The Unbanked and Payday Loan Consumers

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Abstract

Recently, the media and legislators have labelled payday lenders as "predatory lenders". This is due, in part, to their triple digit, annualized interest rates and business model that traps borrowers in cycles of debt. Despite their costly loans, payday loans are frequently used by the most financially vulnerable populations, low-income and minority consumers with low educational attainment. Similarly, the unbanked, those without a checking or savings account, are more likely to be low income, minorities, and people with low educational attainment. Without ties to the conventional financial industry, they must receive financial services from alternative financial institutions, like payday lenders. This research estimates whether there is a relationship between payday loan borrowers and the financially vulnerable, unbanked population. Using the Current Population Survey (CPS) Unbanked \Underbanked Supplements for January 2009, June 2011, and June 2013, this research estimates a recursive bivariate nonlinear probability model. This research shows that the probability a household is unbanked is statistically correlated with the probability that a household uses a payday lender, but unbanked households are less likely to use a payday lender than banked households.

Disclaimer: Any views expressed are those of the author and not necessarily those of the U.S. Census Bureau.

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Introduction

One of the basic indicators of financial health is ownership of a savings or checking account. However, previous research show that low income household are more likely not to have a conventional bank account than other households (FDIC, 2009; FDIC, 2011; FDIC, 2013; Rhine et al., 2006; Bourke, 2012).

The ownership of one of these accounts demonstrates a level of financial literacy and financial well-being; that a person earns enough disposable income that there exists a residual, after consumption, to be saved and that the account holder recognizes the financial benefits to owning the account. In turn, these savings can then be used for emergencies or for larger purchases, rather than procuring debt to cover unexpected events or large purchases. Another benefit is savings and checking accounts pay interest on the amount deposited. The interest rate, while low, is greater than the zero interest earned storing money in a wallet or under a mattress.

Despite the benefits of having a conventional bank account, millions of US household are without a savings or checking account or ties to banking institutions, and these households obtain financial services else where. According to the 2013 FDIC National Survey of Unbanked and Underbanked, about eight percent of US households were unbanked in 2013. This estimate represents almost 10 million households where no member of that household has savings or checking account (FDIC, 2013). Whats more, these households also lack relationships to conventional banking institutions, which prevents access to low interest, conventional loans and credit cards, as well as, wealth building financial products (mutual funds, certificates of deposit, etc). Without ties to conventional banks, when faced with an unexpected bill or change to earnings, these households often look to alternative funding sources, or fringe banking, such as, pawn shops or payday lenders, to cover these expenditure shocks (Caskey, 1994).

Conversely, according to the Center for Responsible Lending, in 2013, payday lenders issued $27 billion in annual loans to consumers experiencing financial emergencies (Center for Responsible Lending, 2015). As such, recent literature shows that the household characteristics of the unbanked are parallel to the household characteristics of payday loan patrons. Both households are more likely to be low income, minority, have low educational attainment, have a female-head of household, and are young (FDIC, 2009; FDIC, 2011; FDIC, 2013; Rhine et al., 2006; Tellalian et al., 2010; Bourke, 2012). The existence of these parallels begs the question: *Are those unbanked households outsourcing their financial needs to payday lenders?*

The relationship between payday loan consumers and unbanked households is the basis of this research. In short, this research found for all households in the sample, being unbanked decreases the probability that a household uses a payday lender by 5.8 percent in 2009, 3.8 percent in 2011, and 3.7 percent in 2013. These results are not consistent when modeled on samples of Black or Hispanic households. This research also found that the probability that a household is unbanked and the probability that a household use a payday lender are best modeled simultaneously rather than separately. The correlation coefficient, ρ, of the simultaneous equation estimation was significantly different from zero, for all years and the full sample of households.

History of the Payday Loan Industry

An early predecessor to today's payday lender was the "salary lender" of the large eastern US cities of the 19th century. The salary lender's consumers were government, railroad, streetcar and clerical employees, who often borrowed from non-banks, to cover expenditure shocks.

These lenders were also called "loan sharks" because they imposed high interest costs to their

loans, frequently trapping the borrower in a cycle of debt. For example, a borrower would take out a loan for $5. By next payday, they were expected to pay back $6. Often, borrowers would not have the 6 dollars, and would instead repay the dollar interest, rolling over the loan to the next payday, then the next. Anecdotal accounts of this cycle of chronic borrowing include "a Chicago worker borrowed 15 dollars, but ten years later [he] had repaid $2,153 and still owed the original $15 " (Hailer and Alviti, 1977).

By the early 20th century, the business of salary lenders was labeled a "loan shark problem" to which nonprofit foundations and legislator sough to remedy. Nonprofit organizations responded by providing low-cost alternatives to salary advances. State governments also responded by raising the interest rate caps, called special usury laws, to encourage banks to enter the salary loan market. Then, the enactment of the special usury laws, ensured that banks could lend small sums at an annual interest rate of 36 to 42 percent. In the end, the main financial sector took over the salary lending market until the 1980s (Keest and Renuart, 2000).

Fo almost a century, the conventional finance companies offered small loans to consumer, but eventually found that the payday loans were not a profitable product. The operating cost of these loans increased less than proportionately with loan size (Lawrence and Elliehausen, 2008). This, with the deregulation of the financial services market of the 1980s, encouraged conventional finance companies to exit the small loan market. However, conventional financial institutions extend low risk consumers small lines of credit through credit cards, but the small loan business moved to pawnshops and in the 1990s, to payday loan businesses.

During the 1990s, the payday loan industry was relatively small and an unregulated aspect of the financial sector. There were less than 300 payday loan establishments in the US. The industry had no consistent reporting of the details of their loan processes and were not subjected to licensing requirements (Caskey, 2001). By 2013, there were over 22,000 payday loan establishments (Center for Responsible Lending, 2015).

A payday loan is a small, short-term loan used by borrowers experiencing a cash flow shortage, or an expenditure shock. How it works is a consumer takes out a loan, between $100 and $500, and pays a fee of $10 to $30 per $100 dollars borrowed. For, example, if a borrower needs a payday advance of $300, the lender loans the $300 at a cost of $15 per $100 borrowed, for a total amount to be repaid of $345 at the loan's maturity. The principle and the fees are due by the consumer's next payday. As collateral, the consumer writes a post-dated check, endorses a paycheck to the lender, or allows the lender access to their bank account.(Bourke, 2012).

One main component of the payday loan business model is that payday lenders do not allow partial payment of the principle loan. The entire loan amount is due when the loan matures, or the consumer can instead pay the fees due and takeout another payday loan for the original principle amount. Often, the consumer does not repay the principle and the fees when the loan is due, and instead, only pays the fee. In the above example, the fee is the $45. By only paying the fee, the consumer must roll over the principle into another payday loan of $300. At the next payday, the consumer has to repay the principle and another fee, a total of $345, or pay again the $45 dollar fee and rollover the principle to another payday loan. If at the second maturity date, the consumer pays the entirety of the loan, he or she would have paid a total of $390. The $90 worth of fees on a $300 loan amount. This ratio of fee to principle for that one month amounts to an annual percentage rate of 391 percent footnote Calculated by dividing the total amount of fees paid, by the principle loan amount, then multiplying the result by 365, the dividing that result by the length of the loan (28 days), then multiplying by 100

The typical borrower takes out 8 payday loans rolling over their initial loan 7 times before they pay the entire amount due. As a result, they pay hundreds of dollars in fees, with the continuous repayment of fees amounting to an annual percentage rate of up to 800%. In the hypothetical

example, if a borrower did not repay the loan for an entire calendar year, and rolled the loan over every two weeks, paying only the $45 fee, the borrower would have paid $1,170 in fees on an initial loan of $300 (Elliehausen and Lawrence, 2001).

So why would anyone get a payday loan? Credit card annual interest rates can range from 3.25 to 32.7 percent and are cheaper alternatives for small lines of credit. Unfortunately, many payday lending patrons have bad credit, maxed out credit cards, limited available credit, or no access to credit unions that will issue such small loans. These people are also employed with minimal assets, who find it easier to use their employment as collateral with payday lenders (Caskey, 2001).

Another possible explanation to *Why a payday loan?* is that those households who use payday lenders may prefer payday lenders over banks. For example, if a household does not have the liquidity to cover an expense, it may be cheaper to pay $10 to $30 in payday loan fees rather than $30 to $40 in overdraft fees. Bouncing a check also creates the risk of the bank closing the overdraft account, especially if the account has been overdrawn before. Then, the payday loan process is relatively quick. With the appropriate documents, a customer walks out with cash in hand in about 30 minutes. Bank loans often require appointments with a loan officer, time with the officer discussing net worth, a credit check, proof of income and assets, and several days to process the loan application with no guarantee of approval.

To be eligible for most payday loans, the borrower must have a bank account and a steady stream of income. For one of the largest payday lending firms in terms of number of establishments, ACE Cash Express requires the loan applicants to have a valid bank account that has been open for at least one month. As such, I expect there to be zero relationship between the probability that a household uses a payday lender and the probability that the household does not have a bank account since these unbanked households do not qualify for most payday loans. Moreover, the share of all households who reported that they used a payday lender is small. About 4 percent of households in 2009 and 5 percent in 2011 and 2013 respondent that they have used a payday lender. As such, I hypothesize that the share of unbanked households who also use a payday lender to be close to zero.

However, there are about 5 payday lending firms that operate predominately online that will issue loans to those without a bank account, but who have a consistent stream of income. Moreover, the characteristics of the people who borrow from payday lenders are very similar to the characteristics of those who are unbanked. Both of these groups are low-income, young, minority households. Nonetheless, this relationship between the probabilities of being unbanked and using a payday lender could be spurious, with the relationship between the two probabilities confounded by the low-income characteristics that both groups share (Caskey, 2001; FDIC, 2009; FDIC, 2011; FDIC, 2013).

This research will explore if there is a statistically significant relationship between households who use payday lenders and households who are unbanked, specifically if the two probability models are correlated, and if unbankedness has any affect on the probability that a household uses a payday lender. Recent literature asserts that the household characteristics of the unbanked are parallel to the household who patronizes a payday lender. Both households are more likely to have low income, be minority, have low educational attainment, and have a female-head. If there is a positive relationship between the unbanked and the probability that a household uses a payday lender, it can be said that unbanked households will outsource their financial needs to payday lenders.

Further support for this research's empirical strategy comes from the work of Rhine et al., (2006). In that paper, the authors estimated a similar joint probability model, but instead of payday lenders, the authors tested whether the probability that a household is unbanked was statistically correlated with the probability that a household used currency exchanges/check cashing establishments. As a result, the authors found that unbanked households were more likely to use a check casher than

other households, and that the correlation coefficient ρ was statistically significant from zero in the simultaneous estimation.

Subsequently, my research will investigate the following:

1. **What effect does being unbanked have on the probability of using a payday lender?**

2. **Is decision to be unbanked made jointly with the decision to use a payday lender?**

Review of Literature

Payday Lending, Predatory Lending

The typical consumer of a payday lender is one who is low income and financially vulnerable. They are currently experiencing an unexpected expenditure or regular expense, to which they do not have the liquidity to cover. These consumers are financially vulnerable in that they do not have access to other lines of credit besides payday loans, or they are unaware that their exists other lines of credit besides payday lenders. As a result, they use expensive financial products like payday loans. The previous research asserts that payday lenders prey upon these consumers, concentrating near vulnerable populations, mistreating and deceiving customers.

