before and after receiving the disclosure as a repeated measure, a mixed two-way ANOVA on the hypothetical intent-to-apply ratings with six between- (positive, anxiety, and neutral mood affect manipulations x good and poor card offers) and two within-subject (pre and post receipt of disclosure periods) conditions revealed no significant main effect of affect manipulation

(*F=0.56, p=0.572*) or of card type (*F=3.37, p=0.069*). An affect manipulation by type of card interaction was also not significant (*F=0.45, p=0.638*). An interaction of card type by the post-disclosure period yields a significant effect on intent to apply ratings after viewing a good or poor card (*F=5.36, p=.023*). These results suggest that the quality of the offer had an effect on post-disclosure scores, but affect condition had no effects pre- or post-disclosure as a main effect or interaction.

A planned between-subjects ANOVA on intent to apply in the pre-disclosure period showed no significant differences between card types, affect condition, or of an affect-condition-by-card-type interaction. This was expected, as no details were yet revealed to create any differences. An ANOVA on hypothetical intent to apply after being provided with detailed mandated disclosures resulted in a main effect of the quality of the card, as would be expected if participants incorporated the disclosure information into their post-disclosure intent-to-apply ratings (*F=13.48, p<.001*). An interaction of card quality and affect was not significant. A summary of the mean hypothetical intent to apply ratings from Study 1 is provided in Table 3.3.

Discussion

One potential outcome was that college students, who may be unfamiliar with credit disclosures, would bypass that information and rely instead on the marketing information to evaluate the card. The significant differences in post-disclosure intent to apply between good and poor card offers suggest that participants did read the disclosure information and incorporated this information into their evaluation of the credit card offer.

There is no evidence that participants in whom anxiety was induced did not use the disclosure information, as might be predicted based on past studies showing that anxiety leads to narrow or expedited thinking. There is also no evidence that

participants in whom anxiety was induced were more negative regarding the card offer either pre- or post-disclosure. This study provides evidence that consumers do use the information contained in disclosures, as shown in Figure 3.1, but is inconclusive regarding the role of affect for consumer processing of disclosure information.

Table 3.3: Study 1 Intent to Apply for Card (1=very unlikely; 7=very likely) for Credit Card Pre- and Post-Disclosure (Means, Variances, and Number of Observations)

Mean (Var) n	Poor card offer		Good card offer	
	Pre	Post	Pre	Post
Positive	4.00 (2.46) 14	3.43 (1.80) 14	3.67 (2.52) 15	4.13 (1.84) 15
Control	3.94 (1.68) 17	3.24 (1.69) 17	3.53 (3.27) 15	4.27 (0.92) 15
Anxiety	3.19 (3.50) 16	3.25 (1.53) 16	3.63 (2.78) 16	4.13 (0.52) 16
All conditions	3.70 (2.56) 47	3.30 (1.60) 47	3.61 (2.73) 46	4.17 (1.04) 46

3.2. Study 2: Positive, Neutral, and Anxious Affect and Intent to Apply for a Single "Average" Card with Controls for Past Credit Card Experiences

The second study employed a 3x1 between-subjects design using word inductions with positive, anxiety, and control conditions with 65 undergraduates (25 female) participating for course credit. The induction procedure was identical to that of Study 1, with the exception that several words were replaced with other words from the original pretest.[2] Participants answered the same set of nine 7-point mood scales

[2] Positive: smile, blossom, joy, *happy*, *gentle*, *sweet*, *pretty, bright, lovely*. Anxious: cancer, exam, interview, panic, *risky*, *evaluation*, *deadline*, failure, perform. Control: *building*, *paper*, *front,* month, door, station, *floor, sign, page* (words not used in Study 1 in italics).

used in Study 1. Of the 65 participants, 22 viewed words of a positive valence, 20 viewed neutral words as a control, and 23 viewed words of an anxious valence.

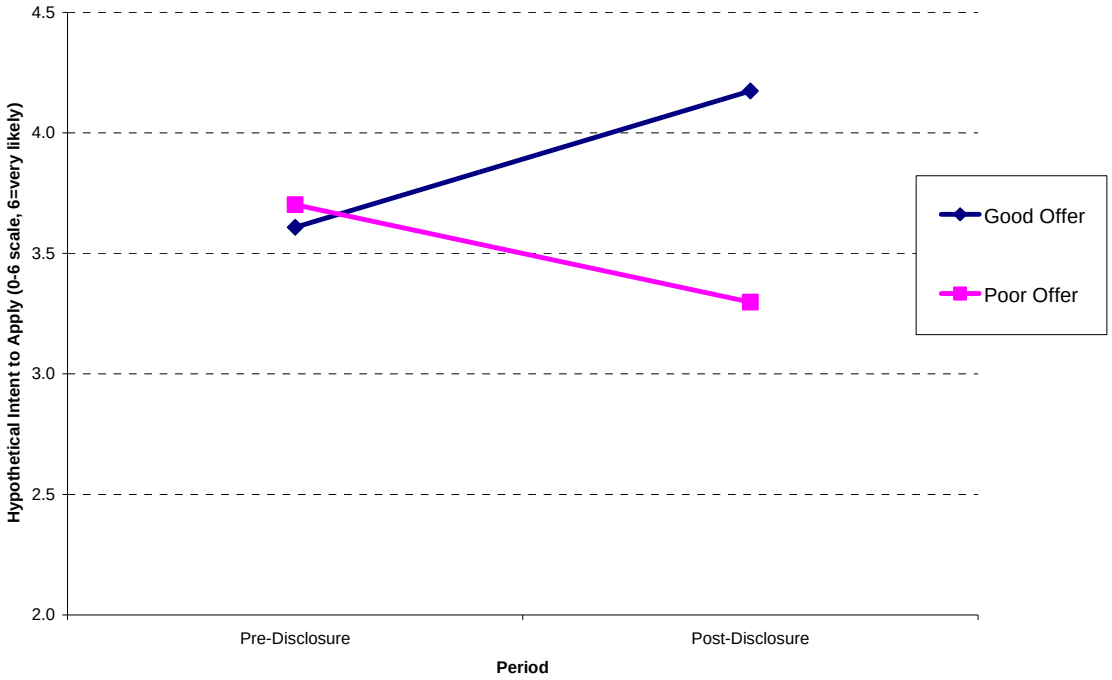


Figure 3.1: Intent to Apply Ratings Pre and Post Disclosure by Quality of Offer

At the start of the main task, all participants received the same two-page credit card offer, which was a photocopy of an actual credit card offer received by the author (see Appendix 3.A). The first page was a cover letter with information about the card, highlighting 10,000 bonus points that could be used to order a $100 gift card that could be used at a leading retail chain. The offer letter also included benefits such as the ability to earn airline miles and a limited-time 0% interest rate on balance transfers. The second page included a standard credit card disclosure with more details on the offer. Participants rated their hypothetical intent to apply after first receiving the information about the card, although they had as much time to review the materials as they wanted before answering. After indicating intent to apply for the card and confidence in that intent-to-apply rating, participants then listed positive and negative

features of the card. After listing positive and negative attributes, participants were again asked to rate their intent to apply and their confidence in that rating. The number of positive and negative items listed was counted for each participant. Although participants could choose to list no items, all participants listed at least one item. No time limits were imposed, and participants could refer to the printed information throughout the study. At the end of the study, participants were asked to indicate the number of cards they owned as a measure of past experiences in the credit card market.

Manipulation Check

The manipulation check involved participants answering the same nine 7-point mood rating scales used in the pretest and Study 1. Each 3-question scale was combined into a composite score, reported in Table 3.4. The positive and anxiety scales were generally reliable; using a Chronbach's alpha the coefficient was *0.95* for the three positive mood items, and *0.94* for the three anxious mood items. As in Study 1, the neutral scale was less reliable (α*=0.51*). A mixed two-way ANOVA on the mood scale ratings with three between (positive, anxiety, and neutral mood scales) and three within (positive words, anxious words, and neutral words) conditions revealed a significant main effect of scale type (*F=45.48, p<.001*), but an affect manipulation condition by scale type interaction was not significant at standard levels (*F=2.18, p=.075*).

Results

Participants received the card offer on paper at the start of the experiment with all information provided and available to answer all questions, much like what consumers would actually experience when receiving a card offer in the mail. After an

initial evaluation, having participants list positive and negative items of information from the offer serves to focus attention on the offer's terms and conditions.

Table 3.4: Manipulation Check Study 1, Mood Scale Ratings (Mean, Variance, and Number of Observations)

	Positive words (n=22)	Control words (n=20)	Anxious words (n=23)
	Mean (Var)	Mean (Var)	Mean (Var)
Positive scale (1=happy)	5.16 * (0.44)	4.70 * (0.95)	4.60 (2.04)
Anxiety scale (7=anxious)	4.62 (2.88)	4.45^ (0.89)	4.98^ (0.83)
Neutral scale	3.56 (0.16)	3.56 (0.12)	3.64 (0.05)

** t=1.8, p=0.04; ^ t=1.9, p=0.04*

Table 3.5 provides a summary of intent to apply, confidence in intent to apply, the number of items participants wrote as being liked and disliked about the card, a relative rating of this card offer compared to other offers, and the number of credit cards participants report owning at the time of the experiment. An two-way mixed ANOVA on intent-to-apply rating before and after the focusing activity as a repeated measure reveals a significant main effect of the focusing activity (*F=4.1, p=.05*), but an interaction between period and affect condition was not significant (*F=2.36, p=.10*).

Participants in whom positive affect was induced provided a higher hypothetical intent to apply at the initial stage (*M=2.6*) than controls (*M=2.0, t=1.94, p=.03*). A comparison of intent to apply for the card after the focusing activity between subjects in whom positive affect was induced and controls was not significant, however. Subjects in whom anxiety was induced exhibited greater intent to apply after the focusing activity than before the focus activity (*M=2.0, M=2.5, t=2.2,*

p=.02). Subjects in the neutral condition exhibited a tendency for greater intent-to-apply ratings after the focusing activity, but not at significant levels (*M=2.0, M=2.45, t=1.6, p=.07*). Subjects in the positive condition did not exhibit significant changes in intent to apply before and after the focusing activity (*M=2.6, M=2.5, t=.78, p=.77*). An ANOVA on intent to apply revealed no significant effects involving the number of credit cards the participant owned, a measure of his or her experience level in this market. Similar ANOVAs on confidence in intent to apply, number of like or disliked items listed, and ratings of this card compared to others all yielded no significant effects of affect condition or number of cards owned as main effects or interactions.

Discussion

The use of a credit card offer letter and attached disclosure provided on paper at the outset and retained throughout the experiment is a more realistic consumer credit card offer experience than was provided in Study 1. Each participant answered an intent to apply for the card based on his or her initial use of the information, and then updated his or her opinion after reviewing the information in the offer and listing positive and negative attributes of the card offer. The process of listing information serves as a focusing activity guiding the participant to review the materials. The card itself was an average offer, designed not to provoke strong positive or negative reactions (unlike the more extreme offers in Study 1).

Participants in whom positive affect was induced rated the card more favorably from the outset. However, since controls and participants in whom anxiety was induced rated the card at similarly high levels at the end of the study, positive affect may be viewed as facilitating a more accurate initial review, whereas other conditions required focusing efforts to recalibrate their evaluation, as shown in Figure 3.2. It cannot be concluded that anxiety is related to focusing on negative aspects, since

participants in whom anxious affect was induced did not list fewer items as being liked or more items as disliked compared to controls. Likewise, participants in whom positive affect was induced did not list fewer negative or more positive items than controls.

Table 3.5: Study 2 Intent to Apply, Confidence in Intent, Number of Items Listed, Relative Rating of Card, and Number of Credit Cards Owned (Means, Variances, and Number of Observations)

	Positive words (n=22)	Control words (n=20)	Anxious words (n=23)
	Mean (Var)	Mean (Var)	Mean (Var)
Hypothetical Intent to Apply 1 (0-6 scale)	2.64 (0.91)	2.00 (1.37)	2.04| (1.13)
Hypothetical Intent to Apply 2 (0-6 scale)	2.50 (0.45)	2.45 (0.37)	2.52 (0.26)
Confidence in Intent Rating 1 (0-6 scale)	1.95 (0.71)	2.00 (0.84)	2.09 (0.81)
Confidence in Intent Rating 2 (0-6 scale)	1.77 (0.28)	2.00 (0.63)	2.13 (0.66)
Number of items participant listed as liked about the card	2.64 (2.24)	3.35 (3.82)	3.48 (8.44)
Number of items participant listed as disliked about the card	1.91 (1.80)	2.50 (1.42)	2.91 (7.90)
Rating of this card offer compared other card offers (0-6 scale)	2.23 (0.28)	2.21 (0.18)	2.26 (0.29)
Number of credit cards participant reports owning	2.00 (0.38)	2.35 (0.98)	2.04 (0.95)

Based on prior literature, it might be predicted that participants with more experience with credit cards would have greater confidence in intent to apply, would list more items as liked or disliked, and would be less likely to change intent-to-apply ratings after the focusing activity. In this study, number of credit cards owned was not

significant as a main effect or as an interaction with affect in terms of intent to apply, confidence in intent to apply, relative rating of the card, or number of liked and disliked items listed about the card.[3]

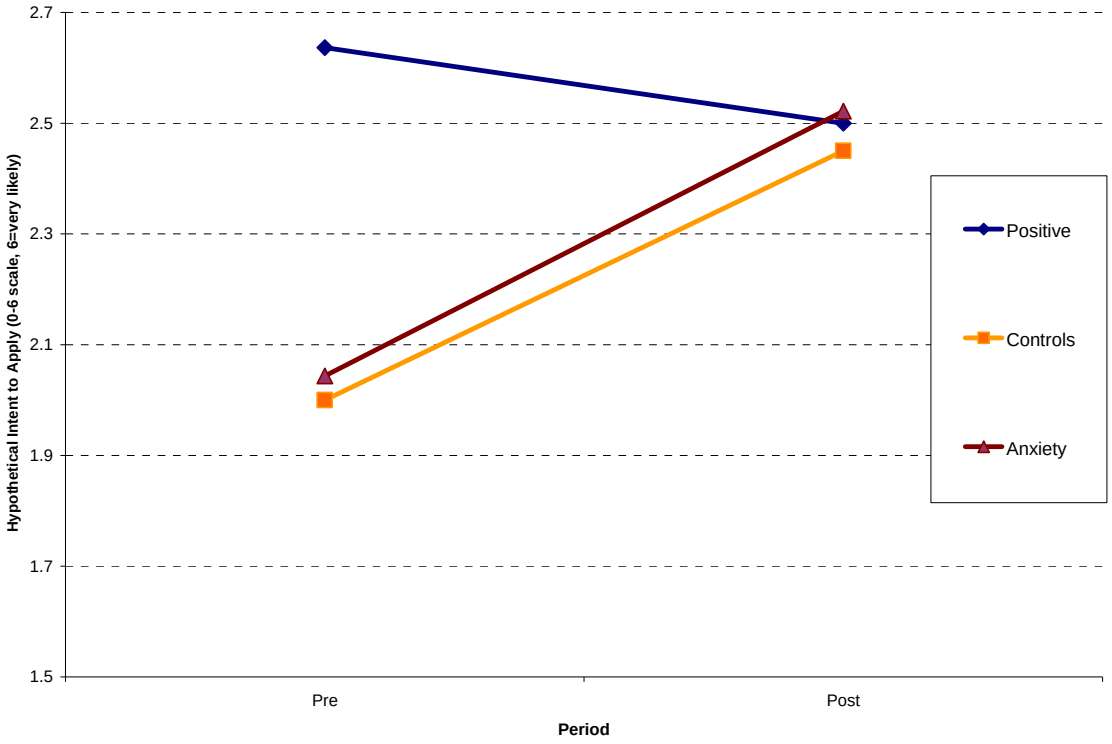


Figure 3.2: Rating of Intent to Apply Pre and Post Activity Focusing on Disclosure Information by Affect Condition

3.3. Study 3: Requests for Information, Detection of Missing Information, and Hypothetical Intent to Apply

The third study was designed to more precisely evaluate how consumers use information and whether they detect missing information in a credit card offer. Like Study 2 participants, all received an identical two-page offer consisting of an offer letter and standard disclosure matrix as might be received in the mail (see Appendix 3.A). Unlike the procedure in Study 2, however, all subjects received a disclosure that

[3] A Sobel test of mediation also revealed no significant results.

omitted all information on annual fees. After receiving the offer letter and disclosure, study participants were first asked what more information they would want, if any, about this offer. They could list as many items as they wished, or none at all. Then participants rated their hypothetical intent to apply and confidence in that intent to apply, as in Study 2. Unlike Study 2, participants then answered 13 factual multiple-choice questions about the card. As in Study 2, participants then listed positive and negative attributes of the card and were given a second opportunity to rate their hypothetical intent to apply as well as their confidence in that rating. Each participant reported the number of credit cards he or she owned, as well as providing a self-reported assessment of how easy or hard it would be to obtain a card, and how many times he or she has applied for a card before.