Grave and Peterson (2005) tested the spatial relationship between payday loan establishments and military service members. The authors used 2000 Census data for demographic characteristics, Department of Defense Annual Base Structure Report of 2004 for military base location data, bank establishment location data from the FDIC, and payday lending establishment location data from individual state databases. They showed that the density of payday lenders was the greatest near military bases than other counties in the same state, controlling for demographic characteristics. Also, near military bases the number of payday lenders per capita exceeds the number of banks and bank branches per capita (Grave and Peterson, 2005). Other research subsequently found that high concentrations of payday lenders near military bases decrease the performance of military personnel (Carrell and Zinman, 2013).

The high concentrations of payday lenders near military and the negative impact the loans had on morale spurred action from Congress. In 2006, Congress passed the Military Lending Act, which capped the interest rate on payday loans to 36% APR for active duty service members and their dependents. Still, members of the armed forces took out payday loans and had difficulties repaying the loans. The Consumer Financial Protection Bureau found that payday loan collectors threatened to report outstanding payday loan debt to the service-member's commanding officer. As a result of the increased scrutiny, some payday lending firms refuse to lend to military service-members or their immediate family (Federal Trade Commission).

Furthermore, an analysis of survey data on payday lenders in Ohio found that several payday lending establishments did not comply with consumer protection laws or the self-regulatory principles of the payday loan industry. Specifically, payday lenders violated the Federal Truth in Lending Act (TILA) by not fully disclosing the terms of the loan, particularly the annualized interest rate. Customers often found out about the high APR after they signed the loan contract. Moreover, lenders refused to provide written information about the terms of the loan, conducted credit checks without consent, and falsely stated that borrowers have the right to void the contract, free of charge. Lenders also charged fees to roll over loans, sued customers in default for treble damages, threatened to seek criminal prosecution for customers with delinquent accounts, and threatened customers with physical harm if they did not pay back the loans (Johnson, 2002).

State Bans

There are eighteen states and the District of Columbia that outright ban payday lending or impose an interest rate ceiling that makes the industry unprofitable in that state. New Jersey and New York have had criminal usury laws in place before the onset of the payday loan industry. Georgia passed racketeering laws, effective in 2004, which banned payday loans. North Carolina allowed the law permitting payday lending to expire in 2001, but establishments were still in operation until 2006 (Melzer and Morgan, 2015). Arizona also sunset the law allowing payday loans in 2010. Oregon capped the annual interest rates at 36 percent in 2007, New Hampshire in 2009, and Montana in 2011 causing most lenders to leave the state. (Desai and Elliehausen, 2017). The District of Columbia repealed its payday law, but an establishment with a license to deposit checks in a bank account can cash post-dated checks for a fee (Same Day Payday). Connecticut, Maryland, Massachusetts, Pennsylvania, Vermont and West Virginia ban payday loans under their usury laws (Payday Loan Consumer Information).

Despite the increased regulation of the industry, consumers will cross state line to payday loan friendly states, or take out loans via the internet. Empirical evidence show that after a state ban there were positive financial effects on borrowers. There were decreases in the rate of Chapter 13 Bankruptcy filings, number of returned checks and overdraft fee income tp banks (Morgan et al., 2012), a decrease in bank account closures (Campbell et al., 2012), and a decreased likelihood of credit accounts going into collections (Bhutta, 2014). Table 1 gives the legal status of payday loans by state.

Table 1: Legality of Payday Lending by State

States	Regulation
AL, AK, CA, CO, DE, HI, FL, ID, IL, IN, IA, KS, KY, LA, MI, MN, MO, MS, NE, NV, NM, ND, OK, OH, RI, SC, TN, TX, UT, VA, WA, WI, WY	Payday lending allowed without regulations.
MA, ME, MT, NC, NH, OR, PA, SD	Payday lending allowed, but interest rates are capped.
AR, AZ, CT, DC, GA, MD, NJ, NY, VT, WV	Payday lending is prohibited and small loan interest rates are capped.

Consumer Welfare

Another strand of empirical analysis of the payday lending industry measures the effects of the industry on consumer welfare. Where welfare is measured by financial health, the majority of the literature finds that access to high cost credit products to consumers facing cash flow shortages lead to negative welfare. Specifically, the rigid business model of payday lenders causes a behavior of chronic borrowing when the business model specifies that consumers must pay back the entirety of the loan, without the option of making installment payments (Stegman and Faris, 2003; Reisdorph, 2005; Flannery, 2005).

North Carolina regulators found that 87 percent of borrowers have rolled over a loan and 77 percent of customers have rolled over a loan in Indiana (Graves and Peterson, 2005). Also, the obligation to pay back the loan increased the Chapter 13 bankruptcy filing rate (Skiba and Tobacman, 2009), decreased job performance (Carell and Zinman, 2013), and increased the insolvency of

borrowers (Melzer, 2011).

However, there exists a disparity in the literature on the affects to welfare. One vein asserts that access to payday loans is beneficial to consumers (Morgan and Strain 2008; Zinman 2010; Morse, 2011; Morgan et al., 2012). Specifically, Morse (2011) examined whether the use of a payday lender increased or mitigated the effect of a financial distress. With the data from the Survey of Consumer Finance, the author found that the welfare of consumers facing financial distress increased when the consumer had access to payday lenders. Welfare was measured by the likelihood a consumer would experience a foreclosure or commit theft. Consumers who were facing a foreclosure following a natural disaster or were likely to commit theft after a disaster were less likely to have a foreclosure or shoplift if they had access to a payday lender (Morse, 2011).

Then, more recently, empirical analysis has found that payday loans do not affect the financial health of borrowers. The research by Bhutta, 2014 found no effect of payday loans on the borrower's financial health. With demographic data from the 2000 Census, payday loan establishment location data from the Census ZIP Code Business Patterns, and longitudinal credit record data from the Federal Reserve Bank of New York Consumer Credit Panel/Equifax (CCP), the author found little to no effect of payday loans on credit scores, new delinquencies, or the likelihood of maxing out credit cards (Bhutta, 2014).

Characteristics of Payday Loan Borrowers

Previous research shows that the typical payday loan borrower faces other financial hardships and difficulty managing debt or accessing lines of credit. That they have exhausted other means of credit and are experiencing a shortage in cash flow. These consumers seek the services from alternative financial services or the fringe banking system to cover unexpected, but more often, regular expenses (Caskey, 2001).

The Pew Charitable Trust has done extensive research on the payday lending industry and the type of consumer who uses a payday loan. In their 2012 report, they collected their own survey data and used a logistic model to estimate the likelihood a person uses a payday lender, given a set of demographic characteristic. Pew shows that payday loan consumers are more likely to be moderate income, unmarried, female, and without a college degree (Bourke, 2012). My results are similar, but I extend the discussion by modeling unbankedness and payday lending together, given a set of demographic characteristics. My choice of a bivariate probability model shows that there is a significant correlation between the error terms of the probability of being unbanked and the probability of using a payday lender. The ρ of models for years 2009, 2011, and 2013 are significantly different from zero, suggesting that the two probability models have sufficient correlation between the two error terms to be modeled jointly. Additionally, this research uses the Current Population Survey (CPS) supplemental data and estimates a non-linear probability model for a relationship between payday loan consumers and the unbanked.

Using the 1999 Survey of Financial Activities of low and moderate income individuals from Los Angeles and New York and their banking habits, Vermilyea and Wilcox (2002) estimated a binomial logistical model. Their estimates show that individuals who are Black or Hispanic, unemployed, and receive government payments are more likely to be unbanked. Females, those with health insurance, those who own their own car, and those who own their own home are less likely to be unbanked (Vermilyea and Wilcox, 2002).

To measure the impact the bank deregulations of the 1980s had on low income households, Caskey and Peterson (1994) used the 1977 consumer Credit Survey and the 1989 Survey of Consumer Finances[1]. With a binomial probit model, the authors estimated the change in probability a

[1] A survey sponsored by the US Federal Reserve Board that collects data every three years on the financial practices,

household would own a deposit account given their level of income, marital status, number of children, race, and other demographic characteristics between 1977 and 1989. The authors found that the share of households with household income less than $84,000 in 1991 dollars without a deposit account increased from 9.5 percent in 1977 to 13.5 percent. Of households with less than $12,000 in household income, about 30 percent had no deposit account in 1977 and almost 41 percent of those households did not have a deposit account in 1989 (Caskey and Peterson, 1994).

Another vein of literature shows that unbanked households receive their financial services primarily from check cashers and pawnshops, but out source their needs for short-term loans to payday lenders (Good, 1999; Caskey, 1994). The drawback of these reports is that they are observational findings, not empirically supported.

This work contributes to the payday lending literature by showing an empirical relationship between payday consumers and another financially vulnerable population, the unbanked. The statistical support of this connection is not present in current literature. Currently, the discussion on the demand-side of the payday lending industry identifies/characterizes the population/demographic composition of payday borrowers, and lists the reasons why consumers use payday loans and the implications of using a payday lender. The reasons include unplanned expenses and shocks to income flow (Elliehausen and Lawrence 2001). From this study, it is reasonable to assume that policy changes that effect payday loan borrowers can also affect the unbanked.

Initiatives to Make the Unbanked, Banked

There have been several programs geared toward bringing the unbanked into the banking system. These programs have successfully converted some of the universe of the unbanked to being banked. Examples of such programs include the Welfare and Medicaid Reform Act of 1996 and the Debt Collection Improvement Act (DCIA) of 1996. Within the Welfare and Medicaid Reform Act of 1996 and the Debt Collection Improvement Act (DCIA) of 1996, the federal government required states to administer all food stamps and other state controlled, federal benefits electronically by 2002 (Welfare and Medicaid Reform Act) and the federal government administered federal benefit, wage, and retirement payments (Debt Collection Improvement Act) electronically by 1999. Under the DCIA, the US Treasury created Electronic Transfer Accounts (ETA). The ETA were offered by financial institutions and guaranteed by the US Treasury to be low cost and offer the same protections as traditional accounts. The ETA also functioned like regular deposit accounts. The accounts received federal payments as well as other deposits. The accounts were subject to a maximum fee of $3, required no minimum balance, could be interest bearing, and could produce monthly statements (Bureau of Fiscal Services). Currently, ETA accounts also offer an ATM or debit card, and 4 free withdrawals every month (ETA).

The Welfare Reform Act of 1996 and DCIA brought many low income households into the banking community when those households had to set up a banking account in order to receive their federal benefits. Though well intentioned, these policies did not bring the entire universe of low income households to banking. The Welfare Reform Act of 1996 allowed households to receive their federal benefits through direct deposit *or* on a prepaid card that was mailed to households and reloaded at some predetermined interval. Then there are households who did not receive any form of federal benefits and were not introduced to banking by these policies (Welfare and Medicaid Reform Act).