Eighty-eight participants (41 females) were assigned to one of five conditions: positive affect induced with images (n=18), positive affect induced with a bag of candy (n=17), anxious affect induced with images (n=19), a control condition with neutral images (n=16), and a no-manipulation condition (n=17). Participants assigned to conditions using images viewed a slide show of 15 photos selected from the pretest as being of positive, anxious, or neutral valence. Each slide was shown for 6 seconds, and the slides advanced automatically. Participants were told to view the entire 90-second slide show and then to "think about the images you just viewed and indicate how these images made you feel, on the scales below." Participants then completed the same set of nine 7-point mood scales as in Study 2. As part of the study check-in and consent process, participants in the candy-induction condition were given a clear plastic bag tied with a red ribbon containing 10 wrapped hard candies. These participants received a note explaining that this was a "token of appreciation for participating today for you to take home and enjoy later." These participants and participants in the no-manipulation condition began the study directly without viewing

any images. After completing the main portion of the study, all participants were asked to solve a word jumble (RGNDEA), which could be solved for several different words (garden, ranged, danger). The valence of the word each participant entered was taken as an implicit measure of mood (for a discussion of the use of implicit measures in affect research, see: Estrada, Isen, & Young, 1994; Isen & Erez, 2007).

Manipulation Check

Of the five condition groups, three completed the same set of 7-point mood scales used in the previous studies after viewing the assigned set of images, which were described as being part of a pretest for another experiment. The no-manipulation condition and candy condition groups did not view the images; therefore, there was no plausible reason to have participants complete the mood scales, which might increase suspicions about the study. All condition groups did receive the word-jumble anagram, however. The jumble is then the primary manipulation check used to confirm the induction and to explore whether the two positive affect conditions (images and candy) could be combined into one group, and whether the two neutral affect conditions (no manipulation and neutral images) could be combined into one group.

Table 3.6 displays the scale responses for the three image inductions. The scales again proved reliable using Cronbach's alpha for the positive scale (α=*.94*) and the anxiety scale (α=*.96*). As in previous studies, the neutral scale had a lower coefficient (α=*.51*).

A mixed two-way ANOVA with 3 between (positive, anxious, and neutral images) and 3 within (positive, anxiety, and neutral mood scales) revealed a significant main effect of affect (*F=30.0, p<.001*) and type of scale (*F=5.0, p=.009*), as well as a significant affect condition by scale type interaction (*F=43.0, p<.001*). Planned comparisons of the positive image condition with the neutral image condition

demonstrate that the positive image condition was significantly more positive on the positive scale (*M=4.9, M=3.9, t=3.0, p=.003*) but that differences on the neutral and anxiety scales were not significant. Likewise, comparisons of the anxious image condition with the neutral image condition demonstrate that the anxious image condition was significantly more anxious on the anxiety scale (*M=5.0, M=2.6, t=8.0, p<.001*) but that differences on the positive and neutral scales were not significant.

Table 3.6: Manipulation Check Study 3, Mood Scale Ratings (Mean, Variance, and Number of Observations)

	Positive images (n=18) Mean (Var)	Neutral images (n=16) Mean (Var)	Anxious images (n=19) Mean (Var)
Positive scale (1=happy)	4.85* (0.81)	3.88* (1.02)	1.90 (0.72)
Anxiety scale (7=anxious)	2.06 (0.96)	2.58^ (0.73)	4.97^ (0.81)
Neutral scale	4.36 (0.97)	3.53 (1.35)	3.29 (1.15)

** t=3.0, p=0.003; ^ t=8.0, p=0.000*

As a check of the word jumble as an implicit mood measure, responses to the mood scale for the three image conditions can be compared to the solutions for the jumble, as displayed in Table 3.7. Solutions to the word jumble were coded as "no solution," "garden," "danger," and "ranged." We conceptualized the solution of "garden" as being reflective of positive affect, "danger" related to anxiety, and "ranged" as neutral. A mixed two-way ANOVA on the mood scales as repeated measures with 4 between (garden, danger, ranged, no solution) and 3 within (positive, anxious, or neutral mood scales) revealed a strongly significant scale type by jumble-solution interaction (*F=4.43, p<.001*), suggesting that the jumble solutions are consistent with mood scale responses.

Table 3.7: Verification of Implicit Measure of Affect Induction, Mood Rating Scales (Mean, Variance, and Number of Observations)

	No solution (n=20)	"Garden" (n=16)	"Danger" (n=9)	"Ranged" (n=8)
	Mean (Var)	Mean (Var)	Mean (Var)	Mean (Var)
Positive scale (1=happy)	3.77 (1.65)	4.23 (2.40)	1.82 (1.06)	3.25 (2.06)
Anxiety scale (7=anxious)	2.80 (1.50)	2.71 (2.10)	5.15 (1.36)	3.38 (2.62)
Neutral scale	3.60 (1.02)	4.25 (1.40)	2.83 (0.69)	4.00 (1.50)

Table 3.8 presents a count of participants' coded responses to the word jumble task. An overall chi-squared of the four jumble solutions (3 correct solutions as well as no correct solution) by affect condition was significant ($\chi^2=26.9, p=.008$). A comparison between the neutral images and no-manipulation conditions was not significant ($\chi^2=.02, p=.87$) for participants solving the jumble for "garden." Likewise, there was no significant difference in the solution for "danger" ($\chi^2=.25, p=.62$), nor for "ranged" ($\chi^2=1.65, p=.2$). Chi-squared comparisons between these two conditions and participants being unable to solve the jumble were not significant ($\chi^2=1.8, p=.18$). Similarly, chi-squared comparisons of the candy and positive image conditions were not statistically significant for the solution of "garden" ($\chi^2=1.5, p=.2$), "danger" ($\chi^2=1.1, p=.3$), or "ranged" ($\chi^2=.95, p=.3$). Chi-squared tests reveal no significant differences between the positive-image and the candy-manipulation conditions for participants being unable to solve the jumble ($\chi^2=.02, p=.89$). The lack of significant differences between the neutral-image and no-manipulation conditions suggests these participants can be combined into one control group. Likewise, the lack of significant differences between the positive image and candy conditions suggests these two conditions can be combined into one positive affect group. This results in three

comparison groups for this study: positive (n=35), anxious (n=19), and controls (n=34).

Table 3.8: Count of Solutions to Word Jumble "RGNDEA" by Condition

	No solution	Garden	Danger	Ranged	n
Positive images	7	9	0	2	18
Neutral images	9	3	1	3	16
Anxious images	4	4	8	3	19
No-manipulation	6	3	2	7	18
Positive candy	7	5	1	4	17

Table 3.9 presents the word jumble as a manipulation check for the three combined groups. An overall chi-squared between affect condition and jumble solution is significant ($\chi^2=21.8, p<.001$). A comparison for the solution of "garden" between participants in whom positive affect was induced and controls is also significant ($\chi^2=4.2, p=.04$) but not significant for other solutions, including no solution. In the same way, a comparison for the solution of "danger" between participants in whom anxiety was induced and controls was also significant ($\chi^2=2.8, p=.004$) but not significant for other solutions, including no solution.

Table 3.9: Combined Conditions, Count of Solutions to Word Jumble: "RGNDEA"

	No solution	Garden	Danger	Ranged	n
Positive	14	14	1	6	35
Controls	15	6	3	10	34
Anxiety	4	4	8	3	19
Total	33	24	12	19	88

Results

Table 3.10 presents the dependent variables for Study 3. After being handed the offer for a credit card, participants were asked to list any additional information they would like to have and were instructed to type "none" if they would not like to see any more information.

Table 3.10: Study 3, Listing of Additional Items Wanted, Intent to Apply, Confidence in Intent, Correct Answers about Card, and Listing of Positive and Negative Attributes (Means, Variances, and Number of Observations)

	Positive (n=35)	Control (n=34)	Anxiety (n=19)
	Mean/Count (Var)	Mean/Count (Var)	Mean/Count (Var)
Number of subjects wanting no more information (count)	10	18	9
Number of items of information wanted (including 0)	1.57 (2.84)	0.74 (1.05)	1.00 (1.78
Number of of subjects listing "annual fee" information as wanted (count)	10	3	4
Intent 1 (0-6 scale)	2.91 (1.20)	3.09 (1.23)	2.37 (1.02)
Intent 2 (0-6 scale)	2.69 (0.81)	2.62 (0.79)	2.16 (0.81)
Confidence Intent 1 (0-6 scale)	2.97 (0.56)	3.06 (0.54)	3.16 (0.59)
Confidence Intent 2 (0-6 scale)	3.09 (0.49)	3.21 (0.53)	3.16 (0.36)
Number of correct answers on factual questions (0-13)	9.57 (2.55)	8.97 (3.61)	9.79 (4.18)
Number of items liked	3.11 (3.28)	3.09 (1.84)	2.47 (3.82)
Number of items disliked	2.80 (1.81)	2.59 (1.89)	2.84 (1.92)

An ANOVA on the number of items listed reveals a significant main effect of affect condition (*F=3.2, p=.04*). A comparison of the number of items listed between participants in whom positive affect was induced and controls reveals that positive-affect participants listed more items than controls did (*M=1.60, M=0.74, t=2.5, p=.008, 1-tailed*). The number of items listed by participants in whom anxious affect was induced was not significant in comparison to controls. Chi-squared comparisons of participants writing down that no additional items of information were wanted was not significant by affect condition. A comparison of participants in whom positive affect was induced reveals they were less likely to type "none" than controls were (χ^2*=4.3, p=.04*). An overall chi-squared on affect condition by a coded variable for participants typing "annual fees" as wanted information was not significant, but a planned comparison between participants in whom positive affect was induced and controls shows the former were more likely to list annual fees as desired information (χ^2*=4.4, p=.04*).

A mixed two-way ANOVA on intent to apply before and after the focusing activity as a repeated measure did not yield a significant effect of affect condition at standard significance levels (*F=2.7, p=.07*) but did reveal a significant main effect of period (*F=16.8, p<.001*). An interaction of period and the affect condition was not significant (*F=1.45, p=.24*).

Comparisons between intent to apply before and after the focusing activity were not significant for participants in whom anxious affect was induced nor for participants in whom positive affect was induced. A comparison of intent to apply before (*M=3.1*) and after (*M=2.6*) the focusing activity reveals that controls did exhibit lower intent-to-apply ratings after answering factual questions and listing positive and negative attributes (*t=1.9, p=.03, 1-tailed*). Comparisons of participants in whom anxious affect was induced and controls yield a significantly lower intent to

apply at both the initial review (*M=2.4, M=3.1, t=2.3, p=.01, 1-tailed*) and after the focusing activity (*M=2.2, M=2.6, t=1.8, p=.04, 1-tailed*).

An ANOVA on confidence in intent to apply as a repeated measure before and after the focusing activity did not yield a significant effect by affect condition. Interactions between affect condition and period were also not significant. As in Study 2, there were no significant differences in participants listing negative or positive attributes by affect condition.

An ANOVA on the number of multiple-choice questions the participant answered correctly (out of 13) was not significant by affect condition. A comparison of means in Table 3.10 shows that participants in whom positive affect was induced and participants in whom anxious affect was induced showed a tendency to answer more of the 13 factual questions about the card correctly than controls, although these results did not achieve the customarily accepted 5% significance level for a 1-tailed test (*both t=1.4, p=.08, 1-tailed*).

Table 3.11 summarizes past experiences with credit card offers, including the number of cards the participant reported owning, the number of times he or she previously applied for a credit card, and his or her perceived difficulty in obtaining a credit card. ANOVAs on the variables in Table 3.11 are not significant as dependent variables by affect, as expected in a randomized setting. An ANOVA on the number of correct answers to the 13 multiple-choice questions participants answered about the card yields a main effect of number of cards owned (*F=2.37, p=.04*) but not the other measures of experience. An ANOVA on number of correct answers reveals a main effect of number of cards (*F=2.79, p=.02*) and significant interaction between number of cards and affect condition (*F=2.21, p=.04*), but no main effect of affect (*F=.33, p=.72*). A Sobel test of mediation on number of cards and affect was not significant.

Table 3.11: Past Experience with Credit Cards, Number of Cards Owned, Self-reported Difficulty in Obtaining a Card, Number of Previous Applications, and Self-reported Likelihood of Being Approved for a Credit Card (Means, Variances, and Number of Observations)

	Positive (n=35)	Control (n=34)	Anxiety (n=19)
	Mean (Var)	Mean (Var)	Mean (Var)
Number of cards owned	1.14 (0.83)	1.53 (1.35)	2.00 (4.44)
Number of times applied for credit card before	1.97 (0.91)	2.47 (1.65)	2.58 (2.04)
How likely to be approved (0-6 scale)	3.61 (0.43)	3.33 (0.98)	3.78 (0.30)

Discussion

Consistent with past studies showing that positive affect contributes to broad yet flexible thinking, participants in whom positive affect was induced were more likely to list more information as being needed than were controls (Isen, Daubman, & Nowicki, 1987). Participants in whom positive affect was induced were also more likely than controls to write down that information on annual fees was desired, information that was omitted from the disclosure form. Participants in whom anxious affect was induced also did not list more items than controls did, and were not significantly more likely to list annual fee as desired information. This suggests that anxiety is not related to broader thinking, a finding reported previously in the literature.

As in Study 2, participants in whom positive affect was induced tended to maintain a consistent intent to apply before and after a focusing activity, while the mean intent to apply for the control group was significantly different after the focusing activity. This again may show participants in whom positive affect was induced more fully using the information at the outset. Figure 3.3 shows that participants in whom

anxiety was induced rated their intent to apply lower both before and after the focusing activity and did not demonstrate a significant change in intent to apply, unlike Study 2. This may be evidence that these participants could sense information was missing and were more conservative when assessing intent to apply in general, even though they failed to specifically list annual fee information as an additional piece of information they would like to have at statistically significant levels. About 21 percent of participants in whom anxiety was induced wrote down that information about annual fee was desired, compared to 9 percent of controls (and 29 percent of the positive affect group).

While participants in whom positive or anxious affect was induced did not change intent to apply for the card after the focusing activity, controls did express lower intent to apply after the focusing activity, as shown in Figure 3.3. This could suggest a need for recalibration from the initial assessment after being guided through the disclosure information.

Overall, these findings suggest that affect does play a role in how consumers use mandated disclosure information for credit card offers. Positive affect is most strongly distinguished by the demand for more items of information as well as the ability to detect missing information, as compared to a neutral affect.

It is notable that the manipulation check shows that participants viewing the neutral images are not significantly different from the no-manipulation group. There is therefore no evidence of the images having a particular effect or causing arousal. Similarly, participants receiving candy and participants viewing positive images were not significantly different from each other. There is no evidence that handing participants a bag of candy created an experimenter effect compared to having participants view positive images. The converging operations of these affect

inductions build on previous studies to support robust mechanisms of inducing affect in a lab setting.

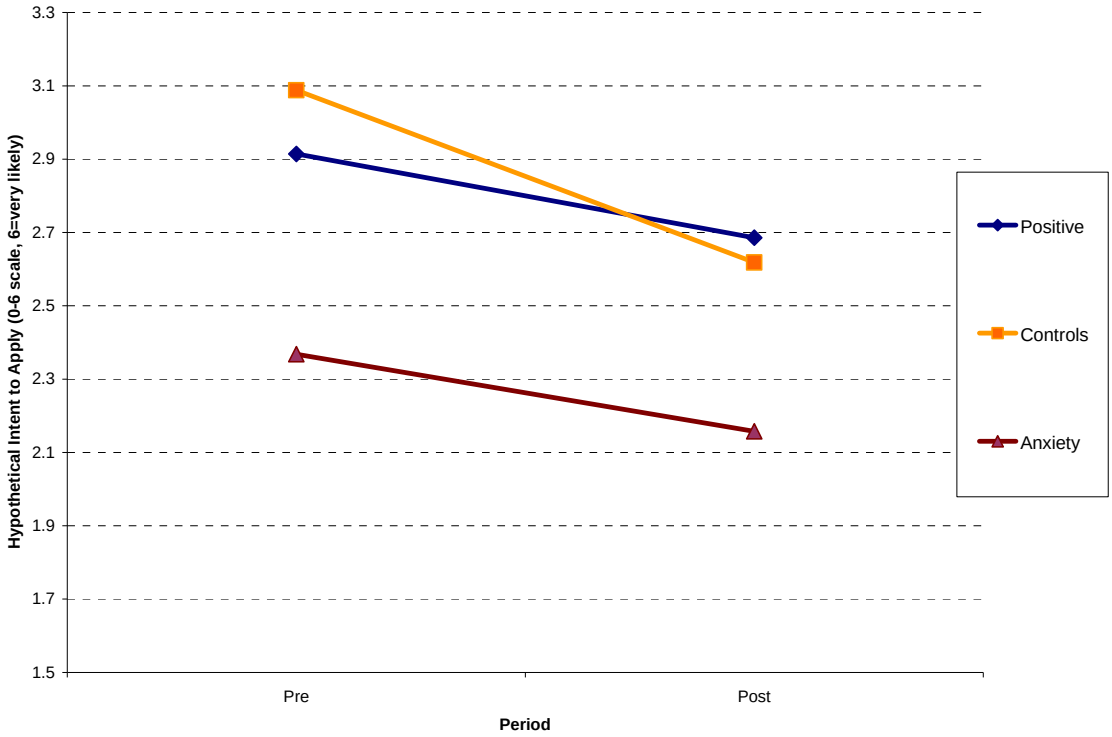


Figure 3.3: Intent to Apply Rating Pre and Post Activity Focusing on Disclosure Information by Affect Condition

4. Implications

Economic models typically predict that households will search for and process information up to the point at which the marginal benefits of more information equal the marginal benefit of that information for making a decision. While disclosures can standardize and expand available information, there is a trend in the design of disclosures to simplify and limit the information provided. This study suggests that consumers who are not in a positive mood are less likely to seek additional information outside of the disclosure and are less likely to make connections to existing knowledge. While simplified formats and user-friendly disclosure designs

should not harm consumers, even simplified formats must include all important information and not expect consumers to search for additional information outside the disclosure form. Meanwhile, the efforts of credit card issuers to induce positive affect through gifts and rewards may result in consumers more carefully using disclosure information—although this is not less likely to result in a decreased intent to apply based on these studies.

More generally, these studies help better define the role of affect and the use of information by consumers. Contrary to the mood-as-information hypothesis (e.g., Schwarz, 2002; Schwarz & Clore, 2003), which holds that positive affect leads to careless thinking and only application of routine existing knowledge structures, this study shows that participants in whom positive affect was induced demonstrate careful and flexible (both broad and focused) thinking. In recent writings (e.g., Schwarz, 2002) the proponents of the mood-as-information view have proposed an exception to the case of material that is "fun" or playful. However, this study shows careful thinking among participants in whom positive affect was induced, even with material that is likely be dry and technical for a typical college student. Positive affect appears to facilitate sufficient attention to the information provided to prompt participants to notice when needed information has been omitted, one of the most difficult of all logical problems. There is no evidence that participants in whom positive affect was induced viewed the credit card offer information through rose-colored glasses; nor did they focus only on items congruent with their mood. Participants in whom positive affect was induced also do not appear to take their positive mood as a signal to "coast" through the materials without paying attention, as some authors have discussed (see Carver, 2003). Instead, these participants listed more items about the card than controls, and showed a tendency to answer more factual questions accurately.

This study also provides little support to mild anxiety as a performance enhancement. Like subjects in whom positive affect was induced, subjects in the anxiety condition in this experiment showed a tendency to answer more factual questions accurately. But participants in whom anxiety was induced did not notice missing information at the rate of those in positive affect, nor did they seek more items of information than controls. It is unclear whether the lower ratings of intent to apply among participants in whom an anxious affect was induced were attributable to their mood or to their sense that information was missing. Although they did not list annual fees as missing, they appear to have reviewed the card information at least as well as did the controls. There is no evidence that participants in whom anxious affect was induced focused more on negative attributes of the card. It may be that anxiety serves to stimulate focusing of attention, somewhat like positive affect. But whereas positive affect is associated with dually broad and flexible thinking, anxious affect does not facilitate connections to material beyond that which is provided.

Study 3 had a larger number of subjects in the control and positive conditions than in the anxiety condition since the latter only used one affect-manipulation method. It is possible that had the anxious affect group been larger, participants in whom anxious affect had been induced might have demonstrated superior performance on the factual questions about the card than controls. A future study could attempt to replicate these results with a larger sample.

A future study could also explore differences in how participants actually search for additional information by affect condition rather than list items they may desire. Positive affect may result in consumers using more information about a product even if searching for information takes some effort.

These findings reinforce affect as a factor that is relevant to the consumer's use of information and provides insights into how consumers evaluate financial products,

using credit cards as an example for a population of likely new entrants to the credit card market.

APPENDIX 3.A. CREDIT CARD INFORMATION

Experiment 1: Initial Credit Card Information Provided

A student card for campus and beyond!

- As an enrolled student you are pre-approved
- Low introductory interest rates.
- Acceptance at millions of locations
- No minimum income or cosigner required
- Receive big discounts at some of your favorite stores for students only when you use this card
- Free credit education tips and tools from UseCreditWisely.com
- Protect your account with identity theft solutions, Photocard option, and the Lost Wallet Service
- Free Online Account Management
- Personal information protected by VISA Privacy Policy
- $0 liability on unauthorized charges

Experiment 1: Disclosures

Please read these Terms and Conditions.

DISCLOSURES	
Annual percentage rate (APR) for purchases	0.00% for 6 months from date of account opening. After that, 18.24% variable.
Other APRs	Balance Transfer APR: 0.00% for 6 months from date of account opening. After that, 18.24% variable. Cash advance APR: 0.00% for 6 months from account opening. After that, 23.24% variable. Default APR: 32.24% variable. See explanation below.*
Variable rate information	Your APRs may vary each billing period. The Platinum Select® Visa® Card purchase and balance transfer rate equals the U.S. Prime Rate** plus 9.99%. The cash advance rate equals the U.S. Prime Rate plus 14.99%, with a minimum cash advance rate of 19.99%. The default rate equals the U.S. Prime Rate plus up to 23.99%, or up to 28.99%, whichever is greater.***
Grace period for repayment of balances for purchases	Not less than 20 days if you pay your total new balance in full each billing period by the due date.
Method of computing the balance for purchases	Average daily balance (including new purchases).
Annual fees	None.
Minimum finance charge	$0.50
Transaction Fee for purchases made in a Foreign Currency	3% of the amount of each foreign currency purchase after its conversion into U.S. dollars.
Transaction fee for cash advances:	3% of the amount of each cash advance, $5 minimum.
Transaction fee for balance transfers:	3% of the amount of each balance transfer, $5 minimum, $75 maximum. However, there is no fee with the 0.00% APR balance transfer offer described above.
Late fee:	$15 .
Over the credit-line fee:	$39.

* All your APRs may automatically increase up to the Default APR if you default under any card member agreement that you have with us because you fail to make a payment to us when due, you exceed your credit line, or you make a payment to us that is not honored.

** For each billing period we use the U.S. Prime Rate published in *The Wall Street Journal* two business days prior to the Statement/Closing Date for that billing period.

*** Factors considered in determining your default rate may include how long your account has been open, the timing or seriousness of a default, or other indications of account performance.

We apply your payments to low APR balances before higher APR balances. That means your savings will be reduced if you make transactions that are subject to higher APRs.

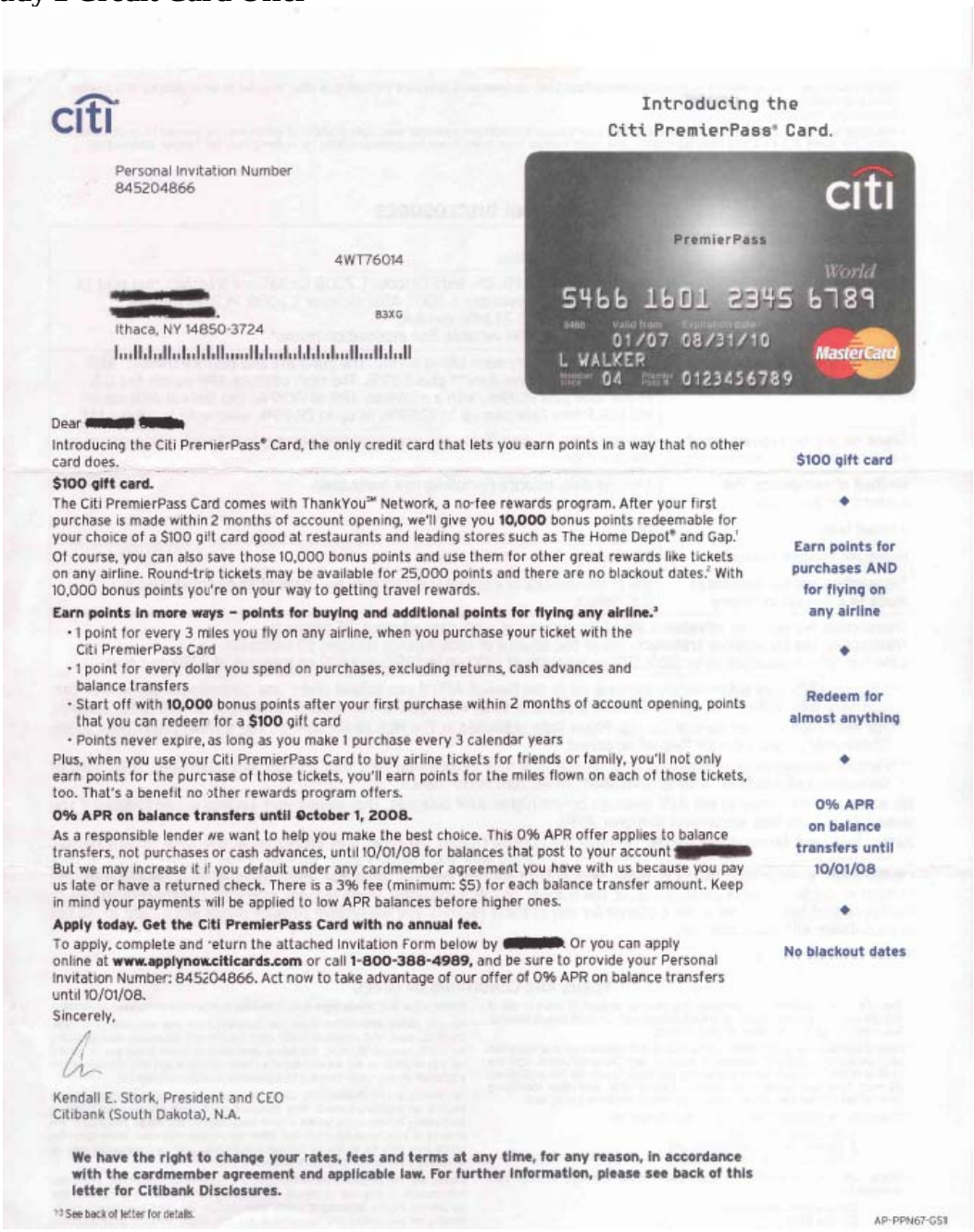
Rates, fees, and terms may change: We have the right to change the rates, fees, and terms at any time, for any reason, in accordance with the card member agreement and applicable law. These reasons may be based on information in your credit report, such as your failure to make payments to another creditor when due, amounts owed to other creditors, the number of credit accounts outstanding, or the number of credit inquiries. These reasons may also include competitive or market-related factors. If we make a change for any of these reasons, you will receive advance notice and a right to opt out in accordance with applicable law.

TERMS AND CONDITIONS OF OFFER

- This offer is only valid for new accounts. You must be at least 18 years of age and a currently enrolled college student.
- Please allow one week from date of submission to process a completed application.
- We may gather information about you, including from your employer, your bank, credit bureaus, and others, to verify your identity and determine your eligibility for credit, renewal of credit, and future extensions of credit. If you ask us, we will tell you whether or not we requested a credit bureau report and the names and addresses of any credit bureaus that provided us with such reports.
- To receive a Platinum Select® Visa® Card, you must meet our credit qualification criteria. Your credit limit will be determined by a review of your credit report. You will be informed of the amount of your credit line when you receive your card. Some credit lines may be as low as $500. Please note that cash advances may be limited to a portion of your credit line.
- If you are approved for credit, you will receive a card member agreement ("Card Agreement") with your card. Read it carefully for important information regarding your account. The Card Agreement will be binding on you unless you cancel your account within 30 days after receiving your card and you have not used or authorized use of your account.

Highlighted items are varied by card 1 versus card 2.

Study 2 Credit Card Offer



citi

Introducing the
Citi PremierPass® Card.

Personal Invitation Number
845204866

4WT76014

[redacted]
B3XG
Ithaca, NY 14850-3724

Dear [redacted]

Introducing the Citi PremierPass® Card, the only credit card that lets you earn points in a way that no other card does.

$100 gift card.

The Citi PremierPass Card comes with ThankYou℠ Network, a no-fee rewards program. After your first purchase is made within 2 months of account opening, we'll give you **10,000** bonus points redeemable for your choice of a $100 gift card good at restaurants and leading stores such as The Home Depot® and Gap.[1]

Of course, you can also save those 10,000 bonus points and use them for other great rewards like tickets on any airline. Round-trip tickets may be available for 25,000 points and there are no blackout dates.[2] With 10,000 bonus points you're on your way to getting travel rewards.

Earn points in more ways – points for buying and additional points for flying any airline.[3]

- 1 point for every 3 miles you fly on any airline, when you purchase your ticket with the Citi PremierPass Card
- 1 point for every dollar you spend on purchases, excluding returns, cash advances and balance transfers
- Start off with **10,000** bonus points after your first purchase within 2 months of account opening, points that you can redeem for a **$100** gift card
- Points never expire, as long as you make 1 purchase every 3 calendar years

Plus, when you use your Citi PremierPass Card to buy airline tickets for friends or family, you'll not only earn points for the purchase of those tickets, you'll earn points for the miles flown on each of those tickets, too. That's a benefit no other rewards program offers.

0% APR on balance transfers until October 1, 2008.

As a responsible lender we want to help you make the best choice. This 0% APR offer applies to balance transfers, not purchases or cash advances, until 10/01/08 for balances that post to your account [redacted]. But we may increase it if you default under any cardmember agreement you have with us because you pay us late or have a returned check. There is a 3% fee (minimum: $5) for each balance transfer amount. Keep in mind your payments will be applied to low APR balances before higher ones.

Apply today. Get the Citi PremierPass Card with no annual fee.

To apply, complete and return the attached Invitation Form below by [redacted]. Or you can apply online at **www.applynow.citicards.com** or call **1-800-388-4989,** and be sure to provide your Personal Invitation Number: 845204866. Act now to take advantage of our offer of 0% APR on balance transfers until 10/01/08.

Sincerely,

Kendall E. Stork, President and CEO
Citibank (South Dakota), N.A.

We have the right to change your rates, fees and terms at any time, for any reason, in accordance with the cardmember agreement and applicable law. For further information, please see back of this letter for Citibank Disclosures.

[1] See back of letter for details.

$100 gift card

◆

Earn points for purchases AND for flying on any airline

◆

Redeem for almost anything

◆

0% APR on balance transfers until 10/01/08

◆

No blackout dates

AP-PPN67-GSI

Study 2 Credit Card Offer

[1] Bonus points can only be earned by new Citi PremierPass Card cardmembers approved through this offer. In order to be eligible for this special offer, you must respond by [redacted]

[2] Restrictions may apply.

[3] The total number of points that may be earned on your card is 100,000 per calendar year, only 50,000 of which may be earned through miles flown. For every point earned from purchases, one point earned from miles flown becomes available for redemption. For further information, please see Citi PremierPass Card Terms and Conditions below.

CITIBANK DISCLOSURES

Annual percentage rate (APR) for purchases	**14.24%** variable.
Other APRs	Balance transfer APR: 0% until October 1, 2008 for balance transfers that post to your account by November 1, 2007. After October 1, 2008, 14.24% variable. Cash advance APR: 23.24% variable. Default APR: 32.24% variable. See explanation below.*
Variable rate information	Your APRs may vary each billing period. The purchase and balance transfer APR equals the U.S. Prime Rate** plus 5.99%. The cash advance APR equals the U.S. Prime Rate plus 14.99%, with a minimum APR of 19.99%. The Default APR equals the U.S. Prime Rate plus up to 23.99%, or up to 28.99%, whichever is greater.***
Grace period for repayment of balances for purchases	Not less than 20 days if you pay your total new balance in full each billing period by the due date.
Method of computing the balance for purchases	Average daily balance (including new purchases).
Annual fees	None.
Minimum finance charge	50 cents.
Transaction fee for purchases made in a foreign currency	3% of the amount of each foreign currency purchase after its conversion into U.S. dollars.
Transaction fee for cash advances: 3% of the amount of each cash advance, $5 minimum. **Transaction fee for balance transfers:** 3% of the amount of each balance transfer, $5 minimum. **Late fee:** $15 on balances up to $100; $29 on balances of $100 up to $250; and $39 on balances of $250 and over.	

* All your APRs may automatically increase up to the Default APR if you default under any cardmember agreement that you have with us because you fail to make a payment to us when due, or you make a payment to us that is not honored.