To reach the remaining unbanked households, the FDIC sponsored the Money Smart program. The Money Smart Program sought to educate the unbanked on the general services banks offer,

pension, and income of US households. The first survey year was 1962 and the most recent survey year is 2016

how to budget money, the importance of saving, credit and bank account. The Money Smart Program also encouraged some of the participants to open accounts, but analysis on the impact of the program also show that despite the amount and quality of financial education, some people just do not have the income to open and maintain bank accounts (Lyons and Scherof, 2004).

Though these households are unbanked, they still demand financial services, such as check cashing, money orders, loans, and money wiring. Since the unbanked do not have ties to conventional banks, they pay a premium for these services at currency exchanges, check cashers, and payday loan stores.

The literature also suggests that banks should open special bank branches called "outlets" to meet the demand of the unbanked population while bringing them into the banking industry. These outlets would offer traditional banking services and a fee based check cashing service, low cost money orders, deposit secured loans, and financial seminars (Caskey, 2002). To attract the large immigrant population who wire money to relatives, banks should offer low cost remittance transactions to customers with an account (Stegman et al., 2005).

Substitutes for Banks

The unbanked demand financial services, like utility bill payment, check cashing, money orders, money wires, and loans. Since these households do not have relationships with banks, they obtain these products from the fringe banking, such as, pawn shops, check cashers, or payday lenders (Caskey, 1994; Good, 1999; Rhine et al., 2006). A study examining the financial behaviors of unbanked Americans and Mexicans found that almost 25 percent of the unbanked borrow from friends and family. About 3 percent have loans from car dealerships and mortgage companies. These households pay a premium for these services of about 4 percent of the median income in US and 15 percent of the median income in Mexico (Caskey et al., 2006).

The unbanked also deposit money on prepaid cards rather than in deposit accounts. These cards advertise on television that they can make funds available "before payday" if wages are directly deposited on to the card. Cardholders can use these cards to make ATM withdrawals, make retail purchases and pay bills over the phone or online (Cheney and Rhine 2006). These cards often bear the VISA, MasterCard, and American Express logos, but they charge cardholders 5 to 15 dollars for each deposit (Khashadourian and Tom, 2007).

Characteristics of the Unbanked

Many household surveys report that unbanked households are more likely to be low-income, minority, young, and renters (Kennickell et al., 2000; Caskey, 2002; Caskey, 2005). Most unbanked households have annual incomes of $ 25,000 or less with the median income among the unbanked between $10,000 and $ 15,000 for a family of five (Tellanlian et al., 2010; Vermilyea and Wilcox, 2002).

Household surveys report that households do not have bank accounts because they do not have enough income left, after consumption, to keep in accounts, they believe bank fees are too high, minimum bank account balances are too high, or they do not trust the banks (Booz- Allen, 1997, and Caskey, 1997a; Caskey, 2002).

Unbankedness is not just a US phenomena, over 2 billion adults are unbanked worldwide. The majority of these adults live in Africa, Asia, South America and the Middle East. Of the 1 billion adults who are banked, two-thirds exist on 5 dollars a day. Usage of the banking system in foreign countries is not just determined by demographic characteristics of the population. There also exists

a positive relationship between the share of the country who is unbanked and the national per capita income and level of urbanization (Chaia et al., 2009).

Latin American immigrants in the US have the highest percentage of unbanked of all immigrants. Using a random effects binary choice model, the authors found that immigrants with low educational attainment, low income, and large families are more likely to be unbanked than immigrants with higher incomes (Rhine and Greene, 2006)

Data

Survey Design

This research used the microdata from the Unbanked\Underbanked Current Population Survey (CPS) supplements [2] for January 2009, June 2011, and June 2013 as well as the corresponding monthly CPS data. These supplements are sponsored by the FDIC. The mission of these data is to provide demographic characteristics of the unbanked and underbanked, as well as, reasons why these households choose their banking status. The supplemental questions were asked of every household in the CPS sample for that month.

Additionally, the CPS uses a probability sampling scheme, and the surveys consist of about 60,000 households sampled from 824 sample areas. There are sample areas in each state and the District of Columbia. The public use files have data available at the national, state, and metropolitan statistical area (MSA) levels. Additionally, each of the 60,000 households follow the 4-8-4 survey life cycle. The households are surveyed for 4 consecutive months, out of sample for 8 months, then interviewed for 4 more months.

Across the three survey years, the survey design and variable definitions changed, making some data incomparable across the supplements. Specifically, the identification of underbanked households and definition of underbanked are not comparable as the survey instrument changed across years. In 2009, an underbanked household was one who used a non-bank check cashing service, non-bank money order, payday lender, pawn shop, rent-to-own agreement, or a refund anticipation loan in the past year. In 2011, the definition of an underbanked household changed in that it added the use of non-bank remittances as an indicator of an underbanked household.

Another change to the survey between the 2009 and 2011 survey years is the measurement of the frequency that the households used alternative financial services. The 2009 survey asked if anyone in the household used a refund anticipation loan in the last five years, but in 2011, the survey asked if anyone in the household *ever* used a refund anticipation loan. Also, the 2009 survey asked households if they used alternative financial service credit products "once or twice a year" or "at least a few times a year". While in 2011, the survey asked respondent if they used these credit products in the "last 12 months".

For the 2013 survey, questions were added to better understand why households enter and exit the banking industry. In particular, the 2013 survey tracked households who were unbanked, but opened a banking account in the past year. Of those households who entered the banking industry, the survey asked why those households chose to open an account. For households who recently exited the banking industry, the survey asked what caused them to be unbanked. Further details of how the survey instruments changed from year to year are listed in Table 2. However, the data that are comparable across surveys is the number of unbanked households in the US and the number of households who have used a payday lender.

[2] The CPS Unbanked\Underbanked Supplements have surveys for January 2009, June 2011, June 2013, and June 2015. The supplements link to the corresponding monthly CPS surveys, but cannot be linked longitudinally.

Table 2: Changes to Survey Instrument

Survey Year	Change
2009	First year of data collection
2011	1. Added a question about non-bank remittances. 2. Redefined the meaning of *underbanked* 3. Changed the question of the frequency of the use of alternative financial service products
2013	1. Added the question of payday loan use in the last 12 months. 2. Added the questions of why households choose to enter or exit banking. 3. Added the questions of where households obtain alternative financial services, e.g. from supermarkets or alternative financial services storefronts. 4. Removed questions about why households use alternative financial services. 5. Removed questions of the frequency households used alternative financial services in the past month. 6. Added questions about how recently households used prepaid cards. 7. Added questions about why households used prepaid cards. 8. Asked the question whether households have direct deposit. 9. Asked the question whether households use mobile banking.

Variable Definitions

The supplemental data include variables at the household level pertaining to household income, banking status, and type of dwelling, as well as person level data, the sex, race, educational attainment, and age of each member of the household. For this analysis, I restricted the sample to data from only the reference person, then used the demographic characteristics of the reference person and attributed them to the entire household[3] . For example, if the reference person identifies as African American or Black, the entire household is label as Black. A reference person is the person who has the rental agreement or mortgage in their name. In the case of married couples the reference person can be either the wife or the husband. The *female* dummy variable equals 1 if the reference person is female.

Since 1980, CPS discontinued the labels of "head of household" and "head of family", as well as automatically labeling the husband as the "head" when the wife is also present in the household. Though this change in subject definition gives consideration to the contributions of women in the household, it makes it difficult to identify women who are the "head of household". For this analysis, I attempt to flag females who are the head of household in *female_head*. *Female_head* equals 1 if the reference person indicated that they are an unmarried female householder or if they are a female, primary individual of the household (Bureau of the US Census).

Furthermore, a household is flagged as *low income* if the household income is $25,000 or less. The $25,000 threshold is based on how the CPS reports household income and how US Department of Health and Human Services (DHH) defines poverty for eligibility for certain federal programs. The CPS give categorical household income data, with one income category cut-off at $25,000. DHH gives the poverty guidelines for a family of four between the range of $22,050 and $23,050, from 2009 to 2013. As such, this analysis defines a low income household for all three survey years as one with household income of $25,000 or less.

[3]In the CPS, household members are labeled as one of the following: not a family member, a reference person, a spouse, a child, or other family member. If a member in the household is not a family member, this research codes them as being their own household and this single individual enters my data as a household and has their demographics attributed to this single person household.

Table 3 lists the definitions of all variables used in this analysis.

Table 3: Variable Definitions

Variable	Definition
Payday	A dichotomous variable equals 1 if someone in the household has ever taken out a payday loan. and 0 if no one in the household has taken out a payday loan.
Unbanked	A dichotomous variable equals 1 if no one in the household has a savings or checking account, and 0 if someone in the household does have an active savings or checking account.
Low income	A dichotomous variable that equals 1 if the household income is $25,000 or less, 0 for all other income amounts.
HS_Diploma	A dichotomous variable equals 1 if the reference person's educational attainment is a high school diploma and its equivalent, or less, 0 for all other levels of education.
Female	A dichotomous variable equals 1 if the reference person is female, 0 otherwise. In this variable, the reference person can be married.
Black	A dichotomous variable equals 1 if the reference person identifies as African American or Black and non-Hispanic.
Hispanic	A dichotomous variable equals 1 if the reference person identifies as Hispanic, 0 otherwise.
Ever_military	A dichotomous variable equals 1 if the reference person indicated that they have ever served in the armed forces, 0 otherwise.
Married	A dichotomous variable equals 1 if the reference person is married, 0 otherwise.
Home_own	A dichotomous variable equals 1 if the reference person indicated that they own their living quarters, 0 otherwise.
Age25	A dichotomous variable equals 1 if the reference person indicated that they are between the ages of 18 and 25 , 0 otherwise.
Female_head	A dichotomous variable equals 1 if the reference person indicated that they are unmarried female householder or civilian female primary individual, 0 otherwise.

Tables 4-6 list the column percentages of the variables and samples used in this analysis for the three survey years. Across the three survey years there are between 44,000 and 50,000 total households in the samples, with about 13 percent of all households identifying as Hispanic and about 12 percent of households identifying as Black.

In Table 4, the *payday* column lists 13.90 percent as the percent of households who used a payday lender and who were also unbanked in the 2009 survey. The *unbanked* column shows that of the households who are unbanked, 7 percent of them used a payday lender, more than 64 percent were low income, and a vast majority (78 percent) had no more than a high school diploma. Comparatively, of all households in the sample, about 4 percent used a payday lender and 8 percent were unbanked in 2009.

Black and Hispanic households also have high shares of low income households and households with low educational attainment. 32 percent of Black households and about 31 percent of Hispanic households were low income in 2009. While only 18 percent of White households and 21 percent of all households in the sample were considered low income. Then about 52 percent of Black households and about 66 percent of Hispanic households had a high school diploma or less in 2009. This was true for only 39 percent of White households.

A larger share of Hispanic and Black households also use payday lenders or are without a bank account than White households. Across the three survey years, around 10 percent of Black households have used a payday lender and about 4 percent of Hispanic households have used a payday lender. Comparatively, only 3 percent of White households have used a payday lender in

Table 4: Descriptive Statistics 2009

Variables	Payday	Unbanked	All Households	White Households	Black Households	Hispanic Households
Payday	NA	7.07%	3.99%	3.21%	8.56%	4.27%
Unbanked	13.90%	NA	8.22%	3.60%	21.30%	21.45 %
Low income	30.97%	64.01%	21.50%	17.91%	32.53%	30.83%
HS_Diploma	50.95%	78.39%	43.99%	39.39%	51.56 %	65.58%
Female	55.76%	55.37%	49.65%	48.87%	57.84%	47.34%
Married	33.35%	25.22%	46.93%	49.25%	28.21%	48.80%
Black	26.61%	32.68%	12.74%	NA	NA	NA
Hispanic	13.28%	32.84%	13.02%	NA	NA	NA
Ever military	9.11%	5.12%	11.01%	13.11%	8.90%	4.43%
Home Owner	38.82%	23.18%	65.01%	72.39%	45.90%	47.42%
Age25	12.12%	16.68%	10.91%	8.92%	10.56%	13.12%
Female head	40.25%	44.14%	31.00 %	28.64%	47.59%	29.47%
N	2,000	4,000	50,000	34,000	6,000	6,500

Table 5: Descriptive Statistics 2011

Variables	Payday	Unbanked	All Households	White Households	Black Households	Hispanic Households
Payday	NA	7.89%	5.20%	4.36%	10.30%	5.51%
Unbanked	12.66%	NA	8.69%	4.25%	21.33%	21.23 %
Low income	35.15%	73.15 %	28.44%	24.54%	42.64%	36.54%
HS_Diploma	46.65%	76.99%	42.71%	38.06%	49.25 %	64.62%
Female	55.54%	57.11%	49.99%	48.78%	58.68%	48.70%
Married	33.82%	23.03%	45.51%	47.64%	28.31%	46.57%
Black	24.70%	31.03%	12.68%	NA	NA	NA
Hispanic	13.65%	31.81%	13.36 %	NA	NA	NA
Ever military	9.77%	5.01%	10.63%	12.66%	8.95%	4.34%
Home Owner	41.07%	21.92%	63.65%	71.08%	44.86%	45.78%
Age25	10.94%	16.30%	10.91%	7.98%	10.83%	13.73%
Female head	40.27%	47.46%	32.39 %	30.19%	49.07%	30.41%
N	2,500	4,400	50,000	34,000	6,000	6,500

2009, and about 4 percent of White households have used a payday lender in the 2011 and the 2013 surveys. Furthermore, about 20 percent of the subsamples of Black and Hispanic households are unbanked across the three surveys, while only 4 percent of White households are unbanked. These differences are also shown graphically in Figure 1 and Figure 2

There are limitations in comparing samples across survey years. Sample means of the 2011 and 2013 sample of households are not statistically different. However, the 2009 sample of households is significantly different from the 2011 and 2013 samples. The subsamples of Black households are not statistically different across the three surveys, but each of the subsamples of Hispanic households are statistically different from each other. As such, only the 2011 and 2013 regression results are comparable for all households, and results from 2009, 2011, and 2013 are comparable for the subsample of Black households.

For the 2009, 2011, and 2013 survey years a larger share of African Americans were unbanked or used a payday lender than Whites and non-Hispanics. Figure 1 shows that for the three survey years, almost 10 percent of African American households used a payday lender compared to about 4 percent of White households. For all three survey years, more than 20 percent of African American households were unbanked compared to less than 5 percent of White households.

Figure 2 shows that more than 20 percent of Hispanic households were unbanked in 2009 and 2011, but that share decreased to about 18.5 percent in 2013. About 6 percent of non-Hispanic households reported that they did not have a bank account over the three survey years.

Alternatively, there is very little difference in the share of Hispanics who used a payday lender

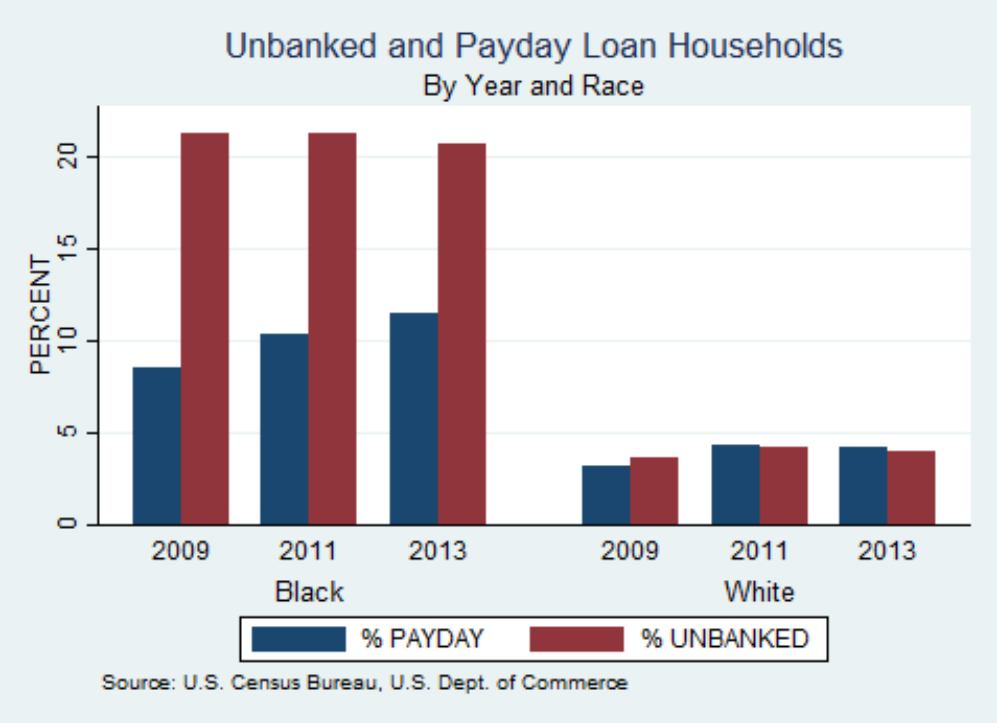

Figure 1: Percent of US White and Black households who are Unbanked or have used a payday lender: 2009, 2011, and 2013 .

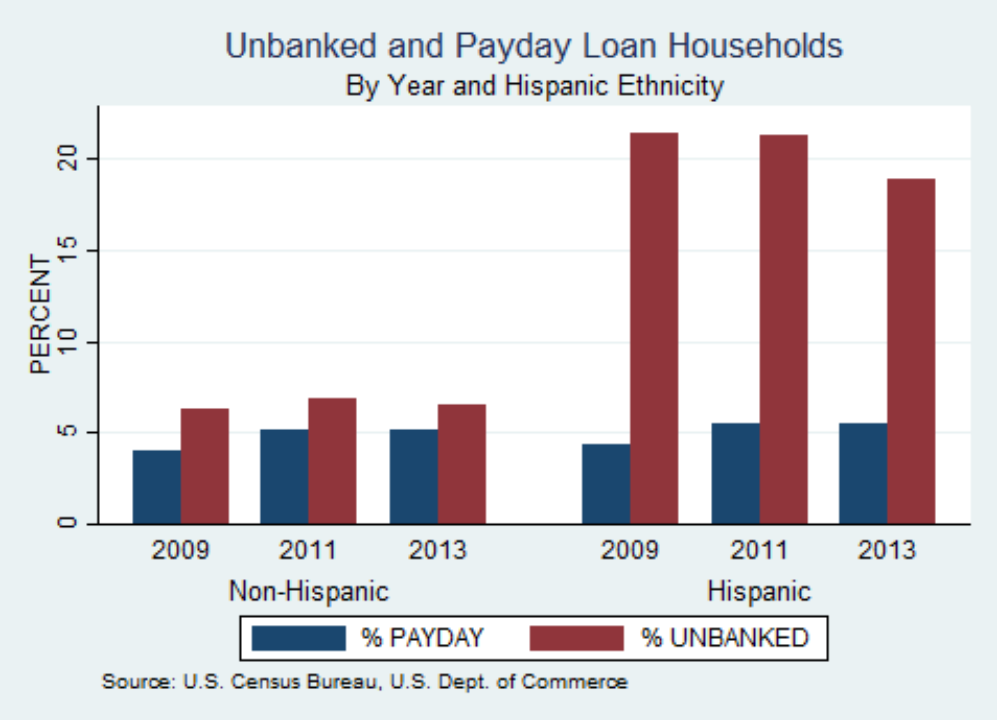

Figure 2: Percent of US Hispanic households who are Unbanked or have used a payday lender: 2009, 2011, and 2013 .

Table 6: Descriptive Statistics 2013

Variables	Payday	Unbanked	All Households	White Households	Black Households	Hispanic Households
Payday	NA	10.05%	5.16%	4.14%	11.52%	5.53%
Unbanked	15.76%	NA	8.21%	3.94%	20.67%	18.85 %
Low income	34.84%	72.00 %	27.11%	23.15%	41.65%	34.54%
HS_Diploma	45.38%	75.54%	40.89%	36.01%	48.49 %	61.36%
Female	57.48%	55.95%	50.43%	49.10%	59.27%	49.90%
Married	31.60 %	22.30%	45.27%	47.50%	28.39%	45.73%
Black	27.60%	31.85%	12.72%	NA	NA	NA
Hispanic	14.73%	31.91%	14.15 %	NA	NA	NA
Ever military	8.08%	4.17%	9.80%	11.71 %	8.71%	4.17%
Home Owner	38.18%	20.18%	62.76%	70.85%	42.44%	45.33%
Age25	10.17%	15.38%	8.81%	7.55%	10.70%	12.54%
Female head	42.31%	47.24%	31.78 %	29.22%	48.48%	31.12%
N	2,300	3,800	44,000	33,000	5,000	5,700

versus the non-Hispanics who used a payday lender. Figure 2 show in 2009 that about 4 percent of both non-Hispanics and Hispanics were payday loan consumer. That share increased to about 5 percent for both samples of non-Hispanics and Hispanics who had used a payday lender.

Though samples are not comparable longitudinally, the share of households who were unbanked or used a payday lender remain largely unchanged over time. Figure 3 shows that there were 8 percent of households who were unbanked in 2009 and almost 5 percent who used a payday lender. For the 2011 and 2013 those shares remain almost constant.[4]

Over the time series of the data, the southern region of the US had the largest share of unbanked households than any other region. Figure 4 shows that in 2009, 10 percent of southern households did not have a bank account while less than 8 percent of households were unbanked in the Northeast, Midwest, and West regions.

Very few households in the Northeast region had ever used a payday lender. In 2009, 2011, and 2013, less than 2 percent of Northeastern households were payday loan consumers. Conversely, the Midwest and West had the largest share of payday consumer households in 2009, about 5.5 percent. In 2011 and 2013, the West had about 7.5 percent and almost 6 percent of households who had taken out a payday loan, respectively.