** For each billing period we use the U.S. Prime Rate published in *The Wall Street Journal* two business days prior to the Statement/Closing Date for that billing period.

*** Factors considered in determining your Default APR may include how long your account has been open, the timing or seriousness of a default, or other indications of account performance.

We apply your payments to low APR balances before higher APR balances. That means your savings will be reduced if you make transactions that are subject to higher APRs.

Rates, fees, and terms may change: We have the right to change the rates, fees and terms at any time, for any reason, in accordance with the cardmember agreement and applicable law. These reasons may be based on information in your credit report, such as your failure to make payments to another creditor when due, amounts owed to other creditors, the number of credit accounts outstanding, or the number of credit inquiries. These reasons may also include competitive or market-related factors. If we make a change for any of these reasons, you will receive advance notice and a right to opt out in accordance with applicable law.

TERMS AND CONDITIONS OF OFFER

- This offer is only valid for new accounts. You must be at least 18 years of age. If you are married, you may apply for a separate account. Citibank (South Dakota), N.A. ("we" or "us") is the issuer of your account.
- Federal law requires us to obtain, verify, and record information that identifies each person who opens an account, in order to help the government fight the funding of terrorism and money laundering activities. To process the application, we must have your name, street address, date of birth, and other identifying information, and we may ask for identifying documents from you as well.
- To process the application for a new account, it must be:
  1. Accurately completed,
  2. Signed and verifiably correct, and
  3. Returned by the expiration date.
- Please send the nontransferable application in the enclosed postage paid envelope to:

  Citibank New Cardmember Services
  P.O. Box 9703
  Hagerstown, MD 21749-9703
- Please allow four weeks from date of mailing to process a completed application.
- We may gather information about you, including from your employer, your bank, credit bureaus, and others, to verify your identity and determine your eligibility for credit, renewal of credit, and future extensions of credit. If you ask us, we will tell you whether or not we requested a credit bureau report and the names and addresses of any credit bureaus that provided us with such reports.
- To receive a Citi PremierPass Card®, you must meet our applicable criteria bearing on creditworthiness. Your revolving credit limit will be determined by your yearly income and a review of your credit report. You will be informed of the amount of your revolving credit line when you receive your card. Some revolving credit lines may be as low as $2,000. Please note that cash advances may be limited to a portion of your revolving credit line.
- Please see the enclosed Initial Disclosure Statement for important additional information. If you are approved for credit, you will receive a cardmember agreement ("Card Agreement") with your card(s). The Card Agreement will be binding on you unless you cancel your account within 30 days after receiving your card and you have not used or authorized use of your account.

Study 3 Credit Card Offer

SPECIAL STUDENT CREDIT CARD OFFER

Credit Card for Students from Chase Bank

YOUR SPECIALIZED STUDENT VISA CARD:

Dear Student,

Introducing the Chase Freedom card for students. This card offers a competitive interest rate and great features for a busy student. This card has an introductory **0% APR*** for balance transfers and a low purchase APR of only 11.99% at a variable rate. This card is also part of the Chase Flexible Rewards program where you earn 1 point for every $1 in purchases that you make on your card. You can redeem your points for your choice of travel, cash or merchandise.# Why keep paying interest on your existing cards when you can pay them off with this card and pay no interest for the introductory period and a low variable rate APR later?

As responsible lenders we want to help you to make the right choice. The 0% APR applies to balance transfers completed within 6 months. See fee disclosures for other important information. The variable rate APR of 11.99% is subject to a credit review and any changes in the prime rate. Your rate may increase under the cardmember agreement if you default on this or other loans. There are minimum fees for balance transfers and late payments. Keep in mind different types of charges on the card may be subject to different APRs.

To apply, call us now or apply online. Act now to take advantage of this special offer just for students!

Benefits

- Low APR
- Emergency Cash and Card Replacement
- Lost/Stolen Card Reporting
- Auto Rental Collision Damage Waiver
- Travel Accident Insurance
- Warranty Manager
- Baggage Delay Protection
- Purchase Security Protection
- No Blackout Dates for Chase Flexible Rewards
- Customized Card Designs

CHOOSE YOUR CARD DESIGN

Your Design:

Willard Straight Hall

Sign up today!

It's fast and easy to apply online at chase.com or by calling 1-800-385-4989

* Annual Percentage Rate. See Disclosures

#Maximum point accumulation on net purchases is 60,000 every 12 months. A service fee of up to $25.00 may be charged for the use of Reward Headquarters services for redemption of air travel, and tickets may be restricted including a minimum of 21 day advance purchase. You may not earn points on balance transfers or cash advances.

Chase Credit Card Disclosures

RATE, FEE AND OTHER COST INFORMATION

Annual Percentage Rate (APR)[2] A **0%** fixed APR for the first 6 months following the opening of your account for balance transfers. **11.99%** variable for purchases and transferred balances after the introductory period[2]
Other APRs
Purchase APR: **11.99%** variable. Balance Transfer APR: **0%** fixed APR for the first 6 billing cycles following the opening of your account. After that, **11.99%** variable. Cash Advance APR: **23.99%** variable. Default APR: Up to **31.24%** variable. See explanation below[3]
Variable rate information
The following APRs may vary monthly based on the Prime Rate:[4] Purchase APR: The Prime Rate plus 5.99%. Balance Transfer APR: The Prime Rate plus 5.99%. Pricing for outstanding and new balances after the introductory period. Cash Advance APR: The Prime Rate plus 17.99%. Default APR: The Prime Rate plus up to 23.99%.
Minimum finance charge $1.00
Transaction fee for balance transfers: 3% of the amount of each transaction, but not less than $5.00 nor more than $75.00.
Transaction fees for cash advances: 3% of the amount of the transaction, but not less than $10.00.
Late Payment fee: $15.00 on balances up to, but not including, $100.00; $29.00 on balances of $100.00 up to, but not including, $250.00; and $39.00 on balances of $250.00 and over
Over-the-Credit-Limit fee: $39.00
International Transaction fee: 3% of the U.S. dollar amount of the transaction, whether originally made in U.S. dollars or converted from a foreign currency

[1]We will first consider you for the pricing above with the lowest rates. We reserve the right, based upon our review of your credit history and information furnished by you, to open an account with alternative pricing as stated above, or not to open an account at all.

[2] **Rates, fees, and terms may change:** We reserve the right to change the account terms (including the APRs) at any time for any reason, in addition to APR increases that may occur for failure to comply with the terms of your account. For example, we may change the terms based on information in your credit report, such as the number of other credit card accounts you have and their balances. The APRs for this offer are not guaranteed; APRs may change to higher APRs, fixed APRs may change to variable APRs, or variable APRs may change to fixed APRs. Any changes will be in accordance with your account agreement.

[3]Your APRs may increase if you default under any Cardmember Agreement you have with us for any of the following reasons: We do not receive, for any payment that is owed on this Account or any other account or loan with us, at least the minimum payment due by the date and time due; you exceed your credit line on this Account, if applicable; or you make a payment to us that is not honored by your bank. Your APRs may increase as of the first day of the billing cycle in which the default occurs. We may consider the following factors to determine the default rate: the length of time your Account has been open; the existence, seriousness and timing of defaults; other indications of your Account usage and performance; and information about your other relationships with us, any of our related companies or from consumer credit reports including payments on other credit cards not issued by our related companies. Payments will be applied to balances with the lowest APR first.

[4]The "Prime Rate" is the highest prime rate published in the Money Rates column of *The Wall Street Journal* two business days before the Closing Date on the statement for each billing period. Variable APRs are based on the 6.00% prime rate on 2/15/2008.

Balance Transfer Option: The Visa,® MasterCard,® Discover,® American Express® or any store card account(s) you list will show a credit, reducing the amount you owe them by the amount you transferred. The available credit on your new account will be reduced, just as if you had made a purchase. The balance transfer amount(s) will show up on your initial statement for your new account. Your other credit card account(s) will not be closed even if you transfer your entire balance(s). If you want to close an account, please contact the other credit card company directly. It may take up to three weeks to set up your account and post the balance transfers. Therefore, you may need to make payments to your other account(s) to keep them current. Balance transfers are contingent upon issuance of your new account. There will be a transaction fee for each balance transfer if one is disclosed in the Rate, Fee and Other Cost Information that accompany this offer. We reserve the right to decline to process any partial or full balance transfer request and will not process a balance transfer request from any other account with us or any of our affiliates.

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CHAPTER 4:
THE IMPACTS OF MANDATORY FINANCIAL EDUCATION: EVIDENCE FROM A FIELD STUDY

This chapter evaluates the impact of a field study in which very-low-income families in a subsidized housing program were randomly assigned to a five-course financial skills training program. Credit reports, bank accounts, and a survey of financial attitudes and behavior were collected at baseline and again 12 months later for 127 clients. Based on difference-in-differences comparisons of 60 clients receiving financial literacy education and 67 in a wait-list control group who did not, financial literacy education stimulates $450 in additional savings over the savings account balances clients reported at baseline. Clients assigned to receive financial literacy education also exhibit improved self-reported financial knowledge by 25 percent over baseline, self-reported behavior by 45 percent, and a 21-point increase in (FICO) credit score. Clients in the treatment group also were more likely to credit a course outside of school as a source of their financial knowledge. The clients in this study were mostly single mothers with incomes under $20,000 at the start of the study, and were nearly all of subprime credit quality. While this population represents a unique research pool, it is a highly relevant group to explore the effects of financial literacy education. Education in this format has a positive effect on the financial status of clients within one year, even among a highly distressed population.

1. Introduction

Public policies mandate financial education for consumers with credit problems such as bankruptcy or foreclosure, as well for consumers with impending financial decisions, such as before buying a home or graduating from high school. Financial education and counseling are provided in the workplace, in schools, by

community programs, and as part of public programs. Despite a growing interest in and support of financial education, the effects of financial education on credit behavior are relatively untested. This study provides a unique opportunity to test the effects of a highly targeted mandatory financial education curriculum among very-low-income clients in a field study.

2. Literature Review

Several studies have documented the extent to which consumers in the U.S. and other countries fail to demonstrate financial literacy, numeracy, or both (for a review, see Lusardi & Mitchell, 2007). Financial knowledge measures tend to be highest for more-educated consumers, and lower for lower-income consumers (Agnew & Szykman, 2005; Bernheim, 1998; Lusardi & Mitchell, 2006; Mandell, 2004). Understanding interest and interest rates tends to be a particular area of weakness (Moore, 2003).

Bucks and Pence (2006) show that low-income mortgage borrowers are most likely to underestimate how much the interest rate on their loan could change relative to their actual contract. Minority borrowers are 30 percent more likely and low-income borrowers are 28 percent more likely to not know their interest rate. Similar effects are shown for less-educated borrowers. Low-income consumers with less than a college degree are among the least accurate or informed about the terms of their mortgage.

Hilgert, Hogarth, and Beverly (2003) present data to suggest that knowledge and behavior are closely linked. By comparing data on 18 financial behaviors with scores on a 28-question financial knowledge questionnaire, they find that lower-scoring respondents engage in less savings and are less likely to pay bills on time or maintain a budget. The authors point out that engaging in regular savings or budgeting behaviors might be the source of the knowledge, however, rather than a result of the

knowledge. Further analysis by Hogarth and colleagues strengthens the linkages between levels of financial knowledge and financial behavior (Hogarth, Beverly, & Hilgert, 2003; Hogarth & Hilgert, 2002). Courchane and Zorn (2005) provide data from a separate survey linked to credit data. They conclude that levels of objective and subjective knowledge about financial issues influence savings and credit behavior and are reflected in events in consumer credit records.

Hogarth (2006) provides a review of financial education efforts, noting a rapid increase in financial education efforts at the state, federal, and local levels in recent years. A study of state mandates for financial education in high schools by Tennyson and Nguyen finds an impact of state mandates on financial knowledge levels among high school students using a survey of financial knowledge (Tennyson & Nguyen, 2001). A separate study helps make the link between increased financial knowledge and improved financial behavior in states with school-based financial education. Bernheim, Garrett, and Maki (2001) studied the relationship between state mandates for high school curriculum and adult savings patterns and net worth. The authors find that students in states with mandates were more likely to be exposed to financial education and had higher savings rates and a larger net worth than students exposed to less (or no) mandated financial education.

Research on the effects of financial education have included school-based financial education and workplace-based retirement planning seminars (Martin, 2007). Studies of workplace-based education seminars, typically focused on retirement choices, show modest effects. Duflo and Saez (2003) conducted an innovative randomized experiment including a course on how to save, showing small improvements in savings levels. Other studies show mixed effects. Many studies of retirement plans are hard to interpret, since firms often simultaneously promote retirement planning seminars and introduce new retirement savings programs (Bayer,

Bernheim & Scholz, 1996, 2003; Bernheim, 1998; Lusardi & Mitchell, 2007; Muller, 2003).

Another set of studies examine education specific to consumers in a particular market. Elliehausen, Lundquist, and Staten (2007) evaluated credit counseling provided to consumers facing certain credit problems. The authors compared clients who received counseling to a general population control group over a 3-year period. Consumers who received counseling reduced total debt, showed evidence of improved credit card management, and had lower credit card delinquency rates. The authors also found the strongest effects among clients who started the study with the lowest credit scores. Hirad and Zorn (2001) evaluated the loan performance of mortgages on which financial counseling was required before purchase, finding that improved loan performance was better among borrowers receiving education. Borrowers receiving pre-purchase homeownership counseling had a 19 percent lower rate of 90-day loan payment delinquencies than those without counseling, using a quasi-experimental control group of another pool of similar loans. Other studies suggested that credit education or counseling has positive effects, although generally small in terms of magnitude (Collins, 2007; Hartarska & Gonzalez-Vega, 2005).

One problem in financial literacy research is determining a measure of knowledge. Many studies rely on self-reported knowledge scales ("how confident are in your knowledge of…"). At least one study shows that most people overestimate their knowledge relative to what they actually know. Based on a comparison of answers to a self-reported scale and scores on an actual test of investment knowledge, Agnew and Szykman (2005) find low correlations, especially for people without a college education. Studies relying on self-reported data can lead to ambiguous results.

A more significant problem with existing studies of financial literacy programs are selection effects (Meier & Sprenger, 2007). Unobserved characteristics drive

more-motivated clients or more-patient individuals to seek out financial education or counseling *and* also to succeed financially. Hogarth (2006) summarizes 25 papers that evaluate financial education. Only two studies use forms of a quasi-experimental technique to evaluate financial education, both in the workplace setting. Bernheim, Garrett, and Maki (2001) make use of changes in state high school curricula to predict retirement savings, finding a positive effect of states with increasing mandates. Duflo and Saez (2003) implemented a randomized experiment for a retirement planning seminar, finding marginally positive results of the offer of education on enrollment in a savings plan. A series of studies with college students randomly assigning an offer of credit card education and credit management training was hampered by low response rates and strong selection effects among responders (Gartner & Todd, 2005). One study used length of exposure to education as an evaluation technique for examining low-income clients in a matched savings program, a portion of whom also received financial education. The study found that each additional hour of education improved savings behavior up to about 8 hours of coursework (Schreiner, Clancy, & Sherraden, 2002). Other studies use nonrandomized control groups or self-reported knowledge and behaviors (or both). There currently are no field experiments of financial education among low-income consumers that use random assignment and behavioral measure of outcomes.

The types of services included in previous studies range from short courses delivered in the context of a decision, to one-to-one counseling, to longer-term formal education programs. The clients targeted are often moderate-income individuals facing impending financial decisions, such as a mortgage, retirement investment, or the need to correct credit problems. Few programs are targeted to very-low-income families, few include mandated education delivered over several weeks, and none include random assignment of clients to education and noneducation groups.

Overall, the evaluation literature suggests that financial education can help individuals gain additional financial knowledge and that knowledge is linked to financial behavior. Evidence of the impact of financial literacy is suggestive of greater levels of savings, usage of bank accounts, and improved credit behavior. Because of problems with selection effects, however, further studies are needed to better understand the causal effects of financial literacy education.

3. Model of the Impact of Financial Education

The model of the potential impact of financial literacy education in a controlled longitudinal study is illustrated in Figure 4.1. It is expected that clients completing financial literacy education will show positive changes in follow-up measures compared to baseline measures in three areas. First, consumers assigned to financial literacy will exhibit greater positive changes at follow-up in their perceived level of understanding of personal finance topics than consumers not completing financial education. Second, consumers assigned to financial literacy education will show greater positive changes in objective measures of financial behavior, such as credit reports and bank statements, than a control group not receiving financial literacy education. Third, consumers assigned to financial education will show greater positive changes in confidence about savings and budgeting in surveys as compared to consumers not completing financial literacy. Figure 4.1 also illustrates that while the effects of financial literacy education are focused on financial knowledge and attitudes, knowledge and behavior may interact through an unobserved feedback mechanism.

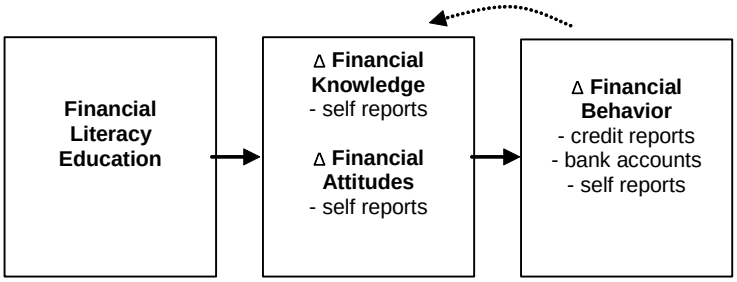

Figure 4.1: Model of the Impact of Financial Education

4. Procedures

Data for this study were provided by the Community Development Corporation of Long Island, New York (CDCLI). This nonprofit agency is the regional administrator for federal rental housing vouchers. Low-income families receive a voucher to subsidize rental payments made to private landlords. Qualification for a voucher is based on income and family size and is adjusted each year. As administrator, CDCLI recertifies that families in the program are in compliance with income limits and other conditions of the program. As a result, the agency maintains a database of income, assets, and other characteristics for all clients over time. Most nonelderly or disabled voucher recipients at CDCLI are also enrolled in the federal family self-sufficiency (FSS) program. This allows families to earn more income without losing their housing subsidy. All housing voucher clients in the FSS program are required to receive financial literacy education, although clients have up to 5 years to complete the education. CDCLI created a financial literacy course called "Financial Fitness" for these clients, delivered over five sessions and covering topics such as credit, savings, and budgeting (see "Financial Literacy Course Topics," Appendix 4.A). In 2005, CDCLI identified clients who would be required to complete the Financial Fitness course by the end of 2007.

Out of the initial pool of 181 clients identified as being required to take the financial literacy course, 144 clients consented to participate in a study of "how people

like you can improve their financial credit and savings." According to case notes provided by CDCLI, of the 37 nonconsenting clients, 22 were in the process of leaving the voucher program or being terminated for noncompliance. Six cited personal or family health issues that prevented them from potentially taking the education course, and 5 simply refused without any reason provided. Only 4 refused to consent because they wanted to take the course immediately and were not willing to be on a waiting list if they took part in the study.

The remaining 144 clients were divided such that odd-identification-number clients were assigned to receive financial education in 2006, while even-numbered clients were assigned to take the course in 2007. This process resulted in 73 clients being assigned to the "treatment" group, which meant they were required to take the financial literacy education course in the next year, and 71 being assigned to the "control" group, which meant they were prohibited from completing the course for one year.[1] All five courses in the "Financial Fitness" series were provided at the CDCLI offices every month from September 2005 to September 2006 for treatment group clients and after this date for control group clients. Treatment group clients completed their baseline data collection the month before they began taking financial literacy courses and their follow-up data collection 12 months later. The majority of treatment group clients completed the five financial education courses in one month or less, although 4 clients took more than 6 months. Completing the course was mandatory, and failure to comply would jeopardize the client's eligibility to receive a housing voucher. Neither group of clients received any other special education or financial services other than financial education. The consent form included an

[1] In this study, "treatment" is defined as a client being assigned to attend Financial Fitness, while "control" is defined as a client being deferred from attending Financial Fitness until after the study period.

agreement to fill out the baseline and follow-up 50-item surveys.[2] Like treatment group clients, control group clients received a follow-up survey and completed other data collection 12 months after the date of their baseline data collection. The sample was completed in September 2007. Clients received $30 as an incentive to complete the baseline survey at the beginning of the study and an additional $30 to complete a follow-up survey. All data were stripped of any personal or identifying information.

A chi-squared test of the planned assignment of each client to treatment or control group (based on an even or odd client identification number) by consent status yields a nonsignificant difference (77% vs 82%, χ^2 =0.907 p =0.341). Poststudy, 17 clients failed to complete a second survey because they were uncooperative or no longer in the program, including 13 in the treatment group and 4 in the control group, resulting in 127 clients with complete data in both periods. Unlike consent, attrition between the two groups does not appear to be random (82% vs 94%, χ^2 =5.124 p =0.024). The final sample consisted of 60 clients in the treatment group and 67 in the control group, with data in both the pre- and posttreatment periods.

Different experimental and quasi-experimental designs provide different types of estimates of impacts, each with tradeoffs. The design of this study is such that measurable outcomes are observed only for clients completing the study. This represents an estimate of treatment on the treated (TOT). Although intention to treat is used in many studies, this study observes assignment, completion, and compliance. Those clients not completing the follow-up data collection are not observed, but clients completing treatment and all controls still in the program are observed. In general this is a preferred design, although the effects of attrition are important to consider. The design of this study also estimates an average treatment effect of

[2] While a 24-month duration was considered, with a longer time period more clients would progress out of the program, moving out of subsidized housing or otherwise being lost from the sample. Any measured effects could be stronger or weaker over a longer period.

treatment on the treated. Treatment effects in this study may be heterogeneous, but treatment itself is homogenous and is randomly assigned. Given the small sample size, exploring treatment effects for subgroups within the treated and control groups is not feasible.

4.1. Study Attrition

Ideally, a randomized design overcomes selection bias and yields a valid comparison group for estimating the effects of an intervention, in this case the effects of financial education. However, it takes time for the effects of a financial education course to be exhibited in the behavior of clients. A study of this nature not only must track data over a sufficiently long time period to be able to detect any changes but must also be aware that as the time between baseline and follow-up lengthens, more clients will be lost from the sample because of moving, changes in circumstance, withdrawal from the program, or even death. The problem of attrition is common in longitudinal evaluations, and when attrition does occur the nature of any bias introduced can be difficult to estimate (Orr, 1999). In this study 5.6 percent of the control group was lost to attrition by the time of the follow-up data collection. Notes in the administrative data provided for this study suggest that 8 of the 13 treatment group clients failing to complete follow-up data were terminated or withdrew from the housing program, compared to 1 of the 4 control group clients. Termination could occur as a result of noncompliance with the terms of the program, or because the client increased income beyond program limits. Of the remaining clients not available for the follow-up data, 2 were deceased, both in the control group. The other control group client and 5 treatment group clients simply refused to complete a final survey or to complete education classes. The effects of attrition bias are difficult to diagnose. It is possible that financial literacy education influenced behavior leading to withdrawal,

such as spurring motivation to obtain a higher-paying job. Completing the second round of data collection might also be a signal of more motivation compared to those clients who were noncompliant, who withdrew, or who were terminated. The direction of bias remains unclear and suggests the need for a quasi-experimental design to supplement the estimates derived from the simple randomized comparisons (LaLonde, 1986; Orr, 1999).

5. Baseline Characteristics

Table 4.1 shows that overall the clients in this study had little savings, with treatment clients holding $1,186 across checking, savings, and other accounts, and control group clients owning $1,776. The mean FICO scores for treatment and control groups were 577 and 566, respectively, and signal poor credit ratings (scores below 580 to 620 are solidly in the subprime credit range). Debt levels were higher on average for the control group ($14,520) than the treatment group ($11,520), but not at statistically significant levels (t=.75). Income for the treatment group was significantly higher at baseline than for controls ($23,239 vs. $19,382, t=1.9). By comparison, federal guidelines define very-low-income, which is 30 percent of the area median income, as income below $24,000 for a family of 4 in this area. In both the treatment and control groups, about 16 to 17 percent of clients received income support through a welfare program (in addition to housing assistance). Of the treatment group, 16 percent has less than a high school education, compared to 21 percent of those in the control group (a nonsignificant difference). Household sizes were similar for both groups, nearly 4 persons per household. Over 90 percent of clients in both groups were female. Seventy-three percent of the treatment group and 68 percent of the control group were single parents (a nonsignificant difference). Although not reported in

Table 4.1, about half of the clients in both groups were African American, one in ten were Latino or Hispanic, and the remaining one-third were White.

Table 4.1: Means and Standard Deviations for Treatment and Control Groups at Baseline: Administrative and Credit Data

	Treatment	Control
Total Savings ($)	1,186	1,776
	(3,130)	(7,492)
Credit Score (FICO) (300-800)	577	566
	(70)	(70)
Total Debt ($)	11,520	14,520
	(12,805)	(12,730)
Total Income * ($)	23,239	19,382
	(12,147)	(11,284)
Welfare Receipt (%)	0.16	0.17
	(0.37)	(0.38)
Less than High School Education (%)	0.16	0.21
	(0.37)	(0.41)
Household Size	3.92	3.94
	(1.88)	(1.87)
Female client (%)	0.96	0.93
	(0.20)	(0.26)
Single headed household (%)	0.73	0.68
	(0.45)	(0.47)
Age (years)	39.30	39.06
	(7.82)	(7.17)
Employed full time ^ (%)	0.52	0.39
	(0.50)	(0.49)
Years in FSS program	3.71	3.64
	(1.46)	(1.50)

* t=1.9 ^ t=1.6; n=144

The baseline survey included 12 questions designed to provide a self-assessment of financial literacy. As might be expected from a relatively disadvantaged population, self-reported scores for financial behavior and knowledge tended to be low in baseline survey responses. Table 4.2 illustrates how clients at the start of the study graded themselves by each category of financial issue. In general, clients give themselves high marks for providing for their family but low ratings for staying abreast of interest rates, saving, or investing. Controls scored higher on several items

including controlling spending and following a budget. With 12 measures, chance suggests it is likely one will be significantly different using a 5 percent level of statistical significance. An overall index comprising all 12 survey items proved reliable (Cronbach's alpha=.87), and the average of the index was not significantly different between the two groups.

Table 4.2: Means and Standard Deviations of Self-Reported Financial Literacy Measures on a 5-point scale (Grade yourself in the following areas in the last 12 months [0=poor; 4=excellent])

	Treatment	Control
Controlling my spending *	1.60	1.97
	(1.16)	(1.13)
Paying my bills on time ^	1.44	1.75
	(1.38)	(1.08)
Planning for my financial future	1.04	1.15
	(1.31)	(1.28)
Providing for my family	2.49	2.71
	(1.25)	(1.01)
Saving money	0.58	0.71
	(0.93)	(0.99)
Knowledge of current interest rates	0.51	0.68
	(0.87)	(1.03)
Knowledge of my current credit rating	0.99	0.83
	(1.26)	(1.13)
Managing my finances	1.15	1.44
	(1.17)	(1.17)
Investing money	0.32	0.27
	(0.80)	(0.76)
Following a budget #	0.97	1.56
	(1.14)	(1.26)
Composite Index **	1.11	1.31
	(0.74)	(0.79)

*t=1.9 ^t=1.5 #t=2.9 **t=1.6; n =144

6. Evaluation Approach

The average treatment effects (of financial education) on the treated (those completing the 5-course sequence) are estimated using three difference-in-differences specifications across 35 measures derived from administrative data, credit reports, and a survey. The first specification is a traditional difference-in-difference experimental

estimator. This approach estimates the difference in changes between treatment and control groups changes each measure from the baseline to follow-up, using an indicator for a client being in the treatment group. The second specification uses propensity score matching to weight the traditional difference-in-difference experimental estimator. This specification attempts to balance the treatment and control groups due to the differential level of attrition. The third specification includes control variables to account for differences in the baseline values for each group that may be associated with the intensity of other services received. All three estimates are presented in Appendix 4.A and discussed in the following sections. The methodology used is discussed below.

6.1. Difference-in-Differences Estimation

Each outcome can be tested using a conventional regression-adjusted impact estimate (Orr, 1999) of the form:

$$\text{Eq. 1} \quad Y_{follow\text{-}up} = \beta 1 Y_{baseline} + \beta 2 X_{Treatment.} + \varepsilon$$

The model tests whether the outcome, $Y_{follow\text{-}up}$, is impacted by the treatment, X, where the treatment is a client being assigned to financial literacy education. When the β2 coefficient on $X_{Treatment}$ is statistically significant, this suggests the program has an effect.[3] This approach controls for each client's baseline state, so that each outcome is relative to the client's status at the start of the study ($Y_{baseline}$). The standard errors in these and all other models in this study are corrected for heteroskedasticity.

This approach produces consistent and unbiased estimators in an experimental setting. This study is based on a relatively small sample and also is challenged by clients refusing to consent, by attrition, and by refusal to complete the follow-up data

[3] Because of the small sample size, significance is reported at the 1%, 5%, *and* 10% levels.

collection. The sample was winnowed from 181 at the initial phase to the 126 observed in the data. Some differences between clients in each group are unobservable and remain a potential source of bias in the estimates. Other aspects of the clients lost from the sample are observable and can be used in part to develop a quasi-experimental estimator, as described in the following section.

6.2. Propensity Score Matching Differences Estimation

One way to balance the treatment and control groups based on observable factors is to use a propensity score. The propensity score is the predicted probability that a client in the control group would have been assigned to the treatment group given pretreatment characteristics. The propensity score can then be used as a weight to increase the influence of control group clients who are more similar to the average treatment group client, controlling for a range of client characteristics (Heckman, Ichimura, & Todd, 1997; Rosenbaum & Rubin, 2001; Smith & Todd, 2005).

The propensity score is the probability of being assigned to and completing financial literacy education as well as all follow-up data collection. This was estimated using the following probit specification of baseline data:

Eq. 2 $$\text{Prob(completed)} = \beta_1 \text{ age} + \beta_2 \text{ age2} + \beta_3 \text{ financial knowledge index} + \beta_4 \text{ debt} + \beta_5 \text{ bankruptcy} + \beta_6 \text{ savings} + \beta_7 \text{ household size} + \beta_8 \text{ rent subsidy} + \beta_9 \text{ income} + \beta_{10} \text{ white} + \beta_{11} \text{ welfare} + \beta_{12} \#\text{delinquencies} + \beta_{13} \text{ Length of time in program} + \varepsilon$$

The propensity score was then used to create quintiles of about 25 clients each based on the relative probabilities predicted by this model. Within each quintile, each control borrower was assigned a weight relative to his or her probability of actually being in the control group (number of treatment subjects in the quintile divided by the number of control subjects in the quintile). Weights ranged from 0.23 to 2.57. Weighted t-tests of the baseline variables show that the propensity score weights effectively balance the treatment and control groups (Morgan & Harding, 2006).

The specification for the weighted difference-in-difference estimator is shown in Eq 3. This model is similar to Eq 1, with the exception of the addition of weights (w=1 for all treatment cases). Again, robust standard errors are used to address heteroskedastic standard error terms. The coefficient on β2 provides a propensity score weighted estimate of the impact of the program, controlling for baseline levels.

Eq. 3 $$Y_{follow\text{-}up}=\{ \beta 2 Y_{baseline} + \beta 2 X_{Treatment.} + \varepsilon \} * [w]$$

6.3. Weighted Differences Estimator with Covariates for Other Services Received

All treatment and control clients in this study receive housing vouchers to help pay their rent and are part of the family self-sufficiency program (FSS). However, the benefits of these programs are provided at different levels. The voucher has more value for low-income clients with more family members and high rent amounts. The longer clients are in FSS, the more opportunities they have had to earn more income without losing voucher benefits. A client with larger benefits from the FSS voucher might also show stronger impacts for the outcomes of interest in this study.

The third difference-in-difference specification includes covariates of baseline data to model the extent to which clients are exposed to these services. The covariates used in these models are displayed in Table 4.3 and include how long the client was enrolled in the FSS program prior to the experiment and the factors that help determine the amount of the voucher subsidy, including household size, rent amount, total debt, and total income.

Table 4.3: Means and Standard Deviations of Program Exposure Used in Regression Models

	Unweighted		Weighted	
	Mean	Std Dev	Mean	Std Dev
Year in FSS Program	3.67	1.45	3.63	1.50
Household size	3.93	1.87	3.78	1.89
Rent Subsidy Amount	1,589	291	1,518	303
Total Debt	11,852	12,773	11,907	12,511
Total Income	19,938	12,680	21,615	12,926

The specification used in these models is shown in Eq. 4 below, where *w* is the weight derived from the quintiles of propensity scores:

Eq. 4 $[Y_{follow\text{-}up}]*[w]=[\beta 1 Y_{baseline}+ \beta 2 x Treatment + \beta 3 Months\ in\ FSS + \beta 4\ Household\ size + \beta 5\ Rent\ level + \beta 6\ Amount\ of\ total\ debt + \beta 7\ Total\ income + \varepsilon\ ] * [w]$

7. Estimated Impacts

The impact model described in Section 3 suggests that financial literacy education influences knowledge and perceptions and ultimately results in evidence of changed financial behaviors. Using the three difference-in-difference estimation procedures described in Section 5, the effect of financial literacy education is developed for 20 measures of financial behavior, 7 measures of self-reported financial literacy, and 7 measures of financial attitudes or perceptions. Including such a large number of dependent variables of interest presents a potential multiple measures problem; by chance several of these measures will show statistically significant differences. To counter this problem, key dependent variables were designated for each of the predicted outcome categories, and when possible indices or scores are used to aggregate similar measures into a composite score.