Empirical Framework and Model

This research investigates the influence that being unbanked has on the probability that a household uses a payday lender and the correlation between the probability a household is unbanked and the probability a household uses a payday lender. The independent variables of this analysis are the dichotomous variables *Unbanked* and *Payday*. *Unbanked* equals 1 if a household is does not have a bank account, and 0 if someone in the household has a bank account. Similarly, *Payday* equals 1 if someone in the household has used a payday lender, and 0 if the household reports that no one had used a payday lender.

Then, controlling for demographic characteristics, this analysis first estimates the probability that a household used a payday lender *or* is unbanked. This method will show if there is any statistically significant relationship between the probability of being unbanked or using a payday lender and household demographics.

[4]These data are from the US Census, restricted microdata and must pass disclosure review before the data can be released. As a result of the disclosure review process, there is a limitation on the amount of data that can be released. Therefore, this dissertation chapter has only most important results.

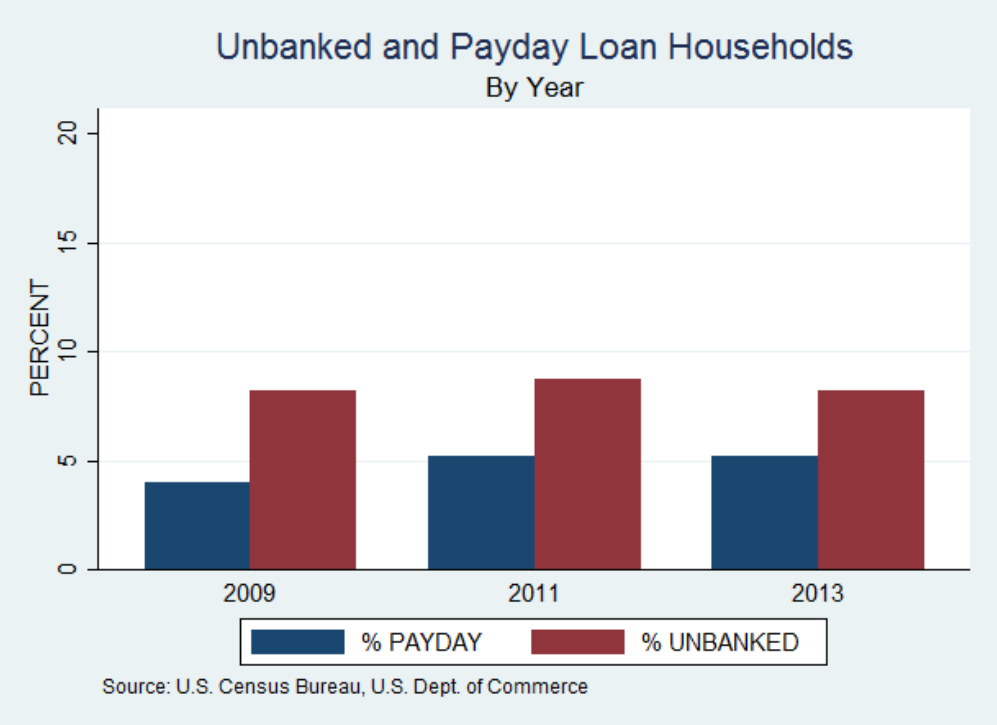

Figure 3: Percent of US households who are Unbanked or have used a payday lender: 2009, 2011, and 2013 .

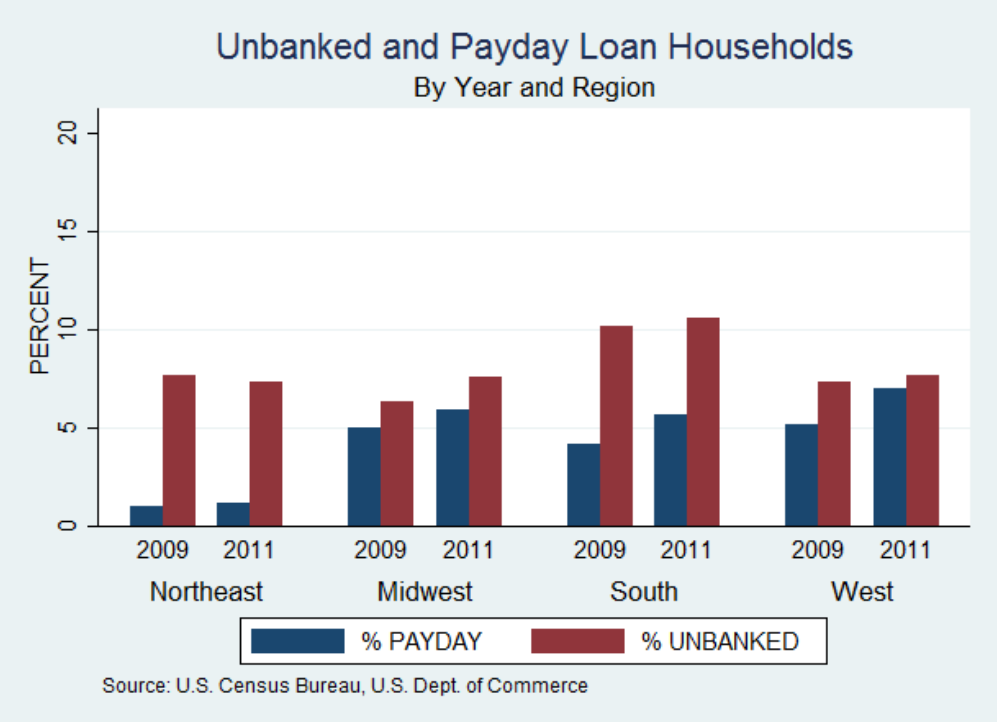

Figure 4: Percent of US households who are Unbanked or have used a payday lender in the Northeast, Midwest, South and West regions: 2009, 2011, and 2013 .

Next, this research estimates the joint probability that a household used a payday lender *and* is unbanked, and whether the consumer's decision to be unbanked influences the decision to borrow from a payday lender. This strategy follows the empirical strategy of Rhine et al. (2006) who estimated the joint probabilities of unbankedness and using a check casher. Specifically, in this analysis, the consumer's choice to use a payday lender and be unbanked are modeled simultaneously with a recursive bivariate probit model with an endogenous regression coefficient.

Latent factors associated with the decision to us a payday lender can affect the decision the household is unbanked. The purpose of the recursive bivariate probit model is to best evaluate the linkages between the decision to be unbanked and the decision to use a payday lender. The first equation, describes the probability a household uses a payday lender as a function of the binary unbanked flag, demographic characteristics, and latent error. The second equation determines whether a household is unbanked, given a set of demographic characteristics and the latent error.

My empirical strategy shows whether these probabilities are jointly determined and accounts for correlation between the unobservable confounder in the Unbanked and Payday equations. The ρ correlation coefficient measures the correlation between the outcomes after the influence of the included factors is accounted for. Specifically, the rho correlation coefficient, if statistically significant from zero, is interpreted in this research as evidence that using a payday lender is directly affected by the decision to be unbanked, but also indirectly influenced through household effects, these unobservable confounders. But through this approach, even if ρ is not statistically significant from zero, these decisions are not completely independent, as unbanked is explicitly included in the payday equation. This research also estimates robust standard errors for all models.

From the previous literature, Black and Hispanic households are more likely to use a payday lender and be unbanked than non-minority households. So, this research has two subsamples of only Black households and only Hispanic households, then estimate the joint probability that each subsample of households are unbanked and are payday loan consumers, controlling for demographic characteristics. This estimation strategy shows if the coefficients of the demographic independent variables have different effects on the probability that a household uses a payday lender and is unbanked when the sample is restricted to Black or Hispanic households. This analysis lists the model estimates for the sample of all households, Black households, and Hispanic households in one table, for each survey year. Since larger shares of Hispanic and Black households use a payday lender or are unbanked, I am interested to see if coefficients of Equation 9 change magnitude or sign when estimated on Black or Hispanic households.

Model Specification

This research tests whether the decisions to use a payday lender and be unbanked are dependent, similar to the work by Rhine et al. (2006) that modeled the dependence of unbankedness and the decision to use a currency exchange. Previous literature show that characteristics of a typical payday loan consumer and an unbanked person are similar. Plus, without a relationship with a conventional bank, to access small or short term lines of credit, unbanked customers use fringe financial services from payday lenders (Good, 1999). Due to these similarities between unbanked and payday loan borrowers, I hypothesized that the error terms are correlated between borrowers and unbanked people, as such, I use a set of seemingly unrelated non-linear probability model regressions to model the relationship between unbanked and payday loan consumer.

The preference for a probability model over a logistic model or a linear probability model is due to many factors. The use of the probability model over the logistic model is due to the specification limitations of the logistic model. There does not exist a bivariate logistic model or a seemingly unrelated logistic regression, and the basis of this research is that the decisions to use a payday

lender and to be unbanked are related, and should be modeled jointly. Later, the value of ρ from the bivariate probability model in the Results section of this paper shows that the errors of the two models are correlated and that the equations should be model together, rather than separately. Also, previous work by Rhine et al., (2006) and Caskey and Peterson, (1994) and their use of a probit model for their analysis supports my model choice.

Considering the linear probability model, there are allowances with the linear probability model (LPM) to estimate a system of equations, not found in logistic models. LPM can also be modeled as seemingly unrelated regressions, allowing the joint modeling of payday loan usage and unbankedness. The coefficients estimated of LPM are also more straightforward in their interpretations. The coefficients for the linear probability model report the mean change in the dependent variables when the independent variable increases by one unit for continuous variables, or change from 0 to 1 for dichotomous variables. Conversely, the coefficients of a probability model give the change in the Z-score for a unit change in the independent variable. The Z-score changes and how they affect the probability that the dependent variable equals 1 is not as intuitive as the slope coefficients of the LPM.

Though the LPM parameters interpretations are more straightforward, the LPM has its problems serving as a binomial probability model as it violates some assumptions of Ordinary Least Squares (OLS). The coefficients of LMP are estimated using Ordinary Least Squares (OLS), and the model's estimation needs to satisfy the assumptions of OLS in order to have the Best Linear Unbiased Estimator (BLUE) properties. The assumptions of OLS are linearity in parameters, random sampling of the data, no multicollinearity, and homoskedasticity, normality, and independence of the error term. However, the LPM violates the assumption of homoskedasticity. The LPM has heteroskedasticity of the error terms. The error terms are only constant if the probability of each household using a payday lender and being unbanked are the same for all households. This heteroskedasticity no longer guarantees that the estimates are the BLUE. However, the heteroskedasticity can be accounted for by estimating robust standard errors.

Another violation of the assumptions is that the errors are not normally distributed. In the LPM the errors can only take on two possible values, as shown in Equations 1-5. Since

$$Prob\left[Y_i = 1|X_i\right] = \beta_1 + \beta_2 x_{i2} + ... + \beta_k x_{ik} + u_i \tag{1}$$

$$y_i = \left(Prob\left[Y_i = 1|X_i\right]\right) + \left(y_i - Prob\left[Y_i = 1|X_i\right]\right) \tag{2}$$

$$= Prob\left[Y_i = 1|X_i\right] + u_i \tag{3}$$

Then, the error term can take on the following two values and are not normally distributed:

$$1 - Prob\left[Y_i = 1|X_i\right] \tag{4}$$

or

$$-Prob\left[Y_i = 1|X_i\right] \tag{5}$$

Likewise, the LPM does not constrain the values of the dependent variable. In this research, the dependent variables are dichotomous, taking on the values of 0 or 1. The LPM treats the dependent variable as continuous and allows the dependent variable to take on values from negative infinity to positive infinity. This lack of boundaries on the dependent variable also suggest that LPM is not the correct model for this analysis. As such, this research estimates non-linear probability models.