The impacts of financial literacy education are presented using the simple difference-in-differences estimator, the weighted difference-in-differences estimator, and the weighted difference-in-differences estimator with covariates. In most cases the results become more robust using the weighted estimator with controls, as might be expected. Given the small sample size, results are reported if the 10 percent statistical significance level is achieved.

All measures are repeated for each subject at follow-up and compared to the baseline measure. Impacts are estimated using difference-in-differences regressions showing the average change in each measure within treatment group subjects relative to control group subjects. These estimates of impacts are then compared to the mean baseline levels of each measure for both groups combined (measures used in the impact models were not statistically different across the treatment and control groups at baseline).

7.1. Financial Behavior Estimates

Based on the prior literature, it is predicted that financial literacy education would have a positive effect on savings levels and credit scores and a negative effect on debt levels and credit card use. All clients in the study regularly provide bank account information as part of the process to remain eligible for housing vouchers. These data were extracted at the baseline and again 12 months later. In addition, clients in the study had their credit reports pulled and analyzed at baseline and follow-up. These represent objective indicators of financial behavior for clients in the treatment and control groups.

At baseline the weighted mean account balance in a savings account for clients was $517 (including $0 for clients with no savings accounts). The estimated average effect of financial literacy education on savings account balances was positive, with an

additional $489 saved using the conventional experimental difference-in-differences estimator, an additional $454 saved using the matching difference-in-differences estimator without covariates, and $474 saved using the weighted difference-in-differences estimator with covariates. These results are strongly significant at the 1 percent level. Figure 4.2 illustrates the estimated marginal increase in savings account balances at follow-up compared to baseline using the weighted difference-in-differences estimator with covariates.

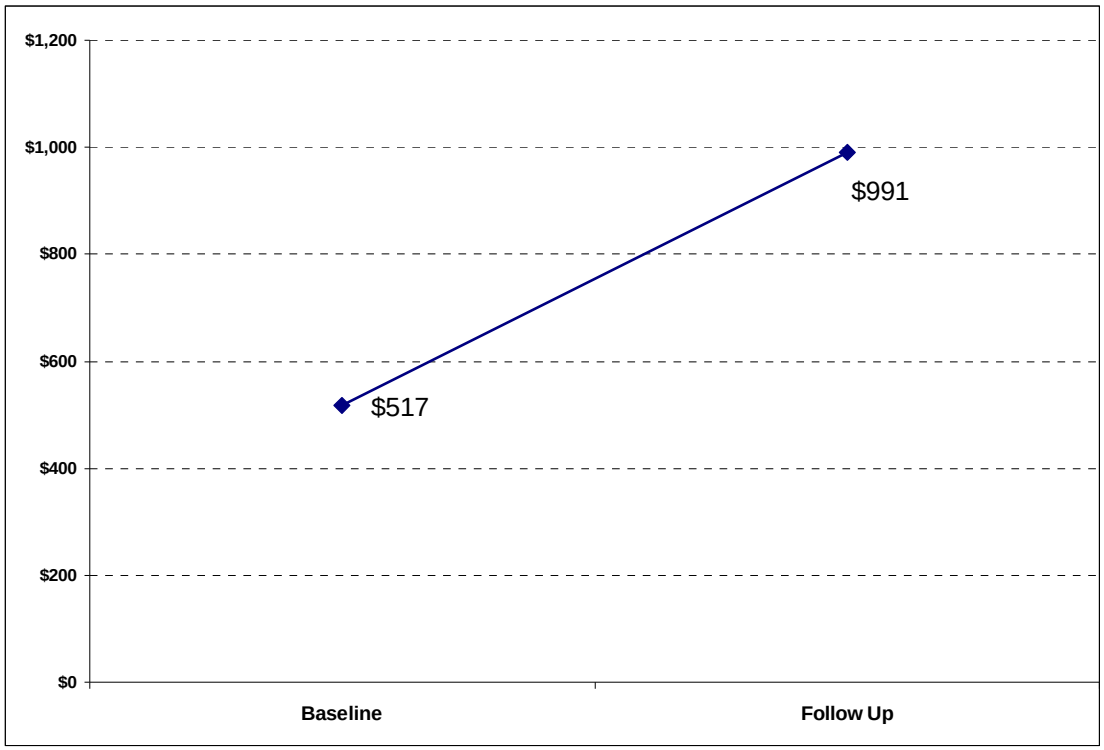

Figure 4.2: Estimated Impact of Financial Literacy Education on Amount in Savings Account from Administrative Data Using Weighted Difference-in-Differences Estimator and Covariates (n=127)

Credit report data include a FICO score—named for the Fair Isaac Corporation, which developed the score. FICO scores range from 300 to 800 and are based on a proprietary formula using multiple variables contained in the credit report, including the number of accounts, amount and age of debt, and share of available

credit in use by the individual. Scores are used by creditors, insurance companies, and even employers to assess the behavior of an individual. Because financial literacy education focuses on the topic of credit and credit reports, it was expected that clients would make an effort to at least check their report for errors and engage in activities that might improve their credit rating, such as paying past due accounts or using less of available credit lines.

A comparison of FICO scores collected for this study showed no significant changes at follow-up using the simple difference-in-differences experimental method nor the matching estimator without covariates. However, the matching difference-in-differences estimator with covariates did yield results that are significant at the 10 percent level, which is a reasonable standard given the small number of observations in this study. The weighted estimator with covariates suggests a 20.8 point increase in scores, compared to a baseline score for both groups combined of 570. This result is shown in Figure 4.3.

According to one analysis provided by Fair Isaac Corporation, the difference between a FICO score of 570 and 590 can result in a decrease in interest rate on a 48-month automobile loan of 2.5 percentage points.[4] This would reduce the borrowing cost of a $10,000 loan by $618 over the four-year life of the loan. Borrowers remain "subprime" credit risks but have reduced borrowing costs.

Financial literacy education for low-income families typically focuses on topics of budgeting and managing debt. Indeed, over one-third of the curriculum used in this study focused on managing credit and debt. Although it was predicted that financial literacy education would be associated with clients paying down debt and reducing the use of credit cards, there were no negative associations significant at standard levels. Using the simple, unweighted differences estimator, but not the

[4] 14.45% APR vs. 16.97% APR. See: http://www.myfico.com/Products/ScoreWatch/Sample/Sample_Means.aspx

weighted estimators, clients completing financial literacy education hold more credit cards at follow-up (the mean was 2.8 cards at follow-up, an increase of 0.7 over baseline, t=1.96) based on credit report data. Although not significant, total debt levels for the treatment group also show a tendency to increase after financial literacy education. This suggests that financial literacy education may be associated with greater use of credit during the time period of this study. An analysis of other credit report measures, such as the number of reported delinquencies, deficiencies, discharges, share of credit limit borrowed, and number of credit cards resulted in no significantly different changes between treatment and control groups using any of the three estimators. The lack of difference between treatment and control groups in these areas could be attributed to the fact that credit report data are additive. Past problems remain on the report for up to 7 years. Clients with improvements in items on their credit reports in the last 12 months would only slowly counteract those historic problems.

In addition to the data collected from bank account statements and credit reports, clients answered a series of questions at baseline and then at follow-up in which they provided self-reported measures of financial behaviors. One problem with self-reported data on financial topics is that people tend to exhibit a positive or upward bias in their responses (Agnew & Szykman, 2005). At least in this study, the baseline and follow-up surveys were filled out by the same person, so that bias should be more systematic by respondent than in a cross-sectional study. Question 3 of the survey includes eight types of behavior, each scored on a 0-to-4 scale, which provides an array of behaviors summarized in this analysis as a single index (see Appendix 4.A for survey instrument).[5] This index is reliable using Cronbach's reliability statistic (α=.87). Clients scoring themselves as "poor" received a 0, and clients grading

[5] An index is used in part to overcome the statistical problem of using multiple measures to test a hypothesis. Condensing measures into an index reduces the number of tests conducted.

themselves as “excellent” received a 4. Most clients graded themselves as poor in most areas at baseline (index mean 1.22 using weights). Using a simple estimator, the index mean increased 0.53, and using the weighted estimator either with or without covariates, the index increased by 0.55. All of these results are significant at the 1 percent level. Examining the questions that make up the index, the items related to budgeting and financial planning showed significant and positive results, while the other items were not significant. This is consistent with the focus of this financial literacy program on budgeting and financial planning skills.

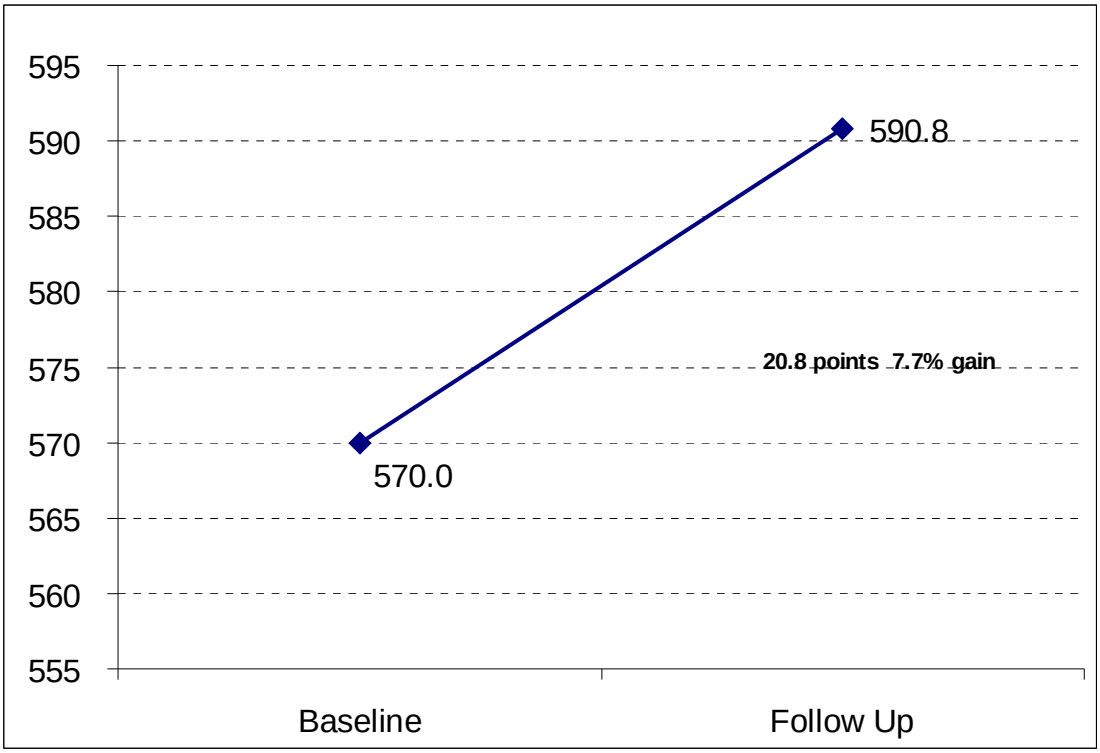

Figure 4.3: Estimated Impact of Financial Literacy Education on FICO Credit Score from Credit Record Using Weighted Difference-in-Differences Estimator and Covariates (n=127)

7.2. Financial Knowledge Estimates

Based on prior studies, financial knowledge has a strong association with financial behavior. It is expected that clients who completed the financial literacy education course would exhibit greater increases in self-reported understanding of a variety of financial topics covered in the course. All clients completed a series of questions about how much they understood about 5 topics in survey Question 5. These questions provide a 0-to-4 assessment of the client's self-assessment of her understanding of interest rates, credit ratings, managing finances, investing, and what is on her own credit report. Responses ranged from "nothing" (0) to "a lot" (4). Similar to the behavioral measures drawn from the client survey, an index of self-reported financial understanding was developed based on 5 items contained in survey Question 5. The index provides an aggregated measure of how well each client perceives his or her understanding or comfort level with various financial topics. This index was reliable at similar levels to the financial behavior index using Cronbach's statistic (α=.82). The weighted mean index value at baseline was 1.96 for both groups combined. The average estimated impact of financial education on the financial knowledge index was 0.52 using a simple difference-in-differences estimator, 0.44 using a weighted estimator, and 0.45 using a weighted estimator with covariates. The latter represents a 26 percent increase over the baseline index value, increasing from 1.75 to 2.20. Decomposing the components of the weighted mean index values, nearly one-half of the gain was due to an increase in reported understanding of current interest rates, and the remainder primarily due to improvements in understanding of credit reports and how to manage personal finances (issues such as budgeting and expense tracking). Figure 4.4 displays the effects of financial literacy education on the financial knowledge index using a weighted difference-in-differences estimator with covariates for the index. The figure also presents the components of the index with

statistically significant impacts related to clients in the treatment group completing the financial literacy education program.

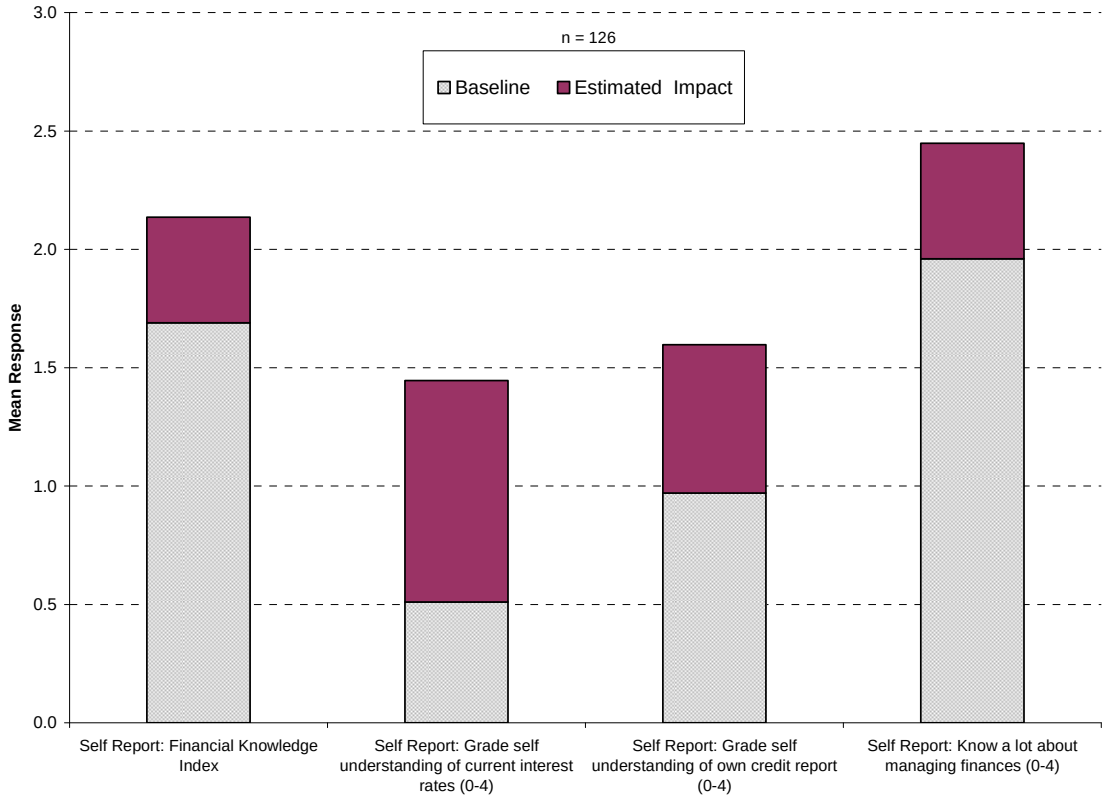

Figure 4.4: Estimated Impacts of Financial Literacy Education on Self-Reported Financial Literacy Using Weighted Difference-in-Differences Estimator with Covariates: 5-item Index and Significant Components of Index

All clients completed a question at baseline and follow-up asking where they learned about financial issues. This survey item can provide a check of the extent to which the financial literacy education course was the source of the client's self-assessed gains in knowledge. Question 6 in the survey asks where the client learned about money management and credit issues, listing 8 sources including "training courses taught outside of school." Estimates of the impacts of financial literacy education on changes in responses to this measure were statistically significant using all three estimators, including an increase of 1.1 using the simple difference-in-

differences estimator, and 1.2 using either weighted estimator. This compares to a weighted baseline across both groups of 1.25, suggesting a near doubling of the attribution of non-school-based coursework to financial knowledge for the group receiving financial literacy education. Since the training course in this study matches this description, it is likely clients are attributing the source of the knowledge to the financial literacy education they received. This finding was significant at the 0.1 percent level.