Equations 6 and 7 are single variate, non-linear probability models with $\mathbf{Y}_{\mathrm{i1}}$ equal to 1 if no one in the household has a savings or checking account, i.e unbanked, 0 if it is reported that someone

in the household has a savings or checking account, and $\mathbf{Y}_{i2}$ equal to 1 if anyone in the household used a payday lender, 0 otherwise. $\mathbf{X}_i$ are vectors of demographic characteristics and $\Phi(*)$ is the typical cumulative distribution function (CDF) that follows a normal distribution.

The final model is Equation 9, the recursive bivariate probability model, that estimates the joint probability that a household is unbanked and used a payday lender. A key factor in this research is whether being unbanked also influences whether a household uses a payday lender. As such, $\mathbf{Y}_{i1}$ is also an endogenous explanatory variable.

$$Prob\left[Y_{i1}|X_i\right] = \Phi(\beta'\mathbf{X_i}) \tag{6}$$

$$Prob\left[Y_{i2}|X_i\right] = \Phi(\gamma'\mathbf{X_i}) \tag{7}$$

$\mathbf{Y}_{i1}$= Unbanked
$\mathbf{Y}_{i2}$= Used a payday lender

$$Prob\left[Y_{i1} = 1, Y_{i2} = 1\right] = \Phi(\beta'\mathbf{X_i}) \tag{8}$$

where Φ is the CDF of the bivariate normal distribution
$\mathbf{Y}_{i1}$= Unbanked $\mathbf{Y}_{i2}$= Use a payday lender
$\mathbf{X}_i$ a vector of demographic characteristics

$$Prob\left[Y_1 = 1, Y_2 = 1\right] = \Phi(\beta'\mathbf{X_i}) \tag{9}$$

where

$$\mathbf{Y}_1 = \begin{cases} 1 & if \quad Y_1^*{>}0, \\ 0 & if \quad Y_1^* otherwise, \end{cases}$$

$$\mathbf{Y}_2 = \begin{cases} 1 & if \quad Y_2^*{>}0, \\ 0 & if \quad Y_2^* otherwise, \end{cases}$$

$$\begin{cases} Y_1^* = \beta\mathbf{X}_1 + \epsilon_1 \\ Y_2^* = \gamma Y_1^* + \beta\mathbf{X}_2 + \epsilon_2 \end{cases}$$

and

$$\begin{bmatrix} \epsilon_1 \\ \epsilon_2 \end{bmatrix} \mid \mathbf{X} \sim N\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}\right), \left(\begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}\right)$$

My preferred model specification and the coefficients of Equation 9 are listed in Model 2 in Tables 10, 13, and 16. These tables show the coefficients estimated for all households for survey years 2009, 2011, and 2013, respectively. The specification listed is my model of choice because controls for the demographics of the typical payday loan consumer like in previous literature. This specification accounts for a household that is low income, with a female head, with a high school diploma or less, minority, and young. The selection of demographic controls align with the current literature. The current literature says that unbanked consumers are low-income, less educated, minority, female, unmarried, or unemployed (Rhine et al., 2006; Vermilyea and Wilcox, 2002; Caskey and Peterson, 1994). Payday loan consumers tend to be renters, African American, low-income, and without a bachelor's degree (Caskey, 2001; Bourke, 2012). I include dummy variables to control for share of households that are the following:

1. low income

2. have a high school diploma or less,
3. have a female reference person
4. married
5. identifies as Black
6. identifies as Hispanic
7. has ever served in the armed forces
8. is a home owner
9. is between the ages of 18 and 25

This specification also has the smallest Bayesian information criterion (BIC) and Akaike information criterion (AIC) than the other model specifications estimated.

As mentioned, the coefficients from the LPM models are straightforward in their interpretations. However, the coefficients on the non-linear probability model show the changes to the Z-score when the indicator variables change from 0 to 1. To give the marginal effect of the conditional means of y_1 and y_2 given the change in an independent variables, I estimate the average marginal effects. The average marginal effect gives the average of the marginal effect at each $x=x_i$.

The average marginal effect is derived by calculating the the marginal effect for each individual, then finding the average. This analysis reports average marginal effects instead of marginal effects at means because marginal effects at means reports marginal effects of the *representative* household. This household has the characteristics of the average values of the independent variables in the sample. For example, these margins represent the probability that a household is unbanked and use a payday lender when the household is 12 percent minority, 23 percent married and 56 percent female. Since it is impossible to be only a share of a female or only some share married, this research used average marginal effects to give more intuitive results.

Threats to Identification

This research employs an endogenous bivariate probit estimation strategy. Where the endogenous *Unbanked* variable captures the effect of unbankedness on the probability that a household uses a payday lender. Generally, endogeneity prevents the identification of parameters, but this is not the case with the recursive bivariate probit in this analysis.

Specifically, in the simple two equation structural model:

$$Y_1 = \alpha_1 y_2 + \beta x_1 + \epsilon_1 \tag{10}$$

$$Y_2 = \alpha_1 y_1 + \beta x_2 + \epsilon_2 \tag{11}$$

The x variables are exogenous and uncorrelated with the error terms, ϵ_1 and ϵ_2. However, y_2 is correlated with ϵ_1, assuming that α_1 α_1 not equal 0. Solving for y_2, there is the following equation :

$$Y_2 = \alpha_2 \left(\alpha_1 y_2 + \beta_1 x_1 + \epsilon_1\right) + \beta_2 x_2 + \epsilon_2 \tag{12}$$

Due to y_2 correlation with ϵ_1 the OLS estimation of this model results in simultaneity bias, with biased and inconsistent estimators. However, the nonlinearity of the bivariate probit, as well

as, the maximum likelihood estimation of the parameters allows for consistent and asymptotically efficient parameter estimates when there is an endogenous explanatory variable (Arendt and Holm, 2006). Furthermore, as long as there exists a varying exogenous regressor, which there are several in the bivariate probit models of this paper, there is enough variation in the data to identify the parameters (Wilde, 2000).

Furthermore, survey data and responses on sensitive behaviors run the risk of having measurement error that can bias estimates. The banking and financial habits of households are sensitive subjects and households may not accurately report whether they have a bank account or have used a payday lender if they deem these behaviors to be negative. However, since data is not collected longitudinally the measurement error is random, and random measurement error will not bias the estimates of the models in this research. Consistent measurement error will bias estimates, since the supplements are not collected longitudinally; I argue that the measurement error is not systematic. Furthermore, Blattman, et al. found that underreporting of sensitive behaviors is low when examining the likelihood that respondents accurately reported their use of drugs in a survey (Blattman et al., 2016).

Results

First, I estimate a univariate probit of the predicted probability that a household is unbanked *or* used a payday lender. Tables 7, 8, and 9 show these baseline results, and how socioeconomic characteristics impact the predicted probability. Namely, the coefficients show the change in the weighted, predicted z-score when the outcome variables go from 0 to 1. In these tables, there are two models. The first model controls for the household's low income status and the education, gender, martial status, race, Hispanic ethnicity, veteran status, and homeownership status. The second model is the preferred model specification, and includes the same dependent variables as Model 1, but adds a control for if the household reference person is between the ages of 18 and 25.

For the 2009 survey of households, Table 7 and Model 1 shows that being a Black households, a household with low income status, or a household with only a high school diploma, increases the predicted probability of using a payday lender or being unbanked. Alternatively, owning a home decreases the predicted probability that a household is unbanked or used a payday lender. The inclusion of *Age25* in Model 2 has no impact on statistical significance or magnitude and direction of the coefficients when when comparing estimates across both models. I expected this age flag to have a significant impact on the predicted probabilities since younger households often do not have as much life experience or financial literacy as their older counterparts. All other coefficients in Table 7 are not significant.

Tables 8 and 9 show the estimates from the 2011 and 2013 survey data of the predicted probability that a household is unbanked *or* used a payday lender. Like in 2009, Black households, households with income $ 25,000 or less, and households with no more than a high school diploma are more likely to use a payday lender or be unbanked than non-Black households than households who earn more than $25,000, or households with more than a high school diploma. Again, homeownership decreases the probability that a household is unbanked *or* used a payday lender.

These results support the literature that low income households lack relationships with conventional banks and often outsource their financial product demand to the fringe banks, payday lenders. Furthermore, homeowners typically have mortgages through traditional banks, use checking accounts to pay their mortgage lenders, and also have a certain level of wealth and financial literacy by proxy of being homeowners. As a result, it is reasonable that homeownership is negatively related to being unbanked or using a payday lender.

Table 7: 2009 Univariate Regression Coefficients

Variables	Model 1	Model 2
Payday or Unbanked=1		
Low income	0.4815***	0.4805***
HS_Diploma	0.1776**	0.1792**
Female	-0.0349	-0.0343
Married	0.0025	0.0028
Black	0.3377***	0.3399***
Hispanic	-0.0214	-0.0211
Ever military	-0.1610	-0.1573
Home Owner	−0.6356***	−0.6321***
Age25		0.0276
Constant	−2.6402***	−2.6481***
N	51,000	51,000
Log likelihood	-3,863,817.9	-3,863,566.4

Tables 10, 13, and 16 show the estimates of Equation 9 for the sample of all households; the joint probability that a household is unbanked and used a payday lender for 2009, 2011, and 2013 survey years. Model 1 controls for the income, education, gender, martial status, veteran status, and homeownership status of households. Model 2 adds *Age25* to the list of independent variables from Model 1, and is the preferred specification for this analysis. Model 3 differs from Model 2 in that it controls for households who have a *female_head*, an unmarried female as the household reference person. Note, *female* is a female reference person who can be either married or single.

For all years, the correlation coefficient ρ is significantly different from zero. So I conclude that for the full sample of households, the two probabilities are related and can be estimated simultaneously.

Since Black households are more likely to use a payday lender or be unbanked than non-Black households, this analysis estimates Equation 9 on the subsample of Black households in 2009, 2011, and 2013. Tables 11, 14, and 14 show that only homeownership is significant in determining the probability that a Black household uses a payday lender. The estimates also show that Black homeowners are less likely to use a payday lender than Black renters.

Though not statistically significant, Blacks who are low income, or who have a high school diploma or less, are more likely to be unbanked than Black households who are not low income or Black households who have more than a high school diploma. Furthermore, married households and homeowners are less likely to be unbanked than the unmarried or renters. These results remain consistent for all survey years.

Hispanic households are also more prone to be unbanked or use a payday lender than non-Hispanic households. As such, I identify Hispanics households in each survey's respondents, then estimate Equation 9 for each survey year. This exercise is to compare covariates between Hispanics households and other households, to test if the magnitude or sign or coefficients change across the two samples. Tables 12, 15, and 18, show the results estimating Equation 9 on Hispanic households in 2009, 2011, and 2013, respectively.

Table 8: 2011 Univariate Regression Coefficients

Variables	Model 1	Model 2
Payday or Unbanked=1		
Low income	0.4312^{***}	0.4339^{***}
HS_Diploma	0.2323^{***}	0.2295^{***}
Female	-0.0003	-0.0016
Married	0.0101	0.0022
Black	0.2454^{***}	0.2432^{***}
Hispanic	-0.0205	-0.0189
Ever military	-0.1988	-0.2086
Home Owner	-0.5370^{***}	-0.5470^{***}
Age25		-0.0902
Constant	-2.634^{***}	-2.615^{***}
N	51,000	51,000
Log likelihood	-4,679,729.2	-4,677,004.9

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 9: 2013 Univariate Regression Coefficients

Variables	Model 1	Model 2
Payday or Unbanked=1		
Low income	0.4077^{***}	0.4081^{***}
HS_Diploma	0.1611^{**}	0.1608^{**}
Female	-0.0068	-0.0070
Married	0.1465^{*}	0.1475^{*}
Black	0.319^{***}	0.3191^{***}
Hispanic	0.0578	0.0580
Ever military	-0.0781	-0.0793
Home Owner	-0.4313^{***}	-0.4326^{***}
Age25		-0.0112
Constant	-2.518^{***}	-2.515^{***}
N	46,000	46,000
Log likelihood	-5,695,947.6	-5,695,896.3

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 10: 2009 Regression Coefficients: All Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.198^{***}	-1.1963^{***}	-1.1968^{***}
low_income	0.2394^{***}	0.2404^{***}	0.2451^{***}
HS_Diploma	0.2978^{***}	0.2936^{***}	0.2921^{***}
Female	0.0406	0.0399	
Married	-0.1045^{***}	-0.1062^{***}	-0.1176^{***}
Black	0.5529^{***}	0.5605^{***}	0.5637^{***}
Hispanic	0.2744^{***}	0.2735^{***}	0.2729^{***}
Ever military	-0.0198	-0.0224	-0.0455
Home Owner	-0.5917^{***}	-0.5959^{***}	-0.5941^{***}
Age25		-0.0384	-0.0415
Female head			-0.0132
Constant	-1.485^{***}	-1.4767^{***}	-1.4458^{***}
Unbanked=1			
Low income	0.6984^{***}	0.6980^{****}	0.7064^{****}
HS_Diploma	0.6438^{***}	0.6449^{****}	0.6451^{****}
Female	-0.0435	-0.0427	
Married	-0.1498^{***}	-0.1463^{***}	-0.1911^{***}
Black	0.7543^{***}	0.7563^{***}	0.7622^{***}
Hispanic	0.7190^{***}	0.7191^{***}	0.7197^{***}
Ever military	-0.1396^{**}	-0.1346^{**}	-0.1431^{**}
Home Owner	-0.6547^{***}	-0.6504^{***}	-0.6517^{***}
Age25		0.0414	0.0329
Female head			-0.1046^{***}
Constant	-1.961^{***}	-1.972^{***}	-1.9419^{***}
ρ	0.7514^{***}	0.7503^{***}	0.7505^{***}
N	50,000	50,000	50,000
Log likelihood	-46119758	-46112298	-46100367

Table 11: 2009 Regression Coefficients:Black Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	0.1024	0.1013	0.1622
Low income	-0.1968	-0.1985	-0.2090
HS_Diploma	-0.1688	-0.1677	-0.1790^{*}
Female	0.1102	0.1114	
Married	-0.1161	-0.1116	-0.0760
Ever military	-0.1356	-0.1317	-0.1601
Home Owner	-0.2589^{*}	-0.2557^{*}	-0.2430^{*}
Age25		0.0501	0.0544
Female head			0.0907
Constant	-1.153^{***}	-1.163^{***}	-1.154^{***}
Unbanked=1			
Low income	0.6920^{***}	0.6922^{***}	0.6914^{***}
HS_Diploma	0.5265^{***}	0.5262^{***}	0.5229^{***}
Female	0.0736	0.0735	
Married	-0.2746^{***}	-0.2753^{***}	-0.2409^{***}
Ever military	-0.1030	-0.1036	-0.1122
Home Owner	-0.6255^{***}	-0.6262^{***}	-0.6242^{***}
Age25		-0.0082	-0.0062
Female head			0.0844
Constant	-1.198^{***}	-1.196^{***}	-1.201^{***}
ρ	-0.0867	-0.0858	-0.1207
N	6,000	6,000	6,000
Log likelihood	-11,317,102	-11,316,487	-11,318,467

$*p < 0.05; **p < 0.01; ***p < 0.001$

In 2009, none of the dependent variables significantly influence whether a Hispanic household uses a payday lender. This lack of significance is not constant for all survey years. For example, in 2011, the unbanked coefficient is significant and shows that unbanked households are less likely to use a payday lender than those with bank accounts.

Furthermore, across all three model specifications, low income and hs_diploma increase the probability of being unbanked. Having served in the armed forces and homeownership decreases the probability that a Hispanic household is unbanked.

Table 12: 2009 Regression Coefficients:Hispanic Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-0.9985	-1.1486	-1.0798
Low income	0.1130	0.1569	0.1530
HS_Diploma	0.1181	0.1628	0.1392
Female	-0.0765	-0.0805	
Married	-0.0789	-0.0851	-0.1646
Ever military	-0.0186	-0.0458	-0.0434
Home Owner	-0.4982	-0.5343	-0.5270
Age25		-0.0692	-0.0982
Female head			-0.1988
Constant	-1.250^{**}	-1.184^{*}	-1.151
Unbanked =1			
Low income	0.6521^{***}	0.6549^{***}	0.6761^{***}
HS_Diploma	0.7098^{***}	0.7101^{***}	0.7094^{***}
Female	-0.0969	-0.0989	
Married	-0.0413	-0.0205	-0.1065
Ever military	-0.3904^{*}	-0.3700^{*}	-0.3697^{*}
Home Owner	-0.7027^{***}	-0.6825^{***}	-0.6901^{***}
Age25		0.2201^{**}	0.2025^{**}
Female head			-0.2176^{**}
Constant	-1.266^{***}	-1.318^{***}	-1.262^{***}
ρ	0.4841	0.5857	0.5366
N	6,500	6,500	6,500
Log likelihood	-9,516,449.5	-9,491,912.3	-9,469,758.2

$*p < 0.05; **p < 0.01; ***p < 0.001$

For Black households in 2009 and 2011, the ρ correlation coefficients are not significantly different from zero. In these years, the probabilities that a households is unbanked and the probability that a household used a payday lender are not correlated. However, in 2013, the ρ coefficient is significantly different from zero. As such, in this year, the two probability models should be estimated simultaneously for the samples of Black households.

In Tables 15 and 18 the ρ correlation coefficients are significantly different from zero for the

Table 13: 2011 Regression Coefficients: All Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.212^{***}	-1.212^{***}	-1.222^{***}
low_income	0.2438^{***}	0.2451^{***}	0.2504^{***}
HS_Diploma	0.2257^{***}	0.2250^{***}	0.2253^{***}
Female	0.0406	0.0399	
Married	-0.0954^{***}	-0.1005^{***}	-0.0946^{***}
Black	0.5011^{***}	0.5188^{***}	0.5217^{***}
Hispanic	0.2578^{***}	0.2588^{***}	0.2615^{***}
Ever military	0.0162	0.0112	-0.0087
Home Owner	-0.5374^{***}	-0.5438^{***}	-0.5442^{***}
Age25		-0.0624	-0.0608
Female head			-0.0240
Constant	-1.379^{***}	-1.366^{***}	-1.348^{***}
Unbanked=1			
Low income	0.7548^{***}	0.7550^{****}	0.7580^{****}
HS_Diploma	0.5922^{***}	0.5922^{****}	0.5923^{****}
Female	-0.0100	-0.0099	
Married	-0.1713^{***}	-0.1711^{***}	-0.1889^{***}
Black	0.6774^{***}	0.6773^{***}	0.6800^{***}
Hispanic	0.6894^{***}	0.6894^{***}	0.6893^{***}
Ever military	-0.1636^{**}	-0.1629^{**}	-0.1700^{**}
Home Owner	-0.6699^{***}	-0.6701^{***}	-0.6692^{***}
Age25		-0.0010	-0.0047
Female head			-0.0374
Constant	-1.964^{***}	-1.964^{***}	-1.9450^{***}
ρ	0.7438^{***}	0.7436^{***}	0.7499^{***}
N	50,000	50,000	50,000
Log likelihood	-53,467,192	-53,460,071	-53,464,931

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 14: 2011 Regression Coefficients:Black Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	0.7068	0.7100	0 .7219
Low income	0.0826	0.0835	0.0835
HS_Diploma	-0.0062	-0.0056	-0.0081
Female	0.0912	0.0911	
Married	-0.0493	-0.0488	-0.0005
Ever military	-0.0370	-0.0377	-0.0291
Home Owner	-0.2462^{**}	-0.2455^{**}	-0.2489^{**}
Age25		0.0131	0.0196
Female head			0.1141
Constant	-1.073^{***}	-1.074^{***}	-1.084^{***}
Unbanked=1			
Low income	0.8445^{***}	0.8440^{***}	0.8423^{***}
HS_Diploma	0.4776^{***}	0.4782^{***}	0.4807^{***}
Female	-0.0565	-0.0565	
Married	-0.4133^{***}	-0.4117^{***}	-0.4209^{***}
Ever military	-0.1806	-0.1787	-0.1631
Home Owner	-0.5246^{***}	-0.5226^{***}	-0.5227^{***}
Age25		-0.0212	-0.0199
Female head			0.0844
Constant	-1.250^{***}	-1.254^{***}	-1.270^{***}
ρ	0.3113	0.3133	0.3195
N	6,000	6,000	6,000
Log likelihood	-12,271,707	-12,271,511	-12,272,040

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 15: 2011 Regression Coefficients:Hispanic Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.129^{***}	-1.137^{***}	-1.119^{***}
Low income	0.1996^{*}	0.1998^{***}	0.1819
HS_Diploma	0.0999	0.1035	0.1025
Female	-0.0345	-0.0356	
Married	-0.2241^{***}	-0.2308^{***}	-0.1989^{*}
Ever military	0.0277	0.0204	0.0534
Home Owner	-0.3870^{***}	-0.3952^{***}	-0.3918^{***}
Age25		-0.0614	-0.0542
Female head			-0.0626
Constant	-1.118^{***}	-1.101^{***}	-1.159^{***}
Unbanked =1			
Low income	0.6596^{***}	0.6600^{***}	0.6495^{***}
HS_Diploma	0.7734^{***}	0.7741^{***}	0.7785^{***}
Female	-0.0969	-0.0989	
Married	-0.0021	-0.0105	-0.0481
Ever military	-0.3857^{*}	-0.3720^{*}	-0.3533^{*}
Home Owner	-0.7729^{***}	-0.7632^{***}	-0.7652^{***}
Age25		0.1008	0.1099
Female head			0.0780
Constant	-1.404^{***}	-1.430^{***}	-1.473^{***}
ρ	0.5711^{**}	0.5764^{**}	0.5647^{**}
N	6,500	6,500	6,500
Log likelihood	10,640,289	-10,633,382	-10,629,996