7.3. Financial Attitude Estimates

There is less literature on the connections between financial attitudes and financial literacy education. Changing preferences, attitudes, or values regarding financial issues is a different objective than imparting factual information and developing financial management skills. Nevertheless, staff of the program cited anecdotal evidence of clients for whom they believed financial literacy education triggered improvements in how clients viewed money and their personal financial situation overall. Measures of attitudes are more challenging to reliably implement than measures of behavior or knowledge. However, there were three categories of attitudes reflected in the client survey at baseline and follow-up that might be expected to be influenced by receiving financial literacy education. The first is a set of 4 items from survey Question 8 about how frequently clients feel worried or stressed about managing money. It was expected that the financial education course would reduce the level of stress clients felt about financial issues as they gained further knowledge and skills, although another alternative is that as clients gain knowledge about financial issues, they realize they should be more worried about their personal financial situation. As with other survey questions, the set of 4 responses was condensed into an index, which is shown to be reliable (α=.83) using Cronbach's statistic at similar

levels. The second category of measures is related to self-esteem based on 7 items in survey Question 13. These are not directly related to financial literacy education but are expected to serve as a general measure of the clients' perception of their ability to make changes in financial or other aspects of their lives. These measures are related to the concept of locus of control (internal versus external) rather than to self-esteem more broadly. It is expected that financial literacy education would result in an increase in clients viewing their level of control over their lives. This index of 7 items was also reliable at similar levels to the other indices (α=.81). The third category of measures is related to the frequency of symptoms of stress or anxiety based on 7 items in survey Question 4. Headaches, fatigue, insomnia, or other physical problems are listed, as well as feelings of inadequacy and fear of losing control. Taken together, these items may indicate greater levels of stress or anxiety. It might be expected that financial literacy education would reduce stress levels, although an alternative view is that more knowledge about the severity of financial problems could increase stress. This index was reliable at slightly higher levels than the other indices (α=.86). While again not a financial-specific outcome, symptoms of stress may be related to financial issues.

In general these indices of client survey data regarding perceptions or attitudes did not yield significant estimates of the impact of financial literacy education. Two of the components of the index are worthy of note, however. The estimate of the impact of financial literacy on the index of financial worry was not significantly different at standard levels. One component of this index (item b) asks how frequently the client feels "worried about having enough money." The coefficient on treatment was -0.34 using the simple experimental difference-in-differences estimator. This is about an 11 percent decrease relative to an unweighted baseline for both groups of 3.1. This was significant at the 10 percent level and only for the simple difference-in-differences

estimator. The weighted difference-in-differences estimators produced coefficients of similar magnitude and direction, but were not statistically significant. The self-esteem (or locus of control) index based on Question 13 was not significant. One component of this index (item a) asked whether the client felt "there is really no way I can solve some of my problems." The estimated effect of financial education on this one question was significant and negative, showing a significant decrease between the baseline and follow-up survey relative to controls using all three estimators, with the largest effect derived from using the weighted estimator with covariates. The weighted mean for both groups was 1.6, where 4 equals the client "always" feels there is really no way to solve some of his or her problems, and 0 equals "never." The simple difference-in-differences estimator predicts a -0.38 impact of financial education, while the weighted model and the weighted model with covariates suggest an effect of -0.51. The latter estimate is about a 30 percent decrease. This measure is not specific to financial issues or behavior, but might signal increased self-efficacy of clients related to completing the financial literacy education courses. Since most of the questions in the survey are related to financial topics, clients may have answered this question in the context of their financial problems. Figure 4.5 shows the result for Question 8b using the simple experimental estimator and for Question 13a using the weighted difference-in-differences estimator with covariates.

In general, the sign on the coefficients for financial risk, attitude, and perception questions is consistent with improvements among clients in the financial literacy education program. Isolating individual questions is problematic in that by statistical chance some questions will be significant, particularly using the weaker 0.10 level as a standard. Ideally, overall indices of questions would be significant in order to overcome this multiple measures problem. It is possible that a larger sample size would have yielded more robust results. Given the available data, there is not strong

support for the hypothesis that financial literacy changed client attitudes about financial issues.

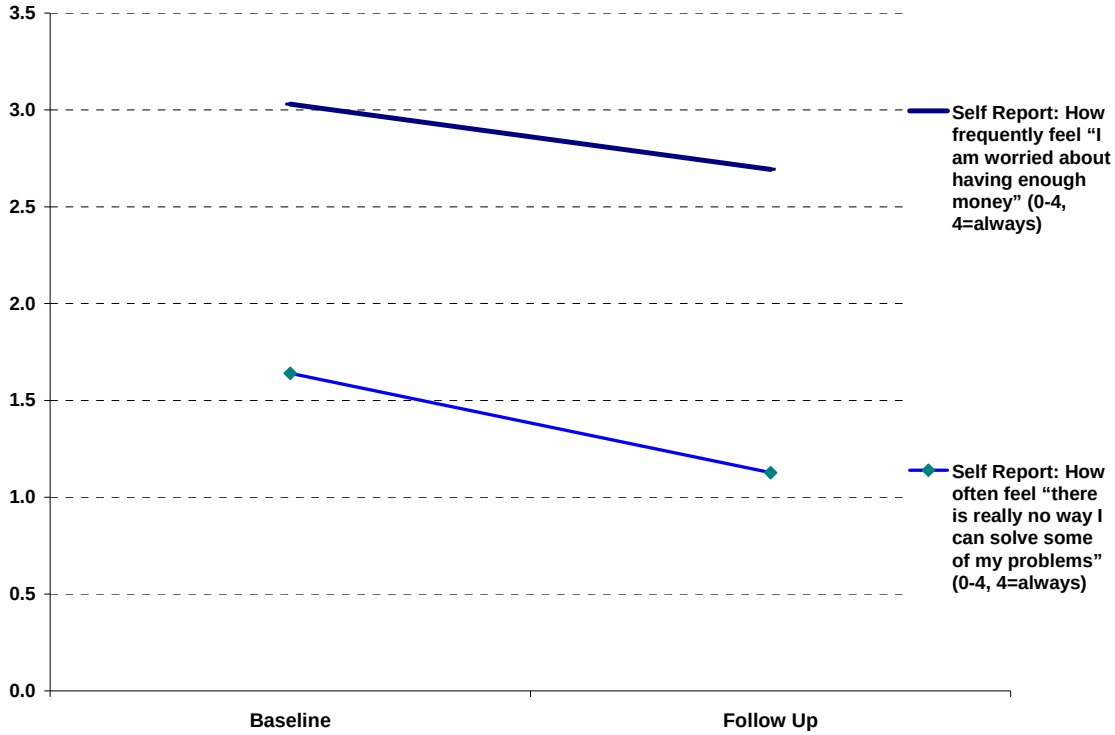

Figure 4.5: Estimated Impact of Financial Education on Self-reported Perceptions Using Weighted Difference-in-Differences Estimator with Covariates (n=127)

8. Discussion

The financial literacy course in this study was designed to help families gain access to basic banking services, learn budgeting skills, boost savings, and repair credit problems. Based on a field study with a very-low-income population, this study shows that financial literacy education is related to improved financial behavior outcomes. The primary evidence of behavioral change is a significant increase in savings account balances, along with modest improvements in credit scores. Client perceptions of financial knowledge also show evidence of improvement, particularly around interest rates, credit, and budgeting. Responses to a survey question about how

clients learned about financial issues also suggests that the financial literacy classes in this program may have played an important role. The findings of this study are surprisingly robust in many cases, especially given the relatively small sample sizes and the weak impacts shown in past studies.

This study has several advantages over previous studies. First, this study includes objective measures of behavior from bank accounts and credit reports, rather than replying on self-reported data. The second advantage of this study is that all clients in the study were mandated to receive financial literacy education, thereby reducing the effects of clients selecting into the program, effects that plague many studies of financial education. Clients were also randomly assigned to either receive the education course immediately or to defer receipt, thereby creating a randomized control group. A third advantage of this study is that the longitudinal design allows for an assessment of impact over a year-long period using a difference-in-differences specification. This allows the knowledge gained from the education course to be incorporated into behavior and for that behavior to be reflected in credit report and bank account data. A final advantage is that because all the clients in the study are enrolled in a housing voucher subsidy program, they are closely monitored and data are regularly available as part of the administrative process for the program.

There are several caveats worthy of discussion. Generalizing these results to other programs requires caution. Clients are at a numerically lower starting point than other populations as measured by initial financial circumstances. This might result in these clients responding more strongly to financial education than consumers at a more moderate initial level. On the other hand, administrative notes included in the data suggest clients in this study experienced problems with domestic violence, unstable employment, drug and alcohol abuse, and problems finding and maintaining

adequate daycare. Given this array of problems, a training program on managing financial resources may be expected to have only a limited effect.

This study is specific to low-income households that were part of a larger housing subsidy program that included a financial self-sufficiency component. Because these clients are enrolled in other programming, they may have differential responses to financial literacy education than clients enrolled in another housing subsidy program without a self-sufficiency component or clients not enrolled in any housing subsidy program. Housing vouchers are in short supply, and a family able to receive a voucher had to go through a sometimes-lengthy application process. Within the voucher program, clients had to enroll in the self-sufficiency program, which allows them to increase their income without losing subsidy. This does not create a problem for the internal validity of the results in this study, as all clients in this study were enrolled in both programs. However, the application of financial literacy education in another setting with clients who did not enroll in other programs related to their financial position may not have similar effects. Exposure to these is included in the covariate estimation models, however, which may help bolster these results.

There are several problems related to the study design. First, the sample is small, as might be expected in a field study. But the size of the sample was reduced considerably by the consent process and attrition. The effects of consent and attrition are only partially observable. In general the assignment of treatment and control groups was not significantly distorted by the consent process—it appears that failure to consent was random. Attrition was not random; clients in the treatment group were more likely to leave the program. The propensity model addresses this issue based on observable characteristics, although it cannot account for unobserved characteristics of the decision to leave the program. The second problem with the design is the control group process. As in most operational programs, clients could not be blind to their

being in a study. The consent process alerted clients to their need to complete a financial education course. Clients who were subsequently told they were not permitted to complete the course for at least 12 months (or "wait listed") may have reacted to this information in ways that could have impacted survey responses or even financial behavior. For example, they may have wanted to create a budget or savings plan but decided to wait until they took the course. Staff of the program suggest that while some clients were excited about the program, most viewed it as another obligation in order to remain in compliance for receipt of their housing voucher. Nonetheless, the design may have created some unobserved bias.

9. Implications

The implications of this study are threefold. First, mandating financial education, at least in the form of Financial Fitness with a similar population in a housing subsidy program, can have positive effects on savings and credit behavior. Financial education can also lead to improvements in self-reported understanding of financial issues. If increasing savings levels and improving credit status is a goal of other public programs, mandating similar financial education programs as part of other programs serving low-income people may be a successful public policy.

Second, from a social welfare perspective, mandating financial education may also lead to improvements in savings levels and in credit quality, which are more valuable than the costs of delivering services. Savings levels for 100 clients are estimated to increase by nearly $50,000 in aggregate in one year. Additional gains will be obtained as clients with improved credit ratings benefit from lower borrowing costs and greater access to credit. To the extent that the delivery of education can be accomplished at or below the marginal benefit, public policies mandating financial

education may be a good investment of public and private resources if improving the financial status of low-income families is a policy goal.

Third, this study suggests that if influencing clients' attitudes and perceptions is deemed important—and the literature suggests beliefs are a precursor to behavior changes—then the content of financial literacy efforts should focus more on examining attitudes toward spending, saving, incurring debt, and taking financial risks. Providers of such courses should focus on the use of debt, planning for financial risks, and providing clients opportunities to weigh the costs and benefits of adding various types of debt versus paying off existing debt or saving. Teaching "values" becomes a challenging task, however, and may require innovative new approaches. One consideration may be to complement educational efforts with longer-term "coaching" services. Using regular check-ins, a coach can help a client implement the skills and knowledge learned in a formal education course. Coaches can help clients formulate and achieve their own financial goals, providing support to maintain behaviors and to form a persistent financial outlook over time (Grant, 2001; Minzner, Hebert, St. George, LoConte, 2006). Programs could also include the use of peer groups as a form of support structure to help clients adhere to financial goals and shape positive attitudes about money and savings.

Methodologically this study demonstrates the use of a randomized design in a field-based setting. CDCLI was able to exploit an education requirement with an existing pool of clients during a 2-year window. The common barrier to random experiments among practitioners is that some clients are denied services. In this case all clients benefited from financial literacy education; all that was randomized was the timing of the service delivery. Practitioners may find that the survey questions and credit report data collected for this study are useful for tracking client outcomes over

time even in a nonexperimental context. This study also provides an applied example of how a propensity score estimator can be used to address problems of attrition bias.

Future research on financial literacy education could augment the findings in this study by examining longer time periods. It is possible that as clients began practicing new behaviors, their knowledge and behavior continued to improve. It is also possible that following an initial burst of careful financial management after completing the financial education course, clients slid back into negative behaviors. A longer study period would allow confirmation that credit problems are not increasing for clients with newly learned financial skills and knowledge and also would potentially detect stronger changes in credit score data. Given the increased risk of attrition as the study period is lengthened, however, such an approach will require a substantially larger initial sample to allow for more extensive modeling.

APPENDIX 4.A. DATA TABLES

Table 4.A.1: Behavioral Baselines: Bank Accounts, Credit Reports, Self-Reports

	Simple Baseline Mean All Clients	Weighted (pscore) Mean All Clients	Number Clients at Follow-Up
Administrative Data:			
Amount in Checking Account	$229	$211	125
Amount in Savings Account	$364	$517	126
Receive Welfare (TANF)	0.112	0.142	126
Credit Report:			
Delinquencies Reported	0.136	0.228	126
Discharges Reported	0.673	0.654	126
FICO Credit Score	573	570	103
Number of Credit Cards	1.7	2.1	126
Subprime (FICO<620)	0.813	0.811	127
Total Dollars in Debt	$11,199	$11,622	126
Self Report:			
Financial Behavior Index	0.39	0.34	115
Grade self at following budget (0-4)	0.38	0.40	103
Grade self at planning for financial future (0-4)	1.11	1.26	126
Grade self at providing for family (0-4)	1.08	1.11	127
Grade self at managing finances (0-4)	2.63	2.65	126

Table 4.A.2: Behavioral Difference-in-Differences: Bank Accounts, Credit Reports, Self-Reports

	Estimated Average Treatment Effect on Treated	*t*	Weighted Estimate	*t*	Weighted Estimate with Program Controls	*t*	Weighted Marginal Effect as % of Baseline
Administrative Data:							
Amount in Checking Account	-$738	*[0.94]*	-$351	*[1.62]*	-$319	*[1.61]*	
Amount in Savings Account	$489	*[2.17]**	$454	*[2.35]**	$474	*[2.41]**	92%
Receive Welfare (TANF)	-0.057	*[0.76]*	0.064	*[0.95]*	0.071	*[1.26]*	
Credit Report:							
Delinquencies Reported	-0.131	*[0.88]*	-0.224	*[1.19]*	-0.222	*[1.25]*	
Discharges Reported	0.354	*[1.01]*	0.309	*[0.84]*	0.336	*[0.92]*	
FICO Credit Score	0.333	*[0.03]*	20.19	*[1.43]*	20.805	*[1.73]+*	4%
Number of Credit Cards	0.695	*[1.96]+*	0.424	*[1.08]*	0.464	*[1.30]*	
Subprime (FICO<620)	0.035	*[0.44]*	0.016	*[0.16]*	0.02	*[0.23]*	
Total Dollars in Debt	$2,533	*[1.64]*	$2,241	*[1.29]*	$2,276	*[1.29]*	
Self Report:							
Financial Behavior Index	0.529	*[4.54]***	0.548	*[4.27]***	0.547	*[4.17]***	45%
Grade self at following budget (0-4)	0.552	*[2.91]***	0.492	*[2.17]**	0.488	*[2.13]**	39%
Grade self at planning for financial future (0-4)	0.765	*[3.83]***	0.83	*[3.40]***	0.858	*[3.57]***	77%
Grade self at providing for family (0-4)	0.437	*[2.23]**	0.469	*[2.07]**	0.476	*[2.04]**	18%
Grade self at managing finances (0-4)	0.621	*[3.19]***	0.482	*[2.16]**	0.488	*[2.17]**	38%

Absolute value of t statistics in brackets
*+ significant at 10%; * significant at 5%; ** significant at 1%*
Controls: duration in FSS program, household size, rent subsidy, debt level, & income

Table 4.A.3: Baseline: Knowledge Self-Reports

	Simple Baseline Mean All Clients	Weighted (pscore) Mean All Clients	Number Clients at Follow-Up
Self Report: Financial Knowledge Index	1.69	1.75	126
Self Report: Grade self understanding of current interest rates (0-4)	0.51	0.58	126
Self Report: Grade self understanding of own credit report (0-4)	0.97	0.94	127
Self Report: Know a lot about credit (0-4)	1.56	1.63	126
Self Report: Know a lot about investing money (0-4)	1.33	1.24	125
Self Report: Know a lot about managing finances (0-4)	1.96	1.95	126
Self Report: Learned a lot about managing money and using credit from training courses outside of school	1.35	1.25	108

Table 4.A.4: Difference-in-Differences: Knowledge Self-Reports

	Estimated Average Treatment Effect on Treated	*t*	Weighted Estimate	*t*	Weighted Estimate with Program Controls	*t*
Self Report: Financial Knowledge Index	0.523	*[3.19]***	0.441	*[2.17]**	0.446	*[2.18]**
Self Report: Grade self understanding of current interest rates (0-4)	0.746	*[3.63]***	0.854	*[2.74]***	0.935	*[3.59]***
Self Report: Grade self understanding of own credit report (0-4)	0.519	*[2.64]***	0.576	*[2.21]**	0.627	*[2.57]**
Self Report: Know a lot about credit (0-4)	0.397	*[1.97]**	0.239	*[0.94]*	0.269	*[1.06]*
Self Report: Know a lot about investing money (0-4)	0.247	*[1.23]*	0.372	*[1.57]*	0.403	*[1.67]+*
Self Report: Know a lot about managing finances (0-4)	0.621	*[3.19]***	0.482	*[2.16]**	0.488	*[2.17]**
Self Report: Learned a lot about managing money and using credit from training courses outside of school	1.06	*[4.82]***	1.125	*[4.92]***	1.185	*[4.91]***

Absolute value of t statistics in brackets
*+ significant at 10%; * significant at 5%; ** significant at 1%*
Controls: duration in FSS program, household size, rent subsidy, debt level, & income

Table 4.A.5: Baseline: Attitudes and Beliefs Self-Reports

	Simple Baseline Mean All Clients	Weighted (pscore) Mean All Clients	Number Clients at Follow Up
Self Report: Financial Worry Index	2.69	2.69	127
Self Report: How frequently feel “I am worried about having enough money” (0-4, 4=always)	3.06	3.03	127
Self Report: Self Esteem Index	1.30	1.30	127
Self Report: How often feel “there is really no way I can solve some of my problems” (0-4, 4=always)	1.68	1.64	126
Self Report: Stress Symptoms Index	2.69	2.69	126

Table 4.A.6: Difference-in-Differences: Attitudes and Beliefs Self-Reports

	Estimated Average Treatment Effect on Treated	*t*	Weighted Estimate	*t*	Weighted Estimate with Program Controls	*t*
Self Report: Financial Worry Index	-0.184	*[1.21]*	-0.214	*[1.15]*	-0.218	*[1.16]*
Self Report: How frequently feel "I am worried about having enough money" (0-4, 4=always)	-0.335	*[1.72]*+	-0.327	*[1.44]*	-0.337	*[1.47]*
Self Report: Self Esteem Index	-0.133	*[1.01]*	-0.152	*[1.09]*	-0.149	*[1.08]*
Self Report: How often feel "there is really no way I can solve some of my problems" (0-4, 4=always)	-0.379	*[1.96]*+	-0.507	*[2.30]**	-0.513	*[2.45]**
Self Report: Stress Symptoms Index	-0.039	*[0.32]*	-0.051	*[0.35]*	-0.051	*[0.35]*

Absolute value of t statistics in brackets
*+ significant at 10%; * significant at 5%; ** significant at 1%*
Controls: duration in FSS program, household size, rent subsidy, debt level, & income

Client Survey

1. Which of the statements comes closest to the amount of financial risk that you and your spouse/partner are willing to take when you save or make investments?

- ☐ "Take substantial financial risks expecting to earn substantial returns"
- ☐ "Take above average financial risks expecting to earn above average returns"
- ☐ "Take average financial risks expecting to earn average returns"
- ☐ "Not willing to take any financial risks"

2. Over the past year, would you say that you and your spouse/partner combined:

- ☐ Spent more than you made in income
- ☐ Spent less than you made in income
- ☐ Your spending equaled your income
- ☐ Don't know

3. How do you grade yourself in the following areas in the last 12 months?

		Poor	Fair	Okay	Good	Excellent
a.	Controlling my spending	☐	☐	☐	☐	☐
b.	Paying my bills on time	☐	☐	☐	☐	☐
c.	Planning for my financial future	☐	☐	☐	☐	☐
d.	Providing for my family	☐	☐	☐	☐	☐
e.	Saving money	☐	☐	☐	☐	☐
f.	Managing my finances	☐	☐	☐	☐	☐
h.	Investing money	☐	☐	☐	☐	☐
h.	Following a budget	☐	☐	☐	☐	☐
i.	Knowledge of current interest rates	☐	☐	☐	☐	☐
j.	Knowledge of my current credit rating	☐	☐	☐	☐	☐

4. How often do you have the following symptoms?

a.	Nightmares, insomnia, or restless sleep	☐
b.	Headaches/migraines	☐
c.	Stomach or back pain	☐
d.	Extreme tiredness or fatigue	☐
e.	Feelings of embarrassment or inadequacy	☐
f.	Loss of appetite	☐
g.	Fear of losing control	☐

5. How much do you know about the following?

a. Interest rates, finance charges, and credit terms ..... ☐
b. Credit ratings and credit files ..... ☐
c. Managing finances ..... ☐
d. Investing money ..... ☐
e. What is on your credit report ..... ☐

6. How much have you learned about managing money and using credit from…?

a.	High school and/or college courses	☐
b.	Training courses and/or seminars taught outside school	☐
c.	Difficult financial experiences / "school of hard knocks"	☐
d.	Parents	☐
e.	Spouse/domestic partner	☐
f.	Friends and peers	☐
g.	Work	☐
h.	TV or radio	☐

7. How would you rate your ***current*** credit record?

Very bad…☐ Bad…☐ About average…☐ Good…☐ Very good…☐

8. How frequently do you feel this way?

a. I am worried about controlling my spending ..... ☐
b. I am worried about having enough money ..... ☐
c. I am stressed about my financial situation ..... ☐
d. I feel I cannot afford to go out ..... ☐

9. Have you or your spouse/partner ever…?

a. Declared bankruptcy ..... ☐
b. Received consumer credit counseling ..... ☐
c. Paid a late fee for a bill ..... ☐
d. Reached the maximum on your credit card ..... ☐
e. Received a phone call from a lender or creditor ..... ☐
f. Paid a utility bill late ..... ☐
g. Took out a cash advance ..... ☐
h. Bounced a check ..... ☐
i. Had items repossessed ..... ☐

10. How strongly do you agree or disagree with the following statements?

a. My parents/guardians were good at managing their finances..... ☐
b. I was aware of my parents'/guardians' financial situation ..... ☐
c. My parent/guardian talked to me about their finances ..... ☐
d. My parent/guardian talked to me about how to manage money..... ☐

11. How strongly do you agree or disagree with the following statements?
Today….

a. I regularly set aside money for savings ..... ☐
b. I am saving for my children's future needs ..... ☐
c. I think taking on more debt is good for my family..... ☐

12. Do you use any of the following tobacco products?

a. Cigarettes ..... ☐
b. Cigars ..... ☐
c. Pipes ..... ☐
d. Chewing tobacco or snuff ..... ☐

13. How often do you feel…?

a.	There is really no way I can solve some of my problems	☐	☐	☐	☐
b.	I am being pushed around in life	☐	☐	☐	☐
c.	There is little I can do to change things in my life	☐	☐	☐	☐
d.	I can do anything I set my mind to	☐	☐	☐	☐
e.	What happens to me in the future depends on me	☐	☐	☐	☐
f.	Helpless in dealing with the problems of life	☐	☐	☐	☐
g.	I have little control over the things that happen to me	☐	☐	☐	☐

14. Have you or your spouse/partner experienced any of the following in the last 12 months?		**Yes**	**No**
a.	Major medical expenses	☐	☐
b.	Theft or destruction of significant property	☐	☐
c.	Major legal or tax problem	☐	☐
d.	A significant involuntary reduction in income	☐	☐
e.	Loss of job	☐	☐
f.	An extended period when you couldn't find a job	☐	☐
g.	Injury / health emergency	☐	☐
h.	Excessive credit card or other loan burden	☐	☐
i.	Problem paying taxes	☐	☐
j.	Death in family	☐	☐
k.	Divorce / separation	☐	☐
l.	Disability or Long-term illness	☐	☐

15. Are you enrolled in the Family Self Sufficiency Program? **Yes** ☐ **No** ☐ **Don't know** ☐

If yes, what was the ***main reason*** you enrolled? (✓ one answer only)

- It was required ☐
- Hoped to improve my financial condition ☐
- To build savings thru escrow account ☐
- To achieve home ownership ☐
- Childcare ☐
- To obtain my GED ☐
- To receive tuition assistance for education ☐
- To access other financial assistance ☐
- Other ☐
- Not Applicable ☐

16. Are you enrolled in the Financial Fitness? **Yes** ☐ **No** ☐ **Don't know** ☐

If yes, what was ***the main reason*** you enrolled? (✓ one answer only)

- It was required ☐
- Hoped to improve my financial condition ☐
- To fix credit problems ☐
- To achieve home ownership ☐
- To build a savings account ☐
- Other ☐
- Not applicable ☐

17. How far do you live from the CDCLI offices? (✓ one answer)

Under 5 minutes away	☐	16-20 minutes	☐
6-10 minutes away	☐	21-25 minutes	☐
11-15 minutes away	☐	More than 25 minutes	☐

18. Do you have any of the following insurance coverage?	**Yes**	**No**
a. Health insurance (HMO, SCHIP, Medicaid, Medicare, etc)	☐	☐
b. Life insurance (whole or term coverage)	☐	☐
c Disability insurance	☐	☐
d. Renter/property insurance	☐	☐
e. Auto insurance	☐	☐

19. What is the highest level of schooling you have completed? (✓ one answer)

Some schooling	☐	Graduated with 2-year associate's degree	☐
High school diploma or equivalent	☐	Graduated 4-year college bachelors degree	☐
Some college	☐	Graduate or professional degree	☐

20. In what year were you born? 19___

21. What best describes your current work status? (✓ one answer)

Full-time Student	☐	Temporarily laid-off or on leave	☐
Homemaker	☐	Unemployed, looking for work	☐
Retired/disabled	☐	Unemployed, not looking for work	☐
Self-employed	☐	Employed full-time	☐
Employed part-time	☐		

22. What is your gender? **Male** ☐ **Female** ☐

23. How many people are there in your household ***including yourself***?

- a. Adults over 18 years old _____
- b. Children 12 to 18 years old _____
- c. Children under 12 years old _____

24. How much would you estimate <u>you and your spouse/partner</u> have in combined total savings and investments? (✓ one)

No assets	☐	$10,000 to $14,999	☐
Less than $1,000	☐	$15,000 to $19,999	☐
$1,000 to $4,999	☐	$20,000 or more	☐
$5,000 to $9,999	☐		

25. How much would you estimate <u>you and your spouse/partner</u> have in combined total debts? (✓ one)

No debts	☐	$10,000 to $14,999	☐
Less than $1,000	☐	$15,000 to $19,999	☐
$1,000 to $4,999	☐	$20,000 or more	☐
$5,000 to $9,999	☐		

Credit Report Measures

Credit score	FICO score from single bureau credit report
Total $ amount of all debt	Aggregate all existing debts from report.
Number of active bank cards	Aggregate bank issued credit cards such as Visa, Mastercard, etc.
Number of total credit cards	Aggregate the of any department store, retail store or other cards plus bank cards
Average age of accounts	Sum of the age of all of all open accounts divided by the total number of accounts rounded to the month
Total $ of credit limits	Aggregate maximum limit for all open accounts, regardless of current status (even if nothing is borrowed).
Total $ credit limit borrowed	Aggregate open account total amount borrowed
Number 60 day delinquencies	Count of any 60 day or greater delinquencies in the last 12 months based on the date of the credit report.
Number Deficiencies	Count of any deficiency judgments listed in the report.
Number Charge-offs	Count of any charge offs listed in the report.
Number Bankruptcies	Count of any bankruptcy listed in the credit report.

50058 Administrative Data Measures

Any checking account	Yes or no.
Amount in checking account	Aggregated if multiple accounts.
Any savings account	Yes or no
Amount in savings account	Aggregated amounts if multiple accounts.
Treatment/ Control	Treatment = assigned to take Financial Fitness class
Census Tract	Of client's home address
# HH members	Size of household
Gender	(M/F)
Single parent	(Y/N)
Citizen	(Y/N)
Disabled	(Y/N)
Total rent amount	
Tenant portion of rent	Net of subsidy from Housing Voucher Program
Age	
Ethnicity	Hispanic/Latino or non- Hispanic/Latino

Race	White, African American, Asian, Native/Pacific Islander
Welfare receipt	(Y/N)
Wage income	(Y/N)
Wage income $	Dollar amount per year
Child support	(Y/N)
Child support $	
Total income	All sources in total per year
Medical expenses	Any reported per year
Child care expenses	Any reported per year

Financial Literacy Course Topics

1. Banks and Financial Institutions
    a. Banking products and services
    b. Cautions about high-cost services (payday loans, etc)
    c. Selecting a bank
    d. Opening a checking account
    e. Balancing a checkbook
2. Money Management and Savings
    a. Tracking spending
    b. Reducing spending
    c. Setting goals
    d. Creating a budget
    e. Why save?
    f. Types of savings
    g. Developing a savings habit
3. Credit
    a. Understanding credit records
    b. Establishing & maintaining good credit
    c. Shopping for a credit card
    d. Avoiding debt
    e. Credit repair
    f. Obtaining a credit report
4. Consumer Finance Awareness
    a. How to avoid scams
    b. How to handle complaints
    c. Understanding how marketing works
    d. Shopping strategies
5. Homeownership
    a. Overview of steps, risks and benefits
    b. Avoiding predatory lending
    c. Scheduling a one-on-one counseling session

Propensity Score Estimation Procedure

A propensity score is the conditional probability of a client being assigned to the treatment group given pretreatment characteristics. Propensity score matching is a way to "correct" the estimation of treatment effects by controlling for the other factors that might create bias. A score is calculated for each client in order to better match control group subjects to treatment subjects. By using these scores as weights, the two groups will be more similarly paired along various baseline factors except for treatment (Heckman, Ichimura, & Todd, 1997; Rosenbaum & Rubin, 2001; Smith & Todd, 2005). The probability of being assigned to treatment and then completing all surveys was estimated using the following probit specification of baseline data:

Eq. A-1 $\text{Prob(treatment)} = \beta_1 \text{ age} + \beta_2 \text{ age2} + \beta_3 \text{ financial knowledge index} + \beta_4 \text{ debt} + \beta_5 \text{ bankruptcy} + \beta_6 \text{ savings} + \beta_7 \text{ household size} + \beta_8 \text{ rent} + \beta_9 \text{ income} + \beta_{10} \text{ white} + \beta_{11} \text{ welfare} + \beta_{12} \text{ \#delinquencies} + \beta_{13} \text{ Length of time in FSS} + \varepsilon$

The propensity score was then used to create quintiles of about 25 clients each based on the relative probability of completing education predicted by this model. Within each quintile, each control borrower was assigned a weight relative to his or her probability of actually being in the control group (number of treatment subjects in the quintile divided by the number of control subjects in quintile). Weights ranged from 0.23 to 2.57. The means of over 20 variables were tested between treatment and control groups using these weights. No comparison had statistically significant differences, and none had a weighted t-test statistic of more than 1.0. This suggests the propensity scores are an effective method (Morgan & Harding, 2006). More than 20 different propensity scoring specifications were tested, including models with as many as 30 covariates. The significance and magnitude of the results of the t-tests and treatment estimates were stable across variations in the scoring model. The model produced quintiles with common support (all treatments and controls were matched) and was the most parsimonious of the variations tested.

Table 4.A.7: PROBIT Model for Propensity Score Estimation

	Propensity Score
	b/t
Age	-0.08
	(0.61)
Age* Age	0.00
	(0.63)
Financial Literacy Index	-0.18
	(1.14)
Total Debt	0.00
	(0.82)
Past Bankruptcy	0.000
	(0.12)
Total Savings	0.000
	(0.26)
Household size	0.07
	(0.87)
Rent Subsidy	-0.00**
	(2.86)
Total Income	0.00**
	(2.94)
White race	0.08
	(0.32)
Welfare Receipt	0.14
	(0.45)
Number of delinquencies on Credit Report	0.56
	(1.71)
Months in Program	0.000
	(0.98)
Constant	2.16
	(0.87)
Observations	144

Absolute value of t statistics in brackets
** significant at 5%; ** significant at 1%*

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