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 16: 2013 Regression Coefficients: All Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.121^{***}	-1.122^{***}	-1.135^{***}
low_income	0.2426^{***}	0.2452^{***}	0.2536^{***}
HS_Diploma	0.2276^{***}	0.2269^{***}	0.2272^{***}
Female	0.0608^{**}	0.0596^{*}	
Married	-0.1317^{***}	-0.1388^{***}	-0.1357^{***}
Black	0.5618^{***}	0.5595^{***}	0.5646^{***}
Hispanic	0.2516^{***}	0.2531^{***}	0.2571^{***}
Ever military	-0.0467	-0.0536	-0.0790
Home Owner	-0.5436^{***}	-0.5533^{***}	-0.5523^{***}
Age25		-0.0926^{*}	-0.0911^{*}
Female head			-0.0191
Constant	-1.485^{***}	-1.4767^{***}	-1.4458^{***}
Unbanked=1			
Low income	0.7664^{***}	0.7662^{****}	0.7709^{****}
HS_Diploma	0.5947^{***}	0.5948^{****}	0.5947^{****}
Female	-0.0419	-0.0417	
Married	-0.1998^{***}	-0.1998^{***}	-0.2310^{***}
Black	0.6526^{***}	0.6527^{***}	0.6557^{***}
Hispanic	0.6446^{***}	0.6447^{***}	0.6442^{***}
Ever military	-0.2268^{***}	-0.2256^{***}	-0.2273^{***}
Home Owner	-0.6826^{***}	-0.6828^{***}	-0.6838^{***}
Age25		0.0011	-0.0053
Female head			-0.0712^{*}
Constant	-1.939^{***}	-1.940^{***}	-1.925^{***}
ρ	0.7628^{***}	0.7636^{***}	0.7714^{***}
N	44,000	44,000	44,000
Log likelihood	–52,395,069	-52,379,379	-52,388,833

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 17: 2013 Regression Coefficients: Black Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.255^{***}	-1.255^{***}	-1.267^{***}
low_income	0.2304^{*}	0.2258^{*}	0.2336^{**}
HS_Diploma	0.1231	0.1245	0.1195
Female	0.1333^{*}	0.1347^{*}	
Married	-0.1908^{**}	-0.1852^{**}	-0.1558^{*}
Ever military	-0.008	-0.0016	-0.0429
Home Owner	-0.4811^{***}	-0.4739^{***}	-0.4703^{***}
Age25		0.0761	0.0779
Female head			0.0894
Constant	-0.8027^{***}	-0.8157^{***}	-0.7781^{***}
Unbanked=1			
Low income	0.7729^{***}	0.7665^{****}	0.7637^{****}
HS_Diploma	0.5376^{***}	0.5417^{****}	0.5438^{****}
Female	-0.0041	-0.0009	
Married	-0.3231^{***}	-0.3135^{***}	-0.2982^{***}
Ever military	-0.3053^{**}	-0.2911^{**}	-0.2779^{**}
Home Owner	-0.6076^{***}	-0.5951^{***}	-0.5940^{***}
Age25		0.1302	0.1341
Female head			0.0309
Constant	-1.279^{***}	-1.301^{***}	-1.323^{***}
ρ	0.7475^{***}	0.7462^{***}	0.7536^{***}
N	5,000	5,000	5,000
Log likelihood	-12,556,363	-12,550,193	-12,561,177

$*p < 0.05; **p < 0.01; ***p < 0.001$

sample of Hispanic households in 2011 and 2013. This is not true in 2009.

Table 18: 2013 Regression Coefficients:Hispanic Households

Variables	Model 1	Model 2	Model 3
Payday=1			
Unbanked	-1.266^{***}	-1.271^{***}	-1.325^{***}
Low income	0.3049^{**}	0.3072^{**}	0.3318^{**}
HS_Diploma	0.0999	0.1035	0.1025
Female	0.0211	0.0209	
Married	-0.1376^{*}	-0.1364^{*}	-0.1378^{*}
Ever military	-0.1521	-0.1525	-0.1794
Home Owner	-0.5137^{***}	-0.5144^{***}	-0.5255^{***}
Age25		0.0047	0.0074
Female head			-0.0018
Constant	-1.059^{***}	-1.059^{***}	-1.026^{***}
Unbanked =1			
Low income	0.7836^{***}	0.7841^{***}	0.8038^{***}
HS_Diploma	0.6255^{***}	0.6246^{***}	0.6208^{***}
Female	-0.0930	-0.0931	
Married	-0.1254^{*}	-0.1189^{*}	-0.1882^{**}
Ever military	-0.7734^{*}	-0.7673^{*}	-0.7647^{*}
Home Owner	-0.7678^{***}	-0.7631^{***}	-0.7693^{***}
Age25		0.0573	0.0392
Female head			-0.1763^{**}
Constant	-1.299^{***}	-1.311^{***}	-1.274^{***}
ρ	0.7577^{**}	0.7604^{**}	0.7950^{**}
N	5,700	5,700	5,700
Log likelihood	-10,969,374	-10,967,829	-10,956,143

$*p < 0.05; **p < 0.01; ***p < 0.001$

Tables 19, 20, and 21 list the main results of this analysis, for survey years 2009, 2011, and 2013, respectively. These tables show the average marginal effects of the household characteristics on the probability that a household uses a payday lender, given that the household is unbanked. The tables show marginal effects for samples all households, Black households, and Hispanic households.

In 2009 and for all households, low income, unbanked households were 3 percentage points more likely to use a payday lender than unbanked households who are not low income. Black and Hispanic unbanked households were also 5 percentage points and 3 percentage points, respectively, more likely to use a payday lender than non-Black or non-Hispanic and unbanked households. Conversely, unbanked homeowners, married households and military veterans are less likely and use a payday lender. As it stands, the gender of the household reference person does not significantly change the predicted probability of using a payday lender.

The average marginal effects of households characteristics for the subsamples of Black and Hispanic households are not significant in 2009. However, it is worthy to note that the directional

Table 19: 2009 Average Marginal Effects

Variables	All Households	Black Households	Hispanic Households
Payday=1 and Unbanked=1			
Low income	0.0308^{***}	0.0081	0.0292
HS_Diploma	0.0273^{***}	0.0053	0.0280
Female	0.0001	0.0043	-0.0073
Married	-0.0072^{***}	-0.0071	-0.0054
Black	0.0547^{***}		
Hispanic	0.0353^{***}		
Ever military	-0.0042^{*}	-0.0048	-0.0120
Home Owner	-0.0384^{***}	-0.0157	-0.0470
Age25	-0.0002	0.0013	0.0014
N	50,000	6,000	6,500

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 20: 2011 Average Marginal Effects

Variables	All Households	Black Households	Hispanic Households
Payday=1 and Unbanked=1			
Low income	0.0367^{***}	0.0375	0.0356^{*}
HS_Diploma	0.0272^{***}	0.0169	0.0308^{*}
Female	0.0015	0.0030	-0.0022
Married	-0.0085^{***}	-0.0159	-0.0132^{**}
Black	0.0534^{***}		
Hispanic	0.0379^{***}		
Ever military	-0.0046^{*}	-0.0042	-0.0107
Home Owner	-0.0405^{***}	-0.0292	-0.0454^{**}
Age25	-0.0022	0.0014	-0.0007
N	50,000	6,000	6,500

$*p < 0.05; **p < 0.01; ***p < 0.001$

Table 21: 2013 Average Marginal Effects

Variables	All Households	Black Households	Hispanic Households
Payday=1 and Unbanked=1			
Low income	0.0377^{***}	0.0791^{***}	0.0628^{*}
HS_Diploma	0.0277^{***}	0.0500^{**}	0.0365^{*}
Female	-0.0008	0.0106	-0.0075
Married	-0.0106^{***}	-0.0339^{***}	-0.0147^{*}
Black	0.0544^{***}		
Hispanic	0.0354^{***}	-0.0252	
Ever military	-0.0083^{***}	-0.0203	-0.0375
Home Owner	-0.0408^{***}	-0.0662^{**}	
Age25	-0.0032	0.0028	0.0013
N	44,000	5,000	5,700

$*p < 0.05; **p < 0.01; ***p < 0.001$

change of the average marginal effects of demographic characteristics on the predicted probability a household uses a payday lender, on the samples of Black and Hispanic, are the same as the directional change of the average marginal effects for all households.

In 2011, Table 20, low income and minority households who are unbanked, are more likely to use a payday lender than higher income and White households. Unbanked households, headed by a married couple, are 0.8 percentage points less likely to use a payday lender than unmarried households. Homeowners and military veterans are also less likely to use a payday lender. Young age and gender do not produce statistically significant average marginal effects. These effects remain largely unchanged on the 2013 full sample of households, shown in Table 21.

Considering the samples of Black and Hispanic households, Table 20, show that none of the average marginal effects are statistically significant for the subsample of Black households. However, for Hispanic households, homeownership and marriage decrease the predicted probability that an unbanked household used a payday lender. Low income and Hispanic households with no more than a high school diploma are more likely to use a payday lender, though these effects are weakly significant at the $p < 0.05$ significance level.The lack of statistical significance on estimates from subsamples of Black and Hispanic households could be due to the small sample size of these households in the survey data.

My results are consistent with the previous research by Pew Charitable Trust. Pew, with their survey data, estimated a logistical model of the decision to use a payday lender, controlling for whether the individual was African American, non-married, without a college degree, had an income of $40,000 or below, rented, and a female show every demographic characteristic was significant and are more likely to use a payday loan than the base groups. Pew and this research also found that Blacks, those who were separated or divorced, those without a college degree, those with income less than $40,000, and those who rented were more likely to use a payday lender than the people not in those demographic categories.

Conclusion

All in all, unbankedness decreases the probability that a household uses a payday lender. This result is significant and consistently inversely related to the predicted probability of using a payday lender for the sample of all households, and across all three survey years. For Hispanic and Black households, most results are not statistically significant. This means that being unbanked prevents a household from obtaining a payday loan. Therefore, per this analysis, it is better to be poor and unbanked than poor with a bank account.

For decades, policymakers have worked to bring low income and minority populations to banking services. Without access to conventional banking products, research has shown that unbanked households purchase financial products from alternative financial outlets and pay a premium for these service. This research shows that there is a statistically significant relationship between the probability that a household is unbanked and probability that the household is a payday loan consumer, as the household characteristics of these two groups are very similar.

Previous policies have aimed to help unbanked households open and maintain bank accounts with marginal success. Likewise, there have been increase regulation of the payday lending industry and increased scrutiny of their business practices. Since payday loan consumers and unbanked households are statistically similar and are predominately low-income, conventional banks could reach these two population by offering bank accounts with low balance minimums. Households with these accounts in good standing could then have access to small, short term loans from the bank. These loans would be similar to payday loans except since they come from a traditional bank, could be repaid in installments, and would be capped a the legal limit for APR.

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